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January 2020

United States Coast Guard Station Lake Tahoe Year-Round Mooring Project NEPA Environmental Assessment/ CEQA Initial Study/ TRPA Environmental Assessment

Public Draft

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List of Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
AB	Assembly Bill
ADT	Average Daily Traffic
AHPA	Archaeological and Historic Preservation Act
AQAP	Air Quality Attainment Plan
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
BMP	best management practice
B.P.	before present
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Cal-OSHA	California Division of Occupational Safety and Health
CalPeco	California Pacific Electric Company
Caltrans	California Department of Transportation
CAP	climate action plan
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CG	United States Coast Guard
CHRIS	California Historic Resources Information System
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
COC	constituent of concern
Compact	Tahoe Regional Planning Compact
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CO_{2e}/yr	carbon dioxide equivalent per year
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Rank
CTC	California Tahoe Conservancy
CWA	Clean Water Act

CWCB	California Wildlife Conservation Board
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
DHHS	Department of Health and Human Services
DTSC	California Department of Toxic Substances Control
DVTE	daily vehicle trip end
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ERSL	Eastern Regional Sanitary Landfill, Inc.
FCAA	Federal Clean Air Act
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HP	horsepower
HU	Hydrologic Unit
IEC	Initial Environmental Checklist
in/sec	inches per second
IPES	Individual Parcel Evaluation System
IS	Initial Study
Lahontan Basin Plan	*Water Quality Control Plan for the Lahontan Region*
L_{dn}	day-night noise level
L_{eq}	equivalent sound level
L_{eq}[h]	equivalent sound level over a 1-hour period
LOS	level of service
LRWQCB	Lahontan Regional Water Quality Control Board
LTAB	Lake Tahoe Air Basin
LTBMU	Lake Tahoe Basin Management Unit
LTD	Lake Tahoe Datum
LUST	leaking underground storage tank
L_v	RMS vibration velocity level
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level

µg/L	micrograms per liter
MRF	Material Recovery Facility
mg/L	milligrams per liter
MMT	million metric tons
MT	metric ton
MND	Mitigated Negative Declaration
MOU	Memorandum of Understanding
Mph	miles per hour
MPO	Metropolitan Planning Organization
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ND	Negative Declaration
NEPA	National Environmental Policy Act
NDEP	Nevada Division of Environmental Protection
NDOW	Nevada Department of Wildlife
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTPUD	North Tahoe Public Utility District
NTU	nephelometric turbidity unit
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PAOT	persons at one time
PCAPCD	Placer County Air Pollution Control District
PCB	polychlorinated biphenyl
PCCDRA	Placer County Community Development Resource Agency
PERP	Portable Equipment Registration Program
PFH	Prime Fish Habitat
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
Project	Station Lake Tahoe Year-Round Mooring Project
RCRA	Resource Conservation and Recovery Act

RMS	root mean square
ROG	reactive organic gas
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDWA	Safe Drinking Water Act
SEL	sound exposure level
SEZ	Stream Environment Zone
SHPO	State Historic Preservation Officer
SHZ	Seismic Hazard Zone
SIP	State Implementation Plan
SO_2	sulfur dioxide
SQIP	Scenic Quality Improvement Program
SR	State Route
SSC	Species of Special Concern
Station	Coast Guard Station Lake Tahoe
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TART	Tahoe Area Regional Transit Agency
TBD	to be determined
TCPUD	Tahoe Public Utility District
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily load
TMPO	Tahoe Metropolitan Planning Organization
TN	total nitrogen
TP	total phosphorus
TPH	total petroleum hydrocarbons
TRPA	Tahoe Regional Planning Agency
TSCA	Toxic Substances Control Act
TTD	Tahoe Transportation District
TTSA	Tahoe-Truckee Sanitation District
TWA	time-weighted average
UC Davis TERC	University of California, Davis – Tahoe Environmental Research Center
UCMP	University of California Museum of Paleontology
U.S.	United States
USA	Underground Service Alert
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency

USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V/C	volume-to-capacity
VdB	vibration decibel
VMT	vehicle miles traveled
WEAP	Worker Environmental Awareness Program
WQC	Water Quality Certification

Executive Summary

The United States (U.S.) Coast Guard (CG) has prepared this document to analyze the potential environmental impacts of the proposed CG Station Lake Tahoe (Station) Year-Round Mooring Project (Project). The proposed Project requires environmental review under the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and Tahoe Regional Planning Agency (TRPA) regulations to determine whether the Project may have significant effects on the environment.

This document describes the Project Alternatives considered by the CG, reviews relevant background information on the environmental resources potentially affected by the Project, and analyzes the impacts on these resources potentially resulting from implementation each of the Project Alternatives. This document also describes measures that would be implemented under each of the Project Alternatives to avoid, minimize, and/or mitigate potential environmental impacts.

ES.1 Project Background, Purpose, and Need

The proposed Project involves implementing modifications at the Station's private single-use pier (which was originally constructed in 1967 and upgraded in 2001) to provide consistent long-term, year-round mooring capabilities. The existing pier is 312 feet long and 8 feet wide, and extends beyond the pierhead line to a lake-bottom elevation of approximately 6,220 feet, Lake Tahoe Datum (LTD). The pier is meant to provide access to the Station's two rapid response boats and ancillary equipment (including a fueling station and boat lift) that supports the operations of the response boats. However, due to cyclical droughts and seasonal low water levels at Lake Tahoe, water depths at the existing pier head are not sufficient for the CG to consistently keep their boats at the Station.

The purpose of the proposed Project is to provide mooring capabilities at the Station at a suitable depth so that the CG's rapid response boats can consistently moor there year round, including in drought conditions. The proposed Project would improve the CG's ability to protect and serve the boating public and agencies that use Lake Tahoe and is in furtherance of the CG's mission of protecting public safety and security. The purpose of the Project is also to enhance the CG's ability to respond to incidents on Lake Tahoe that involve the discharge, or potential discharge, of petroleum products and/or other deleterious materials, and to thereby help protect the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe.

The CG needs year-round, 24-hour, immediate access to the Station's rapid response boats to provide essential emergency search and rescue, law enforcement, commercial and recreational boating safety, and environmental protection services to the boating public and the agencies that use Lake Tahoe. Under current conditions, when water levels are low (generally October through January, and year round during drought conditions), rapid response boats must be moored at alternate sites, which increases response times and creates safety and security issues. Currently, CG crews must keep their response boats at the Tahoe City Marina and therefore must drive from the Station to the Marina to access their boats after receiving a call for assistance on the lake. This adds a minimum of 15 to 20 minutes of loading, travel, and unloading time each time the CG responds to an incident on the lake, and up to 40 minutes during the height of the tourist traffic seasons. In addition to securing an alternative mooring site at the Tahoe City Marina, the CG has attempted to deal with current drought conditions by procuring special-purpose vessels with a shallower draft and installing emergency lights on their response vehicle to minimize traffic delays in reaching their boats, but these measures have not fully eliminated delays in response times and, in the long term, the CG requires year-round mooring capabilities at the Station pier to continue to effectively fulfill their missions.

The Station responds to an average of more than 150 incidents on Lake Tahoe each year. When the CG is required to moor their response boats away from the Station, it is often difficult or impossible to meet the CG's search and rescue standards, which require the CG boat to be underway in less than 30 minutes

after a distress call is received. The survival rate of a person in the water decreases as temperatures decrease, and rapid response time can be vital to saving a person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency on the lake that has staff and equipment available as a permanent presence on the lake to respond to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

In addition to protecting public safety, consistent rapid access to the CG's response boats is needed to allow the CG to more effectively provide spill response, search and rescue, boating safety, and law enforcement services that help protect the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe. The CG serves as a first responder for damaged and submerged vessels that could release fuel and other deleterious materials to the lake. Spill response equipment is kept at the Station, and the Station staff is trained in spill response procedures. Larger recreational vessels on Lake Tahoe can contain more than 350 gallons of fuel (up to 2,000 gallons for commercial vessels) as well as other deleterious materials that could be discharged to Lake Tahoe during a boating incident, and rapid response to such incidents can be crucial in avoiding or limiting the spread of a spill. Through their role in boating safety and law enforcement, the CG can also help prevent incidents from occurring in the first place. The CG also shares responsibility for coordinating spill response on the lake with the U.S. Environmental Protection Agency and state and local emergency response agencies. Ideally, the Station would be able to serve as an Incident Command Post in the event of a larger incident, and has sufficient road access and communications and meeting facilities to do so; however, the current lack of access to the CG pier could hinder the Station's ability to serve in such a role.

In summary, the purpose of the proposed Project is to provide sufficient depth at the Station pier so that the CG can moor their response boats there on a consistent basis, which is needed so that the CG can effectively protect public safety and security and the environmental values of Lake Tahoe.

ES.2 Regulatory Authority and Intended Uses of this Document

The proposed Project requires environmental review pursuant to NEPA, CEQA, and TRPA regulations. This document serves as the following:

- An Environmental Assessment (EA) pursuant to NEPA and in accordance with the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations 1500-1508) and the CG Commandant Instructions Manual 1647 .1D (NEPA Implementing Procedures and Policy for Considering Environmental Impacts).

- An Initial Study (IS) pursuant to Articles 5 and 6 of the CEQA Guidelines.

- An EA pursuant to the TRPA Code of Ordinances Section 3.4.

Because the proposed Project would be funded and conducted by the CG, a federal agency, it would require discretionary approvals from other federal agencies, and therefore requires NEPA compliance. The CG is the lead agency under NEPA. The Project requires discretionary approvals from the Lahontan Regional Water Quality Control Board (LRWQCB), a state agency, and therefore meets the definition of a "project" requiring evaluation under CEQA. The LRWQCB is the lead agency under CEQA. In addition, the proposed Project is within TRPA jurisdiction and requires environmental review by TRPA. This document is a joint document satisfying federal, state, and TRPA agency guidelines.

This joint NEPA EA, CEQA IS, and TRPA EA has been prepared to determine whether the Project may have a significant impact on the environment. It is based upon the CEQ and CG NEPA guidelines and

CEQA and TRPA checklists, which identify the various environmental impacts or effects that may result from implementation of the Project. As required by NEPA and CEQA, this document considers direct impacts (those caused by an action and occurring at the same time and place), indirect impacts (those caused by an action but occurring later or farther away but at a reasonably foreseeable time or place), and cumulative impacts (those caused by the proposed Project in combination with other past, present and reasonably foreseeable future projects).

Each agency will use this document to make decisions based on the respective agency's planning policies and statutory requirements. This document will be circulated for public review and comment pursuant to the requirements of NEPA, CEQA, and TRPA. The lead agencies will consider the findings in this document, along with any comments received during the public review process, prior to taking action. Federal cooperating agencies and state responsible and trustee agencies may also use this document, as needed, for subsequent discretionary actions.

ES.3 Project Alternatives

The following subsections provide summary descriptions of the three alternatives that are considered to meet the proposed Project's purpose and need and are carried forward for further analysis throughout the document. The three Action Alternatives (i.e., Alternatives 1, 2, and 3) are designed to provide a lake-bottom elevation of approximately 6,215 feet, LTD, at the pier head, which would provide a water depth of approximately 5 feet under conditions equivalent to the lowest recorded lake level (6,220.2 feet, LTD, in November 1992; U.S. Geological Survey 2016) since the Truckee River outlet dam was built at Tahoe City. Alternative 1 is the Proposed Action. A No Action/No Project Alternative as required under NEPA and CEQA, which would result in the continuation of existing conditions, is also described.

ES.3.1 Alternative 1 (Proposed Action): Dredging at Existing Pier

Alternative 1 consists of dredging a channel to allow access to the existing pier during low-water conditions. The channel would be dredged to an elevation of 6,215 feet, LTD, with 2 feet of overdepth allowance.[1] The proposed dredging footprint would be approximately 410 feet long, would range from 50 to 90 feet wide, and would cover an area of approximately 27,816 to 29,749 square feet (the lower limit excludes overdepth; the upper limit includes full overdepth, which also provides a 2-foot allowance for the dredging prism's side slopes). The volume of material removed from the lake bottom would be approximately 2,656 to 5,041 cubic yards (CY) (lower limit excludes overdepth; upper limit includes overdepth allowance).

The dredging would be conducted with a barge-mounted long-reach excavator. Dredging would be conducted in accordance with U.S. Army Corps of Engineers (USACE), LRWQCB, and TRPA permitting requirements. The excavator would place the dredged material on a second barge, where the material would be stockpiled temporarily while it dewaters. The work barges would be anchored by spuds (i.e., temporary piles), as needed, and a small tugboat may be used to move the barges.

The dredged material would be transported from the dredging area to the shore by a conveyor belt system mounted on temporary stands. A second excavator may be used to move the material from the barge onto the conveyor. The conveyor system would be composed of overlapping 60-foot-long units. Six of these units would be required to cover the distance between the dredging footprint and the Station parking lot. The supports for the conveyor would sit on the surface of the lakebed and would be positioned in a manner that minimizes disturbance to aquatic vegetation and spawning habitat. The total temporary lake-bottom footprint for the stands that would support the conveyor units would be approximately 38 square feet. The conveyor

[1] The overdepth allowance is meant to account for unavoidable excavation inaccuracies during dredging. The dredging contractor will be instructed to limit dredging to the minimum area necessary to achieve the target elevation and dimensions and to minimize overdepth dredging to the extent practicable. However, dredging of the full overdepth allowance has been considered in the impact analyses in this EA to fully assess potential worst-case impacts.

system would load the dredged materials into lined trucks in the Station parking lot. Once the dredged material is loaded into the lined trucks, it would be transported to the Eastern Regional Material Recovery Facility (MRF), near the junction of State Route (SR) 89 and Cabin Creek Road, Truckee, California, or to another licensed, TRPA-approved upland disposal facility.

The duration of the dredging is expected to be approximately 8 weeks. Maintenance dredging would be required approximately once every 10 to 15 years to remove accumulated sediments and maintain an elevation of 6,215 feet, LTD, at the pier head. The impact analyses for Alternative 1 include a general discussion of the potential environmental effects of future maintenance dredging. The CG would obtain appropriate regulatory approvals before conducting maintenance dredging.

In addition to dredging, Alternative 1 would also include removing the pier's existing 8,000-pound capacity boat lift from the eastern side of the pier head and replacing it with an 18,000-pound lift and installing a 35-foot by 8-foot floating dock. The replacement boat lift and floating dock would be placed on the western side of the existing pier head to minimize the amount of dredging needed, because current lakebed elevations are lower to the west and southwest of the pier. The larger-capacity lift and new floating dock are needed to accommodate the Station's response boats and a range of potential visiting vessels, including those of other first responder and law enforcement agencies, as well as vessels that must be towed back to the Station to evacuate injured boaters or lawbreakers or contain a potential discharge. Because the replacement boat lift and new floating dock would be placed on the western side of the pier, the location of some existing pier-head structures (e.g., existing lighting, ladders, railing, meteorology station, and fueling station) may also need to be reconfigured to allow functionality of the boat lift and floating dock.

To avoid and minimize environmental impacts, a suite of best management practice (BMPs) (described in *Chapter 2, Project Alternatives*) would be implemented during Project construction.

After construction is completed, operations at the Station would continue largely unchanged from current conditions, other than periodic maintenance dredging. The CG would obtain the appropriate regulatory approvals before conducting future maintenance dredging and would implement BMPs, as applicable, when conducting maintenance dredging.

ES.3.2 Alternative 2: 350-Foot Dog-Leg Extension with Dolphin Piles

Alternative 2 would extend the Station's existing 312-foot pier by an additional 350 feet in a dog-leg formation. The proposed pier extension would consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the new pier head itself. Each of these components is described as follows:

Span Connecting to Existing Pier: The connecting span would extend the existing pier 250 feet south into Lake Tahoe and would be 5 feet wide. The pier decking material for the span would consist of pre-fabricated grated metal and would be supported by a dolphin pile configuration.

New Pier Head: The new pier head would be 100 feet long and 8 feet wide and would angle west at an approximate 45-degree angle from the connecting span. The pier head would have a grated metal deck. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, LTD, which is expected to be sufficient for year-round mooring during drought years. The dog-leg orientation of the pier head is designed to reach a sufficient depth while minimizing the length of the connecting span, based on site bathymetry. Facilities on the pier head would include one 18,000-pound capacity boat lift (which would replace the pier's existing 8,000-pound lift); a 70-foot by 8-foot floating dock; a reconfiguration/relocation of the existing fueling station; and utility lines that would run underneath the pier.

The total net footprint for the additional pier under Alternative 2 would be approximately 2,610 square feet. The grated decking would create approximately 70 percent less shading than a solid deck, so the shaded

footprint of Alternative 2 would be equivalent to approximately 1,180 square feet. The total lake-bottom footprint for the 22 total piles would be approximately 12 square feet. The anticipated construction duration for Alternative 2 would be approximately 7 weeks.

To avoid and minimize environmental impacts, a suite of BMPs (described in *Chapter 2, Project Alternatives*) would be implemented during Project construction.

After construction of the pier extension is completed, operations at the Station would continue largely unchanged from current conditions. Additional BMPs would be implemented by the CG during the operations phase of Alternative 2 to avoid and minimize potential adverse impacts to environmental resources (see *Chapter 2, Project Alternatives*).

ES.3.2 Alternative 3: 450-Foot Straight Extension with Dolphin Piles

Alternative 3 would extend the Station's existing 312-foot pier by an additional 450 feet in a straight formation. The pier extension proposed for Alternative 3 would also consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the new pier head itself. Each of these components is described as follows:

Span Connecting to Existing Pier: The connecting span for Alternative 3 would extend 350 feet south. The span would be 5 feet wide and be composed of metal grating supported by dolphin piles.

New Pier Head: The new pier head would be 100 feet long by 8 feet wide and would extend straight south from the connecting span. The pier head would have a grated metal deck. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, LTD, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include an 18,000-pound capacity boat lift (which would replace the existing boat lift), a 70-foot by 8-foot floating dock, reconfiguration/relocation of the existing fueling station, and utility lines that would run underneath the pier. The total footprint of the additional pier under Alternative 3 would be 3,110 square feet, and, due the grated deck, the shaded footprint would be equivalent to 1,330 square feet. Alternative 3 would require a total of 26 piles, which would result in a lake-bottom footprint of approximately 14 square feet. Construction duration would be approximately 8 weeks. The construction techniques used for Alternative 3 would be identical to those described for Alternative 2.

ES.3.3 Alternative 4: No Action

Under Alternative 4, no dredging or pier construction would occur at the existing pier, and CG operations would continue with existing conditions. Due to the ongoing effects of climate change, which is expected to cause more frequent and more severe cyclical droughts and seasonal low water levels at Lake Tahoe, water depths at the existing pier head will not be sufficient for the CG to consistently keep their response boats moored at the Station. The continuation of existing conditions would prevent the CG from providing essential emergency search and rescue, law enforcement, and boating safety services to the boating public and agencies that use Lake Tahoe, because response times would not meet CG search and rescue standards during low-water periods when the response boats must be moored off site.

ES.3.4 Summary Comparison of Alternatives

Table ES-1 provides a summary comparison of the four alternatives that are being considered.

Table ES-1 Summary Comparison of Alternatives

Alternative	Description	New Surface Area over Lake (square feet)	New Shaded Area (square feet)	Lake-Bottom Footprint (square feet)	Material Dredged (CY)	Total Number of Piles	Construction Duration (weeks)
Alternative 1 – Dredging at Existing Pier (Proposed Action)	Dredge a 410-foot-long by 50- to 90-foot wide channel at the existing 312-foot pier, using a barge-mounted excavator. Transport material from the barge to the shore using conveyor, then haul to the materials recovery facility. Requires maintenance dredging every 10 to 15 years. Remove existing 8,000-pound boat lift and replace with new 18,000-pound boat lift and install a 35-foot by 8-foot floating dock on western side of existing pier head. Reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, fueling station) to accommodate new lift and dock.	410	410	27,816 – 29,749	2,656-5,041	2	8
Alternative 2 – 350-foot Dog-Leg Extension with Dolphin Piles	Install new connecting pier span 250 feet long by 5 feet wide south into the lake using grated metal and dolphin piers. Install new pier head using grated metal deck, 100 feet long by 8 feet wide at a 45-degree angle west from the connecting span. The otal pier length would be 662 feet (312 feet existing plus 350 feet new). Install a new 70-foot by 8-foot floating dock. Remove the existing 8,000-pound boat lift, replace with a new 18,000-pound boat lift, reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, and fueling station), and extend existing utility lines that run underneath the pier.	2,610	1,180	12	0	22	7
Alternative 3 – 450-foot Straight Extension with Dolphin Piles	Install a new connecting pier span 350 feet long by 5 feet wide south into the lake using grated metal and dolphin piles. Install a new pier head 100 feet long by 8 feet wide continuing south using grated metal. The total pier length would be 762 feet (312 feet existing plus 450 feet new). Install a new 70-foot by 8-foot floating dock. Remove the existing 8,000-pound boat lift, replace with a new 18,000-pound boat lift, reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, and fueling station), and extend existing utility lines that run underneath the pier.	3,110	1,330	14	0	26	8
Alternative 4 – No Action	Continue with existing conditions	0	0	0	0	0	0

ES.4 Environmental Impacts and Mitigation Measures

Chapter 3 of this document presents detailed information on the affected environment, regulatory setting, and potential environmental impacts of the proposed Project Alternatives (including cumulative impacts) for a broad range of environmental resource areas, as required by NEPA, CEQA, and TRPA regulations. The environmental analysis determines whether each of the proposed Project Alternatives would have a potentially significant impact for each resource analyzed. *Table ES-2* provides a summary of the conclusions of the environmental analysis. For CEQA and TRPA, the impact significance determination is based on the highest degree of impact assessed for the various checklist questions for each resource.

Table ES-2 Comparison Summary of Impact Significance for Each Project Alternative

Resource Area	Legislation	Alternative 1: Dredging at Existing Pier (Proposed Action)	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Aesthetics, Scenic Resources, and Community Design	NEPA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
Air Quality and Greenhouse Gases (GHGs)	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Biological Resources	NEPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
Cultural Resources	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Geology, Soils, and Land	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Hazards, Hazardous	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

Resource Area	Legislation	Alternative 1: Dredging at Existing Pier (Proposed Action)	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Materials, and Risk of Upset	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Hydrology and Water Quality	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
Noise and Vibration	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Recreation	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Transportation, Traffic, and Navigation	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Utilities and Service Systems	NEPA	Less-than-Significant Impact	No Impact	No Impact	No Impact
	CEQA	Less-than-Significant Impact	No Impact	No Impact	No Impact
	TRPA	Less-than-Significant Impact	No Impact	No Impact	No Impact
Cumulative Impacts	All	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact

Chapter 3 of the EA also describes the measures that would be implemented to mitigate for potentially significant effects on environmental resources that would remain after full implementation of the proposed BMPs. For each of the resource areas shown in *Table ES-2* as having a less-than-significant impact with mitigation incorporated, the proposed mitigation measures are described in *Table ES-3*:

Table ES-3 Proposed Mitigation Measures

Resource Area	Mitigation Measure	Description
Aesthetics and Scenic Quality	**MM AES-1, Mitigation of Additional Visible Mass**	In accordance with the requirements of the Lake Tahoe Shoreline Plan, each square foot of visible mass above an elevation of 6,226 feet, LTD, added by the Project will be mitigated at a ratio of 1:2.0. Mitigation will be accomplished by planting additional native landscaping to screen the view of existing Station structures from Lake Tahoe. In accordance with TRPA guidelines, new screening would first be added in the shorezone, and once no additional mitigation in the shorezone is practicable, screening would be added to the upland area between the Station buildings and the lakeshore. The new landscaping will be located and maintained so as to preserve the CG's visibility of the lake from the Station (for operational and safety purposes), meet requirements for fire protection and defensible space, and avoid disturbance of existing native vegetation. The CG will prepare and implement a *Scenic Resources Mitigation Plan* for the selected Project Alternative that will include landscaping plans specifying the location, type, and quantity of new screening plantings, subject to review and approval by TRPA. The landscape plan will use native plant species recommended in the *Home Landscaping Guide for Lake Tahoe and Vicinity* (University of Nevada Cooperative Extension 2006) to reduce the need for irrigation and fertilizer. Survivorship and growth of the new landscaping will be monitored quarterly for the first year, while the plants are establishing, and then annually for an additional 4 years, Corrective actions (e.g., replacement of dead plants) would be taken as needed based on the monitoring results. A *Scenic Mitigation Monitoring Report* describing the monitoring results and any corrective actions taken or proposed will be submitted to TRPA annually during the 5-year monitoring period. Achievement of the 1:2.0 screening criteria will be subject to TRPA verification at the end of the monitoring period.
Biological Resources	**MM BIO-1, Fish Habitat Mitigation and Monitoring**	Removal or displacement of Prime Fish Habitat (PFH) resulting from the proposed Project will be mitigated as required by TRPA. The following mitigation and monitoring protocol will be implemented: • In consultation with TRPA, an area in the nearshore zone (i.e., between a lake-bottom elevation of 6,193 and 6,223 feet, LTD) at the Station will be designated for placing new feed and cover habitat to replace that which will be removed or displaced by the Project. Areas of the lakebed that currently have substrate types that are not considered PFH (e.g., clay) but which are adjacent to the PFH remaining on site after Project construction would be prioritized for habitat enhancement to provide habitat continuity. Littoral processes, human disturbance factors, and potential water level fluctuations will also be considered when choosing the location of the replacement habitat to increase the likelihood that it will remain functional habitat over the long term.

Resource Area	Mitigation Measure	Description
Biological Resources (continued)	**MM BIO-1, Fish Habitat Mitigation and Monitoring (continued)**	• In accordance with TRPA requirements, the area of PFH permanently removed or displaced due to implementation of the proposed Project will be replaced at a ratio of 1:1.5 to ensure no net loss of habitat. To accomplish the required mitigation, substrate similar to that currently present in the affected PFH (i.e., cobble and small boulders) will be placed in the area designated for habitat creation. The replacement habitat will be designed to provide equal or greater function and value as the PFH removed or displaced by the proposed Project. • To the extent practicable, cobble, boulders, and large woody debris removed during the dredging area would be recovered, separated from finer sediments, and used to create the replacement habitat. If additional material is required, it will be washed and free of invasive species or other deleterious materials. As applicable, the CG will obtain approval from the USACE under Clean Water Act Section 404 for the placement of additional fill in a water of the U.S. • The new substrate will be placed in the designated area in an appropriate manner that minimizes lake-bottom disturbance and turbidity (e.g., lowered by excavator, cargo net, or similar equipment and/or placed by hand) and replicates the characteristics of naturally occurring habitat. • An inspection will be conducted just after placement of the replacement substrate and then annually for 3 years thereafter to determine the effectiveness of the mitigation. The inspections will be performed by a qualified fisheries biologist, who will conduct a dive survey to determine whether the condition of the replaced substrate is suitable to provide equal or greater habitat function and value as the PFH removed or displaced by the Project (e.g., in place and not excessively silted over or infested with invasive aquatic organisms). The biologist will also observe whether fish and/or benthic prey organisms are present and using the created habitat. • If the Project biologist determines during the annual inspection that the restored substrate is not meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, then the CG would implement corrective actions, which may include removing silt or invasive organisms, installing additional replacement substrate, or undertaking other actions agreed upon by TRPA. • A PFH Mitigation Monitoring Report will be prepared annually for 3 years after Project completion and submitted to TRPA, U.S. Fish and Wildlife Service, and the California Department of Fish and Wildlife. The report will include photographs of the restored habitat, a description of observations made during the monitoring, a determination of the replacement habitat's effectiveness in meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, and a description of any corrective actions taken or proposed.

ES.5 Conclusions and Selection of Preferred Alternative

The state CEQA Guidelines require identification of an environmentally superior alternative from among the proposed action and the alternatives evaluated. Federal NEPA guidelines also recommend that an environmentally preferred alternative be identified; however, under NEPA, that alternative does not need to be identified until the final findings and decision memoranda are published. Therefore, the discussion in this section of the environmentally superior alternative is intended to satisfy only the state CEQA requirements.

Based on the impact significance determinations in *Table ES-2*, Alternative 1 (the Proposed Action) would be the environmentally superior alternative under CEQA because it meets the purpose and need of the Project while avoiding potentially significant impacts to the environment. As shown in *Table ES-2*, Alternative 1 is not expected to have the potential to result in significant environmental impacts with implementation of the proposed mitigation measures and BMPs, whereas Alternatives 2 and 3 would both have potentially significant and unmitigable impacts on aesthetics, scenic resources, and community design, including

potential cumulatively considerable impacts to those resources. Although Alternative 4 would have no impacts relative to the existing baseline, the No Action Alternative does not fulfill the purpose and need of the Project and would result in the continuation of unacceptable adverse conditions related to public safety and security, as well as air quality, hazardous materials control, water quality, and traffic, caused by the current need for the CG to moor their boats off site during low water conditions.

In addition to not having potentially significant adverse impacts on aesthetics, scenic resources, and community design, Alternative 1 would also have less impact on many other key environmental resources than Alternative 2 or 3, while still fulfilling the purpose and need of the Project. For those resources where the impacts of Alternative 1 are greater than the other Action Alternatives, these impacts can still be minimized or mitigated to a less-than-significant level. A summary of the impacts of Alternative 1 on key resources in comparison to those of the other two Action Alternatives is provided below:

- *Aesthetics, Scenic Resources, and Community Design* – Alternative 1 would involve the addition of substantially less area of new structure visible from Lake Tahoe and public recreation areas than Alternatives 2 and 3 (174 square feet for Alternative 1, versus 734 square feet and 704 square feet for Alternatives 2 and 3, respectively). As discussed, Alternative 1 also would avoid potentially significant and unmitigable impacts to aesthetics, scenic resources, and community design. In contrast, Alternatives 2 and 3 would both have significant and unmitigable impacts related to inconsistency with TRPA's Scenic Quality Improvement Program and design standards and effects on views from public recreation areas. Additionally, multiple comments received during the public scoping period for this document indicated a preference for Alternative 1 because it would avoid significant impacts on public and private views to and from Lake Tahoe.

- *Air Quality and GHG Emissions* – Daily emissions of criteria pollutants during construction of Alternative 1 would be less than for Alternatives 2 or 3. Total emissions of criteria pollutants would also be less for Alternative 1. Daily and total GHG emissions are somewhat higher for Alternative 1 than the two pier extension Alternatives, but would still be well below the Placer County Air Pollution Control District's recommended GHG threshold and therefore would be less than significant. Alternative 1 would also involve periodic maintenance dredging that would generate air emissions, but these emissions are expected to be lower than for the original dredging episode and therefore would be less than significant. In the long term, Alternative 1 would have beneficial effects on air quality and GHG emissions by eliminating vehicle emissions involved with driving between the Station and an off-site mooring location, and by improving the CG's ability to respond to incidents involving release of volatile fuels that contribute to emissions of reactive organic gases.

- *Biological Resources* – Although Alternative 1 would affect a larger area of lake-bottom habitat than Alternatives 2 or 3, most of the area affected does not provide high-quality habitat. Alternative 1 would affect more potential PFH than Alternatives 2 or 3 (up to 1,895 square feet versus 5 and 3 square feet, respectively), but implementation of **MM BIO-1** would mitigate impacts on PFH by replacing the affected PFH at a 1:1.5 ratio, ensuring that there is no net loss of habitat. Alternative 1 would also involve significantly less pile driving than Alternatives 2 and 3, and therefore has less potential to cause hydroacoustic-related impacts to aquatic biota.

- *Cultural Resources* – Alternative 1 would involve greater disturbance of the lake bed than the other Action Alternatives, but no significant cultural resources are likely to occur in the Project Area based on cultural records searches and other historical research. In the unlikely event that buried cultural resources are discovered during dredging, **BMP C1-21** would be implemented, requiring that ground-disturbing activities cease in the area of the find and that appropriate reporting and treatment protocols are implemented.

- *Geology, Soils, and Land* – The main concern related to geology, soils, and land for all Action Alternatives was impacts on littoral processes – i.e., erosion, transport, and deposition of sediment in the shorezone. A littoral drift study conducted for the Project concluded that none of the three Action Alternatives would have significant impacts on littoral processes. Alternative 1 would affect wave heights and velocities over a larger area than Alternatives 2 and 3, but these changes would not

extend to the shoreline and would not affect shoreline or backshore erosion or deposition. Alternative 1 would have less effect on long-shore currents, and therefore on long-shore transport of sediments, than Alternatives 2 and 3, and overall the impacts of Alternative 1 on littoral processes would be less than significant.

- *Hazards, Hazardous Materials, and Risk of Upset* – The three Action Alternatives would involve similar impacts related to hazards, hazardous materials, and risk of upset. The results of sediment and water samples collected at the Project site indicate there are no human health or water quality COC present at levels that would exceed the respective thresholds (AECOM Technical Services 2016). In accordance with **BMP C1-1**, all dredged materials would be transported to an appropriately licensed off-site disposal facility. In the long term, all Action Alternatives would improve the CG's ability to respond to incidents involving releases, or potential releases, of hazardous materials to Lake Tahoe.

- *Hydrology and Water Quality* – Alternative 1 would involve greater lakebed disturbance, and therefore greater potential for turbidity-related impacts on water quality during construction, than Alternatives 2 and 3. Alternative 1 would also involve potential water quality impacts associated with maintenance dredging, which would be required every 10 to 15 years, but which is expected to involve a lower level of water quality impacts than the original dredging episode. Multiple BMPs related to water quality would be implemented during construction and maintenance dredging, as described in *Chapter 2, "Project Alternatives*,*"* and construction-related impacts to water quality would be short term, localized, and less than significant. In the long term, all Action Alternatives would improve the CG's ability to respond to incidents on Lake Tahoe that could involve the discharge, or potential discharge, of deleterious substances that could affect water quality. However, only Alternative 1 would minimize future turbidity caused by boats passing through the dredged area, because the water would be deeper.

- *Noise and Vibration* – Construction of Alternative 1 would generate substantially less noise and vibration than Alternatives 2 and 3, because it would involve substantially less pile driving.

- *Recreation* – Construction of Alternative 1 would involve impacts to recreational users of Lake Tahoe similar to those of Alternatives 2 and 3, and recreational impacts during construction of all three Alternatives would be short term, localized, and less than significant. In the long term, Alternative 1 would have beneficial effects on recreation, by increasing water depth in the approach channel to the Tahoe Public Utility District Lake Forest boat launch facilities and enhancing the CG's ability to provide recreational boating safety services, while avoiding the need for recreationists to have to navigate around a 350- to 450-foot-long pier extension, as they would in the case of Alternatives 2 or 3.

- *Traffic, Transportation, and Navigation* – During construction, Alternative 1 would have more impact on traffic in the Project vicinity, due to truck trips involved with the disposal of dredged material, but these impacts would be short term, localized, and less than significant. Maintenance dredging would also involve impacts on traffic, though these are likely to be less than for the original dredging episode and would be infrequent, short term, and less than significant. Impacts to navigation during construction would be similar for all three Action Alternatives. In the long term, Alternative 1 would have beneficial effects on navigation, by increasing water depth in the Project Area, and would avoid the need for boaters to have to navigate around a 350- to 450-foot-long pier extension, as they would in the case of Alternatives 2 or 3.

- *Utilities and Service Systems* – Alternative 1 would involve the disposal of dredged material, and therefore would affect local solid waste disposal facilities, whereas Alternatives 2 and 3 would only involve disposal of negligible amounts of construction waste. However, local solid waste disposal facilities would have more than sufficient capacity to receive the dredged material generated by Alternative 1, and impacts on solid waste services would be short term, localized, and less than significant. Alternative 1 would also involve dredged material disposal associated with periodic maintenance dredging, but the volume of material is likely to be less than for the original dredging

episode, and impacts of maintenance dredging on solid waste disposal services would be infrequent, short term, and less than significant. Other utilities and service systems would not be significantly affected by any of the Action Alternatives.

In summary, Alternative 1 would not have significant impacts on environmental resources (whereas Alternatives 2 and 3 would have significant impacts), and Alternative 1 would also have less impact on key environmental sources than Alternatives 2 or 3. Alternative 1 also fulfills the purpose and need of the Project, whereas Alternative 4 does not. Alternative 1 would also result in long-term positive impacts on air quality, hazardous materials, water quality, recreation, traffic, and navigation as well as to public health and safety. Following consideration of public comments and preparation of the Final EA/IS/EA, a preferred alternative will be identified from among the alternatives evaluated in the Draft EA under NEPA. Under CEQA, the lead agency will determine whether to implement the Proposed Action (Alternative 1) or one of the other alternatives evaluated in this EA/IS/EA. The alternative that is selected for implementation will be presented to the lead agency decision-makers for consideration and project approval.

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1.0 Introduction

This document has been prepared by the United States (U.S.) Coast Guard (CG) to analyze the potential environmental impacts of the proposed CG Station Lake Tahoe (Station) Year-Round Mooring Project (Project). The proposed Project requires environmental review under the National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and Tahoe Regional Planning Agency (TRPA) regulations to determine whether the Project may have significant effects on the environment.

This document describes the Project Alternatives considered by the CG, reviews relevant background information on the environmental resources potentially affected by the Project, and analyzes the impacts on these resources potentially resulting from implementation each of the Project Alternatives. This document also describes measures that would be implemented under each of the Project Alternatives to avoid, minimize, and/or mitigate potential impacts on environmental resources.

1.1 Project Background

The proposed Project involves implementing modifications at the Station pier to provide consistent long-term, year-round mooring capabilities. The existing pier is 8 feet wide by 312 feet long and extends to a lakebed elevation of approximately 6,220 feet, Lake Tahoe Datum (LTD). The existing private, single-use pier is meant to provide access to the Station's two rapid response boats and ancillary equipment that supports the operations of the boats (boat lift and water, electrical, lighting, and fuel distribution systems). However, due to cyclical droughts and seasonal low water levels at Lake Tahoe, water depths at the existing pier head are not sufficient for the CG to consistently keep their boats on site. Historical lake water levels from the U.S. Geological Survey (USGS) gauge at Tahoe City are shown in *Figure 1-1*. Water depths at the Station pier head have averaged less than 3 feet during several years since the early 1960s, and cyclical droughts have become more frequent in the last 15 years.

The Station is responsible for providing lake-wide emergency search and rescue, commercial and recreational boating safety, law enforcement, and environmental protection services for Lake Tahoe and is the only agency with staff available to respond to incidents on the lake 24 hours a day, 365 days a year. The CG also coordinates with a variety of other first responder agencies around the lake, including local sheriff departments and fire districts, to provide emergency response and public safety services to Lake Tahoe.

Currently, during periods of low lake levels, CG crews must keep their response boats at the Tahoe City Marina and therefore must drive from the Station to the Marina to access their boats after receiving a call for assistance on the lake. This adds a minimum of 15 to 20 minutes of loading, travel, and unloading time each time the CG responds to an incident on the lake, and up to 40 minutes during the height of the tourist traffic seasons in summer and winter. The peak summer traffic season also coincides with the peak boating season, when a higher number of incidents on the lake occur. Also, in the event of a spill of fuel or other deleterious materials on Lake Tahoe, CG staff must spend additional time loading, transporting, unloading, and maneuvering bulky equipment through the Tahoe City Marina.

The CG has attempted to minimize the traffic delays currently involved with accessing the Tahoe City Marina by installing emergency lights on their response vehicle. However, response times are still delayed by at least 15 minutes in the best of circumstances, and the need to drive to the Tahoe City Marina disrupts and contributes to traffic on SR 28, increases safety risks, results in air emissions, and hinders the CG's ability to respond rapidly to incidents on the lake. In addition, the marina entrance and channel leading from the Tahoe City Marina to the lake are narrow and confined. A boating incident blocking the entrance or channel would render the CG boats unable to respond to other incidents on the lake.

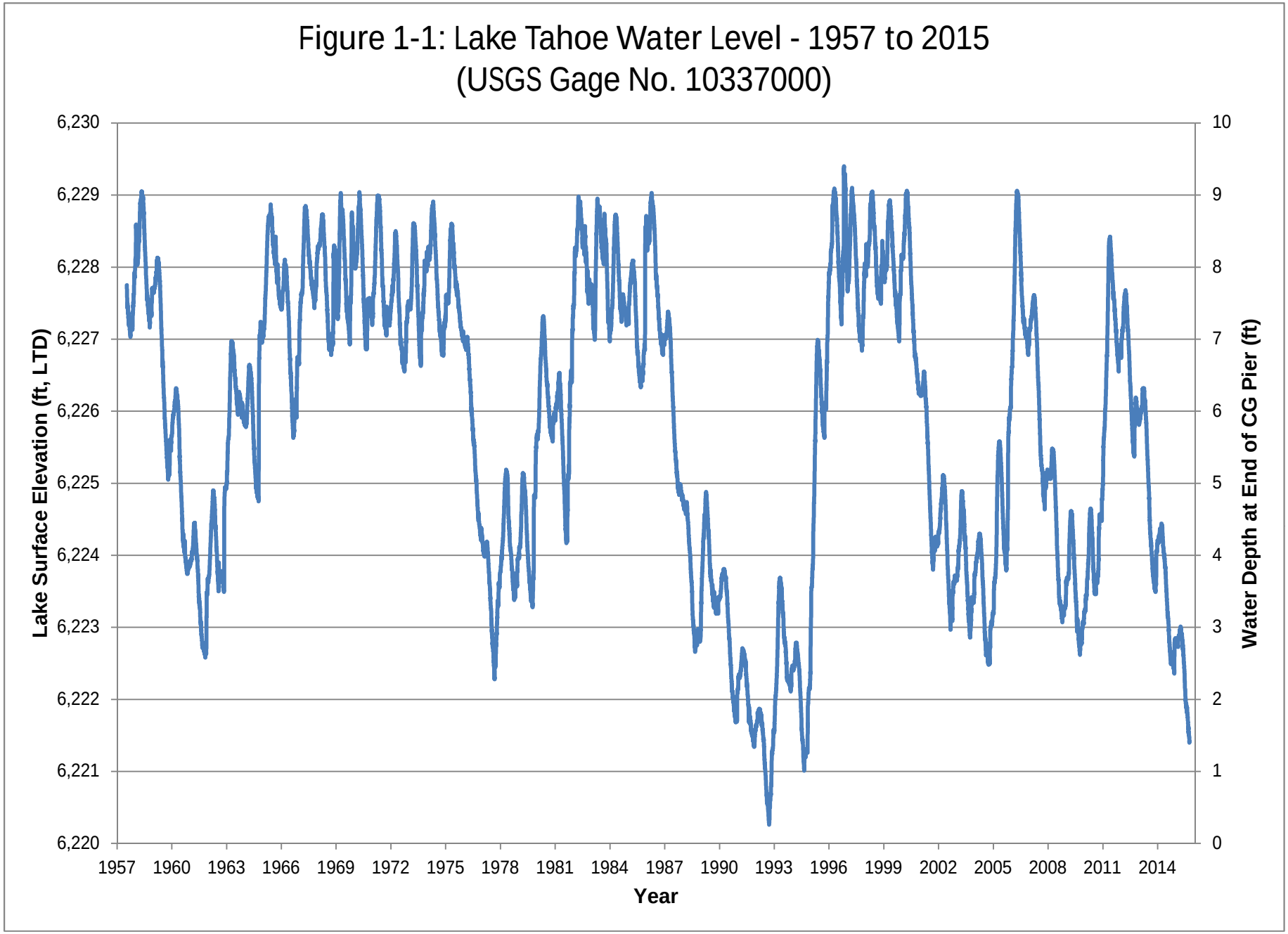


Figure 1-1: Lake Tahoe Water Level - 1957 to 2015
(USGS Gage No. 10337000)
Lake Surface Elevation (ft, LTD)
6,230
6,229
6,228
6,227
6,226
6,225
6,224
6,223
6,222
6,221
6,220
Water Depth at End of CG Pier (ft)
10
9
8
7
6
5
4
3
2
1
0
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
Year

In addition to the operational modifications described above, in 2015 the CG procured special-purpose craft with a shallower draft to replace their standard response boats. Although these shallow-water boats improve the CG's ability to operate in many areas of the lake during low-water conditions, these boats still need to be moored at the Tahoe City Marina during periods of low lake levels. Having to keep these boats at on off-site mooring location leaves them vulnerable to sinking, sabotage, and damage from severe weather. In addition, the new boats are smaller (24 feet versus 29 feet) and slower than the standard response boats, have an open versus closed cockpit, and require re-certification training for the CG crews, all of which present operational and safety challenges for the CG. The CG considers the smaller boats to be only a temporary solution to allow them to continue to be able to respond to incidents on the lake during drought conditions, but in the long term the CG requires year-round mooring capabilities at the Station pier to continue to effectively fulfill their missions.

The Station responds to an average of more than 150 incidents on the lake each year. In addition to responding to incidents that involve threats to public safety, the CG plays an important role in environmental protection. The CG serves as search and rescue responder for damaged or submerged vessels that could release fuel and other deleterious materials to the lake, The CG also shares responsibility for coordinating spill response on the lake with the U.S. Environmental Protection Agency (USEPA) and state and local emergency response agencies. Spill response equipment is kept at the Station, and the Station staff is trained in spill response procedures. In the event of a larger spill or other emergency, the Station can also call on additional CG resources in northern California, including the CG Pacific Strike Team, which is a specialized unit based in Novato, California, whose mission is to prepare for, and respond to, oil spills and other chemical emergencies. Ideally, the Station would be able to serve as an Incident Command Post in the event of a larger incident, and has sufficient road access and communications and meeting facilities to do so; however, lack of access to the CG pier could hinder the Station's ability to serve in such a role.

Quick response times are essential for the CG to effectively fulfill its role in preserving the water quality of Lake Tahoe. With rapid and unrestricted access to the Station pier, the CG would be more likely to be able to reach the scene of a boating accident or other incident in time to prevent or minimize the spread of a discharge. A typical recreational vessel on Lake Tahoe contains 10 to 350 gallons of fuel (gasoline or diesel), depending on the vessel type, which could be discharged during a boating incident. Larger commercial vessels operating on the lake contain up to 2,000 gallons of fuel. Most recreational vessels on the lake have hulls composed of fiber-reinforced plastic or wood, which are more easily punctured than steel or aluminum hulls. When fuel from a vessel is discharged, part of it typically evaporates, leading to air pollution from fuel's volatile components, and part of it enters the water column, where it can adversely affect water quality and aquatic flora and fauna. Heavier components of the fuel may sink to the lake bottom where they become bound to lake-bed sediments and may accumulate to toxic levels that can have long term impacts on benthic biota.

In addition to fuel, deleterious materials potentially discharged by a damaged or submerged vessel include oil, coolant, battery acid, and other mechanical materials; sewage, greywater, and bilge water; debris and garbage; and paints, varnishes, solvents, and cleaning products stored on the vessel. Some of these are potentially toxic in sufficient quantities, and some (e.g., sewage, fuel additives, garbage, and cleaning products) contain nutrients such as nitrogen and phosphorus that can stimulate growth of algae and other organisms that diminish water clarity, which is a major concern for Lake Tahoe. Discharge of marine-grade oil mixed with water creates a milky substance that can also negatively affect water clarity. Additionally, a vessel that runs aground and tries to unground itself can generate more turbidity than it would with prompt CG assistance, thereby adversely affecting lake clarity. Grounding incidents are more likely to occur during low-water conditions, which are now common.

In addition to emergency search and rescue and spill response functions, the CG also has law enforcement and recreational boating safety roles that benefit water quality. Recreational visitors to Tahoe who disregard environmental fueling regulations sometimes refuel on the lake, which is likely to lead to fuel discharge. A faster response time would allow the CG to catch offenders in the act of refueling on the lake or discharging other pollutants. The CG also responds to dangerous vessel operations, including those

stemming from operators under the influence, which could lead to an accident resulting in a discharge event.

Examples of incidents that the CG has responded to that have involved the release, or potential release, of pollutants to Lake Tahoe include the following:

- In August 2014, the CG responded to the grounding of the passenger vessel Tahoe Queen off the southern shore of Lake Tahoe, which occurred due to unexpectedly shallow water resulting from drought conditions. CG presence at the grounding prevented the operator from attempting maneuvers to unground the vessel which could have caused rupture of vessel voids containing pollutants. The CG's presence at the grounding served to prevent a potential large-scale pollution incident from the 300+ passenger vessel.

- The Station receives 20 to 30 reports of vessels sinking on mooring balls per year. These incidents involve the potential release of pollutants into water 200 to 250 yards from shore, too far to be reachable by land-based environmental response units but close enough that adverse effects on shorezone conditions are likely unless a quick CG response is possible.

- In August 2015, the CG received a report of recreationists driving jet skis aground on Nevada Beach and fueling directly, resulting in discharge of fuel and contributing to shoreline erosion. Partly due to delays in reaching their response boat at the off-site mooring location, the CG was unable to respond in time to catch the perpetrators and prevent these events.

- In addition to boating incidents, the CG has played a role in non-boating incidents that can adversely affect water quality. In February 2014, the CG responded to an automobile-based pollution incident affecting the lakeshore. A driver under the influence skidded off the road and into the lake near Sunnyside, California. This type of vehicle incident can result in the release of a substantial quantity of pollutants, because automobiles are not water rated like marine vessels, and therefore a quick response is critical in minimizing the spread of the release.

Given the context of the recent conditions at the Station pier and the CG's important role in protecting the public safety and environmental values of Lake Tahoe, *Section 1.2* provides a summary of the purpose and need of the proposed Project.

1.2 Purpose and Need

The purpose of the proposed Project is to provide mooring capabilities at the Station at a suitable depth so that the CG's rapid response boats can consistently moor there year round, including in low-water conditions. The proposed Project would improve the CG's ability to protect and serve the boating public and agencies that use Lake Tahoe and is in furtherance of the CG's mission of protecting public safety and security. The purpose of the Project is also to enhance the CG's ability to respond to incidents on Lake Tahoe that involve the discharge, or potential discharge, of petroleum products and/or other deleterious materials, and to thereby help protect the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe.

The CG requires year-round, 24-hour, immediate access to the Station's rapid response boats to provide essential emergency search and rescue, law enforcement, commercial and recreational boating safety, and environmental protection services to the boating public and the agencies that use Lake Tahoe. Cyclical droughts and seasonal low-water levels at the current pier do not allow for on-site mooring of the CG's rapid response boats. When water levels are low (generally October through January, and year round during drought conditions), the CG's rapid response boats must be moored at alternate sites, which increases response times and creates safety and security issues.

When the CG is required to moor their response boats away from the Station, it is often difficult to meet the CG's search and rescue standards, which require the CG boat to be underway in less than 30 minutes after a distress call is received. The survival rate of a person in the water decreases as temperatures decrease,

and rapid response time can be vital to saving a person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

In addition to protecting public safety, year-round rapid access to the CG's response boats is needed to allow the CG to more effectively provide spill response, search and rescue, and law enforcement services that protect water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe. Year-round rapid access to the CG's response boats is critical for the CG's ability to quickly reach the scene of incidents affecting Lake Tahoe in time to avoid and minimize water quality impacts. Sufficient access to the Station pier is also needed so that the CG can effectively serve its roles in coordinating multi-agency response to spills and other emergencies and assisting other first responder agencies in fulfilling their missions.

In summary, the purpose of the proposed Project is to provide sufficient depth at the Station pier so that the CG can moor its response boats there during low-water conditions, which is needed so that the CG can effectively protect public safety and security, as well as the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe.

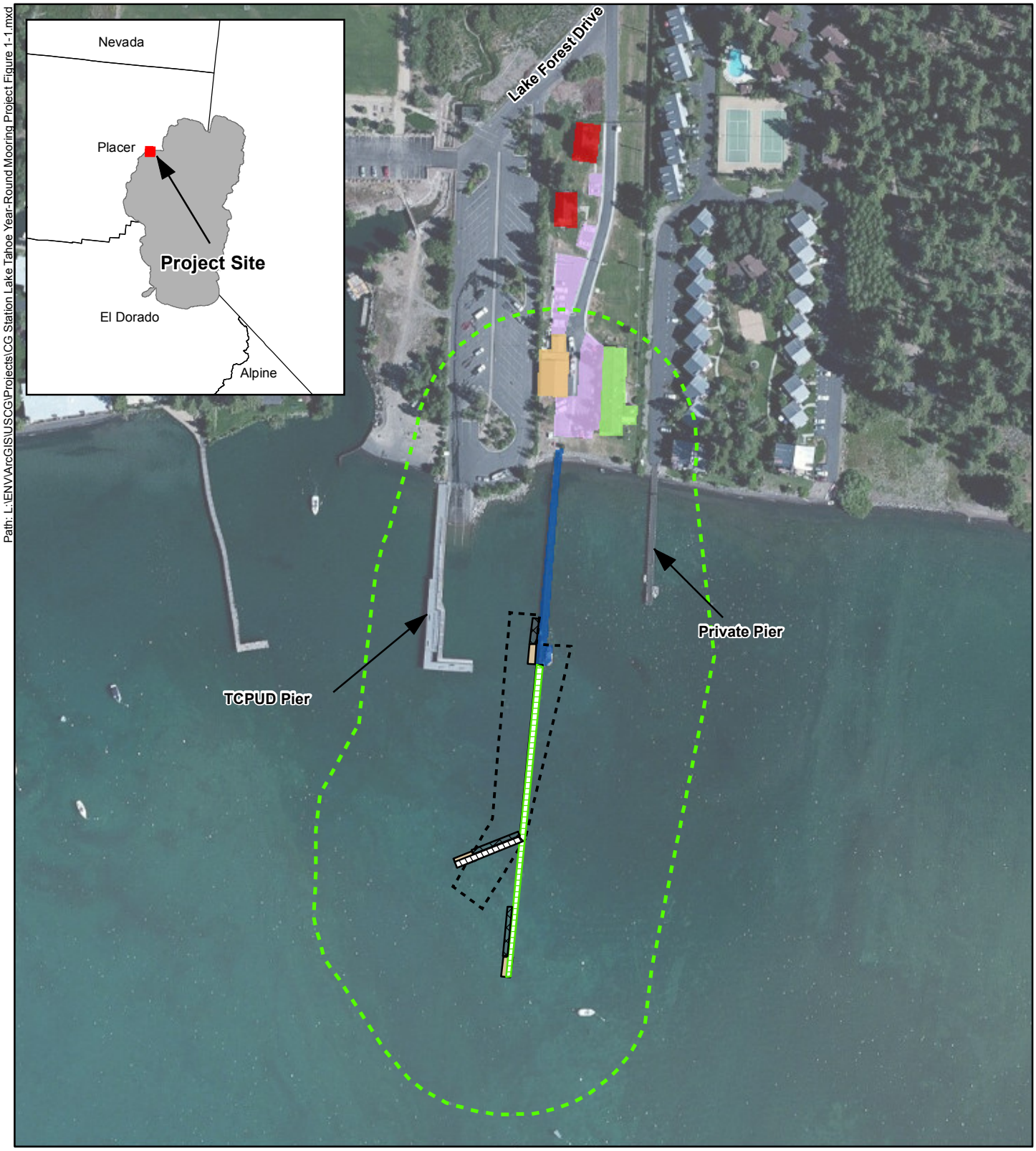
1.3 Project Location and Environmental Setting

The Station is on the northwestern shore of Lake Tahoe at 2500 Lake Forest Road, approximately 1 mile northeast of Tahoe City, Placer County, California (*Figure 1-2*). The existing pier is at the southern end of the Station property and extends 312 feet southward from the shoreline to a lake-bottom elevation of 6,220 feet, LTD. The current steel pier was built in 2001 and replaced a timber pier constructed in 1967.

For the purpose of the analyses in this document, the "Project Area" encompasses the existing pier and the footprints of the proposed dredging and pier extension alternatives (as described in *Section 2.0, Project Alternatives*) plus a 200-foot buffer. The 200-foot buffer also encompasses upland areas of the CG property that may be used for staging of equipment and materials during construction of the Project. The Project Area covers approximately 11.7 acres, including 9.9 acres in the littoral zone of Lake Tahoe and approximately 1.8 acres of upland areas. The term "Project disturbance area" is also used in this document to indicate the area of lakebed that would be permanently disturbed by the construction of the various Project Alternatives considered in this document.

There is a public pier and boat ramp, owned by the California Wildlife Conservation Board (CWCB) and operated by the Tahoe City Public Utilities District (TCPUD), approximately 100 feet to the west of the Station pier, and a private pier associated with the St. Francis Lakeside condominiums is approximately 140 feet to the east. Six private buoys (not associated with the Station) are between 450 and 700 feet south-southeast of the existing Station pier.

Lake Tahoe provides important ecosystem services, such as drinking water, recreation, fish and wildlife habitat, and aesthetics, that are highly valued by the public. Therefore, the proposed Project would be subject to multiple federal, state, and local regulations protecting the region's unique environmental values. The federal and California governments have designated Lake Tahoe as an Outstanding National Resource Water under the Clean Water Act (CWA), and Nevada has designated it as a Water of Extraordinary Ecological or Aesthetic Value. Both designations require no further degradation of the water quality of Lake Tahoe, and, therefore, actions potentially affecting the lake are required to implement reasonable, cost-effective, best management practices (BMPs) to avoid and minimize water quality impacts. Additionally, TRPA has strict regulations for allowed land and water uses in the shorezone that are meant to protect Lake Tahoe's exceptional water quality and clarity and other environmental values.



0 200 400
Feet

Alternative 1 Dredging Footprint
Alternative 2 Dogleg Extension
Alternative 3 Straight Extension
Project Area (200-ft Buffer)
TCPUD = Tahoe City Public Utility District

USCG Facilities
Existing Pier
Garage
Housing
Offices
Parking

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 1-2
Project Site Location

1.4 Contents and Organization of this Document

This document is organized as follows:

- *Section 1 – Introduction*: This section introduces the CG's intent to make modifications at the Station pier, discusses the background context and purpose and need for the proposed Project, and provides the general regulatory framework that drives the environmental analyses required prior to implementation of the Project.

- *Section 2 – Project Alternatives*: This section provides a detailed description of the proposed Project Alternatives and the proposed BMPs (i.e., construction and operations protocols and design features) that would be incorporated into the Project Alternatives to avoid and minimize impacts.

- *Section 3 – Environmental Analysis*: This section provides a focused description of existing environmental conditions, regulatory setting, the environmental impacts potentially resulting from the proposed Project Alternatives, and mitigation measures proposed, where required, to reduce the identified impacts to less-than-significant levels.

- *Section 4 – Conclusions:* This section provides a comparative summary of the impacts of the Project Alternatives; identifies the CG's Proposed Action (i.e., preferred Alternative, selected based on the results of the comparative analysis); and assesses the overall significance of the environmental impacts of that Proposed Action.

- *Section 5 – List of Preparers:* This section lists the individuals who were involved in the preparation of this document.

- *Section 6 – Agencies, Persons, and Organizations Consulted:* This section lists the groups and people consulted during the preparation of this document.

- *Section 6 – References:* This section identifies the references used for the document.

- *Appendices:* These include supporting documentation, including technical studies and reference materials, relevant to the environmental analysis.

1.5 Regulatory Authority and Intended Uses of this Document

The proposed Project would be funded and implemented by the CG, a federal agency, and would require discretionary approvals from other federal agencies and therefore requires review under NEPA. This document serves as an Environmental Assessment (EA) pursuant to NEPA and was prepared in accordance with the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508) and CG Commandant Instruction M16475.1D (*NEPA Implementing Procedures and Policy for Considering Environmental Impacts*). The CG is the lead agency under NEPA.

The CG will use this Draft EA to determine whether implementation of any of the proposed Project Alternatives would have the potential to have significant effects on the quality of the human environment, which includes the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). As required by NEPA, this document considers direct effects (those which are caused by an action and occur at the same time and place), indirect effects (those which are caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable), and cumulative impacts (those which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such actions) (40 CFR 1508.7 and 1508.8).

The EA process also serves as a method of informing the public about the Project Alternatives and obtaining public input on those Alternatives. This Draft EA will be circulated for public review and comment

pursuant to the requirements of NEPA (as described further in *Section 1.6*). The CG will consider the findings of this Draft EA, along with comments received during the public review process, prior to taking action on any of the proposed Project Alternatives. Federal cooperating agencies may also use this document for complying with NEPA when deciding whether to issue discretionary approvals for the Project.

The Project requires discretionary approvals from the Lahontan Regional Water Quality Control Board (LRWQCB), a state agency, and therefore meets the definition of a "project" requiring evaluation under CEQA. The LRWQCB is the lead agency under CEQA. In addition, the proposed Project is within TRPA jurisdiction, which requires TRPA environmental compliance with Article VII of the Tahoe Regional Planning Compact, Chapter 3 of the TRPA Code of Ordinances, and Article IV of the TRPA Rules of Procedure. This document is a joint document satisfying CG, LRWQCB, and TRPA agency guidelines. To this end, the individual questions from the CEQA and TRPA environmental checklists are addressed in the environmental analyses for each resource area (*Section 3.0*) to identify environmental impacts that may result from the proposed Project Alternatives. Copies of the CEQA Environmental Checklist and TRPA Initial Environmental Checklist (IEC) are included in *Appendices A and B,* respectively.

Each agency will use this document to make decisions based on the respective agency's planning policies and statutory requirements. This document will be circulated for public review and comment pursuant to the requirements of NEPA, CEQA, and TRPA. The lead agencies will consider the findings in this document, along with any comments received during the public review process, prior to taking action. Federal cooperating agencies and state responsible and trustee agencies may also use this document, as needed, for subsequent discretionary actions. Additional agencies with jurisdiction over the Project are described in *Section 1.5.4, Other Regulatory Permits and Approvals*.

Brief discussions of the NEPA, CEQA, and TRPA environmental impact assessment processes are provided in the following sections.

1.5.1 National Environmental Policy Act

NEPA (42 U.S. Code [USC] Section 4321 et seq.) was signed into law on January 1, 1970. NEPA sets forth a national policy that encourages and promotes productive harmony between humans and their environment. NEPA procedures require that environmental information is made available to public officials and citizens before federal agency decisions are made and before federal agency actions are taken. The NEPA process is intended to help public officials to make decisions that are based on an understanding of environmental consequences and take actions that protect, restore, and/or enhance the environment. Passage of NEPA resulted in the creation of the CEQ, which formulated *Regulations for Implementing the Procedural Provisions of NEPA* (40 CFR 1500-1508) that are binding on all federal agencies when implementing NEPA.

The proposed Project requires environmental review under NEPA because it would be funded and implemented by a federal agency and because it would require federal approvals for the following activities:

- Construction of structures or work in or affecting navigable waters of the U.S., which is regulated under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403);
- Discharge of fill material into waters of the U.S., which is regulated under Section 404 of the CWA (33 USC 1251 et seq.); and,
- Implementation of actions potentially affecting plant or animal species protected by the federal Endangered Species Act (ESA) (16 USC 1531 et seq.).

Under NEPA, an EA is intended to provide sufficient evidence and analysis to determine the significance of the potential environmental effects of a proposed action and its alternatives. An EA documents, in summary fashion, the consideration of environmental effects in the planning for an action. An EA is the document used to determine whether or not a Finding of No Significant Impact (FONSI) can be supported by the

environmental analysis or whether an Environmental Impact Statement (EIS) must be prepared to further analyze potentially significant effects of the proposed action (40 CFR 1508.9).

1.5.2 California Environmental Quality Act

CEQA (Public Resources Code [PRC] 21000–21177) was passed in 1970 to institute a statewide policy of environmental protection. CEQA requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive a discretionary approval from a state government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment. A "discretionary" approval is one that an agency has the authority to deny and must exercise judgment or deliberation in determining whether the permit or approval will be issued. The proposed Project is subject to review under CEQA because it requires discretionary approvals from the LRWQCB under section 401 certification provisions of the CWA and the *Water Quality Control Plan for the Lahontan Region* (Lahontan Basin Plan), as amended (LRWQCB 1995 and 2014a).

The *CEQA Guidelines* (California Code of Regulations [CCR], Title 14, Division 6, Chapter 3, Sections 15000–15387) explain and interpret CEQA for both the public agencies required to administer the law and for the public generally. The *CEQA Guidelines* provide objectives, criteria, and procedures for the orderly evaluation of projects and the preparation of CEQA environmental impact assessment documentation by public agencies. The fundamental purpose of the guidelines is to make the CEQA process comprehensible to those who administer it, to those subject to it, and to those for whose benefit it exists.

Following preliminary review of a project, the CEQA lead agency typically conducts an Initial Study (IS) to determine if the project may have a significant effect on the environment. The first step in conducting an IS is typically to complete the environmental checklist included as Appendix G of the CEQA Guidelines. Therefore, this document addresses the questions from the CEQA checklist in the environmental analyses (*Section 3.0*).

The IS provides the CEQA lead agency with information to use as the basis for deciding whether to prepare a Negative Declaration (ND), Mitigated Negative Declaration (MND), or Environmental Impact Report (EIR). A ND is a written statement briefly describing the reasons that a proposed project will not have a significant effect on the environment and does not require the preparation of an EIR. An MND is a declaration prepared for a project when the IS has identified potentially significant effects on the environment, but: 1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed ND and IS are released for public review that would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and 2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment. If the CEQA lead agency determines that there is substantial evidence that any aspect of a project, either individually or cumulatively, may cause a significant effect on the environment, regardless of whether the overall effect of the project is adverse or beneficial, the lead agency must prepare an EIR.

1.5.3 Tahoe Regional Planning Agency

The proposed Project would require a Shorezone Permit from the TRPA, and therefore is subject to the environmental review requirements of the *Tahoe Regional Planning Compact* (Compact) and the TRPA Code of Ordinances. TRPA is a bi-state regional planning agency created in 1969 by federal law to oversee development in both the California and Nevada portions of Lake Tahoe and act as the primary permitting agency under the Compact. TRPA environmental review and documentation requirements, which are outlined in Chapter 3 of the *TRPA Code of Ordinances* (TRPA 2013), must be met before the TRPA can issue a permit for most projects.

The TRPA impact assessment process uses similar terminology and requirements to those used for NEPA. Except for exempt classes of projects, TRPA requires the project applicant to prepare either an IEC or an EA to provide the TRPA with sufficient information to determine whether a project could have significant impacts on the environment, in which case an EIS must be prepared. The contents required for a TRPA and NEPA EA are essentially the same (e.g., discussion of the need for the project; description of the proposed project alternatives, discussion of environmental impacts, and determination of whether they are potentially significant). In addition to the EA, the CG would submit a Shorezone Permit Application to TRPA for its Proposed Action (i.e., the preferred Project Alternative selected based on the results of the environmental analysis). Based on the information contained in the EA, the Shorezone Permit Application for the Proposed Action, and other information known to the agency, TRPA would make one of the following findings and take the action prescribed in the applicable finding:

- The Proposed Action could not have a significant effect on the environment and a Finding of No Significant Effect shall be prepared in accordance with TRPA Rules of Procedure (TRPA 2011a) Section 6.6;

- The Proposed Action could have a significant effect on the environment, but, due to the listed mitigation measures that have been added to the project, the project could have no significant effect on the environment and a Mitigated Finding of No Significant effect shall be prepared in accordance with TRPA Rules of Procedure Section 6.7; or

- The Proposed Action may have a significant effect on the environment and an EIS shall be prepared in accordance with Chapter 3 of the TRPA Code of Ordinances and the Rules of Procedure, Article 6.

The TRPA Governing Board would use the TRPA staff's findings and the information in the Final EA and Shorezone Permit Application to determine whether to approve the Proposed Action selected by the CG and issue a Shorezone Permit.

1.5.4 Other Regulatory Permits and Approvals

This document is also intended to be used by other federal, state, and local agencies that may have authority over one or more elements of the proposed Project. Other potential permits and approvals that may be required for development of the proposed Project are described in the following subsections.

1.5.4.1 U.S. Army Corps of Engineers Section 10 and Section 404 Permits

Because the proposed Project would involve work affecting a navigable water of the U.S., the CG must obtain a permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 from the U.S. Army Corps of Engineers (USACE). In addition, the proposed Project would involve the placement of fill in a water of the U.S. (for the purpose of habitat mitigation) and therefore would require a USACE permit pursuant to Section 404 of the CWA. Accordingly, the CG would obtain a Section 10/404 permit from the USACE prior to implementing the Project.

1.5.4.2 U.S. Fish and Wildlife Service Section 7 Consultation

Section 7 of the ESA states that federal agencies shall ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of species listed as threatened or endangered under the ESA (federally listed species) or result in the adverse modification of designated critical habitat. If a project has the potential to jeopardize federally listed species or adversely modify critical habitat, interagency consultation is required with the federal wildlife agency with jurisdiction over the affected species and/or critical habitat. The U.S. Fish and Wildlife Service (USFWS) is the agency with jurisdiction over federally listed species and critical habitat in the Project Area. In addition, pursuant to the Fish and Wildlife Coordination Act, the USFWS evaluates impacts on fish and wildlife from projects subject to the requirements of USACE Section 404 permitting, which is applicable to the proposed Project.

Preparation of a Biological Assessment (BA) is required under Section 7(c) of the ESA if listed species or critical habitat may be present in the area affected by any “major construction activity” as defined in 50 CFR 404.02. Through discussions with the USFWS, it was determined that Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*), a species listed as Threatened under the ESA, has potential to occur in the Project Area. The CG has prepared a BA for the proposed Project (AECOM 2014), which is included as *Appendix C*. As discussed further in *Section 3.4, Biological Resources*, the BA concluded that the proposed Project may affect but is unlikely to adversely affect Lahontan cutthroat trout and would not affect other federally listed species. Accordingly, the CG is engaged in informal consultation with USFWS to seek their concurrence with these findings. The outcome of this informal consultation would determine whether the USFWS issues a concurrence letter or whether formal consultation is required. The CG will complete the Section 7 consultation process prior to implementing the proposed Project.

1.5.4.3 Lahontan Regional Water Quality Control Board Approvals

Under CWA Section 401, applicants for a federal permit or license for activities which may result in a discharge to a water body must obtain a Water Quality Certification (WQC) that the proposed activity will comply with state water quality standards. Most WQCs are issued in connection with USACE CWA Section 404 permits for dredge and fill discharges. In California, WQCs are generally issued by the Regional Water Quality Control Boards (RWQCBs). The LRWQCB must issue a WQC before the USACE may issue a CWA Section 404 permit for the proposed Project. Any conditions set forth in the WQC would also be included as conditions of the Section 404 permit if and when it is issued. After obtaining the WQC, the proposed Project would also be regulated under State Water Resources Control Board (SWRCB) Order No. 2003-0017-DWQ, “General Waste Discharge Requirements for Dredge and Fill Discharges That Have Received State WQC.”

In addition to the WQC, the LRWQCB would also need to issue an exemption to certain prohibitions contained in Lahontan Basin Plan for the Project to be approved. The specific Basin Plan prohibitions and exemption criteria applicable to the proposed Project are discussed in detail in *Section 3.8*.

The LRWQCB also regulates discharge of stormwater from construction projects that disturb 1 acre or more under the CWA Section 402 National Pollutant Discharge Elimination System (NPDES) permit program. Because the proposed Project would disturb less than 1 acre of land, it is exempt from NPDES permitting.

1.5.4.4 California Department Fish and Wildlife Consultation

The California Department of Fish and Wildlife (CDFW) manages and protects the state's diverse fish, wildlife, plant resources, and native habitats and is responsible for enforcing provisions of the California Fish and Game Code (CFGC). The California Endangered Species Act of 1984 (CESA; CFGC Sections 2050-2098) establishes provisions for the protection and management of species listed by the state as endangered or threatened, or designated as candidates for such listing. Section 2080 of the CFGC prohibits "take" of any species listed under CESA, where “take” is defined in as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (CFGC Section 86). However, CESA also allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset losses of listed species. If a project would result in take of a state-listed species, then either a Section 2080.1 Consistency Determination or a Section 2081 Incidental Take Permit from the CDFW would be required.

The Project’s BA (*Appendix C*) includes information on species protected under CESA and other state regulations. The BA concluded that no state-listed species would be adversely affected by the proposed Project and that a state Incidental Take Permit is not required.

Section 1602 of the CFGC requires notifying CDFW prior to constructing any Project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. The CG has notified CDFW of the proposed Project, and CDFW has determined that a Section 1602 Lake and Streambed

Alteration Agreement is not required for the proposed Project, because it would be carried out by a federal entity and thus not subject to Section 1602.

1.5.4.5 National Historic Preservation Act Section 106

Section 106 of the National Historic Preservation Act (NHPA; Public Law 89.665, as amended) requires federal agencies consider the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Section 106 also requires federal agencies to afford the State Historic Preservation Officer (SHPO) reasonable opportunity to comment on the project. *Section 3.5, Cultural Resources*, includes an evaluation of the proposed Project Alternatives' potential impacts on cultural resources protected under the NHPA. The CG is engaging in consultation with the SHPO and will provide a copy of the Draft EA to the SHPO for comment. Any comments received from the SHPO will be considered and addressed in preparing the Final EA.

1.5.4.6 Tahoe Regional Planning Agency Shoreline Plan

On October 24, 2018, the TRPA Governing Board adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. The Shoreline Plan is a set of policy concepts to guide resource management and development in the shorezone and lakezone of Lake Tahoe. These concepts will be implemented through amendments to the TRPA Code of Ordinances also adopted on October 24, 2018. The Shoreline Plan and associated revisions to the TRPA Code of Ordinances became effective on December 24, 2018. Substantive changes were adopted to TRPA Code of Ordinances Chapters 80 through 86, with minor changes to Chapters 1, 2, 10, 14, 50, 63, 66, and 90 and to Article 10 of the Rules of Procedure. The Board also adopted an implementation program for the Shoreline Plan. The Shoreline Plan addresses five policy areas that focus on boating, lake access, marinas, piers, and low lake level adaptation. Under the Shoreline Plan, TRPA will review applications for new structures in the shorezone, including piers, moorings, ramps, and activities and structures at marinas while coordinating permitting with federal and state agencies through the Shoreline Review Committee. The Committee is made up of representatives from agencies that have jurisdiction of the shorezone to review all shoreline projects to assure they meet all applicable regulations. The Shoreline Plan will continue to allow maintenance dredging that complies with TRPA's approved dredging BMPs and installation of all upland BMPs. New dredging would be allowed only at marinas, existing public boat ramps, and the essential public health and safety facilities. For new dredging, individual projects must comply with applicable state and federal standards. In particular, TRPA Code Section 84.9 has been revised to apply standards similar to state and federal requirements for new dredging at public health and safety facilities and public boat ramps. Under the Shoreline Plan, the maximum length of single-use piers would be 6,219 feet or the pierhead line, whichever is more limiting. For single use piers, an additional 15 feet may be allowed to increase functionality during low lake level conditions. Additional Code amendments require a littoral drift analysis for piers with floating sections longer than 25 feet, specify color standards for piers, and prohibit the rigid mooring of floating piers to the lake bottom. In addition, Code amendments also require avoidance of historical and archaeological resources, and avoidance of Tahoe Yellow Cress plants. Provisions of the Shoreline Plan and revised ordinances that are applicable to the Action Alternatives are discussed in *Section 2, Project Alternatives*, and in the individual topic area sections, as applicable, throughout *Chapter 3* of this document.

1.5.4.7 Tahoe Regional Planning Agency Shorezone Permitting Process

All development in the shorezone of Lake Tahoe requires TRPA review and approval. TRPA review of projects in the shorezone is governed by the *Lake Tahoe Shoreline Plan* and associated amendments to the TRPA Code of Ordinances described generally above. This Project is an Essential Public Safety Facility, and the CG is in the process of going through the TRPA's current shorezone permit application and review process. To approve the proposed Project, TRPA must make the required findings outlined in TRPA Code Chapter 4 and Section 80.3. This EA provides information to assist TRPA in making the required findings.

Certain elements of some of the proposed Project Alternatives would not conform to several of the location, design, and construction standards required by TRPA Code of Ordinances Chapter 84 (updated 2018). The Shorezone Subelement, Conservation Element of the Goals and Policies (Chapter 84) requires TRPA to regulate the placement of new piers, buoys, and other structures in the nearshore and foreshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds, and other relevant concerns. Chapter 84 also requires TRPA to conduct studies, as necessary, to determine potential impacts to fish habitats and apply the results of such studies and previous studies on shoreline erosion and shorezone scenic quality in determining the number of, location of, and standards of construction for facilities in the nearshore and foreshore. In 2016, TRPA adopted code amendments for Essential Public Safety Facilities within the Shorezone (Section 84.10.2, subsequently updated to Section 84.8.2 in 2018) that permit deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders as set forth below:

Code Section 84.8.2. Safety and Navigation Devices

Essential Public Safety Facilities within the Shorezone provide lake access and egress for public safety and emergency response.

A. New safety and navigational structures may be permitted only upon the recommendation of USACE or the U.S. Coast Guard.

B. One Essential Public Safety Facilities in the Shorezone may be designated in each of El Dorado, Placer, Washoe, and Douglas Counties, and one for the U.S. Coast Guard.

C. Essential Public Safety Facilities in the Shorezone shall comply with the location, design and construction standards set forth in subsections 84.4.2, 84.4.3.A, and 84.4.3.D for piers, subsections 84.5.2.A and 84.5.3 for boat ramps, subsection 84.3.3.D for mooring buoys, and subsection 84.8.1 for floating platforms; except that a facility recognized by TRPA as an Essential Public Safety Facility pursuant to this subsection may deviate from location, design and construction standards set forth in the following subsections, when necessary for functionality: 84.4.3.C.2.b, 84.4.3.C.2.d, 84.5.2.A, 84.5.3.D.1, 84.3.3.D.1.a, 84.3.3.D.2.b, 84.8.1.A.1, 84.8.1.B.2, and 84.8.1.B.5.

Details of the various Project Alternatives as related to these Code Sections are discussed further in *Section 2, Project Alternatives*. This Project is an Essential Public Safety Facility project and therefore would qualify for processing under TRPA Code of Ordinances Section 84.8.2.

1.6 Public Involvement

NEPA, CEQA, and TRPA rules require public notification and involvement in the environmental review process. To initiate the public involvement process, on August 8, 2014, the CG mailed a scoping letter to interested parties, including public agencies with regulatory oversight over or potential interest in the proposed Project, local newspapers and libraries, and landowners within 500 feet of the proposed Project. The scoping letter and public notice described the proposed Project, requested public input on the scope and content of the EA/IS/EA, and announced the time and location of a public open house. The public open house was held at the North Tahoe Event Center in Kings Beach, California, on August 26, 2014. The scoping period lasted from August 12 to September 12, 2014.

At the conclusion of the initial scoping process, a scoping report was prepared (*Appendix D*). The report summarizes comments received during the public scoping process and includes copies of the comments received. The CG used the report to determine areas in the EA/IS/EA where additional assessment, information, or clarification was needed. The comments received during the scoping process have been considered by the lead agencies and addressed, where appropriate, in this Draft EA/IS/EA.

The CG has prepared a Notice of Availability (NOA) of the Draft EA/IS/EA for public review. The NOA has been mailed to interested parties and published in the Sierra Sun and Tahoe Daily Tribune. As described in the NOA, the Draft EA is being distributed for a 30-day public review period. The Draft EA/IS/EA is available for public review at the TRPA office (128 Market Street, Stateline, Nevada), and is posted electronically on the TRPA's website (TRPA.org). Copies of the Draft EA/IS/EA on compact disc have also been distributed to public agencies with regulatory oversight over or potential interest in the proposed Project, including the LRWQCB and TRPA.

Written comments on the Draft EA/IS/EA should be sent to the following address, postmarked no later than the end of the close of the comment period:

Kelly Bayer
AECOM
300 Lakeside Drive, Suite 400
Oakland, CA 94612
kelly.bayer@aecom.com

All comments received during the 30-day public review period for the Draft EA/IS/EA will be compiled and reviewed, and responses will be prepared to address significant environmental issues that are raised in the comments.

After receiving comments on the Draft EA, the CG will revise the document to incorporate pertinent comments into a final version of the EA/IS/EA. The CG will circulate the Final EA/IS/EA for 30 days before taking action on the Preferred Alternative. Following the 30-day circulation period and lead agency consideration of all comments received during public review of the Draft EA/IS/EA and circulation of the Final EA/IS/EA each of the lead agencies (CG, LRWQCB, and TRPA) would follow their respective agency processes to complete the environmental review process.

Based on the final outcome of the environmental impact analysis, the CG will prepare a Decision Document (i.e., a FONSI, or, if applicable, a Notice of Intent to prepare an EIS). The Decision Document will be circulated for 30 days along with the Final EA, after which the CG will finalize and certify the Decision Document and either approve the proposed Project or proceed with preparation of an EIS.

The LRWQCB will review the Final IS during the 30-day circulation period to consider certification of the Final IS and to decide whether or not to approve a Preferred Alternative. The LRWQCB will then issue a Notice of Determination that documents their decision. If the Project is approved, the Notice of Determination would include the RWQCB's determination that the Project will not have a significant effect on the environment, a statement that an MND was adopted pursuant to the provisions of CEQA, and a statement indicating whether mitigation measures were made a condition of the approval of the Project, and whether a mitigation monitoring plan/program was adopted.

The TRPA Governing Board will use the Final EA when considering approval of one of the Project Alternatives. Before action by the Governing Board on the Project, the Board must certify the Final EA. The TRPA Governing Board will hold a public hearing to consider certification of the Final EA during the 30-day circulation period and to decide whether or not to approve the proposed Project. Based on the information contained in the Final EA, TRPA will make a Finding of No Significant Effect, a Mitigated Finding of No Significant Effect, or a finding that an EIS must be prepared.

2.0 Project Alternatives

This section provides detailed descriptions of the alternatives that the CG considered for the proposed Project. The section also discusses BMPs that would be incorporated as part of the Project design and construction methodology for each Project Alternative to avoid and minimize environmental impacts. The three Action Alternatives (i.e., Alternatives 1, 2, and 3) are designed to provide a lake-bottom elevation of approximately 6,215 feet, LTD, at the pier head. This would give a water depth of approximately 5 feet under conditions equivalent to the lowest recorded lake level (6,220.2 feet, LTD, in November 1992; USGS 2016). Historical lake water levels from the USGS gauge at Tahoe City are shown in *Figure 1-1*.

2.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

Alternative 1 (the Proposed Action) consists of dredging a channel to allow access to the existing 312-foot-long pier during low-water conditions (*Figure 2-1*). The channel would be dredged to an elevation of 6,215 feet, LTD, with 2 feet of overdepth allowance.[2] The proposed dredging footprint would be approximately 410 feet long, would range from 50 to 90 feet wide, and would cover an area of approximately 27,816 to 29,749 square feet (square feet) (the lower limit excludes overdepth; the upper limit includes full overdepth, which also provides a 2-foot allowance for dredging side slopes). The volume of material removed from the lake bottom would be approximately 2,656 to 5,041 cubic yards (CY). The southern portion of the proposed dredging footprint angles slightly to the west to minimize the overall length of the channel while providing a consistent elevation of 6,215 feet, LTD, throughout, taking into account the existing site bathymetry.

The dredging would be conducted with a barge-mounted long-reach excavator (i.e., backhoe dredge). Dredging would be conducted in accordance with USACE, LRWQCB, and TRPA requirements. The excavator would place the dredged material on a second barge, where the material would be stockpiled temporarily while it dewaters. The work barges would be anchored by spuds (i.e., temporary piles), as needed, and a small tugboat may be used to move the barges.

The dredged material would be transported from the dredging area to the shore by a conveyor belt system mounted on temporary stands. A second excavator may be used to move the material from the barge onto the conveyor. The conveyor system would be composed of overlapping 60-foot-long units. Six of these units would be required to cover the distance between the dredging footprint and the Station parking lot. The supports for the conveyor would sit on the surface of the lakebed and would be positioned in a manner that minimizes disturbance to aquatic vegetation and spawning habitat. The total temporary lake-bottom footprint for the stands that would support the conveyor units would be approximately 38 square feet. The conveyor system would load the dredged materials into lined trucks in the Station parking lot. Once the dredged material is loaded into the lined trucks, it would be transported to the Eastern Regional Material Recovery Facility (MRF), near the junction of State Route (SR) 89 and Cabin Creek Road, Truckee, California, or to another licensed, TRPA-approved upland disposal facility.

The duration of the dredging is expected to be approximately 8 weeks. Maintenance dredging would be required approximately once every 10 to 15 years to remove accumulated sediments and maintain an elevation of 6,215 feet, LTD, at the pier head. The impact analyses for Alternative 1 in *Section 3.0* include a general discussion of the potential environmental effects of future maintenance dredging. The CG would obtain appropriate regulatory approvals before conducting future maintenance dredging.

TRPA and the LRWQCB differentiate between maintenance dredging and new dredging for permitting purposes. Maintenance dredging is defined as the dredging of previously dredged areas to maintain previously permitted lake-bottom elevations and dimensions. New dredging is defined as dredging occurring in areas that have not been previously dredged or to elevations that are lower than previously permitted.

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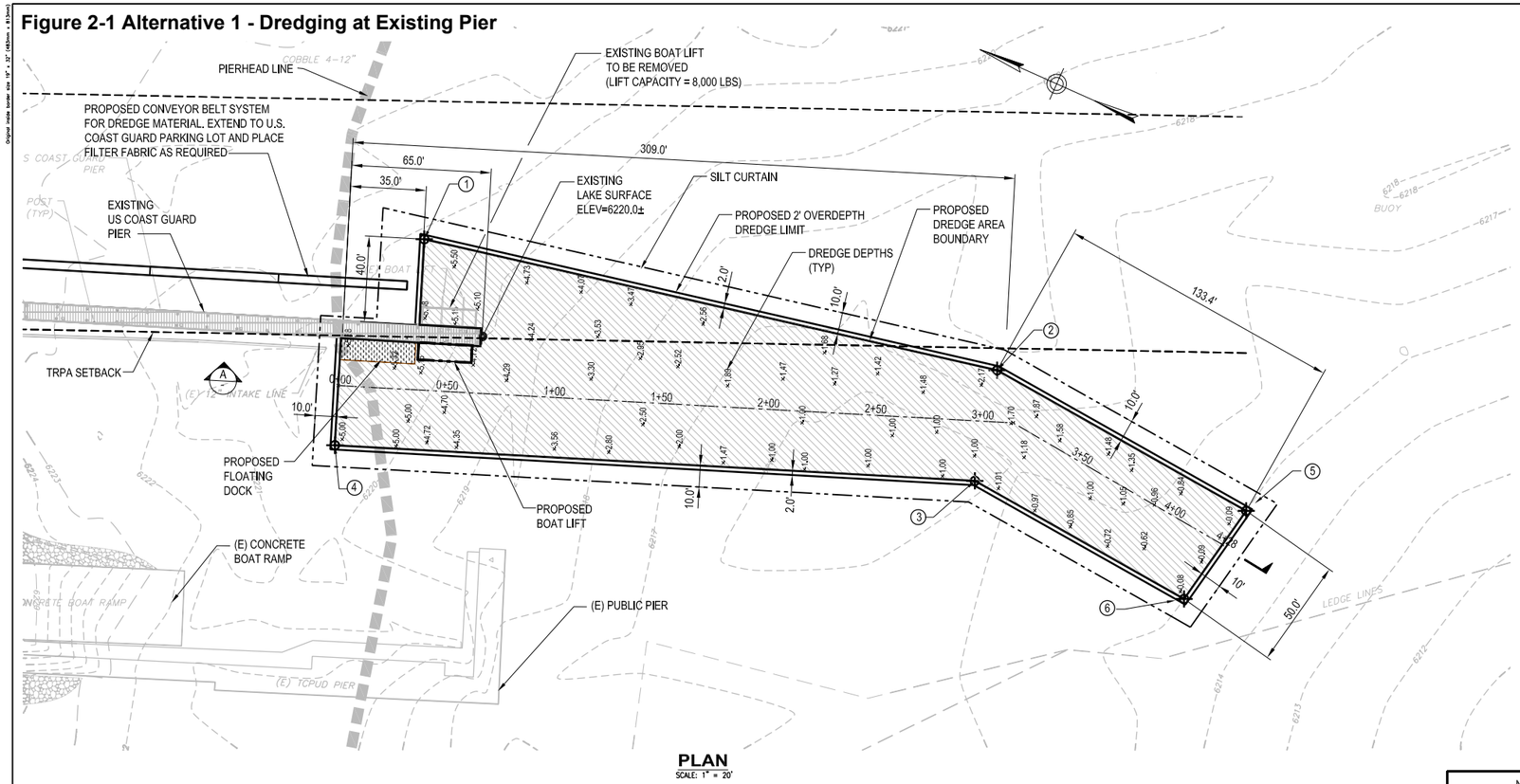
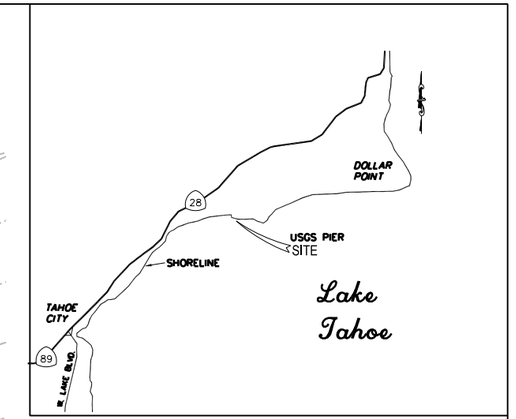
[2] The overdepth allowance is meant to account for unavoidable excavation inaccuracies during dredging. The dredging contractor will be instructed to limit dredging to the minimum area necessary to achieve the target elevation and dimensions and to minimize overdepth dredging to the extent practicable. However, dredging of the full overdepth allowance has been considered in the impact analyses in this EA to fully assess potential worst-case impacts.

Figure 2-1 Alternative 1 - Dredging at Existing Pier



PLAN
SCALE: 1" = 20'



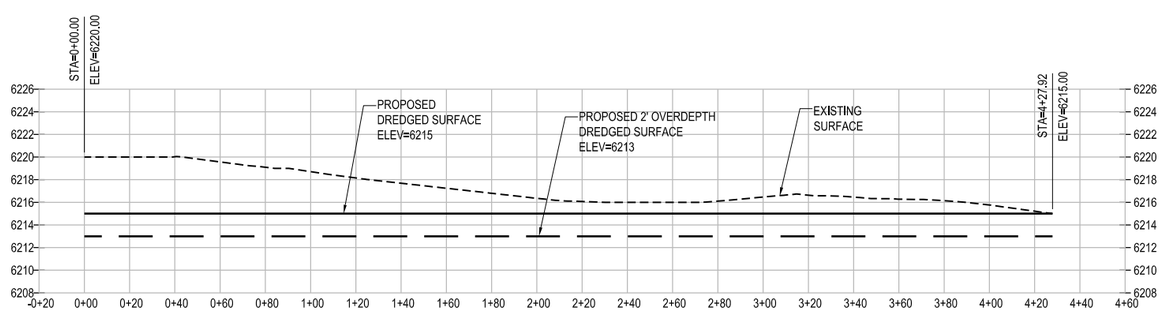
VICINITY MAP

DREDGE VOLUME SUMMARY

NAME	AREA	CUT	FILL	NET
PROPOSED DREDGE VOLUME	27,816.00 Sq. Ft.	2,656 Cu. Yd.	0.00 Cu. Yd.	2,656 Cu. Yd.<Cut>
PROPOSED OVERDREDGE ALLOWANCE	29,749.00 Sq. Ft.	5,041 Cu. Yd.	0.00 Cu. Yd.	5,041 Cu. Yd.<Cut>

DREDGE BOUNDARY COORDINATES

POINT #	NORTHING	EASTING
1	3636.23	6413.99
2	3369.25	6352.90
3	3379.61	6301.34
4	3677.92	6317.94
5	3253.14	6287.37
6	3282.10	6246.30



PROFILE A
SCALE: 1" = 20' HORIZ
1" = 4' VERT

0' 20' 40' 60'
SCALE: 1" = 20' FULL SIZE
1" = 40' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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Approved By:
Date: 12/01/15
Meeting: Meeting 1

U.S. Department of Homeland Security
United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 1 DREDGING AT EXISTING PIER
Project Number: 60218657
Sheet Number: C1.0

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L:\Projects\Legacy\Trans\60218657-TahoePier\000_CAD\006_Civil\Sheets Current Dredging\C1.0_C1.1_C1.2 ALT 1 DREDGING AT EXIST PIER.dwg, 11/30/2015 9:57:40 AM, Adobe PDF

According to historical records, the northern portion of the proposed dredging footprint was previously dredged to an elevation of 6,218 feet, LTD, during construction of the adjacent TCPUD Lake Forest boat ramp in 1963. However, because the proposed dredging would be to a lower elevation than and extend outside of the 1963 dredging footprint, it would be considered new dredging. Authorization of new dredging requires that TRPA and the LRWQCB find that the dredging would be beneficial to existing shorezone conditions and water quality and clarity. The effects of Alternative 1 on shorezone conditions and water quality and clarity are discussed in *Section 3.0.*

In addition to dredging, Alternative 1 would also include removing the pier's existing 8,000-pound capacity boat lift from the eastern side of the pier head and replacing it with an 18,000-pound lift and installing a 35-foot by 8-foot floating dock.[3] The replacement boat lift and floating dock would be placed on the western side of the existing pier head to minimize the amount of dredging needed, because current lakebed elevations are lower to the west and southwest of the pier. The larger-capacity lift and new floating dock are needed to accommodate the Station's response boats and a range of potential visiting vessels, including those of other first responder and law enforcement agencies, as well as vessels that must be towed back to the Station to evacuate injured boaters or lawbreakers or contain a potential discharge. Because the replacement boat lift and new floating dock would be placed on the western side of the pier, the location of some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, fueling station) may also need to be reconfigured to allow functionality of the boat lift and floating dock.

To mount the replacement boat lift, two steel h-piles would be installed on the western side of the existing pier head. Piles would be installed using a pile driver mounted on the work barge. Piles would be driven to the tip elevation shown on the construction plans and to a minimum driving resistance to obtain the specified minimum bearing capacity. There are two methods of pile installation that may be used: the vibratory hammer method and impact hammer method. Each pile driving process is described as follows:

Vibratory Hammer Method: Vibratory pile hammers contain a system of counter-rotating eccentric weights, designed to cancel out horizontal vibration and transmit vertical vibration to the pile. Their driving ability derives from this vibration and the weight of driver and pile. The pile driving machine is lifted and positioned over the pile by means of a crane or excavator and is fastened to the pile by a clamp and/or bolts.

Vibratory hammers are typically hydraulically powered. Hydraulic fluid is generally supplied to the driver by a diesel-engine-powered pump connected to the driver head through a set of hoses. Vibratory pile drivers are often chosen to mitigate noise. Vibratory hammers are typically effective for granular sediments, but less effective in stiff cohesive soils, which are known to occur in the Project Area.

Impact Hammer Method: An impact hammer installs piles by striking them from above, driving them into the sediment through the downward force of the hammer. Impact hammers have a lead that holds the hammer and pile in place while a heavy rod moves up and down, striking the surface of the pile. Impact hammers are typically either hydraulic- or diesel-powered. Pile caps and/or cushion blocks can be used with impact hammers to protect the top of the pile and reduce noise.

A vibratory hammer would be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. Typically, the construction contractor would be required to attempt to drive the pile using a vibratory hammer until refusal (i.e., the vibratory hammer can longer be advanced into the substrate), and then an impact hammer would be used.

Due to the presence of stiff clay substrates in the Project Area, techniques such as pre-drilling or jetting may also be required to assist with pile driving. The need for these techniques is not considered likely for

[3] In public scoping documents for the Project, the CG originally proposed a 70-foot-long floating dock for the Dredging Alternative. However, the length of the proposed floating dock has been decreased by 35 feet, and the dredging footprint in the area of the floating dock has been reduced accordingly, to avoid impacts to potential spawning habitat occurring in that area, as discussed further in *Section 3.4.1.1*.

Alternative 1 based on past experience installing piles for the existing Station pier in 2001. However, if the piles cannot be driven to the required depth using conventional techniques, then holes may be pre-drilled slightly smaller than the diameter and depth of the pile. The pile would then be inserted, and the weight of the pile-driving hammer would force the pile down near the bottom of the drill hole. The pile would then be driven to the required depth. Alternatively, jetting may be used for a similar purpose. Jetting is a method of forcing water and/or compressed air around and under a pile to loosen and displace the surrounding soils during pile driving. Jetting is performed by inserting a pipe down along the inside of the pile and forcing water and/or air through the pipe to loosen the soil, and then driving the pile into the jetted hole.

Once the new piles have been driven, the tops of the piles would be cut to the required elevation using a welding torch. After the piles are cut, the mounting hardware and boat lift would be installed.

The 2018 amended TRPA Code of Ordinances includes specific location, design, and construction standards for piers, floating docks and platforms, and other boating facilities. However, in 2016, TRPA adopted code amendments for Essential Public Safety Facilities within the Shorezone (Section 84.10.2, subsequently updated to Section 84.8.2 in 2018) that permit deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders. TRPA determined that the primary anticipated design features would be additional pier lengths to reach navigable water in drought conditions, a second boatlift to accommodate both sheriff and fire, and pier head modification to facilitate ingress and egress (TRPA 2016b). Alternative 1 includes the following deviations from the 2018 TRPA code related to boating facilities, that would be allowed under the Section 84.8.2 code amendments for Essential Public Safety Facilities within the Shorezone:

- Code Section 84.4.3.A.4. states that a project application for an additional pier shall meet the following requirements: (a) the project area shall initially score a minimum of 21 points based on the Contrast Rating System; and (b) no later than 6 months following project application submittal, the project area shall score a minimum of 25 points based on the Contrast Rating System, unless the project applicant demonstrates that a score of 25 points is infeasible. The project area has an initial contrast rating system score of 18. Furthermore, the visual mitigation that would be implemented to plant additional screening may raise the contrast score; however, it may not be possible to achieve a score of 25 points because certain areas of the project site cannot be screened due to public safety requirements for visibility between the existing on-site buildings and the pier.

- Code Section 84.4.3.B.2(e) limits the allowable visible mass to 220 square feet (not including lateral public access accommodations such as added height, ladders, or stairs). The existing pier's visible mass is 244 square feet. The area of new visible mass for Alternative 1 would be 174 square feet.

- Code Section 84.4.3.B.2(d) and (j) limit single-use piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet in width) and a single catwalk (not to exceed 3 feet in width and 30 feet in length). With the addition of the 8-foot-wide floating dock, the Station pier would be 16 feet wide, exceeding the TRPA's maximum width limit by 6 feet.

- Code Section 84.8.1.B.2 states that floating platforms shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line designated by TRPA, whichever is more limiting. The southern end of the proposed floating dock would extend approximately 35 feet beyond the pier head line.

- Code Section 84.8.1.B.3 states that the setback for new floating platforms is 20 feet from the projected property line of the adjacent property. The proposed floating dock would extend beyond the 20-foot setback line by approximately 10 feet.

- Code Section 84.8.1.B.5 limits floating platforms to a maximum area of 100 square feet and a maximum length of 10 feet. The proposed floating dock would exceed these limits, having an area of 280 square feet and a length of 35 feet.

2.1.1 Alternative 1: Proposed Best Management Practices

To avoid and minimize environmental impacts, the following BMPs would be implemented during the construction[4] of Alternative 1:

BMP C1-1: The results of the *U.S. Coast Guard Station Lake Tahoe Sampling and Analysis Report* (AECOM Technical Services 2016) will be used by the contractor to guide the dredging operations and to determine the location for disposal of dredged sediments. Sediments would be handled in accordance with applicable regulations and disposed of at a properly licensed facility.

BMP C1-2: Prior to construction, the contractor will be required to document whether there are any subsurface utilities in the area of excavation.[5] This can be accomplished by: 1) contacting all utilities that provide service in the area, documenting these contacts; 2) contacting Underground Service Alert (USA), documenting this contact; or, 3) some other equivalent affirmative action to determine whether there are subsurface utilities in the area of construction. If subsurface utilities are identified, the contractor would provide a utility avoidance plan before dredging starts.

BMP C1-3: The disturbance area will be limited to the minimum required to complete the Project. To the extent practicable, dredging will be kept to the minimum area necessary to achieve the target channel width, depth, and gradient, and overdepth dredging will be minimized. A final bathymetric survey will be performed, within 1 week after dredging is completed, that describes the actual final elevations in and dimensions of the dredging prism and the volume of material removed from the dredged area. The final bathymetric survey report will be provided to the USACE, LRWQCB, and TRPA.

BMP C1-4: To avoid the spread of turbidity and the sedimentation of surrounding sensitive habitats, a turbidity curtain will be installed around the dredging area that is sufficiently strong and durable to ensure integrity will be maintained under potential wind and wave actions. The bottom of the turbidity curtain will be securely anchored to the lakebed, and the top will include a floating boom with adequate freeboard to contain turbid waters in high wave and wind conditions. A double turbidity curtain may be used if required by the TRPA Compliance Inspector. In accordance with TRPA BMP handbook guidelines (TRPA 2014a), the turbidity curtain will be installed at least 10 feet from work activities to prevent equipment from damaging the curtain. Filter fabric will be placed under the conveyor belts, and fiber rolls will be installed along both sides of the belts to control the spread of sediment. Prior to daily dredging activities, the turbidity barriers will be checked to ensure proper installation and functionality. This will include checking that the base of the turbidity curtain is securely anchored, that there are no gaps in the floating boom or fiber rolls, and that all turbidity barriers are in good condition. Needed repairs or replacements will be performed before dredging for that day begins. The turbidity curtain would be removed only when construction is completed and turbidity returns to natural levels.

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[4] Note that the term “construction” when used in the context of Alternative 1 is meant to include both dredging and installation of the new boat lift and floating dock.

[5] TCPUD has been contacted and has confirmed that none of their utility lines are in the proposed Project disturbance area, and no other utilities are expected to occur. However, as a best practice for excavation, a formal utility clearance will be conducted and documented prior to work.

BMP C1-5: Dredging operations will cease immediately if inclement weather or high wave and/or wind action threatens to cause turbidity to spread beyond the turbidity-curtained area. Dredging would only resume once weather conditions improve. The dredging contractor will be required to prepare a dredging and discharge mitigation plan prior to the start of project-related dredging activities. The plan will include specific actions that the dredging contractor will be required to take immediate action to ensure that turbidity outside the curtained area is kept to a minimum at all times, including during inclement weather, to the extent that this can be done safely.

BMP C1-6: The contractor will ensure that the dredge operator is familiar with and skilled in using operational controls for minimizing turbidity, including minimizing bucket speed, avoiding jerking the bucket, deliberate placement of material on the conveyor, and avoiding smoothing the bottom at the end of dredging.

BMP C1-7: A Spill Prevention and Response Plan will be prepared and implemented during construction. Petroleum products and other hazardous materials will be kept in non-leaking containers stored in secondary containment on an impermeable surface (on either the work barge or the upland staging area) and covered in a manner that will prevent stormwater from contacting the container. Material Safety Data Sheets (MSDSs) for hazardous materials used during construction and operations will be available on site to provide information on storage, disposal, protective equipment, and spill-handling procedures. If a spill occurs, it will be contained and cleaned up immediately to the extent that this can be accomplished safely. A supply of suitable spill control and cleanup materials, such as absorbent booms and pads, will be available on site for prompt cleanup of spills. Coatings for new structures will be applied in advance and not over the lake. Application of paints, sealers, and coatings over water will be limited to minor touch up that must be done after structures are constructed and in place.

BMP C1-8: Construction equipment will be kept in good repair and will be inspected (prior to construction) and monitored (during construction) for leaks and invasive species and removed from service for maintenance or cleaning if necessary to prevent water quality or invasive species impacts. Any mechanical equipment that will be submersed in Lake Tahoe during dredging will be steam cleaned and inspected for leaks prior to use.

BMP C1-9: To minimize turbidity impacts to Lake Tahoe, handling and dewatering of dredged materials over the lake will occur only in the areas confined by turbidity barriers. Any dredged material spilled onto the ground or pavement during dredged material transfer or loading will be cleaned up in a manner that minimizes discharges to storm drains or the lake. Temporary filter inserts will be installed in storm drains in the Station parking lot to further avoid potential discharges to the stormwater system or lake during dredged material transfer and loading. The dredged materials will be transported off site in lined trucks to avoid discharges during transportation.

BMP C1-10: Staging and use of construction equipment and materials will be limited to paved upland areas and areas contained by turbidity barriers. Materials subject to wind or stormwater displacement will be secured. Upland staging areas will be centralized and delineated with construction boundary fencing as needed to minimize impacts to soil and vegetation. The stands for the conveyor system will also be placed in a manner that minimizes disturbance of soil and vegetation, to the extent practicable.

BMP C1-11: A Water Quality Monitoring Plan will be prepared and implemented during construction. Continuous visual inspection will be conducted to check that the turbidity curtain is functioning properly and that the dredging equipment is in good working order. If a turbidity plume or petroleum product sheen is detected outside the turbidity-curtained area, work will be suspended and a discharge mitigation plan (to be prepared by the contractor) will be implemented. At least once every 2 hours, the turbidity level will be measured at a point no more than 5 feet outside the turbidity-curtained area. If turbidity levels 5 feet outside the

curtain exceed 1 nephelometric turbidity units (NTUs) or more than 10 percent of the natural concentration of the levels in the lake then in evidence (i.e., due to wind, wave, storm or other conditions), whichever is greater, actions will be taken to reduce turbidity from the work activity to below the required limits as required in the contractor's discharge mitigation plan. Additionally, lake water samples will be collected weekly at a point no more than 5 feet outside the turbidity-curtained area and analyzed for total nitrogen (TN) and total phosphorus (TP). If levels exceed the LRWQCB's water quality objectives for these constituents (0.15 milligram per liter [mg/L] TN or 0.008 mg/L TP) or background concentrations, whichever is greater, corrective actions, such as use of a double turbidity curtain or modification of dredging rate or methodology, would be taken to reduce these levels to below the required limits. Additional parameters may be added to the monitoring program if the need is indicated by the results of the pre-construction sediment analysis. A daily written record will be kept documenting inspections, water sampling, exceedances (if any), and corrective actions (if any) and provided to the LRWQCB and TRPA at the end of construction, or as otherwise required.

BMP C1-12: No chitosan or other flocculants will be used in the lake to reduce turbidity.

BMP C1-13: The construction crew will keep the work area free from trash or litter. Waste material will be transported off site and disposed of in accordance with federal, state, and local regulations.

BMP C1-14: Work will be conducted between the hours of 8:00 a.m. and 6:30 p.m., in accordance with TRPA's construction noise guidelines. Construction activities will be limited to daytime hours to avoid the use of bright lights at night that could affect the behavior of fish and other aquatic organisms and/or cause visual impacts.

BMP C1-15: To reduce noise impacts, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used. If the use of an impact hammer is required, a wooden cushion block would be used to muffle sound from the hammer strike. Use of pre-drilling or jetting will be limited to situations where these techniques are required for proper pile installation and/or to minimize environmental impacts. The construction contractor will follow Occupational Safety and Health Administration (OSHA) and California Division of Occupational Safety and Health (Cal-OSHA) requirements for occupational noise exposure and the provision of hearing protection to construction workers during pile driving, drilling, and other noise-producing activities.

BMP C1-16: In-water work will only occur during the non-spawning season (October 1 to May 1) unless written authorization is obtained from the CDFW and TRPA to dredge outside of those dates.

BMP C1-17: Should construction activities occur during nesting bird season (February through August), a qualified biologist would perform a nesting bird survey, covering all areas within 100 feet of proposed construction activities and upland staging areas, within 14 days prior to the start of construction. The survey shall be conducted by a qualified biologist. If nests are discovered, an appropriate non-disturbance buffer zone would be established around the nesting site. A qualified biologist would monitor active nests to determine when the young have fledged and are feeding on their own. The Project biologist would consult the CDFW for clearance before construction activities may resume within the non-disturbance buffer.

BMP C1-18: To avoid potential adverse effects on Tahoe yellow cress, a pre-construction survey will be conducted to confirm that no Tahoe yellow cress is present in the Project Area. The survey will be conducted by a qualified biologist familiar with the vegetation of the Lake Tahoe region. The survey will take place during the Tahoe yellow cress flowering season (June 15 to September 30) prior to start of construction and will follow the survey protocol from Appendix N of the *Conservation Strategy for Tahoe Yellow Cress* (Pavlik et al. 2002). All un-

submerged areas of the shorezone in the Station property will be surveyed. If Tahoe yellow cress is observed, then the plants will be marked and fenced for avoidance, and construction personnel will be required to avoid disturbing the plants. Results of the survey will be provided to the USFWS, CDFW and TRPA prior to the start of construction, and these agencies would be consulted regarding suitable impact avoidance measures if Tahoe yellow cress is found.

BMP C1-19: During construction, the contractor will minimize idling time to a maximum of 5 minutes for all diesel powered equipment. Signs will be posted in the designated queuing areas of the construction site to remind equipment operators of the idling restriction. Idling of construction-related equipment and vehicles will be discouraged within 1,000 feet of sensitive receptors. All construction equipment will be equipped with properly operating mufflers and engine shrouds, in accordance with manufacturers' specifications.

BMP C1-20: The contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, or natural gas) generators for temporary power rather than diesel power generators. In accordance with state law, portable generators or other portable equipment with an engine of 50 horsepower (HP) or greater will be required to have either California statewide portable equipment registration (issued by the California Air Resources Board [CARB]) or an individual permit issued by the Placer County Air Pollution Control District (PCAPCD).

BMP C1-21: In the unlikely event that buried cultural resources are discovered during Project activities, ground-disturbing activities would cease within a 30-foot radius of the find and the CG would consult a qualified archaeologist for recommended procedures. Any necessary investigation and treatment will be completed before work continues in the vicinity of the find. If the find is related to tribal cultural resources, the Tribal Historic Preservation Officer (THPO) for the Washoe Tribe of Nevada and California will be contacted and invited to consult with the Project archaeologist and to monitor investigation and treatment. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the Native American Heritage Commission (NAHC), which would contact the most likely descendants for consultation on treatment of the burial site. TRPA will also be notified in writing if cultural resources are discovered in the Project Area.

BMP C1-22: New structures will use materials and colors that blend with the natural environment rather than contrast with it, and the use of reflective materials will be avoided to the extent practicable.

BMP C1-23: A Traffic Management Plan will be prepared and implemented during construction. The Traffic Management Plan will be subject to review and approval by TRPA. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts.

BMP C1-24: The CG will inform the dredging contractor of these BMPs and the specific conditions of Project permits and approvals and be responsible for maintaining compliance with those BMPs and permit conditions. A Worker Environmental Awareness Program (WEAP) will be mandated for personnel involved in construction activities. Training will include the importance of the aquatic environment to special-status species and the environmental protection measures that are being implemented to avoid and minimize adverse environmental impacts.

After construction is completed, operations at the Station would continue largely unchanged from current conditions, other than periodic maintenance dredging. The CG would obtain the appropriate regulatory approvals before conducting future maintenance dredging and would incorporate the same BMPs listed above, as applicable, when conducting maintenance dredging.

2.2 Alternative 2: 350-Foot Dog-Leg Extension with Dolphin Piles

Alternative 2 would extend the Station's existing 312-foot pier by an additional 350 feet in a dog-leg formation (*Figure 2-2*). The proposed pier extension would consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. Each of these components is described as follows:

Span Connecting to Existing Pier: The connecting span would extend the existing pier 250 feet south into Lake Tahoe and would be 5 feet wide. The pier decking material for the span would consist of pre-fabricated grated metal. The connecting span would be supported by a dolphin pile configuration. The dolphin configuration would consist of 10-inch-diameter steel pipe battered piles (two opposing piles installed at an angle toward each other). The dolphins would be spaced 50 feet apart, for a total of five dolphins (total of 10 piles).

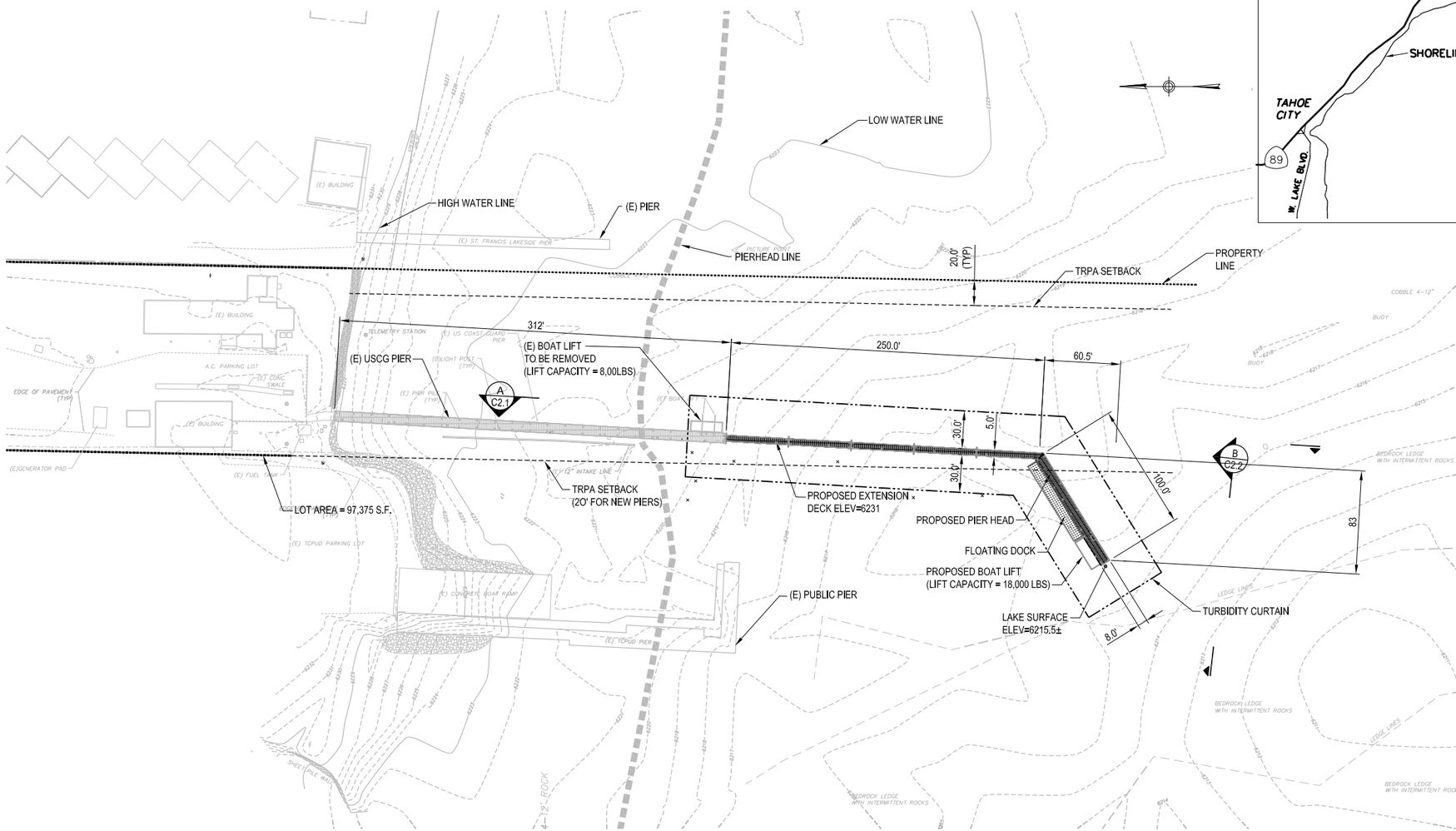
New Pier Head: The new pier head would be 100 feet long and 8 feet wide and would angle west at an approximate 45-degree angle from the connecting span. The pier head would have a grated metal deck supported by 10 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, LTD, which is expected to be sufficient for year-round mooring during drought years. The dog-leg orientation of the pier head is designed to reach a sufficient depth while minimizing the length of the connecting span, based on site bathymetry. Facilities on the pier head would include one 18,000-pound capacity boat lift (which would replace the pier's existing 8,000-pound lift) supported by two piles 10 inches in diameter; a 70-foot by 8-foot floating dock; a relocated/reconfigured fueling station; and extension of existing utility lines that would run underneath the pier.

The total net footprint for the new pier under Alternative 2 would be approximately 2,610 square feet. The grated decking would create approximately 70 percent less shading than a solid deck, reducing the shaded footprint of Alternative 2 to approximately 1,180 square feet. The total lake-bottom footprint for the 22 total piles would be approximately 12 square feet. The anticipated construction duration for Alternative 2 would be approximately 7 weeks.

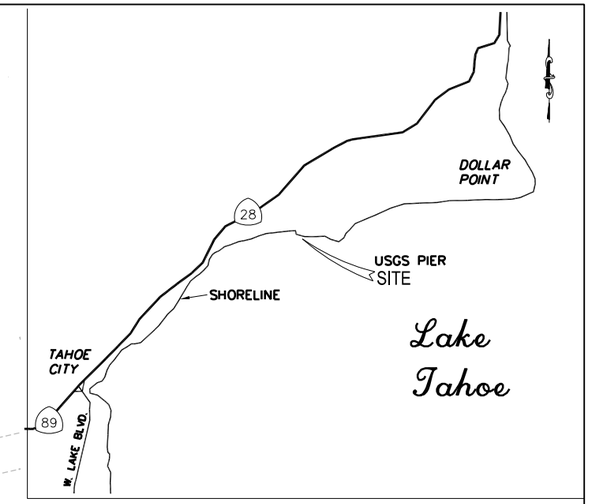
Construction of the pier extension would involve installing the supporting piles and pile caps, followed by installation of the pier decking and accessory structures. Piles would be installed using a pile driver mounted on a barge. Piles would be driven to the tip elevation shown on the construction plans and to a minimum driving resistance to obtain the specified safe minimum bearing capacity. There are two methods of pile installation: vibratory hammer method and impact hammer method, both of which were described previously in *Section 2.1*. A vibratory hammer will be used as the preferred method to drive piles for the proposed Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used. Due to the presence of stiff clay substrates in the Project Area, techniques such as pre-drilling or jetting may also be required to assist pile driving, though the need for these techniques is unlikely based on the experience of installing the piles for the existing Station pier and other pier construction projects in the Project vicinity. These techniques are described in *Section 2.1*.

Once the new piles have been driven, the tops of the piles would be cut to the required elevation using a welding torch. After the piles are cut, the steel cap would be placed and joined by welding or riveting. After the pile caps are installed, the aluminum gangway elements and the pier head stringers, decking, and handrails would be placed and attached. Gangway elements would arrive on site pre-fabricated, including handrails and utility supports. After the gangway and pier head decking are installed, accessory structures, including the floating dock, boat lift, and relocated fueling station, lighting, and utility lines would be installed.

Figure 2-2: Alternative 2 350-ft Dogleg Pier Extension



PLAN



VICINITY MAP

0' 30' 60' 90'
SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
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Meeting: Meeting 1

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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 2 350 FOOT DOGLEG EXTENSION WITH DOLPHIN PILES
Project Number: 60218657
Sheet Number: C2.0 of

The 2018 amended TRPA Code of Ordinances include specific location, design, and construction standards for piers, floating docks and platforms, and other boating facilities. However, in 2016, TRPA adopted code amendments for Essential Public Safety Facilities within the Shorezone (Section 84.10.2, subsequently updated to Section 84.8.2 in 2018) that permit deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders. TRPA determined that the primary anticipated design features would be additional pier lengths to reach navigable water in drought conditions, a second boatlift to accommodate both sheriff and fire, and pier head modification to facilitate ingress and egress (TRPA 2016b). Alternative 2 includes the following deviations from the 2018 TRPA code related to boating facilities, that would be allowed under the Section 84.8.2 code amendments for Essential Public Safety Facilities within the Shorezone:

- Code Section 84.4.3.A.4. states that a project application for an additional pier shall meet the following requirements: (a) the project area shall initially score a minimum of 21 points based on the Contrast Rating System; and (b) no later than 6 months following project application submittal, the project area shall score a minimum of 25 points based on the Contrast Rating System, unless the project applicant demonstrates that a score of 25 points is infeasible. The Project area has an initial contrast rating system score of 18. Furthermore, the visual mitigation that would be implemented to plant additional screening may raise the contrast score; however, it may not be possible to achieve a score of 25 points because certain areas of the Project site cannot be screened due to public safety requirements for visibility between the existing on-site buildings and the pier.

- Code Section 84.4.3.B.2(e) limits the allowable visible mass to 220 square feet (not including lateral public access accommodations such as added height, ladders, or stairs). The existing pier's visible mass is 244 square feet. The new visible mass of Alternative 2 would be 734 square feet.

- Code Section 84.4.3.B.2(b) states that single-use piers shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line, whichever is more limiting. Alternative 2 would extend to a lake-bottom elevation of approximately 6,215 feet, LTD, to provide adequate depth for year-round access, and would extend approximately 350 feet beyond the pier head line.

- Code Section 84.4.3.B.2(g) states that the setback for new single-use piers is 20 feet from the projected property line of the adjacent property. With the proposed dog-leg configuration, Alternative 2 would extend approximately 90 feet beyond the TRPA setback line.

- Code Section 84.4.3.B.2(d) and (j) limit single-use piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet in width) and a single catwalk (not to exceed 3 feet in width and 30 feet in length). The proposed pier head would be 8 feet wide and would include an 8-foot-wide floating dock, exceeding TRPA's maximum width limit by 6 feet.

- Code Section 84.8.1.B.2 states that floating platforms shall not extend beyond lake-bottom elevation 6,219 or beyond the pier head line, whichever is more limiting. The proposed floating dock for Alternative 2 would extend approximately 350 feet beyond the pier head line.

- Code Section 84.8.1.B.3 states that the setback for floating platforms is 20 feet from the projected property line of the adjacent property. The proposed floating dock for Alternative 2 would extend approximately 75 feet beyond the required setback line.

- Code Section 84.8.1.B.5 limits floating platforms to a maximum area of 100 square feet and a length of 10 feet. The proposed floating dock would exceed these limits, having an area of 560 square feet and a length of 70 feet.

2.2.1 Alternative 2: Proposed Best Management Practices

To avoid and minimize environmental impacts, the following BMPs would be implemented during the construction of Alternative 2:

BMP C2-1: The disturbance area will be limited to the minimum required to complete the Project.

BMP C2-2: Prior to initiating construction, the construction contractor will be required to document whether there are any subsurface utilities in the area of excavation. This can be accomplished by: 1) contacting all utilities (both public and private) that provide service in the area, documenting these contacts; 2) contacting USA, documenting this contact; or, 3) some other equivalent affirmative action to determine whether there are subsurface utilities in the area of construction. If there are subsurface utilities are in the area of excavation, the construction contractor must provide a utility avoidance plan before construction starts.

BMP C2-3: A turbidity curtain will be installed around the construction area to avoid the spread of suspended sediments in the water column and the sedimentation of surrounding sensitive habitats. The bottom of the turbidity curtain will be securely anchored to the lakebed and the top will include a floating boom with adequate freeboard to contain turbid waters in high wave and wind conditions. A double turbidity curtain may be used if required by the TRPA Compliance Inspector. At the TRPA Compliance Inspector's discretion, caissons may be used in addition to, or instead of, turbidity curtains to control turbidity during pile driving. In accordance with TRPA BMP handbook guidelines, the turbidity curtain will be installed at least 10 feet from work activities to prevent equipment from damaging the curtain. Prior to daily construction activities, the perimeter of the turbidity curtain will be checked to ensure proper installation and functionality. This will include checking that the base of the turbidity curtain is securely anchored, that there are no gaps in the floating boom, and that all turbidity barriers are in good condition. Needed repairs or replacements will be performed before construction for that day begins. The turbidity curtain would be removed only when construction is completed and turbidity returns to background levels.

BMP C2-4: During periods of high wind and wave action that could cause water to breach the turbidity curtain, construction will cease until weather conditions improve.

BMP C2-5: A Spill Prevention and Response Plan will be prepared and implemented during construction. Petroleum products and other hazardous materials will be kept in non-leaking containers stored in secondary containment on an impermeable surface (on either the work barge or the upland staging area) and covered in a manner that will prevent stormwater from contacting the container. MSDSs for hazardous materials used during construction and operations will be available on site to provide information on storage, disposal, protective equipment, and spill-handling procedures. If a spill occurs, it will be contained and cleaned up immediately to the extent that this can be accomplished safely. A supply of suitable spill control and cleanup materials, such as absorbent booms and pads, will be available on site for prompt cleanup of spills. Coatings for new structures will be applied in advance and not over the lake. Application of paints, sealers, and coatings over water will be limited to minor touch up that must be done after structures are constructed and in place.

BMP C2-6: Construction equipment will be kept in good repair and will be inspected (prior to construction) and monitored (during construction) for leaks and invasive species and removed from service for maintenance or cleaning if necessary to prevent water quality or invasive species impacts. Any mechanical equipment that will be submersed in Lake Tahoe during construction will be steam cleaned and inspected for leaks prior to use.

BMP C2-7: Staging and use of construction equipment and materials will be limited to paved upland areas and areas contained by turbidity barriers. Materials subject to wind displacement into the water will be secured. Upland staging areas will be centralized and delineated with

construction boundary fencing to minimize impacts to adjacent soils and vegetation. Construction materials and equipment will not be stored along the beach or shoreline.

BMP C2-8: A Water Quality Monitoring Plan will be prepared and implemented during construction. Continuous visual inspection will be conducted to check that the turbidity curtain is functioning properly and that the construction equipment is in good working order. If a turbidity plume or petroleum product sheen is detected outside the turbidity-curtained area, work will be suspended and a discharge mitigation plan (to be prepared by the contractor) will be implemented. At least once every 2 hours, the turbidity level will be measured at a point no more than 5 feet outside the turbidity-curtained area. If turbidity levels 5 feet outside the curtain exceed 1 NTUs or more than 10 percent of the natural concentration of the levels in the lake then in evidence (i.e., due to wind, wave, storm or other conditions), whichever is greater, actions will be taken to reduce turbidity from the work activity to below the required limits as required in the contractor's discharge mitigation plan. Additionally, lake water samples will be collected weekly at a point no more than 5 feet outside the turbidity-curtained area and analyzed for TN and TP. If levels exceed the LRWQCB's water quality objectives for these constituents (0.15 mg/L TN or 0.008 mg/L TP) or background concentrations, whichever is greater, corrective actions, such as use of a double turbidity curtain or modification of construction rate or methodology, would be taken to reduce these levels to below the required limits. Additional parameters may be added to the monitoring program if the need is indicated by the results of the pre-construction sediment analysis. A daily written record will be kept documenting inspections, water sampling, exceedances (if any), and corrective actions (if any) and provided to the LRWQCB and TRPA at the end of construction, or as otherwise required.

BMP C2-9: No chitosan or other flocculants will be used in the lake to reduce turbidity.

BMP C2-10: The construction crew will keep the work area free from trash or litter. Waste material from the site will be transported off site and disposed of in accordance with federal, state, and local regulations.

BMP C2-11: Work will be conducted between the hours of 8:00 a.m. and 6:30 p.m. in accordance with TRPA's construction noise guidelines. Construction activities will be limited to daytime hours to avoid the use of bright lights at night that could affect the normal behavior of fish and other aquatic organisms and/or cause visual impacts.

BMP C2-12: To reduce noise impacts, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used. If the use of an impact hammer is required, a wooden cushion block would be used to muffle sound from the hammer strike. Use pre-drilling or jetting will be limited to situations where these techniques are required for proper pile installation. The construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving, drilling, and other noise-producing activities.

BMP C2-13: In-water work will only occur during non-spawning season (October 1 to May 1) unless written authorization is obtained from the CDFW and TRPA for work outside of these dates.

BMP C2-14: Should construction activities occur during nesting bird season (February 1 through August 31) a nesting bird survey will be performed covering areas within 100 feet from construction activities and upland staging areas within 14 days prior to the commencement of construction activities. The survey will be conducted by a qualified biologist. If nests are discovered, an appropriate non-disturbance buffer zone will be established around the nesting site. A qualified biologist will monitor active nests to determine when the young have fledged and are feeding on their own. The Project biologist and CDFW will be consulted for clearance before construction activities may resume within the non-disturbance buffer.

BMP C2-15: To avoid potential adverse effects on Tahoe yellow cress, a pre-construction survey will be conducted to confirm that no Tahoe yellow cress are present in the Project Area. The survey will be conducted by a qualified biologist familiar with the vegetation of the Lake Tahoe region. The survey will take place during the Tahoe yellow cress flowering season (June 15 to September 30) prior to start of construction and will follow the survey protocol from Appendix N of the *Conservation Strategy for Tahoe Yellow Cress* (Pavlik et al. 2002). All un-submerged areas of the shorezone in the Station property will be surveyed. If Tahoe yellow cress is observed during the pre-construction survey in areas potentially disturbed by the Project, then the plants will be marked and fenced for avoidance and construction personnel will be advised of the need to avoid disturbance of the plants. Results of the survey will be provided to the USFWS, CDFW, and TRPA prior to the start of construction, and these agencies will be consulted regarding suitable impact avoidance measures if Tahoe yellow cress is found during the survey.

BMP C2-16: During construction, the contractor will minimize idling time to a maximum of 5 minutes for all diesel powered equipment. Signs shall be posted in the designated queuing areas of the construction site to remind off-road equipment operators of the idling restriction. Idling of construction-related equipment and vehicles will be discouraged within 1,000 feet of sensitive receptors. All construction equipment shall be equipped with properly operating mufflers and engine shrouds, in accordance with manufacturers' specifications.

BMP C2-17: The contractor shall use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators rather than temporary diesel power generators. In accordance with state law, portable generators or other portable equipment with an engine of 50 HP or greater will require either California statewide portable equipment registration (issued by the CARB) or an individual permit issued by the PCAPCD.

BMP C2-18: In the unlikely event that buried cultural resources are discovered during Project activities, ground-disturbing activities would cease within a 30-foot radius of the find and the CG would consult a qualified archaeologist for recommended procedures. Any necessary treatment/ investigation will be completed before Project activities continue in the vicinity of the find. If the find is related to tribal cultural resources, the THPO for the Washoe Tribe of Nevada and California will be contacted and invited to consult with the hired professional archaeologist and monitor any further necessary treatment or investigation. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. TRPA will also be notified in writing if cultural resources are discovered in the Project Area.

BMP C2-19: New structures will use materials and colors that blend with the natural environment rather than contrast with it, and use of reflective materials will be avoided to the extent practicable. New lighting will be shielded, down-directed, compliant with TRPA height restrictions, and of the minimal quantity and intensity needed to meet the CG's operational and safety requirements.

BMP C2-20: A Traffic Management Plan will be prepared and implemented during construction. The Traffic Management Plan will be subject to review and approval by TRPA. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts.

BMP C2-21: The CG will inform the construction contractors of the specific conditions of Project permits and be responsible for maintaining compliance with those permits. A WEAP will be mandated for personnel involved in construction activities. Training will include the importance of the aquatic environment to special-status species and the environmental protection measures that are being implemented to avoid and/or minimize adverse environmental impacts.

After construction of the pier extension is completed, operations at the Station would continue largely unchanged from current conditions. The CG will implement the following BMPs during the operations phase of Alternative 2 to avoid and minimize potential adverse impacts to environmental resources:

BMP O2-1: A Fueling Plan would be prepared and implemented for operation of the fueling station and other activities at the pier. The CG will obtain an Authority to Construct/Permit to Operate the modified fueling station from the PCAPCD and comply with the PCAPCD's requirements for vapor recovery equipment and practices. Spill prevention and response measures would be implemented during operations, and if a spill occurs, it would be contained and cleaned up immediately to the extent work can be accomplished safely. A supply of suitable cleanup materials, such as absorbent booms and pads, would be available on site for prompt cleanup of spills. Signs would be posted at the pier head to educate personnel on proper fueling and materials handling techniques to avoid and minimize spills.

2.3 Alternative 3: 450-Foot Straight Extension with Dolphin Piles

Alternative 3 would extend the Station's existing 312-foot pier by an additional 450 feet in a straight formation (*Figure 2-3*). The pier extension proposed for Alternative 3 would also consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. Each of these components is described as follows:

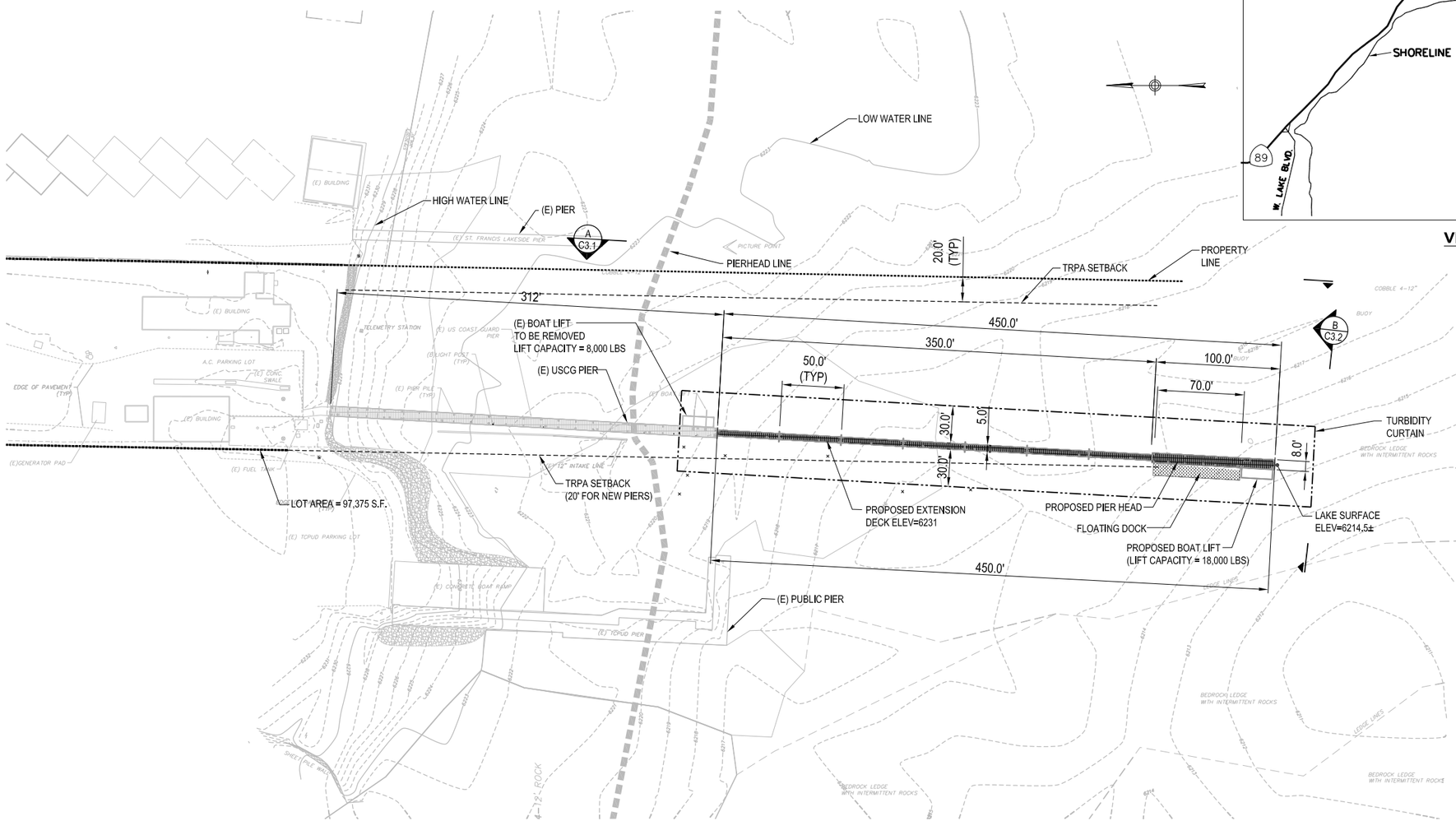
Span Connecting to Existing Pier: The connecting span for Alternative 3 would extend 350 feet south. The span would be 5 feet wide and composed of grated sections supported by 10-inch-diameter steel pipe pile dolphins. The dolphins would be spaced 50 feet apart, for a total of seven dolphins (total of 14 piles).

New Pier Head: The new pier head would be 100 feet long by 8 feet wide and would extend straight south from the connecting span. The pier head would have a grated metal deck supported by 10 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, LTD, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include an 18,000-pound capacity boat lift (which would replace the existing boat lift) supported by two steel pipe piles 10 inches in diameter, a 70-foot by 8-foot floating dock, relocation of the existing fueling station, and extension of existing utility lines that would run underneath the pier. The total net footprint of the new pier under Alternative 3 would be 3,110 square feet, and, due the grated deck, the shaded footprint would be equivalent to 1,330 square feet. Alternative 3 would require a total of 26 piles, which would result in a lake-bottom footprint of approximately 14 square feet. Construction duration would be approximately 8 weeks. The construction techniques used for Alternative 3 would be identical to those described for Alternative 2.

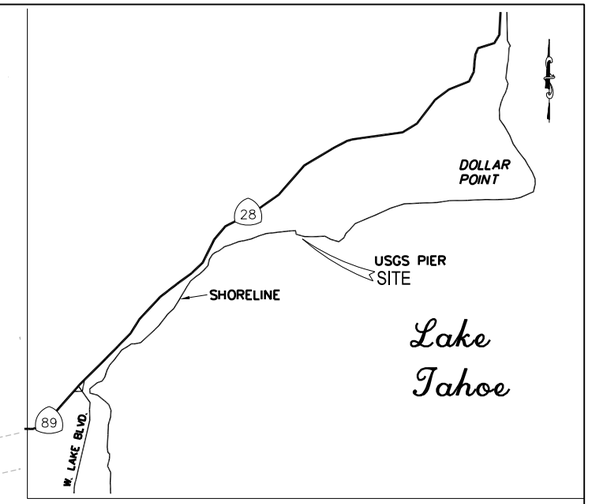
The 2018 amended TRPA Code of Ordinances include specific location, design, and construction standards for piers, floating docks and platforms, and other boating facilities. However, in 2016, TRPA adopted code amendments for Essential Public Safety Facilities within the Shorezone (Section 84.10.2, subsequently updated to Section 84.8.2 in 2018) that permit deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders. TRPA determined that the primary anticipated design features would be additional pier lengths to reach navigable water in drought conditions, a second boatlift to accommodate both sheriff and fire, and pier head modification to facilitate ingress and egress (TRPA 2016b). Alternative 2 includes the following deviations from the 2018 TRPA code related to boating facilities, that would be allowed under the Section 84.8.2 code amendments for Essential Public Safety Facilities within the Shorezone:

- Code Section 84.4.3.A.4. states that a project application for an additional pier shall meet the following requirements: (a) the project area shall initially score a minimum of 21 points based on the Contrast Rating System; and (b) no later than 6 months following project application submittal, the project area shall score a minimum of 25 points based on the Contrast Rating System, unless the project applicant demonstrates that a score of 25 points is infeasible. The Project area has an initial contrast rating system score of 18. Furthermore, the visual mitigation that would be implemented to plant additional screening may raise the contrast score; however, it may not be possible to achieve a

Figure 2-3: Alternative 3 450-ft Straight Pier Extension



PLAN



VICINITY MAP

0' 30' 60' 90'
SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

TRANSPORTATION

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Drawn By: EM
Approved By:
Date: 7/26/12
Meeting
Meeting 1

U.S. Department of Homeland Security
United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 3 450 FOOT STRAIGHT EXTENSION WITH DOLPHIN PILES
Project Number: 60218657
Sheet Number: C3.0 of

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score of 25 points because certain areas of the Project site cannot be screened due to public safety requirements for visibility between the existing on-site buildings and the pier.

- Code Section 84.4.3.B.2(e) limits the allowable visible mass to 220 square feet (not including lateral public access accommodations such as added height, ladders, or stairs). The existing pier's visible mass is 244 square feet. The new visible mass of Alternative 3 would be 704 square feet.

- Code Section 84.4.3.B.2(b) states that single-use piers shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line, whichever is more limiting. Alternative 3 would extend to a lake-bottom elevation of approximately 6,215 feet, LTD, to provide adequate depth for year-round access and therefore would extend approximately 460 feet beyond the pier head line.

- Code Section 84.4.3.B.2(g) states that the setback for new single-use piers is 20 feet from the projected property line of the adjacent property. With the proposed straight configuration, Alternative 3 would extend approximately 30 feet beyond the TRPA setback line.

- Code Section 84.4.3.B.2(d) and (j) limit single-use piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet width) and a single catwalk (not to exceed 3 feet width). The proposed pier head would be 8 feet wide and would include an 8-foot-wide floating dock. The total width of the pier head would be 16 feet, exceeding TRPA's maximum width limit by 6 feet.

- Code Section 84.8.1.B.2 states that floating platforms shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line, whichever is more limiting. The floating dock for Alternative 3 would extend approximately 430 feet beyond the pier head line.

- Code Section 84.8.1B.3 states that the setback for floating platforms is 20 feet from the projected property line of the adjacent property. The proposed floating dock for Alternative 3 would extend approximately 30 feet beyond the required setback line.

- Code Section 84.8.1.B.5 limits floating platforms to a maximum area of 100 square feet and a length of 10 feet. The proposed floating dock would exceed these limits, having an area of 560 square feet and a length of 70 feet.

2.3.1 Alternative 3: Best Management Practices

The BMPs to be implemented for Alternative 3 would be identical to those implemented under Alternative 2.

2.4 Alternative 4: No Action

Under Alternative 4, no dredging or pier construction would occur at the existing pier, and CG operations would continue with existing conditions. Due to the ongoing effects of climate change, which is expected to cause more frequent and more severe cyclical droughts and seasonal low water levels at Lake Tahoe, water depths at the existing pier head will not be sufficient for the CG to consistently keep their response boats moored at the Station. The continuation of existing conditions would prevent the CG from providing essential emergency search and rescue, law enforcement, and boating safety services to the boating public and agencies that use Lake Tahoe, because response times would not meet CG search and rescue standards during low-water periods when the response boats must be moored off site.

2.5 Summary Comparison of Alternatives

Table 2-1 provides a summary comparison of the four alternatives that are being considered.

Table 2-1 Summary Comparison of Alternatives

Alternative	Description	New Surface Area over Lake (square feet)	New Shaded Area (square feet)	Lake-Bottom Footprint (square feet)	Material Dredged (CY)	Total Number of Piles	Construction Duration (weeks)
Alternative 1 – Dredging at Existing Pier (Proposed Action)	Dredge a 410-foot long by 50- to 90-foot wide channel at the existing 312-foot pier, using a barge-mounted excavator. Material would be transported from barge to shore using a conveyor, then hauled to materials recovery facility. Requires maintenance dredging every 10 to 15 years. Remove existing 8,000-pound boat lift and replace with new 18,000-pound boat lift and install a 35-foot by 8-foot floating dock on western side of existing pier head. Reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, fueling station) to accommodate new lift and dock.	410	410	27,816 – 29,749	2,656-5,041	2	8
Alternative 2 – 350-foot Dog-Leg Extension with Dolphin Piles	Install a new connecting pier span 250 feet long by 5 feet wide south into the lake using grated metal decking and dolphin piers. Install a new pier head using grated metal deck, 100 feet long by 8 feet wide at a 45-degree angle west from the connecting span. The total pier length would be 662 feet (312 feet existing plus 350 feet new). Install a new 70-foot by 8-foot floating dock. Remove the existing 8,000-pound boat lift and replace with a new 18,000-pound boat lift, reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, and fueling station), and extend existing utility lines that would run underneath the pier.	2,610	1,180	12	0	22	7
Alternative 3 – 450-foot Straight Extension with Dolphin Piles	Install a new connecting pier span 350 feet long by 5 feet wide south into the lake using grated metal decking and dolphin piles. Install a new pier head using grated metal deck, 100 feet long by 8 feet wide continuing south. The total pier length would be 762 feet (312 feet existing plus 450 feet new). Install a new 70-foot by 8-foot floating dock. Remove the existing 8,000-pound boat lift and replace with a new 18,000-pound boat lift, reconfigure some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, and fueling station), and extend existing utility lines that would run underneath the pier.	3,110	1,330	14	0	26	8
Alternative 4 – No Action	Continue with existing conditions	0	0	0	0	0	0

2.6 Alternatives Considered but Eliminated from Further Analysis

As discussed in *Section 1.1*, the CG has already considered, and implemented, a number of operational modifications at the Station to deal with low-water conditions at Lake Tahoe, including using other existing mooring facilities in the vicinity of the Station during low-water conditions, installing lights on their emergency response vehicle to minimize traffic delays in accessing that off-site mooring facility, and procuring special-purpose shallow-water craft to use during drought conditions. However, even after implementing these alternative solutions, the lack of consistent access to the Station pier still results in delayed CG response times that have the potential to adversely affect public safety and the environmental quality. At the suggestion of TRPA, the CG has considered other temporary measures, such as using a buoy to moor their response boat. However, the delays and logistical issues involved with ferrying CG staff and equipment to an offshore buoy to respond to an incident make this impractical. In addition, mooring at a buoy would leave the CG boat vulnerable to sinking, sabotage, and damage from severe weather, and the CG requires that their vessels be in their control at all times.

In addition to the temporary operational changes discussed above, several other long-term alternatives for providing consistent year-round mooring capabilities were considered by the CG but have been eliminated from further analysis because they are infeasible or would result in greater environmental impacts than the alternatives that have been chosen for detailed analysis. These alternatives are described briefly in the following sections along with the rationale for excluding them from further analysis.

2.6.1 Pier Extension with Monopiles

The CG also considered pier extension alternatives that would have used 1-foot-diameter steel-pipe monopiles to support the connecting span in place of dolphins in both the dog-leg and straight configurations. To provide the required support, the monopiles would have been spaced approximately 10 feet apart. This would have resulted in approximately 2.5 times more piles being required for the connecting span than the dolphin pile designs, and therefore a substantially increased total number of piles for the monopile designs (37 versus 22 total piles for the dog-leg configuration and 47 versus 26 total piles for the straight configuration). The increased number of piles would have led to proportionate increases in most impacts (e.g., lake-bottom and fish habitat disturbance, impacts to water quality and littoral drift, added visual mass, longer construction timeframe, etc.). In addition, the pier extensions would not comply with several of TRPA's requirements for scenic resources and community design and therefore could not be approved by TRPA. Because the monopile designs' larger disturbance footprints would result in greater impacts than the corresponding dolphin pile designs and presented no environmental advantages over the dolphin pile designs, the monopile pier extension alternatives were eliminated from further analysis.

2.6.2 Alternative Site

The CG also considered relocating their facilities to a new site on Lake Tahoe to access adequate year-round mooring conditions. A number of options were considered, including 1) leasing mooring space at an existing marina with adequate water depth and leasing nearby office space for the CG staff, and 2) leasing or purchasing a property to relocate the CG office and mooring facilities. However, no suitable site was identified that would not result in continued delays in response times or the need for construction of a new pier and/or offices and other facilities at a new site, resulting in greater impacts than modification of the pier at the existing Station. Because alternative sites would not meet the CG's purpose and need for the proposed Project and/or would result in potentially significant environmental impacts due to the construction of a new pier, moving the Station to an alternative site was eliminated from further analysis.

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3.0 Environmental Analysis

Section 3 presents information on the affected environment, regulatory setting, and potential environmental impacts of the proposed Project Alternatives for a broad range of environmental resource areas, as required by NEPA, CEQA, and TRPA regulations. Where potentially significant impacts are identified for a resource, *Section 3* also describes measures that would be implemented to mitigate those impacts.

3.1 Approach to the Environmental Analysis

This environmental analysis is provided to assess and document the potential environmental impacts of the four proposed Project Alternatives. Discussion of each resource area of concern is contained in *Sections 3.2* through *3.12*. For each resource area, the analyses describe the existing environmental setting, applicable regulatory background, the potential for the proposed Project Alternatives to affect the resource, the significance of potential impacts, and measures to mitigate potentially significant impacts (if any). *Section 3.13* contains a discussion of Project impacts in the context of other past, present, and foreseeable future projects that may contribute to cumulative impacts in the Project vicinity. The technical approach to the cumulative impact analysis is discussed further in *Section 3.15.1*.

Sections 3.2 through *3.12* of this document are organized into the following major subsections:

Affected Environment – This subsection describes the existing regional and local conditions at the time the environmental analysis was conducted as related to the specific resource area under analysis. The description of the affected environment provides a baseline from which environmental impacts of the proposed Project Alternatives are identified.

Regulatory Setting – This subsection describes applicable federal, state, and local laws, ordinances, regulations, and policies for each resource area. The analyses of environmental effects in *Sections 3.2* to *3.12* assume that construction and operation of the proposed Project Alternatives would comply with relevant regulatory requirements.

Environmental Impacts and Mitigation Measures – This section identifies and discusses whether each of the proposed Project Alternatives would potentially have impacts on the resource area under analysis; determines the level of significance of those impacts; proposes feasible measures to mitigate potentially significant impacts, if any are identified; and describes whether the proposed mitigation measures would reduce the impacts to a less-than-significant level. The discussion is organized by alternative and includes the analysis, rationale, and evidence upon which conclusions are drawn. Impacts are addressed at a level of detail that is commensurate with the magnitude of the potential impact. As is standard for both NEPA and CEQA, the determination of whether a Project Alternative would have potential impacts was made by comparing anticipated conditions during and after Project construction to a baseline of the existing conditions described in the *Affected Environment* sections for each resource. Negative aspects of the existing conditions that would continue to be present after implementation of the Project are therefore not considered “impacts,” though they are discussed where applicable to the impact analysis. A Project Alternative is only considered to have an impact if it would make conditions worse than those currently existing. For the impact analysis, the BMPs presented in the descriptions of the various Project Alternatives are considered to be incorporated as integral components of the proposed Project’s methodology and design and therefore are not considered “mitigation.” Mitigation measures are proposed only when potentially significant impacts remain after full implementation of the BMPs and additional measures are required to offset or compensate for those impacts to reduce them to a less-than-significant level.

Separate impact analyses are provided according to NEPA, CEQA, and TRPA criteria. The NEPA analysis presents a general discussion of environmental effects of the proposed Project Alternatives (with a focus on impacts that relate to specific federal regulations or requirements) and an assessment of the significance of the effects given their context and intensity. The CEQA analysis is intended to provide the LRWQCB with sufficient information to complete their CEQA review and addresses the specific questions

included in the CEQA checklist. Similarly, the TRPA analysis addresses the questions included in the TRPA IEC and is intended to provide the TRPA with sufficient information to prepare the findings required for their approval process.

NEPA and CEQA have slightly different definitions and approaches to determining whether or not an impact is "significant." The NEPA regulations define significance in terms of context and intensity. Context refers to the need to consider impacts in the setting and scale in which they occur (40 CFR 1508.27(a)). Intensity refers to the severity of the impact, and the NEPA regulations provide ten criteria to consider when analyzing the intensity of an impact (40 CFR 1508.27(b)). Under NEPA, impacts include not only physical conditions but also economic and social effects (40 CFR 1508.8).

CEQA defines a significant impact as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (14 CCR 15382). An economic or social change by itself is not considered a significant effect on the environment under CEQA, though a social or economic change related to a physical change may be considered in determining whether the physical change is significant. The CEQA Guidelines encourage agencies to adopt their own thresholds for what constitutes a significant impact (14 CCR 15064.7(a)). A "threshold of significance" is "an identifiable quantitative, qualitative, or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant" (14 CCR 15064.7). Thus, some state or local agencies may have specific definitions of significance for particular resources or impacts. Even in the absence of adopted thresholds, CEQA requires an agency to evaluate the factual and scientific data to determine whether an impact may be significant. The determination of significance may depend to some degree on a project's context and setting (14 CCR 15064(b)). Significance determinations must be "based on substantial evidence in the record of the lead agency" (14 CCR 15064(f)).

In addition to findings of significance, the TRPA Code of Ordinances also requires findings regarding the effects on environmental carrying capacity thresholds. TRPA has established thresholds for water quality, air quality, scenic resources, soil conservation, fish habitat, vegetation, wildlife habitat, noise, and recreation. These thresholds are used by TRPA to set environmental goals and standards for the Lake Tahoe Basin. To approve a project, TRPA must find that the project will not cause any threshold to be exceeded (TRPA Code, Section 4.4.1.B). Therefore, a discussion of the effect of each Project Alternative on TRPA thresholds is also included each of the applicable environmental analysis sections.

The proposed Project Alternatives have been analyzed at an equal level of detail. Alternatives 2 and 3 are very similar, because they represent two variations of a pier extension with slight differences in length and configuration, and they would be expected to have similar types of impacts. Therefore, when impacts are similar, the reader will be referred to the impact discussion for Alternative 2 in the impact analysis of Alternative 3 to reduce redundancy. In those cases, the relative differences in the magnitude or quantity of impacts for the two pier extension alternatives will be discussed in detail.

3.1.1 Resources Analyzed in Detail

The CG considered the full range of environmental resources that are typically addressed in NEPA, CEQA, and TRPA environmental documents. The resource areas listed below would potentially be affected by the proposed Project and thus are discussed in detail in the environmental analysis:

- Aesthetics, Scenic Resources, and Community Design
- Air Quality and Greenhouse Gases (GHGs)
- Biological Resources
- Cultural Resources
- Geology, Soils, and Land
- Hazards, Hazardous Materials, and Risk of Upset
- Hydrology and Water Quality
- Noise and Vibration
- Recreation

- Transportation, Traffic, and Navigation
- Utilities and Service Systems
- Cumulative Impacts

Each resource section includes a description of existing conditions and an analysis of environmental consequences according to NEPA, CEQA, and TRPA criteria.

3.1.2 Resources Not Analyzed in Detail

As part of the scoping and environmental analysis conducted for the proposed Project, the following environmental resources were considered but no potential for adverse impacts was identified. Consequently, there is no further discussion regarding these issues in this document.

- *Agricultural and Forest Resources* – There are no agricultural or forestry resources in the Project Area, and the proposed Project would have no effect on agriculture or forestry.

- *Land Use and Planning* – The Project would not involve a change in type of land use, expansion or intensification of any non-conforming use, or conflicts with applicable land use plans. TRPA's community design criteria as they apply to the Project Alternatives are discussed in *Section 3.2, Aesthetics, Scenic Resources, and Community Design.*

- *Mineral Resources, Energy, and Natural Resources* – There are no known mineral or energy resources in the Project Area, and the proposed Project would not have substantial impacts on energy, mineral, or natural resource use or availability.

- *Population and Housing* – The Project would not affect population or housing.

- *Public Services* – The Project would not result in increased need for public services (e.g., fire and police services, schools, and parks) or impose a strain on existing public services. The Project's potential impacts on public utilities and service systems (e.g., wastewater, stormwater, and solid waste services) are addressed in *Section 3.12, Utilities and Service Systems.*

- *Socioeconomics and Environmental Justice* – The Project would not substantially affect socioeconomics. The Project also would not occur in an area with a minority or low income population of greater than 50 percent or meaningfully greater than the surrounding region (U.S. Census Bureau 2014) and would not have disproportionate adverse environmental justice effects on minority or low income populations.

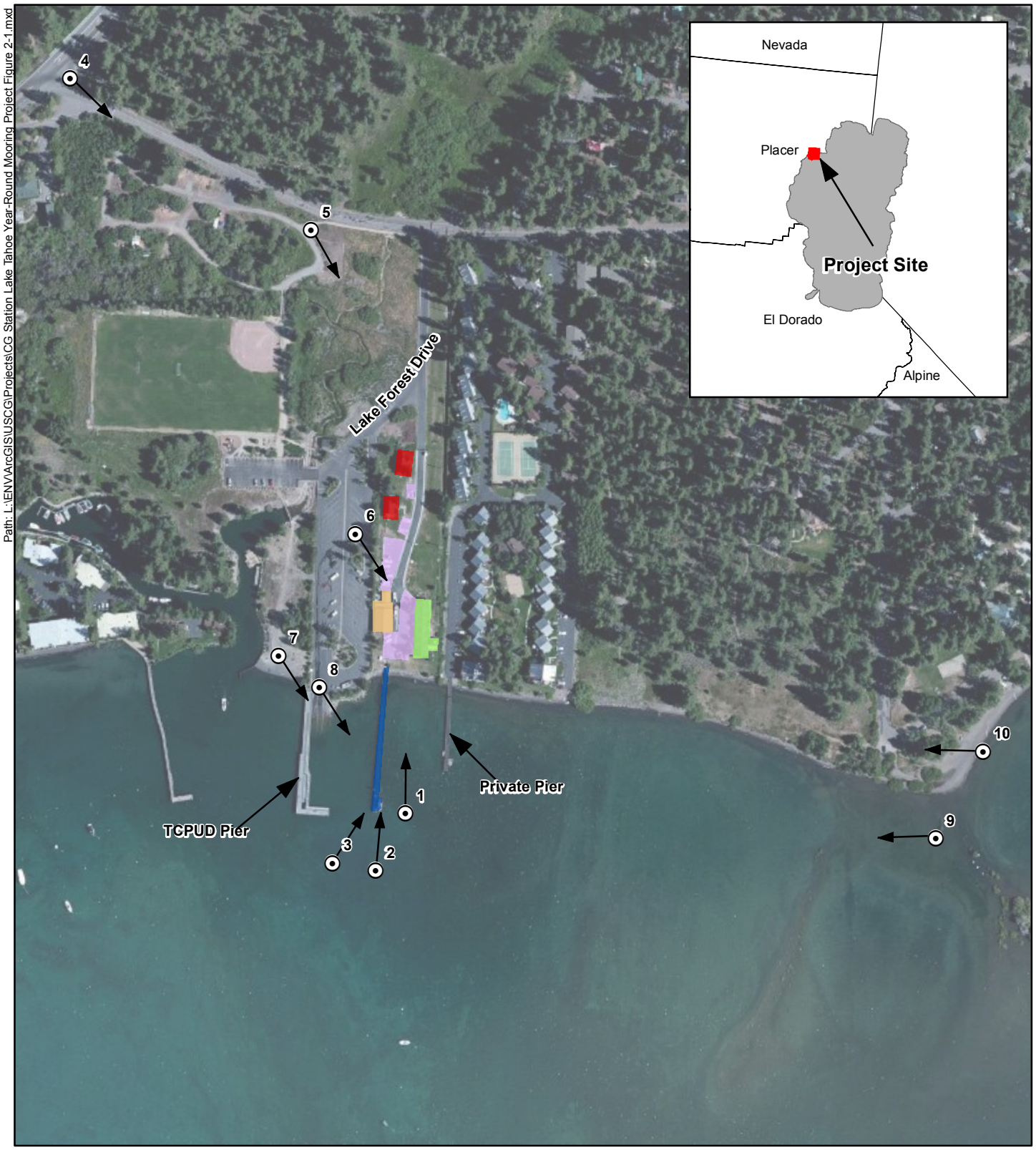
Discussions of the affected environment, regulatory setting, and environmental impacts and mitigation measures for those resources that were analyzed in detail are provided in the following sections, beginning with *Section 3.2, Aesthetics, Scenic Resources, and Community Design.*

3.2 Aesthetics, Scenic Resources, and Community Design

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to aesthetics, scenic resources, and community design.

3.2.1 Affected Environment

This section describes the existing scenic conditions of the Project Area and vicinity to provide a baseline for evaluation of the proposed Project Alternatives. *Figure 3-1* identifies the location of the viewpoints in and around the Project Area that are discussed in this section, and *Figure 3-2* through *Figure 3-11* show photographs from each of those viewpoints.



0 300 600
Feet

USCG Facilities

- Existing Pier
- Garage
- Housing
- Offices
- Parking

Photo View Point

TCPUD = Tahoe City Public Utility District

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 3-1
Photo Viewpoint Index

Figure 3-2 View from 300 Feet from High Water Line to the North (Viewpoint 1)

Figure 3-3 View from Lake Tahoe to the North (Viewpoint 2)

Photos by Kaufman Planning, 2015.

Figure 3-4 View from Lake Tahoe to the Northeast (Viewpoint 3)

Figure 3-5 View from SR 28 to the Southeast (Viewpoint 4)

Photos by Kaufman Planning, 2015.

Figure 3-6 View from Lake Forest Campground to the Southeast (Viewpoint 5)

Figure 3-7 View from Lake Forest Boat Ramp Parking Lot to the Southeast (Viewpoint 6)

Photos by Kaufman Planning, 2015.

Figure 3-8 View from Lake Forest Boat Ramp Beach to the Southeast (Viewpoint 7)

Figure 3-9 View from Lake Forest Boat Ramp to the Southeast (Viewpoint 8)

Photos by Kaufman Planning, 2015, and AECOM, 2019.

Figure 3-10 View from West Lake Forest Beach to the West (Viewpoint 9)

Figure 3-11 View from East Lake Forest Beach to the West (Viewpoint 10)

Photos by Kaufman Planning, 2015.

3.2.1.1 Visual Character of the Project Area and Surrounding Properties

The Station is on the northern shore of Lake Tahoe in the Lake Forest neighborhood, a medium-density, mixed-use area. Existing man-made structures in the upland portion of the Station property include the CG main office, garage, A-frame cabins, parking lot, and other accessory structures and equipment (*Figure 3-2*). Chain link fencing surrounds the west, north, and east boundaries of the Station property, and a security gate is on the northern side of the property at the Station entrance. Various accessory structures to support the facility, including a fuel tank, telemetry station and antennas, flagpole, metal storage containers, and picnic bench, are on the southern portion of the Station property and are visible from Lake Tahoe. Existing shorezone structures include a 312-foot-long steel pier with an 8,000-pound capacity boat lift, fueling station, light poles, handrails, grated decking, and other ancillary equipment (*Figure 3-3* and *Figure 3-4*). The backshore contains a rock revetment above the high-water line of Lake Tahoe that extends along the width of the property, and there is a pair of solar panels in front of the revetment. Overall the site is highly developed.

Existing vegetation on site consists of aspen, pine, and willow trees; various ornamental plants; and lawn grass around the perimeter of the Station buildings. Landscaping is minimal around the lakeward side of the main buildings as it is necessary for the CG to have a clear view of the lake from the Station's main office.

The properties to the west of the Station contain the Lake Forest Campground and Boat Ramp and Pomin Park, public recreation areas owned by the CWCB and operated by the TCPUD. The TCPUD recreational facilities include a boat ramp, pier, beach, parking lot, campground, sports fields, playground, and picnic area (*Figure 3-6* to *Figure 3-9*). The TCPUD pier is approximately 325 feet long, including a 60-foot extension that angles 90 degrees from the main pier. An 8-foot-wide floating dock runs along the length of the pier. At their closest point, the TCPUD pier and floating dock are approximately 95 feet to the west of the existing CG pier. To the west of the TCPUD facilities is the Star Harbor condominium development, which includes a 345-foot-long L-shaped home-owners' association pier. The area to the north of the Station consists of a driveway from Lake Forest Road that provides shared access to the Station and the TCPUD facilities. The property to the east of the Station consists of the private St. Francis condominium complex, which includes a 200-foot-long homeowners' association pier approximately 140 feet east of the CG pier. Lake Forest Beach, a public beach operated by TCPUD, is approximately 1,000 feet east of the CG pier. Lake Tahoe is adjacent and to the south of the Station.

Shoreline views from Lake Tahoe in the Project Area include the TCPUD pier and boat ramp facility, the CG pier and buildings, the St. Francis condominium complex, utility poles, and a forest backdrop. Forested ridges are visible in the background and middle ground. Most visible structures at the Station are relatively low profile and do not extend above the height of the existing trees. The CG main office, the closest building to the lake at the Station, is approximately 45 feet from the high-water line.

3.2.1.2 TRPA Scenic Quality Ratings

The Lake Tahoe Basin offers a variety of scenic vistas that make it one of the most beautiful areas of the country, and scenic quality is one of the Lake Tahoe Basin's most important resources. The Compact requires TRPA to ensure the preservation and enhancement of the region's scenic resources and states that "Maintenance of the social and economic health of the region depends on maintaining the significant scenic values provided by the Lake Tahoe Basin." To meet the Compact's requirements, TRPA has established environmental thresholds for scenic quality (further described in *Section 3.2.2.2*) and has developed stringent scenic quality requirements and guidelines to attain these thresholds.

TRPA's scenic thresholds provide standards to identify changes in scenic quality resulting from land use decisions. Change is measured based on an evaluation of scenic resources as viewed from Lake Tahoe, highways, public recreation areas, bike trails, and scenic vistas. Scenic thresholds are guided by the following overarching goals:

- Maintain and enhance the dominant natural-appearing landscapes for the vast majority of views and lands in the basin.
- Maintain or improve the aesthetic characteristics of the man-made environment to be compatible with the natural environment.
- Restore, whenever possible, damaged natural landscapes.
- Maintain levels of lighting necessary for public health and safety and in keeping with the unique environment of the Lake Tahoe Basin.

To monitor the status of scenic thresholds, TRPA has identified scenic corridors and other scenic resources. Scenic corridors include views from Lake Tahoe and from highways in the Lake Tahoe Basin. These corridors have been divided into 33 shoreline and 45 roadway units. The scenic quality of these units was first surveyed and rated in 1982, and these ratings have been updated periodically since then. Each roadway and shoreline unit is given a travel route rating and a scenic quality rating. Travel route ratings are overall scores for the entire unit that consider human-made and natural elements, while scenic quality ratings are a composite of the ratings for specific views or natural features of the landscape. The ratings indicate whether or not an area is in attainment with TRPA's scenic threshold standards. The TRPA *Scenic Quality Improvement Program* (SQIP) (TRPA 1989b) identifies specific issues and recommends scenic improvements for units not in attainment.

In 1993, TRPA adopted scenic rating standards for 37 public recreation areas and 11 bike trails identified as scenic resources. The *Lake Tahoe Basin Scenic Resource Evaluation* (TRPA 1993) discusses and rates these scenic resources and includes recommendations for preserving and enhancing scenic quality for each.

The CG property is visible from Lake Tahoe and is in Shoreline Unit 16 – Lake Forest, as designated in TRPA's SQIP. Shoreline Unit 16 extends along approximately 2.4 miles of shoreline between Tahoe City and Dollar Point (*Figure 3-12*). The Project Area is also in Roadway Unit 16 – Lake Forest; however, the Project Area is not visible from public roads in Roadway Unit 16 and therefore scenic ratings for the Roadway Unit are not discussed further. The Project Area is also visible from several public recreation areas designated as scenic resources by TRPA. The TRPA's scenic ratings for each of the designated scenic resources with views of the Project Area are discussed in the following subsections.

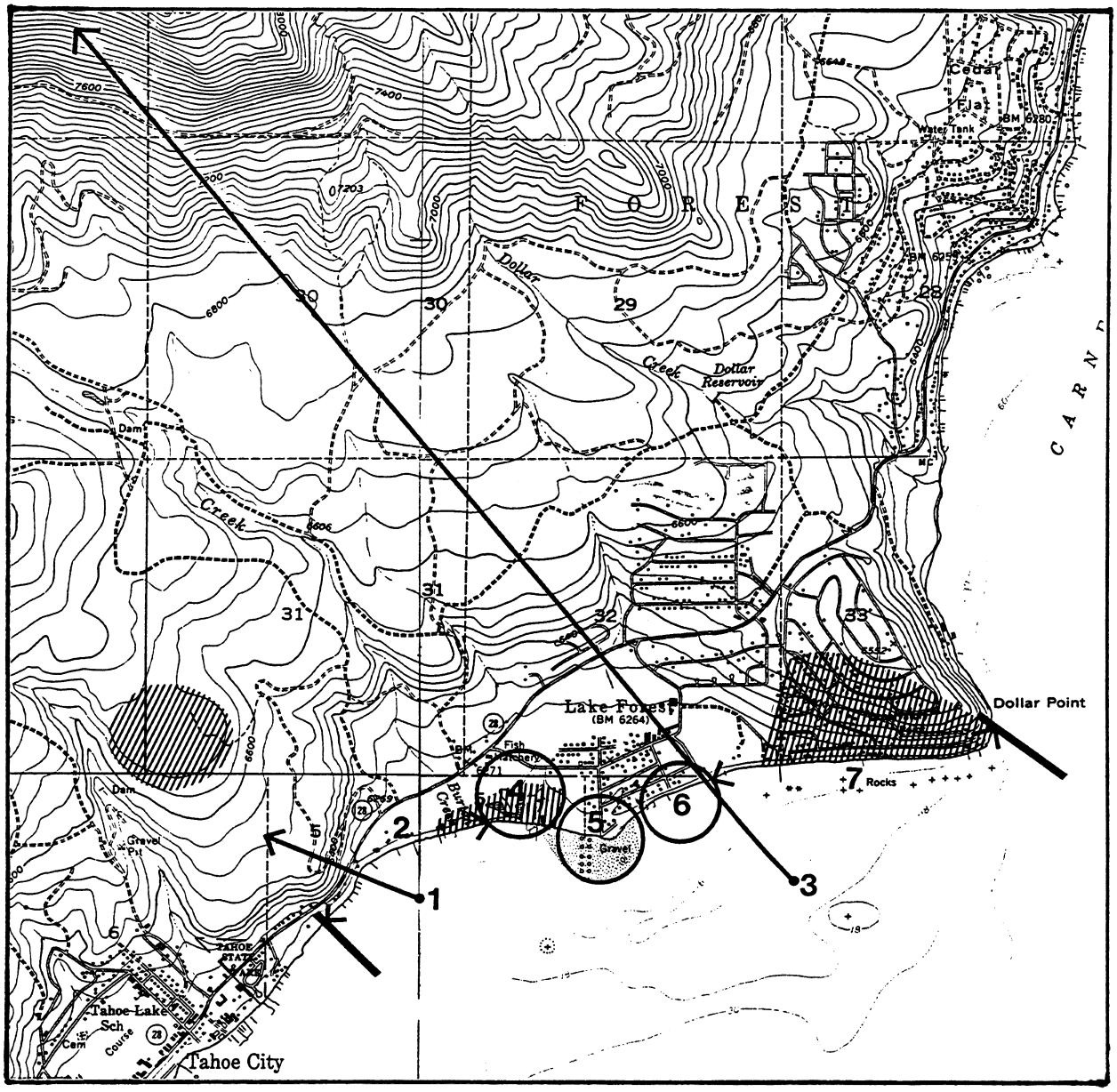
Shoreline Travel Route Ratings

Shoreline units are given two ratings related to visual resources: a scenic travel route rating and a scenic quality rating (discussed in the next section). Travel route ratings reflect scenic conditions looking toward the shore from Lake Tahoe and consider the entire shoreline unit as a whole. The ratings consider long-term cumulative changes to the views from Lake Tahoe in the shoreline unit and are evaluated approximately every 5 years. The factors used in the ratings include:

- Man-made features along the shoreline.
- General landscape views from the shoreline unit.
- Variety of scenery from the shoreline unit.

Each factor is rated on a scale of 1 to 5, with 5 being the highest rating. The composite rating for an individual shoreline travel unit can range from 3 to 15. To be in attainment of the threshold standard, a shoreline unit must have a composite travel route rating of higher than 7 and at or above the rating originally assigned in 1982. Shoreline Unit 16 received a composite travel route rating of 5 in 1982. When the ratings were updated in 1993, the composite rating for Shoreline Unit 16 decreased to 4 due to a reduction in the variety score as a result of the addition of new structures that did not blend with natural setting between 1982 and 1993. In subsequent evaluations, the composite rating has remained at 4 (*Table 3-1*), and Shoreline Unit 16 is currently not in attainment with the scenic travel route rating threshold standard.

Figure 3-12 Shoreline Unit 16



SHORELINE MAPS LEGEND

- Shoreline Unit Boundaries
- 3 Shoreline Section
- 8 Visual Feature
- 5 Major View of Backdrop
- 7 Panoramic View of Backdrop
- Areas of Concern

SHORELINE UNIT 16 LAKE FOREST

Table 3-1 2015 Scenic Travel Route Ratings for Shoreline Unit 16 – Lake Forest

Parameter	Rating
Man-made Features	1
Background (Shoreline Views)	2
Variety	1
Threshold Composite	**4**
Status	**Non-Attainment**
Source: TRPA 2016a, Appendix G-1.	

The travel route rating for Shoreline Unit 16 is relatively low based on several areas of concern including the large amount of dispersed residential development along the lake's edge. The TRPA SQIP states that one specific area of concern in the Unit in 1989 was the "particularly unattractive [area]…located between Burton Creek and Lake Forest Point where intense condominium development and the U.S. Coast Guard station are located very close to the shoreline with little or no forest cover to screen them" (TRPA 1989b). According to the SQIP, other scenic concerns in Shoreline Unit 16 include road scars, non-buffered ridgeline development, overhead utility lines, and stairs and other structures along the lake edge resulting in a lack of cohesiveness and detracting from the natural character of the shoreline. The SQIP gives recommendations to improve the visual quality of Shoreline Unit 16 including the use of building materials and colors that blend with the natural environment, the addition of more landscaping and revegetation, limitations on development of structures that extend out over the lake, and removal of overhead wires.

The 2015 threshold evaluation indicates that overall scenic conditions in Shoreline Unit 16 are "considerably worse than target with little or no change" (TRPA 2016a: Table 9-5).Scenic Quality Ratings for Shoreline Units.

The scenic quality rating for a Shoreline Unit is based on a numeric system that rates the scenic quality of natural landscape views from the lake. The purpose of the TRPA scenic quality ratings are to maintain or enhance views of individual, existing views of the natural landscape and distinctive natural features identified and evaluated as part of the *Lake Tahoe Basin Scenic Resource Inventory* (Wagstaff and Brady 1982). The thresholds are used to ensure that development does not remove or substantially degrade individual scenic resources. Scenic resources affecting views from the lake include:

- Views of the shoreline, water's edge, and foreground as viewed from the lake.
- Views of the backdrop landscape, including the skyline, as seen from the lake.
- Visual features seen from the lake that are points of particular visual interest on or near the shore.

Each scenic resource is given a scenic quality rating based on a composite score for the following four individual parameters:

- *Unity* – the extent to which a landscape feature can be described as cohesive or joined together to form a single coherent harmonious unit.
- *Vividness* – a measure of contrasting elements such as such as color, line, and shape.
- *Variety* – the intermixture of interesting elements of a landscape unit or richness.
- *Intactness* – the extent to which a landscape retains its natural condition or the degree to which modifications emphasize or enhance the natural condition of the landscape.

Each characteristic is rated from 0 (absent) to 3 (high). Therefore, the composite rating can range from 0 to 12.

The 1982 Scenic Resource Inventory identifies seven numbered scenic resource subcomponents in Shoreline Unit 16, comprising background views, shoreline views, and visual features (*Figure 3-12*)*:*

- Background Views:
  - Subcomponent 1 – view of the developed ridgeline at the western end of the Unit
  - Subcomponent 3 – views of rolling forested hills and ridges in the middle-ground

- Shoreline Views:
  - Subcomponent 2 – view of the sand and gravel beach located west of mouth of Burton Creek (approximately 0.4 mile west of the existing CG pier)
  - Subcomponent 7 – view of the rocky shoreline below Dollar Hill (approximately 1 mile east of the CG pier), which includes considerable residential development visible among the trees

- Visual Features:
  - Subcomponent 4 – the flat grassy area of Lake Forest Meadow (north of Star Harbor and approximately 0.1 mile northeast of the CG pier);
  - Subcomponent 5 – Lake Forest Point and the small brushy island just off-shore (approximately 0.2 mile east of the CG pier); and
  - Subcomponent 6 – the distinctive sandy-gray rock cliffs just east of Lake Forest Point (approximately 0.4 mile east of the CG pier).

The SQIP identifies Subcomponent 5 (Lake Forest Point) as the highest rated feature of Shoreline Unit 16's scenic resources, as the colorful vegetation creates an attractive visual feature in the area.

The TRPA's 1982 *Study Report for the Establishment of Environmental Threshold Carrying Capacities* included a composite scenic quality rating for all subcomponents in Shoreline Unit 16 (*Table 3-2*) Shoreline received a composite rating of 2 (on a scale from 1 to 3) indicating moderate scenic quality. To be in attainment of the threshold standard for scenic quality, a shoreline unit must have a composite scenic rating at or above the rating originally assigned in 1982. The most recent (2015) threshold evaluation indicates that Shoreline Unit 16 is in attainment of the threshold standard for scenic quality.

Table 3-2 Scenic Quality Rating for Shoreline Unit 16

Parameter	Rating
Unity	2
Vividness	2
Variety	2
Intactness	1
Total	**7**
Threshold Composite[1]	**2**
Status	**In Attainment**

Note:
[1] Threshold composite is based on the total score:

Total Score		Threshold Composite
1-5	=	1 (low)
6-9	=	2 (moderate)
10-12	=	3 (high)

Source: TRPA 2016a: Appendix G-2; TRPA 1982

Public Recreation Areas

The TRPA Regional Plan establishes a threshold requiring the maintenance or improvement of the scenic quality ratings for public recreation areas and bicycle trails identified as scenic resources in the *Lake Tahoe Basin Scenic Resource Evaluation of Public Recreation Areas* (TRPA 1993). The evaluation rated the quality of three general types of scenic resources for these recreation areas:

- Type 1 – Views from the recreation area or bicycle trail of the lake and natural landscape.
- Type 2 – Views of natural features in the recreation area or along the trail.

- Type 3 – Visual quality or views of man-made features in the recreation area or adjacent to the trail that influence the viewing experience.

Scenic quality ratings for Type 1 and 2 scenic resources use the same visual indicators of unity, vividness, variety and intactness as the Shoreline Unit scenic quality ratings. Ratings for Type 3 resources are rated for coherence, condition, compatibility, and design quality. In both cases, each indicator is rated on a scale of 1 to 5, and therefore composite scores can range from 4 to 20.

TRPA's 1993 evaluation identifies the Project Area as being in the viewshed of four recreation areas:

- Recreation Area 13 – Lake Forest Beach
- Recreation Area 14 – Lake Forest Campground and Boat Ramp
- Recreation Area 15 – Tahoe State Recreation Area
- Recreation Area 16 – Tahoe City Commons Beach

The Project Area would primarily be visible from the two closest Recreation Areas—13 and 14—and so the scenic ratings and existing conditions for each are discussed in detail below. Although the Project Area may be partially visible from Recreation Areas 15 and 16, the Project's potential impacts to the views from these areas would be minimal due to the intervening distances from the Station—approximately 1 mile and 1.5 miles, respectively—and they are therefore not discussed in detail. Both Recreation Area 15 and 16 are currently in attainment of the scenic threshold.

Recreation Area 13 – Lake Forest Beach

Lake Forest Beach is approximately 1,000 feet to the east of the Station on the southern shoreline of the Lake Forest Peninsula at the southern end of Bristlecone Street. The beach is used by the public for recreation activities such as swimming, picnicking and water sports. Lake Forest Beach is owned by Placer County and operated and maintained by the TCPUD. For scenic quality ratings, TRPA splits Recreation Area 13 into nine subcomponents (*Figure 3-13*), including two views from the beach: Subcomponent 1 is the view from the eastern portion of the beach, and Subcomponent 2 is the view from the western side of the beach. Both Subcomponents have panoramic views of the lake and the mountains in the distance. The Project Area would only be visible from Subcomponent 2, as intervening vegetation prevents visibility from Subcomponent 1, as shown in *Figure 3-11.*

The 2015 threshold evaluation reported in detail only those Recreation Areas and Subcomponents where the scores changed since the previous (2011) evaluation. In 2015, there were no changes to the scores for Recreation Area 13 (TRPA 2016a). In the 2011 threshold evaluation, Recreation Area 13, Subcomponent 2 received a composite score of 13 (*Table 3-3*). To be in attainment of the threshold standard, a recreation area must maintain a composite rating at or above the rating originally assigned in 1993. The ratings for Subcomponent 2 have not changed since 1993, and Subcomponent 2 is currently in attainment of the threshold standard (TRPA 2016a).

Table 3-3 2011 and 2015 Scenic Quality Ratings for Recreation Area 13, Subcomponent 2

Parameter	Rating
Unity	3
Vividness	4
Variety	3
Intactness	3
Threshold Composite	**13**
Status	**In Attainment**
Sources: TRPA 2016a; TRPA 2011b: Appendix 3; TRPA 1993	

Figure 3-13 Lake Forest Beach

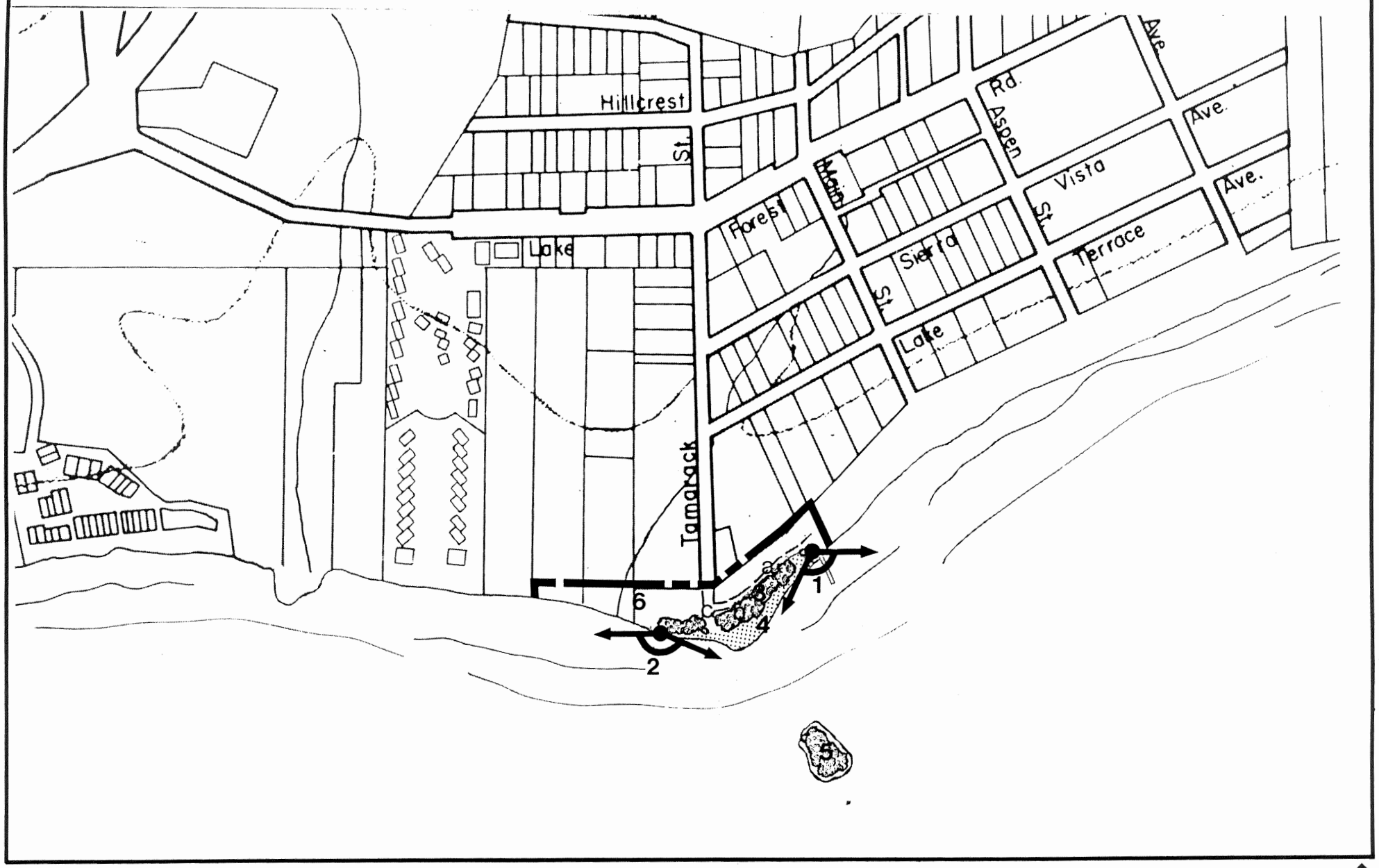


Figure 13a Scenic Resources

LAKE FOREST BEACH

NORTH

SCALE: 1"=400'

According to the 1993 TRPA evaluation, scenic quality is relatively high for Resource Unit 13 due to the sweeping views of the southern half of the Lake Tahoe Basin, internal interest (vegetation and the offshore island), and the natural appearing landscape. Although several areas of development are visible, none of them detracts greatly from the view. Subcomponent 2 has a 135-degree panoramic view to the south and west. The Project would be visible from Subcomponent 2 looking west up the shore (*Figure 3-10).* The current view to the west is of a developed shoreline with multiple piers and shorezone structures, including the existing St. Francis, CG, and TCPUD piers. The view of the upland consists of various residential and multi-family structures that are partially screened with vegetation.

Recreation Area 14 – Lake Forest Campground and Boat Ramp

The Lake Forest Campground and Boat Ramp are approximately 2 miles east of Tahoe City off of Lake Forest Road and are adjacent and to the west of the Station. The recreation area is owned by the CWCB and operated by the TCPUD. The recreation area is made up of two distinct areas: the campground and the boat ramp/pier. The Project Area is not visible from the campground, due to extensive intervening vegetation (*Figure 3-6*), but it is visible from the boat ramp and pier.

The TCPUD pier, which was constructed in 1963, provides a sweeping view of the lake: down the western shore, around to the south, and then along the more distant eastern shore. The focus of attention is the surrounding landscape and in particular the openness of the lake. The existing CG pier is just east of, and highly visible from, the boat ramp area. The TCPUD pier extends out roughly 15 feet further into Lake Tahoe than the existing CG pier, and includes a 60-foot dog-leg extension (installed in 2001) that angles to the east towards the CG pier and blocks much of the view of the lake from the TCPUD boat ramp (*Figure 3-9*). The existing CG pier obstructs some of the view of the lake from the TCPUD boat ramp but does not extend out far enough into the lake to affect the lakeward view from the end of the pier.

The 1993 Scenic Resources Evaluation stated that the accessory structures on the CG property create a cluttered appearance as viewed from the TCPUD boat ramp area. In addition, there are various structures and overhead wires at the Station, so that the overall effect is one of intense development dominating the natural landscape (TRPA 1993). Since the 1993 evaluation, a more natural-appearing green chain-link fence has been installed along the boundary separating Station from the TCPUD facilities, and trees and other vegetation have been planted along the fenceline (*Figure 3-7*).

For assessing scenic quality ratings, Recreation Area 14 is split into seven subcomponents (*Figure 3-14*), two of which are relevant to the proposed Project: Subcomponent 1 is the view of the lake from the southern end of the TCPUD parking lot, and Subcomponent 3 is the view from the lake of the small beach west of the pier. Subcomponent 1 has a direct view of the existing CG pier (*Figure 3-9*). The existing CG pier does not currently block the view from the lake of Subcomponent 3, but the tops of the light fixtures on the existing pier are visible from the beach (*Figure 3-8*).

The 2015 threshold evaluation reported in detail only those Recreation Areas and Subcomponents where the scores changed since the previous (2011) evaluation. In 2015, there were no changes to the scores for Recreation Area 14 (TRPA 2016a). In the 2011 threshold ratings, Subcomponent 1 received a composite score of 13 and Subcomponent 3 received a composite score of 9 (*Table 3-4*). To be in attainment of the threshold standard, a recreation area must maintain a composite rating at or above the rating originally assigned in 1993. The ratings for both Subcomponents of Recreation Area 14 have remained unchanged since 1993 and the area is currently in attainment (TRPA 2016a).

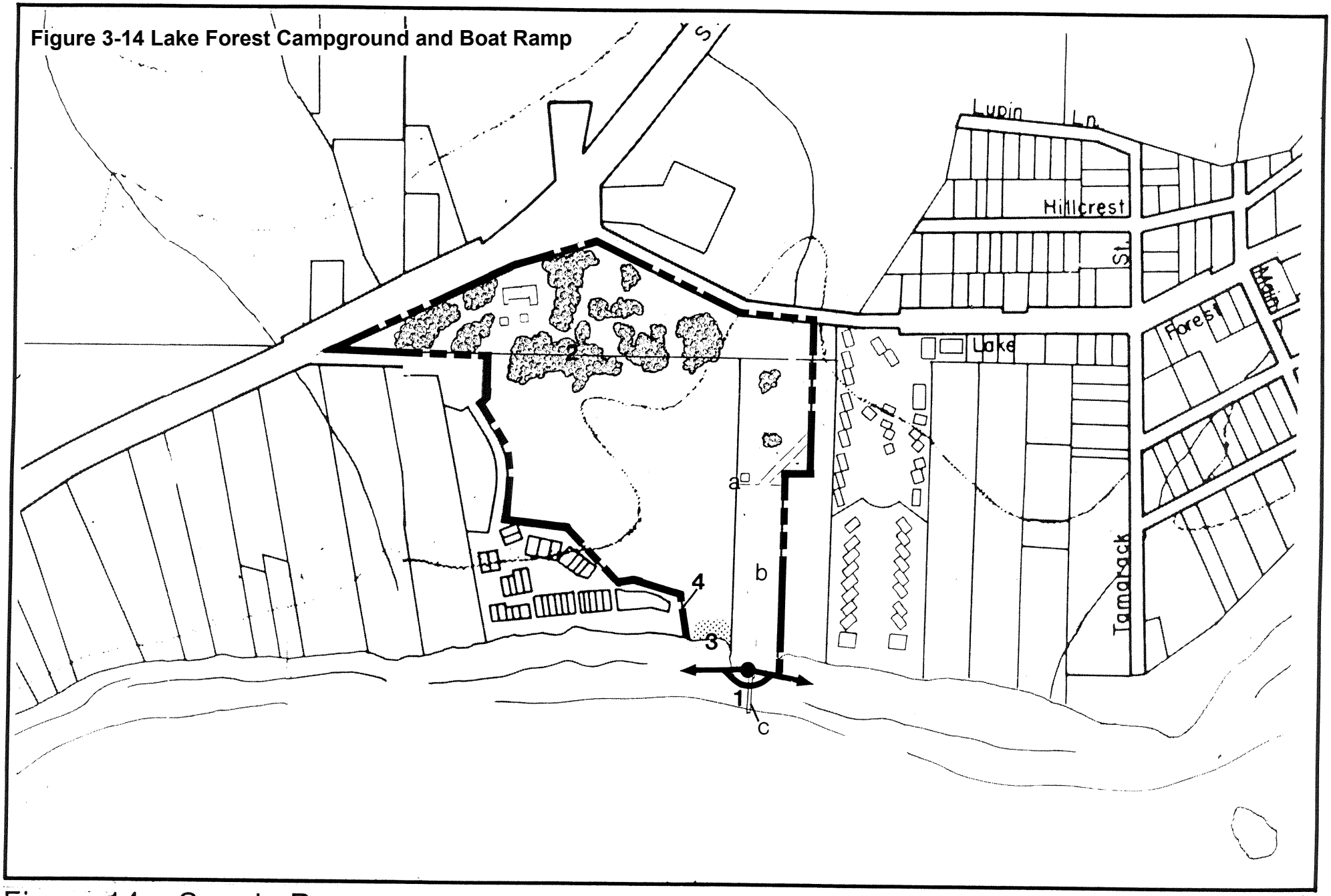


Figure 14a Scenic Resources

LAKE FOREST CAMPGROUND/BOAT LAUNCH

NORTH

SCALE: 1"=400'

Table 3-4 2011 and 2015 Scenic Quality Ratings for Recreation Area 14 – Lake Forest Boat Ramp

Parameter	Rating	
	Subcomponent 1	Subcomponent 3
Unity	3	3
Vividness	4	2
Variety	4	2
Intactness	2	2
Threshold Composite	**13**	**9**
Status	**In Attainment**	**In Attainment**
Source: TRPA 2016a; TRPA 2011b: Appendix 3; TRPA 1993		

The 1993 Scenic Resource Evaluation included several specific recommendations for improving scenic quality for views of the Station from Recreation Area 14:

- The area is already so intensively developed that further development is unlikely. However, if possible, mitigation should be instituted to improve visual quality of the CG facility when viewed from the recreation area.

- Replacement of the cyclone fence with one made with wood or a natural looking material to complement the natural environment would screen all objects placed along this side of the property and visually simplify the edge. Trees should be planted along the fence to introduce a natural element between the two properties. (Since the 1993 evaluation, the cyclone fence has been replaced with a dark green fence, in accordance with the color requirements of TRPA Code Section 83.11.3, and trees and other vegetation have been planted along the fence-line).

- Tall vertical elements like light poles, telephone poles and the accompanying wires that cross in the air should be reduced or eliminated wherever possible. Telephone and utility lines should be placed underground and alternative light sources developed to replace the tall towers

3.2.1.3 Baseline Scenic Assessment

TRPA requires that non-repair projects in the shoreland or shorezone[6] of Lake Tahoe complete an assessment to establish a baseline scenic condition against which expected post-project conditions can be compared to determine a project's impacts to scenic quality. The scenic baseline assessment includes a determination of a contrast rating and the visible surface area of the existing lakefront façade, including all primary and accessory buildings and other structures in the shoreland that are visible from 300 feet offshore. The contrast rating is based on the color, reflectance, texture, and number of surface planes for the lakefront façade.

A baseline scenic assessment was prepared in 2012 for existing site conditions at the Station (*Appendix E*) and was reviewed and revised by TRPA. The baseline assessment determined a composite contrast rating score of 18 for existing Station structures (out of a possible score of 30, with higher scores indicating better conditions). This score was based on (1) the colors, materials, and visible area of existing primary and accessory buildings and structures visible from 300 feet offshore, and (2) structures lakeward of the high water line that were visible from 300 feet offshore. TRPA's scenic quality regulations for piers in the

[6] The TRPA Code of Ordinances defines the shoreland as the area from the high water line of Lake Tahoe to the most landward boundary of the littoral parcel, or 300 feet landward, whichever is lesser. The shorezone is defined as the area from the backshore boundary lakeward to an elevation of 6,193 feet, LTD, or 350 feet from the shoreline, whichever is greater. The proposed Project's permanent visual impacts occur entirely within the shorezone and outside of the shoreland. However, the Project's baseline scenic assessment also considered the existing scenic conditions in the shoreland at the Station, as required by the TRPA Code of Ordinances Section 84.4.3.A.4.

shorezone were amended in 2018 to require the same contrast rating standards as structures in the shoreland.

In addition to determining the current contrast rating, the baseline scenic assessment also determined the existing surface area of the Station's lakefront façade, as well as the area screened by current landscaping. The baseline assessment determined that the total area of existing lakefront façade is 2,748 square feet, including 2,493 square feet in the shoreland (main office building, garage, rock revetment, and other accessory structures) and 255 square feet lakeward of high water (solar panels and most of the existing pier). The existing lakefront façade currently has 900 square feet of screening in the form of landscape plantings, and therefore the remaining unscreened area is 1,848 square feet, including 1,593 square feet in the shoreland and 255 square feet lakeward of high water. Excluding areas that could not be screened for safety or operational reasons (i.e., the windows of the main office and other areas where visibility must be preserved, and areas more than 15 feet in height) the area in the shoreland that could potentially be screened for visual mitigation is 1,391 square feet. A breakdown of the potentially screenable area is provided in *Table 3-5*.

Table 3-5 Potentially Screenable Area at Station

Structure	Screenable Area
Shorezone	
Rock revetment	600 square feet
Upland	
Main office building	255 square feet
Garage	289 square feet
Chain-link fence	126 square feet
Above-ground fuel tank and accessory structures	60 square feet
Storage boxes	28 square feet
Flagpole	5 square feet
Picnic bench	28 square feet
Upland subtotal	791 square feet
Total	**1,391** square feet

3.2.2 Regulatory Setting

3.2.2.1 Federal and State Regulatory Setting

The California Scenic Highway Program, managed by the California Department of Transportation (Caltrans), identifies and protects scenic highway corridors. There are no designated scenic highways that would be affected by the proposed Project. There are no other federal or state policies or regulations specifically applicable to aesthetics, scenic resources, and community design in the Project Area.

3.2.2.2 Regional and Local Regulatory Setting

At the regional and local level, TRPA sets goals, policies, and regulations related to scenic resources and community design in the Project vicinity. TRPA requirements for scenic resources and community design are contained in the TRPA Regional Plan Goals and Policies, Code of Ordinances, SQIP, Design Review Guidelines, and threshold standards.

TRPA Regional Plan

TRPA has established a set of policies relating to scenic quality which require property owners to blend man-made structures with the natural environment. Specific goals and policies from the Community Design, Scenic, and Shorezone Subelements of the Regional Plan (TRPA 2012) that pertain to scenic resources and community design include:

Goal CD-1: Ensure preservation and enhancement of the natural features and qualities of the region, provide public access to scenic views, and enhance the quality of the built environment.

Policy CD-1.1: Scenic quality ratings established by the thresholds shall be maintained or improved.

Policy CD-1.2: Restoration programs based on incentives will be implemented in those areas in need of scenic restoration to achieve the recommended rating.

Goal CD-2: Regional building and community design criteria shall be established to ensure attainment of the scenic thresholds, maintenance of desired community character, compatibility of land uses, and coordinated project review.

Goal SR-1: Maintain and restore the scenic qualities of the natural appearing landscape.

Policy SR-1.1: All proposed development shall examine impacts to the identified landscape views from roadways, bike paths, public recreation areas, and Lake Tahoe.

Policy SR-1.2: Any development proposed in areas targeted for scenic restoration or within a unit highly sensitive to change shall demonstrate the effect of the project on the 1982 travel route ratings**.**

Policy SR-1.3: The factors or conditions that contribute to scenic degradation, as specified in the SQIP, need to be recognized and appropriately considered in restoration programs, plan development, and during project review to improve scenic quality.

GOAL SZ-1: Provide for the appropriate shorezone uses of Lake Tahoe, Cascade Lake, and Fallen Leaf Lake while preserving their natural and aesthetic qualities.

Policy SZ-1.1: All vegetation at the interface between the backshore and foreshore zones shall remain undisturbed unless allowed by permit for uses otherwise consistent with the shorezone policies.

Policy SZ-1.9: The Agency shall regulate the placement of new piers, buoys, and other structures in the foreshore and nearshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds, and other relevant concerns.

TRPA Code of Ordinances and the Lake Tahoe Shoreline Plan

Chapter 36, “Design Standards,” and Chapter 66, “Scenic Quality,” of the TRPA Code contain standards pertaining to scenic quality. These chapters establish a process for analyzing projects for scenic quality and define those circumstances that require preparation of scenic assessments and/or other documents. Sections 66.1.3, 66.1.4, 66.1.5, and 66.2.4 describe scenic quality standards for roadway and shoreline travel units, and for public recreation areas and bicycle trails. Section 66.1 sets scenic quality standards and requires that projects not cause a decrease in the scenic quality ratings for roadway and shoreline units, travel routes, public recreation areas, or bicycle trails.

Section 66.3 outlines the scenic quality review process and mitigation requirements for projects that involve new or existing structures in the shoreland, which is defined as the area between the high-water line and the most landward parcel boundary, or 300 feet landward, whichever is lesser. All of the structures that would be added or altered under the proposed Project Alternatives would be located lakeward of the high water line, and not in the shoreland. Therefore, the shoreland review and mitigation requirements of Section 66.3 do not apply to the proposed Project.

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

To attain and maintain the established scenic threshold standards, TRPA evaluates and regulates the visible mass of shoreline structures. Visible mass is defined by TRPA as the total visible area of a shoreline structure, including all elements of the structure. Visible mass is calculated by summing the area (in square feet) of visible elements of the structure when viewed in profile (i.e., parallel to the shore), and the area of visible elements of the structure when viewed from the end (i.e., perpendicular to the shore). Mitigation for visual mass is determined by the type of shoreline in which a particular project is located. The *Lake Tahoe Shoreline Plan* defines four shoreline character types, presented below, based on the level of human development that is visible:

- Visually Dominated Shoreline. Approximately 2 percent of the shoreline is composed of visually dominated character types. This character type includes all marinas and other areas with large prominent buildings, high boat density and buoy fields, equipment, and commercial activity. There is usually considerable visual clutter associated with these uses.

- Visually Modified Shoreline. Approximately 48 percent of the shoreline is composed of visually modified character types. This character type includes areas with visually prominent homes and other structures along the shoreline, but with considerable vegetation intact. This character type can include limited areas with high intensity clusters of shoreline structures. Most of the developed portions of the shoreline fall into this category.

- Visually Sensitive Shoreline. Approximately 16 percent of the shoreline is composed of visually sensitive character types. These are highly scenic or vulnerable landscapes exhibiting the influence of man-made modifications within an otherwise natural setting. Visually Sensitive areas include long expansive sandy beaches where shoreline structures are highly visible and difficult to screen from view.

- Natural Dominated Shoreline. Approximately 34 percent of the shoreline is composed of natural dominated character types. These areas consist of either naturally appearing landscapes (e.g., easternshore, Emerald Bay, Upper Truckee Marsh), or historical/traditional locations that include culturally modified landscapes in highly scenic locations (e.g., Thunderbird Lodge, Vikingsholm).

The Project site is in a Visually Modified Shoreline (TRPA 2018: Exhibit 9-7).

TRPA Code of Ordinances Chapter 84 regulates the placement of new piers, buoys, and other structures in the nearshore and foreshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds, and other relevant concerns. The development standards of Chapter 84 (as modified by the *Lake Tahoe Shoreline Plan*) that are related to scenic resources and are relevant to the proposed Project include:

- Code Section 84.4.3.A.4. In accordance with the provisions set forth in Chapter 66 (Scenic Quality Review in the Shoreland), a project application for an additional pier shall meet the following requirements:

    a. The project area shall initially score a minimum of 21 points based on the Contrast Rating System; and

    b. No later than 6 months following project application submittal, the project area shall score a minimum of 25 points based on the Contrast Rating System, unless the project applicant demonstrates that a score of 25 points is infeasible.

- Code Section 84.4.3.A.5. All new or expanded piers shall be matte medium to dark grey. TRPA may require alternate colors depending on the background view of the project site.

- Code Section 84.4.3.A.6. Additional piers and expansions of existing piers shall mitigate additional visible mass according to the following provisions:

1. In Visually Dominated Areas, as identified on the official TRPA Shoreline Conditions Map, the scenic mitigation ratio shall be 1:1.5;

2. In Visually Modified Areas, as identified on the official TRPA Shoreline Conditions Map, the scenic mitigation ratio shall be 1:2.0;

3. In Visually Sensitive Areas, as identified on the official TRPA Shoreline Conditions Map, the scenic mitigation ratio shall be 1:3.0;

4. The location of scenic mitigation shall occur in the following order of decreasing preference:
   (i) On the littoral parcel and in the shorezone;
   (ii) On the littoral parcel and in the upland area;
   (iii) On a different littoral parcel in the same unit and in the shorezone;
   (iv) On a different littoral parcel in the same unit and in the upland; and
   (v) In a different non-attainment unit.

- Code Section 84.4.3.A.8. Lighting on additional private use piers shall be directed downward and only onto the pier deck and shall not exceed 2 feet in height above the deck. Lighting shall be the minimum illumination necessary to ensure safety and shall comply with all applicable standards set forth in Chapter 36, Design Standards. Pier lights for navigational purposes must be approved by the U.S. Coast Guard and USACE.

- Code Section 84.4.3.A.10(a). Boatlifts, handrails, and other allowable accessory structures and safety devices shall not extend more than four feet above the pier deck, with the exception of flag poles.

- Code Section 84.4.3.A.10(b). A maximum of one flagpole is permitted on any private pier. Flag poles shall be medium or dark in color and shall have a value of 4 or less on the Munsell Color Chart. Flagpoles shall have a non-reflective finish, shall be a maximum of 20 feet high above the pier deck and have a maximum diameter at the base of 6 inches.

- Code Section 84.4.3.B.2(b). Single-use piers shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line, whichever is more limiting.

- Code Section 84.4.3.B.2(e). Allowable visible mass shall not exceed 220 square feet. Visible mass due to lateral public access accommodations (e.g. added height, ladders, or stairs) shall not count towards the visible mass limit nor be subject to the mitigation requirements of subsection 84.4.3.A.6 nor be part of the parcel's shoreland scenic score.

- Code Section 84.4.3.B.2(g). The setback for new single-use piers is 20 feet from the projected property line of the adjacent property.

- Code Sections 84.4.3.B.2(d) and (j) limit single-use piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet in width) and a single catwalk (not to exceed 3 feet in width and 30 feet in length).

- Code Section 84.8.1.B.2. Floating platforms shall not extend beyond lake-bottom elevation 6,219 feet, LTD, or beyond the pier head line, whichever is more limiting.

- Code Section 84.8.1.B.3. The setback for floating platforms is 20 feet from the projected property line of the adjacent property.

- Code Section 84.8.1.B.5 limits floating platforms to a maximum area of 100 square feet and a length of 10 feet.

In 2016, TRPA adopted code amendments for Essential Public Safety Facilities within the Shorezone (Section 84.10.2, changed to Section 84.8.2 in 2018) that permit deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders. The Project is an Essential Public Safety Facilities project, and therefore would be processed under TRPA Code of Ordinances Section 84.8.2.

TRPA Scenic Quality Improvement Program

The SQIP was adopted as part of the Regional Plan to provide a program for implementing physical improvements to the built environment in the Lake Tahoe Basin for those shoreline and roadway units that are not in attainment with the scenic thresholds (TRPA 1989b).

The Project Area is in Shoreline Unit 16. The SQIP makes the following recommendations on how to improve scenic quality in Shoreline Unit 16 that are relevant to the proposed Project:

Building material and colors. Many of the residences that are visible from the lake attract attention because they have used light-colored or reflective materials (e.g. metal roofs, solar panels, etc.) that sharply contrast with the forest backdrop. Existing and future development should be encouraged to use materials and colors that blend with the natural environment rather than contrast with it.

Landscape screening. In general, more landscaping needs to be introduced between development and the shoreline to screen views of development from the lake. The large condominium developments west of Lake Forest Point and on the ridge north of SR 28, the CG Station, and the parking area for the Lake Forest boat ramp need substantial landscaping to significantly reduce the visual impact on views from the lake. Landscaping should be done with primarily native species and include substantial tree planting to visually integrate the developments with their natural surroundings. Screening does not need to totally obscure the buildings or obstruct desirable views out from the buildings, but it should significantly reduce the visibility of the buildings from the lake. Future development should be required to maintain substantial setbacks from the shoreline to accommodate adequate screening.

Piers and Boathouses. Sections of the shoreline appear visually cluttered by boathouses, piers, boat ramps, and wooden stairways to the beach. Additional development of structures that extend out over the water or of structures, like the stairways, which cannot be adequately screened by vegetation are strongly discouraged. Additions to piers should not be out of scale with existing structures.

TRPA Design Review Guidelines

The TRPA Design Review Guidelines (TRPA 1989a) provide guidance for attaining the design and construction standards set forth in the Code of Ordinances. Each set of guidelines relates to a particular standard adopted in the Code. The Code standards are rules that must be met. The guidelines are not rules – they are suggestions on how to meet a required standard. More latitude and flexibility exists when dealing with guidelines than with standards. TRPA may allow deviation from the Design Review Guidelines if an applicant proposes an alternative design solution that, in the opinion of TRPA, meets a design standard in a manner which is equal or superior to a guideline identified in the Design Review Guidelines.

Chapters 7 and 11 of the Design Review Guidelines contain guidance relevant to the proposed Project. Chapter 7 contains guidelines for attaining the exterior lighting standards contained in Code Section 36.8, including the following guidelines relevant to the Project:

- **Lighting Design.** Exterior lighting should be designed as an integral part of the architecture and landscape and located in a manner that minimizes the impact upon adjacent structures and properties.

- **Lighting Levels.** Avoid consistent overall lighting and overly bright lighting. The location of lighting should respond to the anticipated use and should not exceed the amount of light actually required by users. Lighting for pedestrian movement should illuminate entrances, changes in grade, path

intersections, and other areas along paths which, if left unlit, would cause the user to feel insecure. As a general rule of thumb, one foot candle per square foot over the entire Project area is adequate.

- **Fixture Design.** Exterior lighting fixtures should be simple in design and should be well-integrated with other architectural site features.

- **Lighting Height.** As a rule, the light source should be kept as low to the ground as possible while ensuring safe and functional levels of illumination. Area lighting should be directed downward with no splay of lighting directed off site. The height of light fixtures or standards must meet the height limitations in Chapter 37 [of the TRPA Code of Ordinances]. Direct light downward to avoid sky lighting. Any light source more than 10 feet high should incorporate a cut-off shield to prevent the light source from being directly visible from areas off site. The height of luminaries should be in scale with the setting and generally should not exceed 10 to 12 feet.

Chapter 11 of the Design Review Guidelines contains guidance for attaining design standards for projects in the shorezone from Code Chapters 83 and 84, including the following relevant to the Project:

Guidelines for Code Section 83.11 (Design Standards with the Shorezone)

- **Use Colors Which Blend or Recede.** Use dark colors and flat finishes which blend rather than contrast with surrounding landscape to help minimize the apparent visibility structure.

- **Use Vegetation to Screen Structures.** Using existing or planted vegetation to soften the structure's appearance from the Lake will help "fit" the structure into the landscape.

- **Minimize Reflectivity of All Structures and Surfaces Visible from the Lake.** Use flat or matte finishes on all visible surfaces. Avoid large flat surfaces which face the Lake.

- **Protect Shorezone Vegetation.** Protect existing shorezone (backshore and foreshore) vegetation against disturbance or mechanical injury during construction activities by using temporary fencing or other barriers.

Guidelines for Code Section 84.4 (Piers)

- **Minimize Pier Cross Section When Viewed from Lake.** The pier design should result in a structure with minimal apparent mass or bulk. This includes boat lifts, pilings, fenders, handrails, signs, lighting, catwalks below piers, and other appurtenances. Dimensions and material sizes should be limited to the minimum necessary to insure function and safety.

- **Minimize Pier Profile When Viewed From Shoreline.** Consider the visual impact of the pier when viewed from along the adjacent shoreline. The pier design should result in a structure which does not appear bulky or massive, and does not obstruct views of the lake.

- **Minimize Use of Reflective Colors and Materials on All Structures Visible from the Lake or adjacent Scenic Highway Corridors.** Use dark colors or colors which blend in with the immediate background, and flat finishes.

- **Use Single Pile Construction Techniques.** Consider using single pile pier design and construction techniques rather than the traditional double pile design and construction for single use residential piers. The use of single pile design will generally result in pier widths of approximately 6 feet.

- **Pier Lighting.** Lighting the pier may be done to increase safety and visibility. Lighting should be provided to the minimum extent necessary, and should include the use of low level lighting fixtures. Lighting should generally be directed downward and incorporate cutoff shields where necessary.

Guidelines for Code Section 84.8 (Floating Docks and Platforms)

- **Minimize Mass.** Design the floating dock or platform using materials that do not appear bulky or massive. Use minimum dimensions and material sizes to insure function and safety.
- **Minimize Use of Reflective Colors and Materials on All Structures Visible From the Lake**. Use dark colors or colors which blend with the immediate background and flat finishes.
- **Lighting.** Lighting the floating dock may be done to increase safety and visibility. Lighting should be provided to the minimum extent necessary, and should include the use of low-level lighting fixtures. Lighting should generally be directed downward and incorporate cutoff shields where necessary.

TRPA Shorezone Permitting Process

TRPA review of projects in the shorezone is governed by the *Lake Tahoe Shoreline Plan* (TRPA 2018) and associated amendments to the TRPA Code of Ordinances described generally above. This Project is an Essential Public Safety Facility and the CG is in the process of going through TRPA's current Shorezone Permitting Process. (See Section 1.5.4.7 for additional details.)

TRPA Thresholds

TRPA threshold carrying capacities (thresholds) are standards of environmental quality to be achieved in the Tahoe region. The standards identify the level of human impact the Lake Tahoe environment can withstand before irreparable damage occurs. TRPA thresholds relevant to scenic resources in the Project Area are summarized in *Table 3-6*.

Table 3-6 TRPA Thresholds for Scenic Resources Applicable to the Project

Category	Standard	Current Status
Roadway and Shoreline Units	Maintain or improve numerical rating assigned to each unit, including the scenic quality rating of the individual resources in each unit, as recorded in the Scenic Resources Inventory. Maintain the 1982 ratings for all roadway and shoreline units as shown in the Draft Study Report. Restore scenic quality in roadway units rated 15 or below and shoreline units rated 7 or below.	Travel Unit Ratings for Shoreline Travel Units – At or Somewhat Better than Target Scenic Quality Ratings for Shoreline Travel Units – At or Somewhat Better than Target
Other Areas	Maintain or improve the numerical rating assigned to each identified scenic resource, including individual subcomponent numerical ratings, for views from bike paths and other recreation areas open to the general public as recorded in the 1993 Lake Tahoe Basin Scenic Resource Evaluation.	At or Somewhat Better than Target

According to TRPA's SQIP, when determining whether an individual project would affect the threshold status of a roadway or shoreline unit, the amount of contribution made by an individual parcel or use in relation to the rating for its overall unit can be determined using a prorated share of its lineal frontage divided by the total frontage of the unit (TRPA 1989b).

3.2.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on aesthetics, scenic resources, and community design in the context of NEPA, CEQA, and TRPA requirements. Where potentially significant impacts are identified, a discussion of proposed measures to mitigate those impacts is also provided. *Table 3-7* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-7 Significance Determinations for the Project Alternatives (Aesthetics and Scenic Resources)

Aesthetics and Scenic Resources	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on aesthetics and scenic resources?	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
CEQA				
Would the Project: *a) Have a substantial adverse effect on a scenic vista*	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	No Impact	No Impact	No Impact	No Impact
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable	No Impact
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	No Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
Light and Glare: *Will the Project:* *a) Include new or modified sources of exterior lighting?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Create new illumination which is more substantial than other lighting, if any, within the surrounding area?	No Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Cause light from exterior sources to be cast off-site or onto public lands?	No Impact	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
d) Create new sources of glare through the siting of the improvements or through the use of reflective materials?	No Impact	No Impact	No Impact	No Impact
Scenic Resources and Community Design: *Would the Project:* *a) Be visible from any state or federal highway, Pioneer Trail or from Lake Tahoe?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
b) Be visible from any public recreation area or TRPA-designated bicycle trail?	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
c) Block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area?	Less-than-Significant Impact	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
d) Be inconsistent with the height and design standards required by the applicable ordinance or Community Plan?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Be inconsistent with the TRPA SQIP or Design Review Guidelines?	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for scenic quality?*	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact

For the three Action Alternatives, the primary impact on aesthetics and scenic quality will be the addition of visible mass due to the construction of new structures in the shorezone. *Table 3-8* provides a summary of the new visible mass that will be added for each alternative. The proposed Project is in Shoreline Travel Unit 16, which is not in attainment with TRPA's travel route rating threshold, and the Project is in a Visually Modified Shoreline (TRPA 2018: Exhibit 9-7); therefore, the Project's new visible mass would require mitigation at a ratio of 1:2.0. The area of mitigation required to comply with TRPA requirements for mitigation at a 1:2.0 ratio is shown in *Table 3-8*. New visible mass was calculated by adding the perspective view visible mass to the front view mass above lake level (elevation 6,226 feet, LTD) for each alternative, in accordance with TRPA guidelines. Discussions of the specific impacts and mitigation for each alternative are provided after *Table 3-8.*

Table 3-8 Summary Comparison of New Visible Mass for the Project Alternatives

Alternative	Area of New Visible Mass (square feet)	Area of Required Mitigation (square feet; 1:2.0 ratio)
Alternative 1 – Dredging at Existing Pier	174	348
Alternative 2 – 350-foot Dogleg Extension	734	1,468
Alternative 3 – 450-foot Straight Extension	704	1,408

3.2.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on aesthetics and scenic resources?

Less than Significant with Mitigation: Temporary visual impacts would occur during construction of Alternative 1 due to the presence of construction equipment used for dredging and installation of the new boat lift and floating dock. The duration of construction is expected to be 8 weeks. In accordance with **BMP C1-10**, most construction equipment and materials would be stored in a central location during construction in a paved upland area or on the work barge. Construction equipment and materials will be completely removed off site when the work is complete. In accordance with **BMP C1-14**, work activities will be limited to daytime hours to avoid scenic impacts from the use of night lighting, and in accordance with **BMP C1-16**, construction would be scheduled between October and April, which would avoid the prime season for water recreation and thus minimize visual impacts to recreational users of the lake. Visual impacts during construction would be short term, localized, and less than significant.

Alternative 1 would affect scenic resources in the Project vicinity by adding new visible mass above the lake level in the shorezone of Lake Tahoe, though the amount of visible mass added would be limited to: 1) the net difference in visible mass between the existing 8,000-pound boat lift, which would be removed, and the 18,000-pound boat lift that would replace it; 2) the two piles that would support the boat lift; and 3) the 35-foot by 8-foot floating dock. *Figures 3-15* and 3-*16* show simulations of the visual effects of these new structures and include a breakdown of the new visible mass that would be added. Because the new structures would be placed on the western side of the pier head (whereas the current boat lift is on the eastern side), the placement of some existing pier head structures and equipment (e.g., lighting, ladders, railing, meteorology and fueling stations) may need to be reconfigured to allow functionality of the new boat lift and floating dock, but this would not result in a net increase of visible mass.

As indicated in the figures and in *Table 3-8*, Alternative 1 would result in a net total of 174 square feet of new visible mass. Of the three Action Alternatives considered, Alternative 1 would have by far the least impact on scenic resources, because it involves the addition of substantially less new visible mass. Implementation of the following mitigation measure would reduce the impacts of added visible mass to a less-than-significant level:

Figure 3-15: Visual Simulation of Alternative 1 (Side View)

PROPOSED STRUCTURES
VISUAL MASS CALCULATIONS

PARCEL APN 094-140-015-510
STREET ADDRESS 2500 LAKE FOREST ROAD
TAHOE CITY, CALIFORNIA 96145

PROPOSED STRUCTURES

(P) BOAT LIFT (LIFT CAPACITY = 18,000 LBS)		300 SF
(P) 10" DIA. BOAT LIFT PILE (2 TOTAL)	2' X 8.5' X 0.83 = 8.3'	14 SF
(P) FLOATING DOCK	35' X 1' = 35 SF	35 SF
(E) BOAT LIFT (LIFT CAPACITY = 8,000 LBS) TO BE REMOVED		(-190 SF)
VISUAL MASS TOTAL		159 SF

PERSPECTIVE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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Drawn By: EM
Approved By:
Date: 12/01/15
Meeting: Meeting 1

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Staff Symbol: EVD

USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 1 DREDGING AT EXISTING PIER
Project Number: 60218657
Sheet Number: C1.3

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Figure 3-16: Visual Simulation of Alternative 1 (Front View)

PROPOSED STRUCTURES
VISUAL MASS CALCULATIONS

PROPOSED STRUCTURES

(P) BOAT LIFT		NA *
(P) 10" DIA. BOAT LIFT PILE (1 IN VIEW)	8.5' X 0.83'	7 SF
(P) FLOATING DOCK	8' X 1'	8 SF
VISUAL MASS TOTAL		15 SF

*NOTE:
THE VISUAL MASS SHOWN FOR THE BOAT LIFT IN THE PERSPECTIVE VIEW INCLUDES THE COMBINED TOTAL FOR BOTH FRONT AND SIDE MASSING (BASED ON DATA FROM TRPA).

FRONT VIEW

PRELIMINARY

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Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 1 DREDGING AT EXISTING PIER
Project Number: 60218657
Sheet Number: C1.4 of

L:\Projects\Legacy\Trans\60218657-TahoePier\000_CAD\006_Civil\Sheets\C1.4 FRONT SIMULATION ALT 1 DREDGING AT EXIST PIER.dwg, 11/30/2015 9:34:42 AM, Adobe PDF

MM AES-1, Mitigation of Additional Visible Mass: In accordance with the requirements of the *Lake Tahoe Shoreline Plan*, each square foot of visible mass above an elevation of 6,226 feet, LTD, added by the Project will be mitigated at a ratio of 1:2.0. Mitigation will be accomplished by planting additional native landscaping to screen the view of existing Station structures from Lake Tahoe. In accordance with TRPA guidelines, new screening would first be added in the shorezone, and once no additional mitigation in the shorezone is practicable, then screening would be added to the upland area between the Station structures and the lakeshore. The new landscaping will be located and maintained so as to preserve the CG's visibility of the lake from the Station (for operational and safety purposes), meet requirements for fire protection and defensible space, and avoid disturbance of existing native vegetation. The CG will prepare and implement a *Scenic Resources Mitigation Plan* for the selected Project Alternative that will include landscaping plans specifying the location, type, and quantity of new screening plantings, subject to review and approval by TRPA. The landscape plan will use native plant species recommended in the *Home Landscaping Guide for Lake Tahoe and Vicinity* (University of Nevada Cooperative Extension 2006) to reduce the need for irrigation and fertilizer. Survivorship and growth of the new landscaping will be monitored quarterly for the first year, while the plants are establishing, and then annually for an additional 4 years, Corrective actions (e.g., replacement of dead plants) would be taken as needed based on the monitoring results. A *Scenic Mitigation Monitoring Report* describing the monitoring results and any corrective actions taken or proposed will be submitted to TRPA annually during the 5-year monitoring period. Achievement of the 1:2.0 screening criteria will be subject to TRPA verification at the end of the monitoring period.

At a ratio of 1:2.0, the required mitigation for Alternative 1 would be 348 square feet. The baseline scenic assessment conducted for the Station concluded that there is currently 1,391 square feet of existing lakefront façade that could potentially be screened for mitigation, including 600 square feet in the shorezone (composed of the rock revetment). Therefore, the new plantings for Alternative 1 would be placed in the shorezone and would focus on screening the view of the rock revetment from the lake. Native plants suitable for the shorezone (e.g., willows or other riparian vegetation) would be used for the screening, and the plants would be pruned periodically as needed to preserve the visibility of the lake from the Station's main office.

In addition to being visible from Lake Tahoe, the new boat lift and floating dock would be visible from the adjacent TCPUD pier and boat ramp. However, the visible area of new structures is relatively small, and the low profile of the floating dock would reduce its visual impact. The floating dock and boat lift also do not extend lakeward beyond the existing pier, minimizing their visual impact compared to existing conditions.

In accordance with **BMP C1-22**, the new structures would use colors and materials that blend in with the environment, further reducing impacts on the view from the TCPUD facility. The new landscaping added at a 1:2.0 ratio under **MM AES-1** would also improve the view of the Station shoreline from the TCPUD pier and mitigate for the visible mass added by the boat lift and floating dock. The new structures are unlikely to be visible from other TRPA-designated scenic viewpoints from nearby public recreation areas (i.e., the beach to the west of the TCPUD pier and Lake Forest Beach) due to existing structures that would block the view of the new structures and, in the case of Lake Forest Beach, the intervening distance. Therefore, the impact of Alternative 1 on the view from public recreation areas would be less than significant.

In summary, with implementation of **MM AES-1** and various BMPs proposed to avoid and minimize visual impacts, Alternative 1 would have less-than-significant impacts on aesthetics and scenic quality from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) related to scenic resources.

Would the Project:

a) Have a substantial adverse effect on a scenic vista?

Less-than-Significant Impact with Mitigation. Under CEQA, a "scenic vista" is defined as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Under this definition, the views from Lake Tahoe, the TCPUD boat ramp facility, and the western side of Lake Forest Beach would qualify as scenic vistas. Construction activities and equipment would be visible from these scenic vistas during Alternative 1's 8-week construction period. However, visual impacts from construction would be short term and localized. Additionally, in accordance with **BMP C1-16**, construction would be scheduled between October and April, which would avoid the times of year when people would be most likely to be using these scenic vistas.

Long-term impacts associated with Alternative 1 would include the addition of 174 square feet of new visible mass, resulting from the installation of the replacement boat lift and new floating dock on the western side of the existing Station pier. This relatively small area of new visible mass would primarily be visible from Lake Tahoe and portions of the TCPUD Lake Forest boat ramp and pier; the new Project structures would only be minimally visible from Lake Forest Beach. In accordance with **BMP C1-22**, the new structures would use colors and materials that blend in with the environment, which would minimize impacts on the views from these scenic vistas. Additionally, the impact of Alternative 1 on the view from Lake Tahoe would be reduced to a less-than-significant level by implementation of **MM AES-1**, which would mitigate the addition of 174 square feet of visible mass at a 1:2.0 ratio through planting native landscaping sufficient to screen 348 square feet of existing Station structures. With implementation of these measures, the impact of Alternative 1 on scenic vistas would be less than significant.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway?

No Impact. The Project Area is not visible from a state scenic highway, and Alternative 1 would have no impacts related to damaging scenic resources in a state scenic highway.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less-than-Significant Impact with Mitigation. The long-term impacts of Alternative 1 on the visual character or quality of the site and its surroundings would be minimized by implementation of **BMP C1-22,** and impacts from the addition of 174 square feet of new visible mass would be mitigated by implementation of **MM AES-1**, which would result in a net decrease of visible mass when viewed from Lake Tahoe. With implementation of this mitigation, Alternative 1 would have a less-than-significant impact in regard to degradation of the existing visual character or quality of the site and its surroundings.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. During construction, work activities will be limited to daytime hours to avoid the use of night lighting, in accordance with **BMP C1-14**. In the long term, Alternative 1 would require no new lighting. Existing lighting on the pier head may need to be relocated to the eastern side of the pier, but the lights would continue to be shielded and down-directed and the relocation would not significantly alter views in the area. In accordance with **BMP C1-22**, the use of reflective, glare-producing materials for new structures would be avoided. Therefore, Alternative 1 would have no impacts related to creating a new source of substantial light or glare which would adversely affect day or nighttime views of the area.

TRPA Analysis

The TRPA analysis provides answers to the questions found in the TRPA IEC related to Project impacts on TRPA-designated scenic resources. Visual impacts were evaluated and mitigation measures would be implemented consistent with TRPA regulations and guidelines.

Light and Glare:

Will the Project:

a) Include new or modified sources of exterior lighting?

Less-than-Significant Impact. During construction, work activities will be limited to daytime hours to avoid the use of night lighting, in accordance with **BMP C1-14**. In the long term, Alternative 1 would require no new lighting. Existing lighting on the pier head may need to be relocated to the eastern side of the pier to accommodate relocation of the boat lift and installation of the floating dock, but the lights would continue to be shielded, down-directed, and compliant with TRPA height restrictions, and therefore the relocation of the lights would not significantly alter views in the area. Therefore, the impacts of Alternative 1 related to new or modified sources of exterior lighting would be less than significant.

b) Create new illumination which is more substantial than other lighting, if any, within the surrounding area?

No Impact. No new lighting is proposed for Alternative 1. During construction, work activities will be limited to daytime hours to avoid the use of night lighting, in accordance with **BMP C1-14**. Therefore, implementation of Alternative 1 would have no impacts related to creating new illumination which is more substantial than other lighting in the surrounding area.

c) Cause light from exterior sources to be cast off-site or onto public lands?

No Impact. No new lighting is proposed for Alternative 1. Existing lighting on the pier head may need to be reconfigured to accommodate relocation of the boat lift and installation of the floating dock, but the lights would continue to be shielded, down-directed, and compliant with TRPA height restrictions. If relocated to the eastern side of the pier head, the lights would be approximately 20 feet from the property line to the west and the relocation of the lights is not expected to cause light to be cast off site. Therefore, Alternative 1 would have no impacts related to causing light from exterior sources to be cast off-site or onto public lands.

d) Create new sources of glare through the siting of the improvements or through the use of reflective materials?

No Impact. In accordance with **BMP C1-22**, the use of reflective materials will be avoided, and Alternative 1 would have no impact related to creating new sources of glare or the use of reflective materials.

Scenic Resources/Community Design:

Will the Project:

a) Be visible from any state or federal highway, Pioneer Trail, or from Lake Tahoe?

Less-than-Significant Impact with Mitigation. The Project Area is not visible from any state or federal highway or Pioneer Trail, but is visible from Lake Tahoe. Construction activities would have visual impacts on the view from Lake Tahoe due to the presence of construction equipment during the 8-week construction period. However, these impacts would be short term, localized, and less than significant.

Long-term impacts to the view from Lake Tahoe would include the addition of 174 square feet of new structures (replacement boat lift, boat lift piles, and 35-foot by 8-foot floating dock) on the western side of the existing pier that would be visible from Lake Tahoe. In accordance with **BMP C1-22**, the new structures would use colors and materials that blend in with the environment, which would minimize impacts on the views from Lake Tahoe. Additionally, the impact of Alternative 1 on the view from Lake Tahoe would be reduced to a less-than-significant level by implementation of **MM AES-1,** which would mitigate the addition of 174 square feet of visible mass through planting native landscaping sufficient to screen 348 square feet of existing Station structures. With implementation of this mitigation, the impact of Alternative 1 on the view from Lake Tahoe would be less than significant.

b) Be visible from any public recreation area or TRPA-designated bicycle trail?

Less-than-Significant Impact with Mitigation. Portions of two TRPA-designated scenic public recreation areas have views of the Project Area: Recreation Area 13 – Lake Forest Beach, and Recreation Area 14 – Lake Forest Campground and Boat Ramp. Project construction activities would only be visible from the western side of Lake Forest Beach and visibility would only be minimal due to distance and intervening structures. Construction activities would be visible from the TCPUD Lake Forest boat ramp, pier, and adjacent beach, but impacts would be short term, and less than significant. Additionally, in accordance with **BMP C1-16**, construction would be scheduled between October and April, which would avoid the times of year when people would be most likely to be using the TCPUD recreational facilities.

Long-term impacts to the view from the TCPUD boat ramp and pier would result from the addition of 174 square feet of visible mass to the western side of the Station pier. The area of new visible structures would be relatively small, and the low profile of the floating dock would reduce its visual impact. The floating dock and boat lift also do not extend lakeward beyond the existing pier, minimizing their visual impact compared to existing conditions. In addition, in accordance with **BMP C1-22**, the new structures would use colors and materials that blend in with the environment, further reducing impacts on the view from the TCPUD boat ramp and pier. The new landscaping added at a 1:2.0 ratio under **MM AES-1** would also improve the view of the Station shoreline from the end of the TCPUD pier and mitigate for the visible mass added by the boat lift and floating dock. For these reasons, Alternative 1 is not considered likely to reduce the TRPA scenic quality ratings for the view from the southern end of the TCPUD parking lot (Recreation Area 14 – Subcomponent 1).

The new structures added under Alternative 1 would not extend out far enough into Lake Tahoe to affect the views of the beach to the west of the TCPUD pier (Recreation Area 14 – Subcomponent 3), and they would be only minimally visible (if at all) from the western side of Lake Forest Beach (Recreation Area 13 – Subcomponent 2) due to intervening distance and structures. The new structures would not be visible from TRPA-designated scenic bicycle trail segments.

The new structures are unlikely to be visible from other TRPA-designated scenic viewpoints from nearby public recreation areas (i.e., the beach to the west of the TCPUD pier and western side of Lake Forest Beach) due to existing structures that would block the view of the new structures and, in the case of Lake Forest Beach, the intervening distance. Therefore, the impact of Alternative 1 on the view from public recreation areas would be less than significant.

In summary, with implementation of **MM AES-1**, the impact of Alternative 1 on the view from public recreation areas would be less than significant.

c) Block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area?

Less-than-Significant Impact. The Project Area is not visible from any public road and would not block or modify views of Lake Tahoe or other scenic vistas from public roads. The new boat lift and floating dock would be visible in the view of Lake Tahoe from the TCPUD public boat ramp and pier. The low-profile floating dock will not substantially block or modify the current panoramic view of the lake from the TCPUD facilities. The new boat lift will replace the current lift and will not extend lakeward of the end of the existing CG pier, and therefore will not substantially block or modify the view of the lake compared to current conditions. The new structures will not block or modify the view of Lake Tahoe from the beach to the west of the TCPUD pier or Lake Forest Beach. Therefore, Alternative 1 would have a less-than-significant impact related to blocking or modifying an existing view of Lake Tahoe or other scenic vista seen from public roads or other public areas.

d) Be inconsistent with height and design standards required by the applicable ordinance or Community Plan?

Less-than-Significant Impact. Alternative 1 would not have impacts related to height standards, because the proposed new dock will be floating on the surface of Lake Tahoe and the new boat lift will be at the same height as the existing pier and will conform to TRPA height standards. The addition of these new structures

would not conform to several of the other location, design, and construction standards required under Sections 84.4 and 84.8 of the TRPA Code of Ordinances. However, TRPA Code Section 84.8.2 allows deviations to TRPA location, design, and construction standards so structures can meet the long-term operational and safety needs of emergency responders. The Project is an Essential Public Safety Facilities project, and therefore would be processed under TRPA Code of Ordinances Section 84.8.2. The specific design guidelines that would need to be waived for Alternative 1 as related to scenic resources are as follows:

- Code Section 84.4.3.A.4. states that a project application for an additional pier shall meet the following requirements: (a) the project area shall initially score a minimum of 21 points based on the Contrast Rating System; and (b) no later than 6 months following project application submittal, the project area shall score a minimum of 25 points based on the Contrast Rating System, unless the project applicant demonstrates that a score of 25 points is infeasible. The Project area has an initial contrast rating system score of 18. Furthermore, the visual mitigation that will be implemented to plant additional screening may raise the contrast score; however, it may not be possible to achieve a score of 25 points because certain areas of the Project site cannot be screened due to public safety requirements for visibility between the existing on-site buildings and the pier.

- Code Section 84.4.3.B.2(e) limits the allowable visible mass to 220 square feet (not including lateral public access accommodations such as added height, ladders, or stairs). The Project's floating dock would have an area of 280 square feet.

- Code Sections 84.4.3.B.2(d) and (j) limit piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet in width) and a single catwalk (not to exceed 3 feet in width and 30 feet in length). With the addition of the 8-foot-wide floating dock on the western side of the pier, the total width would be 16 feet, exceeding the TRPA's maximum width limit by 6 feet.

- Code Sections 84.4.3.B.2(b) and 84.8.1.B.2. state that single-use piers and floating platforms shall not extend beyond a lake-bottom elevation of 6,219 feet, LTD, or beyond the pier head line designated by TRPA, whichever is more limiting. The existing pier extends approximately 45 feet beyond the pier head line, which is more limiting in this case, and the southern end of the proposed floating dock would be approximately 35 feet beyond the pier head line.

- Code Section 84.8.1.B.3 states that the setback for new floating docks is 20 feet from the projected property line of the adjacent property. The proposed floating dock would extend approximately 10 feet beyond the required setback line.

- Code Section 84.8.1.B.5 limits floating docks to a maximum area of 100 square feet and a length of 10 feet. The proposed floating dock would exceed these limits, having an area of 280 square feet and a length of 35 feet.

These variations from the current design standards would not contribute to a significant impact on visual resources or community design as shown in the visual simulations prepared for Alternative 1 (*Figures 3-15 and 3-16*). As an Essential Public Safety Facility, the Project would be consistent with Code Section 84.8.2 and therefore would have less-than-significant impacts related to inconsistencies with applicable design standards.

The Project Area is not within the planning boundaries of any adopted Community Plans and would have no impacts related to conformance with height or design standards of any such plan.

In summary, implementation of Alternative 1 would have less-than-significant impacts related to inconsistency with height and design standards required by applicable ordinance or Community Plans.

e) Be inconsistent with the TRPA SQIP or Design Review Guidelines?

Less-than-Significant Impact with Mitigation. The Project Area is in Shoreline Unit 16 – Lake Forest. The SQIP guidelines for improving scenic quality in Unit 16 include several recommendations that are relevant to the proposed Project. SQIP Recommendation 1 for Unit 16 states that projects should use materials and colors that blend with the natural environment rather than contrast with it. The recommendation has been incorporated into **BMP C1-22**. SQIP Recommendation 2 states that more landscaping needs to be introduced between development and the shoreline to screen views of development from the lake. Implementation of **MM AES-1** will address this recommendation. SQIP Recommendation 3 concerns revegetation along SR 28 and is not relevant to the proposed Project. SQIP Recommendation 4 discourages the development of additional structures over the water that cannot be screened by vegetation and states that additions to piers should not be out of scale with existing structures. The amount of new visible mass to be added to the pier through installation of the replacement boat lift and floating dock would be minimal, and impacts with be reduced by implementation of **BMP C1-22** and mitigated to less-than-significant levels by implementation of vegetative screening in the shorezone under **MM AES-1.** The replacement boat lift would be only slightly larger than the existing lift and the proposed floating dock would be much smaller than the existing floating dock at the adjacent TCPUD pier. Therefore, the new structures proposed under Alternative 1 would not be out of proportion to existing structures in the shoreline unit.

Multiple BMPs and design features will be incorporated to achieve consistency with TRPA Design Review Guidelines. In accordance with **BMP C1-22,** new structures will use materials and colors that blend with the natural environment, and the use of reflective materials will be avoided. The scale of proposed structures would be compatible with existing structures and the surrounding environment. **BMP C1-10** would be implemented to avoid and minimize disturbance of vegetation during construction, and additional screening vegetation would be installed to mitigate the addition of visible mass, in accordance with **MM AES-1**, The new floating dock would be low profile and of the minimum dimensions to ensure function and safety, and the overall width of the pier would be the same as the existing pier, thus minimizing the pier cross section and profile.

In summary, with implementation of **BMPs C1-10 and C1-22** and **MM AES-1**, Alternative 1 would have less-than-significant impacts related to inconsistencies with the SQIP or Design Review Guidelines.

Threshold Analysis

Less-than-Significant Impact with Mitigation. The TRPA threshold standards for scenic resources require: 1) maintaining a minimum composite travel route rating above 7 and at or above the original rating assigned in 1982, 2) maintaining a minimum composite scenic quality rating of at or above the original rating assigned in 1982, and 3) maintaining a minimum composite scenic quality score for recreation areas at or above the rating assigned in 1993. Shoreline Unit 16 is currently out of attainment with the travel route rating threshold standard, and all other designated scenic resources in the Project vicinity are in attainment.

Alternative 1 is not expected to result in a change in the ratings for the shoreline unit or the affected recreation areas. The proportion of the overall shoreline unit or scenic views from the recreation areas that would be affected by the new structures added under Alternative 1 would be extremely small and long-term visual impacts would be minimized by **BMP C1-22**. As indicated in the SQIP, when determining whether a project would affect scenic quality ratings of a Shoreline Unit, the amount of contribution made by an individual parcel or use in relation to its overall unit can be determined using a prorated share of its lineal frontage divided by the total frontage of the unit. The 150 feet of shoreline at the Station property is only roughly 1 percent of the 2.4 miles of shoreline in Shoreline Unit 16, and Alternative 1 would only affect a small portion of the overall view of the Station's shoreline. Therefore the small amount of development at the Station proposed under Alternative 1 would have virtually no effect on the travel route rating attainment status of Shoreline Unit 16. The *Lake Tahoe Shoreline Plan* establishes a requirement for visual mitigation at a ratio of 1:2.0 for project in a Visually Modified Shorelines. **MM AES-1** would conform to this mitigation requirement, resulting in a net decrease in visible mass in the shorezone at the Station. With implementation of this mitigation measure, the impacts of Alternative 1 with regard to the TRPA scenic thresholds would be less than significant.

3.2.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on aesthetics and scenic resources?

Potentially Significant and Unmitigable Impact: Temporary visual impacts would occur during construction of Alternative 2 due to the presence of construction equipment and materials. The duration of construction is expected to be 7 weeks. In accordance with **BMP C2-7**, construction equipment and materials would be stored in a central location during construction in a paved upland area or on the work barge. Construction equipment and materials will be completely removed off site when the work is complete. In accordance with **BMP C2-11**, work activities will be limited to daytime hours to avoid scenic impacts from the use of night lighting, and in accordance with **BMP C2-13**, construction would be scheduled between October and April, which would avoid the prime season for water recreation and thus minimize visual impacts to recreational users of the lake. Visual impacts during construction would be temporary, localized, and less than significant.

Alternative 2 would affect scenic resources by adding new visible structures (i.e., pier extension, boat lift, floating dock, and other accessory structures) above the lake level in the shorezone of Lake Tahoe. *Figures 3-17* and 3-*18* show simulations of the visual effects of these new structures and include a breakdown of the area of new visible mass that would be added. As indicated in the figures and in *Table 3-8*, the new structures would add an additional 734 square feet of visible mass. Of the three Action Alternatives considered, Alternative 2 would have the most impact on scenic resources because it involves the addition of more new visible mass above the lake level than the other alternatives (*Table 3-8*). Although the pier extension for Alternative 2 is 100 feet shorter than for Alternative 3, the dog-leg orientation of the 100-foot-long pier head would result in more apparent visible mass when viewed from Lake Tahoe and the TCPUD boat ramp and pier.

Implementation of **MM AES-1** would reduce the impacts of the visible mass added under Alternative 2 to a less-than-significant level. At a ratio of 1:2.0, the required mitigation for Alternative 2 would be 1,468 square feet. The baseline scenic assessment conducted for the Project concluded that there is currently 1,391 square feet of existing lakefront façade that could potentially be screened for mitigation, so most of the mitigation for the new visible mass for Alternative 2 could occur on site. Approximately 77 square feet of mitigation would have to occur off site. In accordance with TRPA Code Section 84.4.3.A.6.d, the off-site mitigation would occur either (1) on a different littoral parcel in the same unit and in the shorezone; (2) on a different littoral parcel in the same unit and in the upland; or (3) in a different non-attainment unit. The exact location would be determined in consultation with TRPA.

In addition to being visible from Lake Tahoe, the new pier extension and accessory structures would be visible from the adjacent TCPUD pier and boat ramp and adjacent beach, portions of which currently have sweeping views of the lake and the landscape beyond. The TCPUD pier is approximately 95 feet from the existing CG pier and visibility from the TCPUD pier and boat ramp is high. In accordance with **BMP C2-19**, the colors and materials used for the pier extension would be designed to blend with the surrounding environment and lighting would be shielded, down-directed, compliant with TRPA height restrictions, and of the minimal quantity and intensity needed to meet the CG's operational and safety requirements, which would reduce the visual impacts of Alternative 2 somewhat. However, due to the dog-leg orientation of the pier head, its full profile would face broadside to the TCPUD facilities, increasing its apparent visible mass from that angle. The new pier head would be approximately 275 feet to the south-southeast of the southern end of the TCPUD pier. The existing dog-leg portion of the TCPUD pier and the existing CG pier already obstruct most of the view of the lake from the boat ramp, and Alternative 2 would further obstruct the view from the boat ramp as well as from the pier and adjacent beach. No screening would be practicable between the TCPUD facilities and the CG pier extension. Therefore, Alternative 2 would have a potentially significant impact on the view of Lake Tahoe from the TCPUD facility, which is designated as a scenic recreation area by TRPA.

Figure 3-17 Visual Simulation of Alternative 2 (Side View)

VISUAL MASS CALCULATIONS

PARCEL APN 094-140-015-510
STREET ADDRESS 2500 LAKE FOREST ROAD
TAHOE CITY, CALIFORNIA 96145

PROPOSED PIER DETAILS

DESCRIPTION	CALULATIONS	TOTAL
(P) PIER DECKING HEIGHT	250' X 0.33	83 SF
(P) PIERHEAD DECKING HEIGHT	60.5' X 0.67'	40 SF
(P) STEEL FLANGE (5 TOTAL)	4' X 0.67' (W8X31)	13 SF
(P) STEEL PILE CAP (5 TOTAL)	(W8X31) 2 SF EA.	10 SF
(P) CATWALK DOLPHIN W/ 2 BATTER PILES (5 TOTAL VIEW) HEIGHT AT ELEV. 6226 LAKE TAHOE DATUM	4'H X 0.83'	17 SF
(P) 10" DIAMETER STEEL PIPE PILES AT PIERHEAD (14 IN VIEW)	4'H X 0.83'	46 SF
(P) 3'-6" STEEL HANDRAIL	310' X 0.25'	78 SF
(P) 12' HIGH LIGHTPOLE (10 TOTAL)	12 X 0.5 '	60 SF
(P) STEEL DOCK ACCESS LADDER	28' X .063'	2 SF
(P) TIMBER FLOATING DOCK HEIGHT	57' X 1'	57 SF
REMOVAL OF EXISTING BOAT LIFT AND FUEL STATION		-195 SF
(P) BOAT LIFTS (2 TOTAL)		485 SF
(P) FUEL STATION		10 SF
VISUAL MASS TOTAL		706 SF

PERSPECTIVE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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Drawn By: EM
Approved By:
Date: 7/26/12
Meeting: Meeting 1

U.S. Department of Homeland Security
United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 2
350 FOOT DOGLEG EXTENSION
WITH DOLPHIN PILES

Project Number: 60218657
Sheet Number: C2.3 of

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Figure 3-18 Visual Simulation of Alternative 2 (Front View)

PROPOSED PIER DETAILS
VISUAL MASS CALCULATIONS

USCG PIER
PARCEL APN 094-140-015-510
STREET ADDRESS 2500 LAKE FOREST ROAD
TAHOE CITY, CALIFORNIA 96145

PROPOSED PIER DETAILS

DESCRIPTION	CALULATIONS	TOTAL
(P) PIERHEAD DECKING HEIGHT	83' X 0.67'	72 SF
(P) 10" DIAMETER STEEL PIPE PILES AT PIERHEAD (14 IN VIEW)	4'H X 0.83'	46 SF
(P) 3'-6" STEEL HANDRAIL	82' X 0.25'	21 SF
(P) 12' HIGH LIGHTPOLE	5 X 0.5 '	3 SF
(P) STEEL DOCK ACCESS LADDER	28' X .063'	2 SF
(P) TIMBER FLOATING DOCK HEIGHT	57' X 1'	57 SF
(P) BOAT LIFT		NA*
(P) FUEL STATION		10 SF
VISUAL MASS TOTAL		211 SF

* The visual mass indicated for the boat lift in the perspective view includes the combined total for both front and side massing (based on data from TRPA).

FRONT VIEW

PRELIMINARY

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Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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Date: 7/26/12
Meeting
Meeting 1

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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 2
350 FOOT DOGLEG EXTENSION
WITH DOLPHIN PILES

Project Number: 60218657
Sheet Number: C2.4 of

The pier extension would also be visible from the western side of Lake Forest Beach, though the visual impact would be less due to distance and the fact that the pier head would angle away from that viewpoint.

In summary, although other visual impacts described previously would be less than significant from the standpoint of NEPA with implementation of **MM AES-1** and the BMPs described above, the impacts on the view of Lake Tahoe from the TCPUD boat ramp and pier would be potentially significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Have a substantial adverse effect on a scenic vista?

Potentially Significant and Unmitigable Impact. Under CEQA, a "scenic vista" is generally defined as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Under this definition, views of the Project Area from Lake Tahoe, the TCPUD boat ramp, and the western side of Lake Forest Beach would qualify as scenic vistas. Construction activities for Alternative 2 would have visual impacts on these scenic vistas due to the presence of construction equipment and materials during the 7-week construction period. However, these impacts would be short term and localized. Additionally, in accordance with **BMP C2-13**, construction would be scheduled between October and April, which would avoid the times of year when people would be most likely to be using these scenic vistas.

Long-term impacts associated with Alternative 2 would include the addition of 734 square feet of new visible mass comprising the pier extension and accessory structures. The new visible mass would primarily be visible from Lake Tahoe and the TCPUD Lake Forest boat ramp and pier, though the new pier extension would also be somewhat visible from the western side of Lake Forest Beach. In accordance with **BMP C2-19**, the new structures would use colors and materials that blend in with the environment, which would minimize impacts on the views from these scenic vistas. Additionally, the impact of Alternative 2 on the view from Lake Tahoe would be reduced to a less-than-significant level by implementation of **MM AES-1,** which would mitigate the addition of 734 square feet of visible mass through planting native landscaping sufficient to screen 1,468 square feet of existing structures. However, there is no possibility of screening the view of the pier extension from the TCPUD Lake Forest boat ramp and pier, and impacts to these scenic vistas would be potentially significant.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The Project Area is not visible from a state scenic highway, and Alternative 2 would have no impacts related to damaging scenic resources, including trees, rock outcroppings, or historic buildings, in a state scenic highway.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Potentially Significant and Unmitigable Impact. Some of Alternative 2's long-term impacts on the visual character or quality of the site and its surroundings would be avoided and minimized by implementation of **C2-19,** and impacts from the addition new visible mass would be mitigated by implementation of **MM AES-1**, which would result in a net decrease of visible mass when viewed from Lake Tahoe. However, the visual character and quality of the site when viewed from the TCPUD Lake Forest boat ramp and pier will be substantially affected by the presence of the dog-leg extension. Therefore, Alternative 2 would have a potentially significant impact in regard to degrading the existing visual character or quality of the site and its surroundings.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less-than-Significant Impact. During construction, work would be limited to daytime hours to avoid the use of night lighting, in accordance with **BMP C2-11**. During operation of the pier extension, the pier will require nighttime visibility so that the CG can provide emergency services on a 24-hour basis. Alternative 2 would include the addition of approximately 10 new low-wattage lights along the handrail of the pier extension, plus two lights for the boat lift. In accordance with **BMP 2-19**, lighting would be shielded, down-directed, compliant with TRPA height restrictions and other Design Review Guidelines, and limited to the minimum quantity and brightness needed to meet the CG's operational and safety requirements. The lights for the boat lift would be motion activated so that they would only be illuminated when needed. In addition, the new pier extension lighting would occur in a setting where there is already nighttime lighting over the lake for the existing CG pier and adjacent public and private piers, and the new lighting would be similar to existing lighting. In accordance with **BMP C2-19**, the use of reflective materials will be avoided, and there will be no impacts related to glare. For these reasons, Alternative 2 would have less-than-significant impacts related to creating a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Light and Glare

Will the Project:

a) Include new or modified sources of exterior lighting?

Less-than-Significant Impact. During construction, work would be limited to daytime hours to avoid the use of night lighting, in accordance with **BMP C2-11**. During operation of the pier extension, the pier will require nighttime visibility so that the CG can provide emergency service on a 24-hour basis. Alternative 2 would include the addition of approximately 10 new low-wattage lights along the handrail of the pier extension, plus two lights for the boat lift. In accordance with **BMP 2-19**, lighting would be shielded, down-directed, compliant with TRPA height restrictions and other Design Review Guidelines, and limited to the minimum quantity and brightness needed to meet the CG's operational and safety requirements. The lights for the boat lift would be motion activated so that they would only be illuminated when needed. In addition, the new pier extension lighting would occur in a setting where there is already nighttime lighting over the lake for the existing CG pier and adjacent public and private piers, and the new lighting would be similar to existing lighting. In accordance with **BMP C2-19**, the use of reflective materials will be avoided, and there will be no impacts related to glare. For these reasons, Alternative 2 would have less-than-significant impacts related to creating a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

b) Create new illumination which is more substantial than other lighting, if any, within the surrounding area?

Less-than-Significant Impact. Alternative 2 will include addition of new lighting on the pier extension. In accordance with **BMP 2-19**, lighting would be shielded, down-directed, compliant with TRPA height restrictions and other Design Review Guidelines, and limited to the minimum quantity and brightness needed to meet the CG's operational and safety requirements. The lights for the boat lift would be motion activated and would only be illuminated when needed. In addition, the new pier extension lighting would occur in a setting where there is already nighttime lighting over the lake for the existing CG pier and adjacent public and private piers, and the new lighting would be similar to existing lighting. Therefore, Alternative 2 would have less-than-significant impacts related to creating new illumination which is more substantial than other lighting in the surrounding area.

c) Cause light from exterior sources to be cast off-site or onto public lands?

Potentially Significant and Unmitigable Impact. The southwestern end of the pier head would extend approximately 70 feet past the projected property line between the CG property and the adjacent property line of the TCPUD facility. The area that is encroached upon comprises submerged lands of the state under the jurisdiction of the California State Lands Commission and would be considered "public lands." Although the lighting will be low-wattage and directed at the surface of the pier extension deck and boat ramps, it is likely that some will be cast into the adjacent water on these public lands. The pier extension lighting would also be visible from the two public recreation areas in the Project vicinity. Therefore, Alternative 2 would have potentially significant impacts relating to light from exterior sources being cast off-site and onto public lands.

d) Create new sources of glare through the siting of the improvements or the use of reflective materials?

No Impact. In accordance with **BMP C2-19**, the use of reflective materials will be avoided, and Alternative 2 would have no impacts related to creating new sources of glare or the use of reflective materials.

Scenic Resources/Community Design:

Will the Project:

a) Be visible from any state or federal highway, Pioneer Trail or from Lake Tahoe?

Less-than-Significant Impact with Mitigation. The Project Area is not visible from any state or federal highway or Pioneer Trail, but is visible from Lake Tahoe. Construction activities would have visual impacts on the view from Lake Tahoe due to the presence of construction equipment during the 7-week construction period. However, these impacts would be short term, localized, and less than significant.

Alternative 2's long-term impacts would include the addition of 734 square feet of new structures that would be visible from Lake Tahoe. In accordance with **BMP C2-19,** the new structures would use colors and materials that blend in with the environment, which would minimize impacts on the views from Lake Tahoe. Additionally, the impact of Alternative 2 on the view from Lake Tahoe would be reduced to a less-than-significant level by implementation of **MM AES-1,** which would mitigate the addition of 734 square feet of visible mass at a 1:2.0 ratio through planting native landscaping sufficient to screen 1,468 square feet of existing structures. With implementation of this mitigation, the impact of Alternative 2 on the view from Lake Tahoe would be less than significant.

b) Be visible from any public recreation area or TRPA designated bicycle trail?

Potentially Significant and Unmitigable Impact. The Project Area is not visible from any TRPA-designated bicycle trail. However, the proposed pier extension would be visible from portions of two TRPA-designated public recreation areas listed in the *1993 Scenic Resources Evaluation* (TRPA 1993): Recreation Area 13 – Lake Forest Beach and Recreation Area 14 – Lake Forest Boat Ramp and Campground. Portions of the Project Area are visible from the western end of Lake Forest Beach. With the addition of the 350-foot extension, the CG pier would be by far the longest pier in the vicinity, making it more apparent from Lake Forest Beach, though the ¼ mile distance between the pier and the beach would reduce the impacts somewhat.

Construction activities would be visible from the TCPUD's Lake Forest boat ramp, pier, and adjacent beach, but impacts would be temporary and less than significant. Long-term impacts to the view from the TCPUD facility would result from the addition of 734 square feet of visible mass comprising the pier extension and accessory structures. The TCPUD boat ramp and pier currently have sweeping views of Lake Tahoe that would be partially blocked by the pier extension and particularly the pier head. Due to the dog-leg orientation of the pier head, its full profile would be facing broadside to the TCPUD facilities, increasing its apparent visible mass from that angle. The dog-leg pier head would detract from the natural-

appearing landscape views from the shoreline looking to the lake and also from the lake looking back to the shore. No screening would be practicable between the TCPUD facilities and the CG pier extension. Therefore, Alternative 2 would have a potentially significant impact on the view of Lake Tahoe from the TCPUD facility, which is designated as a scenic public recreation area by TRPA.

c) Block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area?

Potentially Significant and Unmitigable Impact. The Project Area is not visible from any public road and would not block or modify views of Lake Tahoe or other scenic vistas from public roads. The Project Area is visible from Lake Forest Beach and the TCPUD Lake Forest Boat Ramp, pier, and adjacent beach. Construction activities for Alternative 2 would have visual impacts on the views from these public areas due to the presence of construction equipment and materials during the 7-week construction period. However, these impacts would be temporary and less than significant.

Long-term impacts associated with Alternative 2 would include the addition of 734 square feet of new visible mass, which would partially obstruct the view of Lake Tahoe from the TCPUD facilities. The dog-leg configuration of the pier head increases the apparent visible mass from the TCPUD facilities because the full profile of the pier head would be facing the recreation area. Although impacts could be reduced by implementation of **BMP 2-19** and further mitigated by implementation of **MM AES-1**, there is no way of completely of screening the view of the pier extension from the TCPUD facilities. Therefore, Alternative 2 would have potentially significant impacts related to blocking and modifying the existing view of Lake Tahoe from a public area.

d) Be inconsistent with height and design standards required by the applicable ordinance or Community Plan?

Less-than-Significant Impact. The proposed design of Alternative 2 would not conform to several of the location, design, and construction standards required by Section 84 of the TRPA Code of Ordinances. Alternative 2 includes the following deviations from the 2018 TRPA code related to boating facilities, that would be allowed under the Section 84.8.2 code amendments for Essential Public Safety Facilities within the Shorezone:

- Section 84.4.3.B(2) states that single-use piers shall not extend beyond lake-bottom elevation of 6,219 feet, LTD, or the pier head line, whichever is more limiting. Alternative 2 would extend the Station pier approximately 350 feet beyond the pier head line, which is more limiting in this case.

- Section 84.4.3.B.2(g) states that the setback for existing single-use piers is 20 feet from the projected property line of the adjacent property. With the proposed dog-leg configuration, Alternative 2 would extend approximately 90 feet beyond the 20-foot setback line.

- Sections 84.4.3.B.2(d) and (j) limit piers to a maximum width of 10 feet, including all appurtenant structures except for a single low-level boat lift (not to exceed 10 feet width) and a single catwalk (not to exceed 3 feet in width). With an 8-foot-wide pier head deck and an 8-foot-wide floating dock, the total width of the pier would be 16 feet, exceeding TRPA's maximum width limit by 6 feet.

- Section 84.8.1.B.2 states that floating platforms shall not extend beyond lake-bottom elevation 6,219 or beyond the pier head line, whichever is more limiting. The floating dock proposed for Alternative 2 would extend approximately 330 feet beyond the pier head line.

- Section 84.8.1. B.3 states that the setback for new floating docks is 20 feet from the projected property line of the adjacent property. The floating dock proposed for Alternative 2 would extend approximately 75 feet beyond the required setback line.

- Section 84.8.1.B.5 limits floating docks to a maximum area of 100 square feet and a maximum length of 10 feet. The proposed floating dock would exceed these limits, having an area of 560 square feet and a length of 70 feet.

The Project Area is not within the planning boundaries of any adopted Community Plans and would have no impacts related to conformance with height or design standards of any such plan.

In summary, Alternative 2 would have a less-than-significant impact related to inconsistency with height and design standards because the Project is an Essential Public Safety Facility and therefore would be processed under TRPA Code Section 84.8.2.

e) Be inconsistent with the TRPA SQIP or Design Review Guidelines?

Potentially Significant and Unmitigable Impact. The Project Area is in Shoreline Unit 16. The SQIP guidelines for improving scenic quality in Unit 16 include several recommendations that are relevant to the proposed Project. SQIP Recommendation 1 states that projects should use materials and colors that blend with the natural environment rather than contrast with it. The recommendation has been incorporated into **BMP C2-19**. SQIP Recommendation 2 states that more landscaping needs to be introduced between development and the shoreline to screen views of development from the lake. Implementation of **MM AES-1** will address this recommendation. SQIP Recommendation 3 concerns revegetation along SR 28 and is not relevant to the proposed Project. SQIP Recommendation 4 discourages the development of additional structures over the water that cannot be screened by vegetation and states that additions to piers should not be out of scale with existing structures. Alternative 2 would involve the addition of a substantial area of new structures over the lake. The existing CG pier is already among the longest piers in Shoreline Unit 16, and the proposed 350-foot extension would make it by far the longest pier in the unit and therefore out of proportion to existing structures. Therefore, Alternative 2 would have a potentially significant impact related to inconsistency with the SQIP.

The new lighting proposed for Alternative 2 would be consistent with the lighting guidelines in Chapter 7 of the Design Review Guidelines. In accordance with **BMP C2-19**, lighting would be shielded, down-directed, compliant with TRPA height restrictions and other Design Review Guidelines, and limited to the minimum quantity and brightness needed to meet the CG's operational and safety requirements. Similarly, **BMP C2-19** would conform to the guidance in Chapter 11 of the Design Review Guidelines for use of colors that blend or recede and avoidance of the use of reflective materials. **BMP C2-7** would include measures to protect shorezone and shoreline vegetation during construction, and additional screening vegetation would be installed under **MM AES-1.**

Alternative 2 would not be consistent with several of the Design Review Guidelines from Chapter 11 related to Code Section 84.4 (Piers). Specifically, the dog-leg orientation of the pier head would increase the apparent mass of the pier when viewed from both the lake and shoreline. Implementation of **MM AES-1** would mitigate the impacts to the view from the lake, but it is not possible to mitigate the impacts on the view from the shoreline, particularly from the TCPUD boat ramp facility. The proposed dolphin piles would not conform with the guidance to use single pile construction techniques; however, the proposed dolphin pile design has less visual mass than the monopile design that was dropped from consideration, because it has fewer piles spread farther apart, and so the impact of this deviation from the guidelines does not result in a significant impact on scenic resources. However, because of the aforementioned inconsistency with the guidance to minimize the view of the pier when viewed from the shoreline, Alternative 2 would have a potentially significant impact related to inconsistency with portions of the Design Review Guidelines.

TRPA Thresholds

Potentially Significant and Unmitigable Impact. The TRPA threshold standard for scenic resources require: 1) maintaining a minimum composite Travel Route rating of above 7 and at or above the original rating assigned in 1982, 2) maintaining a minimum composite Scenic Quality rating of at or above the original rating assigned in 1982, and 3) maintaining a minimum composite Scenic Quality rating for recreation areas at or above the rating assigned in 1993. Shoreline Unit 16 is currently out of attainment

with the travel route rating threshold standard, and all other designated scenic resources in the Project vicinity are in attainment.

Alternative 2 is not expected to result in a reduction in the travel route or scenic quality ratings for Shoreline Unit 16. The proportion of the overall shoreline in Unit 16 that would be affected by Alternative 2 is very small – the length of shoreline at the Station is approximately 150 feet, compared to the approximately 2.4-mile length of total shoreline in Unit 16, and the proposed pier extension would only affect a small portion of the view of the Station's shoreline. In addition, the proposed Project would take place in a portion of the shoreline that is already highly developed. Both the travel route and scenic quality ratings are based on the view of the shoreline from Lake Tahoe. Implementation of **MM AES-1** would mitigate the impacts on the view from the Lake by screening the view of existing Station structures from the lake. Implementation of **BMP C2-19** would further reduce impacts to scenic quality.

Alternative 2 could result in a reduction of the scenic quality ratings of certain subcomponents of Recreation Areas 13 (Lake Forest Beach) and 14 (Lake Forest Campground and Boat Ramp). Alternative 2 could also affect the ratings for Recreation Area 13, Subcomponent 2 (views from the western side of the beach). The pier extension would be clearly visible from the western side of the beach and would extend out substantially farther into the lake than other piers in the area. Therefore, the pier extension may particularly impact the rating for intactness (i.e., the extent to which a landscape retains its natural condition or the degree to which modifications emphasize or enhance the natural condition of the landscape).

Alternative 2 would have an even more substantial effect on Recreation Area 14, because it is immediately to the west of the Project Area and would have high visibility of the pier extension, particularly the dog-leg pier head. Recreation Area 14, Subcomponent 1 is the view of the lake from the southern end of the TCPUD parking lot, which is already partially obstructed by the existing CG and TCPUD piers (*Figure 3-9*) and would be further blocked by the proposed pier extension. This would primarily affect the intactness rating for this resource and could possibly also affect ratings for other parameters (unity, vividness, and variety).

Subcomponent 3 is the view from the lake of the small beach west of the pier. Most of the proposed pier extension would not be visible from this beach, or affect the view of the beach from the lake, because of the intervening TCPUD pier. However, the far southwestern end of the extension may block views from the lake of the far western end of the beach, and tops of the new light poles on the pier extension would also be visible from the beach. Therefore, the pier extension still has the potential to reduce the ratings for Subcomponent 3. In addition, due to the high visibility of the pier extension from the pier and adjacent areas, Alternative 2 would have a potentially significant impact on the composite scenic quality ratings for Recreation Area 14 as a whole.

3.2.3.3 Alternative 3: Straight Extension with Dolphins

Potentially Significant and Unmitigable Impact. Alternative 3 would have similar types of impacts on aesthetics, scenic resources, and community design as Alternative 2, though the quantity or intensity of certain impacts may differ somewhat. Overall, the impacts of Alternative 3 on aesthetics, scenic resources, and community design are expected to be somewhat less than Alternative 2 because Alternative 3 would add less apparent visible mass when viewed from key viewpoints (e.g., from Lake Tahoe and the TCPUD boat ramp facility). As shown in *Table 3-8,* the area of new visible mass for Alternative 3 is 704 square feet, versus 734 square feet for Alternative 2. Although Alternative 3 would be 100 feet longer overall than Alternative 2, the dog-leg configuration of the pier head for Alternative 2 would give it more apparent visible mass when viewed from the TCPUD facilities and portions of Shoreline Unit 16. *Figures 3-19* and 3-*20* depict simulations of the visual effects of Alternative 3 when viewed from Lake Tahoe.

Similar to Alternative 2, Alternative 3 would have temporary visual impacts during construction due to the presence of equipment and materials. The construction duration for Alternative 3 is 1 week longer than for Alternative 2 (8 weeks versus 7 weeks), increasing construction-related impacts slightly, though the overall impact would still be temporary, localized, and less than significant.

Figure 3-19 Visual Simulation of Alternative 3 (Side View)

PROPOSED PIER DETAILS
VISUAL MASS CALCULATIONS

USCG PIER
PARCEL APN 094-140-015-510
STREET ADDRESS 2500 LAKE FOREST ROAD
TAHOE CITY, CAFIFORNIA 96145

PROPOSED PIER DETAILS

DESCRIPTION	CALULATIONS	TOTAL
(P) PIER DECKING HEIGHT	350' X 0.33	115 SF
(P) PIERHEAD DECKING HEIGHT	100' X 0.67'	67 SF
(P) STEEL FLANGE (14 TOTAL)	4' X 0.67' (W8X31)	38 SF
(P) STEEL PILE CAP (7 TOTAL)	(W8X31) 2 SF EA.	14 SF
(P) CATWALK DOLPHIN W/ 2 BATTER PILES (7 IN VIEW) HEIGHT AT ELEV. 6226 LAKE TAHOE DATUM	4'H X 0.83'	23 SF
(P) 10" DIAMETER STEEL PIPE PILES AT PIERHEAD (7 IN VIEW)	4'H X 0.83'	23 SF
(P) 3'-6" STEEL HANDRAIL	450' X 0.25'	113 SF
(P) 12' HIGH LIGHTPOLE (12 TOTAL)	12 X 0.5 '	72 SF
(P) STEEL DOCK ACCESS LADDER	28' X .063'	2 SF
(P) TIMBER FLOATING DOCK HEIGHT	70' X 1'	70 SF
REMOVAL OF EXISTING BOAT LIFT AND FUEL STATION		-195 SF
(P) BOAT LIFTS (2 TOTAL)		485 SF
(P) FUEL STATION		10 SF
VISUAL MASS TOTAL		814 SF

PERSPECTIVE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

TRANSPORTATION

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Drawn By: EM
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Date: 7/26/12
Meeting:
Meeting 1

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United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
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Staff Symbol: EVD

USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 3
450 FOOT STRAIGHT EXTENSION
WITH DOLPHIN PILES

Project Number: 60218657
Sheet Number: C3.3

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Figure 3-20 Visual Simulation of Alternative 3 (Front View)

PROPOSED PIER DETAILS
VISUAL MASS CALCULATIONS

USCG PIER
PARCEL APN 094-140-015-510
STREET ADDRESS 2500 LAKE FOREST ROAD
TAHOE CITY, CAFIFORNIA 96145

PROPOSED PIER DETAILS

DESCRIPTION	CALULATIONS	TOTAL
(P) PIERHEAD DECKING HEIGHT	8' X 0.67'	5 SF
(P) STEEL PILE CAP	5' X 0.67' (W8X31)	3 SF
(P) 10" DIAMETER STEEL PIPE PILES AT PIERHEAD	4'H X 0.83'	3 SF
(P) 3'-6" STEEL HANDRAIL		10 SF
(P) 12' HIGH LIGHTPOLE	12 X 0.5 '	12 SF
(P) TIMBER FLOATING DOCK HEIGHT	8' x 1'	8 SF
(P) BOAT LIFTS (2 TOTAL)		NA*
(P) FUEL STATION		10 SF
VISUAL MASS TOTAL		51 SF

* The visual mass indicated for the boat lift in the perspective view includes the combined total for both front and side massing (based on data from TRPA).

FRONT VIEW

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
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Date: 7/26/12
Meeting
Meeting 1

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Commanding Officer
United States Coast Guard
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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 3
450 FOOT STRAIGHT EXTENSION
WITH DOLPHIN PILES

Project Number: 60218657
Sheet Number: C3.4 of

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Similar to Alternative 2, the long-term impact of adding new visible mass on the view from Lake Tahoe would be reduced to a less-than-significant level by implementation of **MM AES-1.** The amount of mitigation required would be 1,408 square feet (versus 1,468 square feet for Alternative 2). There is approximately 1,391 square feet of on-site screenable area. Therefore, approximately 17 square feet of screening as mitigation would have to occur off site (versus 77 square feet of off-site mitigation under Alternative 2).

Alternative 3 would also be highly visible from Recreation Area 14, particularly from the TCPUD pier and boat ramp. The receding angle of the straight extension would result in somewhat less visual impact than the dog-leg configuration, though this benefit would be partially eroded by the extra 100 feet of length required for Alternative 3. The existing TCPUD and CG piers already obstruct most of the view of the lake from the boat ramp, and Alternative 2 would further obstruct the view from the boat ramp as well as from the pier and adjacent beach. No screening would be practicable between the TCPUD facilities and the CG pier extension. Therefore, Alternative 2 would have a potentially significant impact on the view of Lake Tahoe from the TCPUD facility, which is designated as a scenic recreation area by TRPA. Similar to Alternative 2, Alternative 3 has the potential to cause a reduction in the scenic quality ratings for Recreation Area 14 and therefore has potentially significant impacts related to non-conformance with the TRPA thresholds for scenic quality.

The pier extension for Alternative 3 would also be visible from the western side of Recreation Area 13 – Lake Forest Beach. In this case, the impacts are expected to be slightly more than for Alternative 2, because the 100 feet of extra length extends the pier out further into the lake, and from the perspective of the western side of Lake Forest Beach, the full profile of the extension would be facing broadside toward the beach. Similar to Alternative 2, Alternative 3 has the potential to cause a reduction in the scenic quality ratings for Recreation Area 14 and therefore has a potentially significant impact related to non-conformance with the TRPA thresholds for scenic quality.

Alternative 3 would involve the installation of 12 new lights along the handrail of the pier extension, two more lights than Alternative 2. In accordance with **BMP 2-19**, lighting would be shielded, down-directed, compliant with TRPA height restrictions and other Design Review Guidelines, and limited to the minimum quantity and brightness needed to meet the CG's operational and safety requirements. Lighting impacts on the adjacent public area would be less than for Alternative 2, because the straight pier extension would only extend 10 feet beyond the projected property line, rather than 70 feet.

Similar to the Alternatives 2, Alternative 3 would be inconsistent with certain location, design, and construction standards in the TRPA Code. The proposed straight pier extension would differ somewhat in the amount of non-conformance when compared to the dog-leg extension. The pier extension would extend 460 feet beyond the pier head line (vs. 350 feet for Alternative 2) and 30 feet beyond the 20-foot setback line (vs. 90 feet). The floating dock would extend 430 feet beyond the pier head line (vs. 350 feet for Alternative 2) and 30 feet beyond the setback line (vs. 75 feet). However, Alternative 3 would not have significant impacts related to noncompliance with the TRPA Code of Ordinances because the Project is an Essential Public Safety Facility and therefore would be processed under TRPA Code Section 84.8.2.

Alternative 3 also would not conform to SQIP Recommendation 4, which states that additions to piers should not be out of scale with existing structures. Alternative 3 would involve the addition of a substantial area of new structures over the lake. The 450-foot extension proposed under Alternative 3 would make the Station pier by far the longest pier in the Shoreline Unit 16, and therefore it is likely to be considered out of proportion with existing structures. Therefore, Alternative 3 would have a potentially significant impact related to inconsistency with the SQIP.

In summary, Alternative 3 would have potentially significant impacts on aesthetics, scenic resources, and community design, particularly due to its impacts on the views from public recreation areas and nonconformance with the SQIP.

3.2.3.4 Alternative 4: No Action

No Impact. Under Alternative 4, no dredging or construction would take place and no new visible mass would be added to the shorezone or shoreland. Alternative 4 would therefore have no impact on aesthetics

and visual resources when compared to existing conditions. However, Alternative 4 does not fulfill the purpose and need of the proposed Project, and CG response times would continue to be adversely affected.

3.3 Air Quality and Greenhouse Gases

The following sections provide a general discussion of the affected environment, relevant environmental regulations, and potential Project impacts related to air quality.

3.3.1 Affected Environment

The Project Area is in the Placer County portion of the Lake Tahoe Air Basin (LTAB). The LTAB comprises the surface of Lake Tahoe and the land up to the surrounding rim of mountain ridges, occupying approximately 193 square miles. The LTAB includes portions of Placer and El Dorado Counties in California and Washoe and Douglas Counties and the Carson City Rural District in Nevada. Air quality in the Placer County portion of the LTAB is regulated by the USEPA, CARB, TRPA, and the PCAPCD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. The PCAPCD is responsible for controlling sources of air pollution in the Project vicinity and assuring compliance with federal and state environmental laws governing air quality. TRPA manages air quality in the LTAB and has developed its own set of air quality standards and ordinances. Descriptions of the federal, state, and local regulations related to air quality in the LTAB are provided in *Section 3.3.2*.

3.3.1.1 Local Topography, Climate, and Meteorology

The ambient concentrations of air pollutant emissions in an air basin are determined by the amount of pollutants emitted and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include topography, climate, and meteorology. These factors are discussed below.

The LTAB's topography makes it vulnerable to air quality issues. Lake Tahoe lies in a depression between the Sierra Nevada and Carson mountain ranges at a surface elevation of approximately 6,226 feet, LTD. The mountains surrounding the lake average 8,000 to 9,000 feet in elevation, with some exceeding 10,000 feet. The deep waters of Lake Tahoe remain at a constant, relatively cool 39 degrees Fahrenheit year round, which tends to also keep the air above the surface of the lake relatively cool. This characteristic, in combination with the lake's location between two mountain ranges, leads to frequent shallow subsidence and radiation inversions in which cool air is trapped above the surface of the lake and below warmer air flowing into the basin from the west. Pollutants from local sources are trapped by these inversions, greatly limiting mixing and dilution and resulting in accumulation of pollutants in the lower atmosphere. In addition, rapid radiation cooling at night regularly generates nocturnal winds that blow from the mountain ridges down to the shore and then fan across the lake. Each night these down-slope winds transport local pollutants from developed areas around the lake perimeter out over the lake. This meteorological regime, characterized by weak but regular down-slope winds and a strong inversion, is the most common pattern year round (Cahill and Cliff 2000).

A second typical and related meteorological regime is the transport of pollutants from the Sacramento Valley and San Francisco Bay Area into the LTAB as winds from these areas move upslope to the east, across the Sierra Nevada, and into the LTAB. This pattern develops when the western slopes of the Sierra Nevada are heated, causing the air to rise in a chimney effect and move upslope across the Sierra crest and into the LTAB. The strength of this pattern depends on the amount of heating, and thus is strongest in summer, beginning in April and ending in late October (Cahill and Cliff 2000).

At times, strong large-scale weather patterns overcome the dominant terrain-defined regimes described previously. The most important is the winter storm regime, which is responsible for precipitation in the form of snow or rain from November to March. Winter storms dilute the local and upwind pollution with strong vertical mixing and the incorporation of clean North Pacific air (Cahill and Cliff 2000).

Each of these meteorological regimes influences pollution concentrations in the LTAB. Pollutant concentrations typically increase when emissions-trapping inversions are present and when conditions allow pollution to be transported into the LTAB from the Sacramento and San Francisco areas. Lower pollutant concentrations are associated with winter storms and high winds (Cahill and Cliff 2000).

3.3.1.2 Air Quality Standards Attainment Status

The USEPA has established National Ambient Air Quality Standards (NAAQS) for the following six pollutants: ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. Similarly, the CARB has established California Ambient Air Quality Standards (CAAQS) for ten pollutants: ozone, CO, SO_2, NO_2, PM_{10}, $PM_{2.5}$, lead, sulfates, hydrogen sulfide, and visibility reducing particles. These are known as "criteria" air pollutants because the USEPA and CARB have set permissible levels based on established human health and/or environmental criteria. Most of the criteria pollutants are directly emitted. However, ground-level ozone is a secondary pollutant that is produced by the photochemical reaction of sunlight with reactive organic gases (ROGs; also referred to as volatile organic compounds or VOCs) and nitrogen oxides (NO_x) that have been released into the atmosphere. The most significant source of most criteria pollutants, including ozone precursors, in the LTAB is the combustion of hydrocarbon fuels and wood.

The USEPA and CARB designate areas as being in attainment, nonattainment, maintenance, or unclassified for the NAAQS and CAAQS, respectively. These designations are defined as follows:

- *Attainment:* Pollutant concentrations did not violate the NAAQS or CAAQS for that pollutant in that area.
- *Nonattainment:* A pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an “exceptional event” as defined by the standards.
- *Nonattainment-Transitional (state):* A subcategory of the nonattainment designation category for state standards that signals progress and implies the area is nearing attainment. Districts with nonattainment-transitional status may revise their attainment plans to delay adoption of control measures if they anticipate attainment without the measures.
- *Maintenance (federal):* The area was previously nonattainment and is currently attainment for the applicable pollutant. The area must demonstrate continued attainment for a specified number of years before it can be redesignated as an attainment area.
- *Unclassified:* Data do not support either an attainment or nonattainment status.

The LTAB is currently in attainment or unclassified for all NAAQS. The region is currently designated as nonattainment for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and in attainment or unclassified for all other CAAQS. TRPA has also set numerical threshold standards for ozone, CO, and visibility. For the TRPA threshold standards, the LTAB is classified as “considerably better than target” for CO and “at or somewhat better than target” for ozone and visibility (TRPA 2016a).

3.3.1.3 Hazardous Air Pollutants/Toxic Air Contaminants

Hazardous air pollutants (HAPs) are air contaminants that are not included as criteria air pollutants regulated by the NAAQS but are considered hazardous to human health. They are designated at the federal level. Similarly, Toxic Air Contaminants (TACs) are air contaminants not included in the CAAQS but which the CARB considers to be hazardous to human health.

Most of the health risk from HAPs/TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel engines. CARB estimates that diesel particulate matter is responsible for about 70 percent of the total ambient air toxics risk statewide, causing 540 excess cancer cases per

million people (CARB 2000). Health risks from diesel particulate matter are highest in areas of concentrated emissions, such as near major ports, rail yards, freeways, or warehouse distribution centers. Diesel particulate matter differs from other HAPs/TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. The composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is installed. Diesel-powered vehicles and other mobile sources of pollutants are also largely responsible for emissions of several other TACs, including benzene, formaldehyde, acetaldehyde, diesel exhaust organic gases, acrolein, and 1,3-butadiene.

Both USEPA and CARB have adopted diesel-exhaust control measures and requirements for more stringent emissions standards and cleaner-burning diesel fuel. Diesel particulate matter emissions decreased 37 percent from 2000 to 2010 primarily as a result of these measures. Emissions from diesel mobile sources are projected to continue to decrease after 2010. Statewide emissions are forecasted to decline by 71 percent between 2000 and 2035 (CARB 2013a).

Existing sources of HAPs/TACs in the Project vicinity include mobile-source emissions from surrounding highways (e.g., SR 28). There are no major stationary sources of HAPs/TACs in the Project vicinity.

3.3.1.4 Sensitive Receptors

Sensitive receptors are locations with population concentrations that may be particularly susceptible to impacts from air pollution or other disruptions (e.g., noise). Depending on the type of impact involved, sensitive receptors can include schools, daycare centers, churches, hospitals and other medical facilities, nursing homes, parks and other recreational facilities, and/or residential areas. Sensitive receptors within 2 miles of the Project Area are shown in *Figure 3-21*. For air quality, the nearest sensitive receptors to the Project Area are the adjacent TCPUD recreational facilities (Lake Forest boat ramp, pier, and campground and Robert Pomin Park), nearby residences in the Star Harbor and St. Francis Lakeside developments to the west and east, respectively, and Lake Forest Beach. The nearest schools are the North Tahoe High School and Middle School (2945 Polaris Road, 0.9 mile north of the Project Area) and the Tahoe Community Nursery School (3125 North Lake Boulevard, 0.9 mile northeast). The nearest daycare center is Little Sprouts Daycare (2810 Lake Forest Road; 0.3 mile northeast). The nearest churches are the Tahoe Christian Center (2566 Lake Forest Road; 0.2 mile northeast), Jehovah's Witness Kingdom Hall (3005 North Lake Boulevard; 0.7 mile northeast); and Christ the King Lutheran Church (3125 North Lake Boulevard; 0.9 mile northeast). There are no hospitals, nursing homes, or other medical facilities near the Project Area.

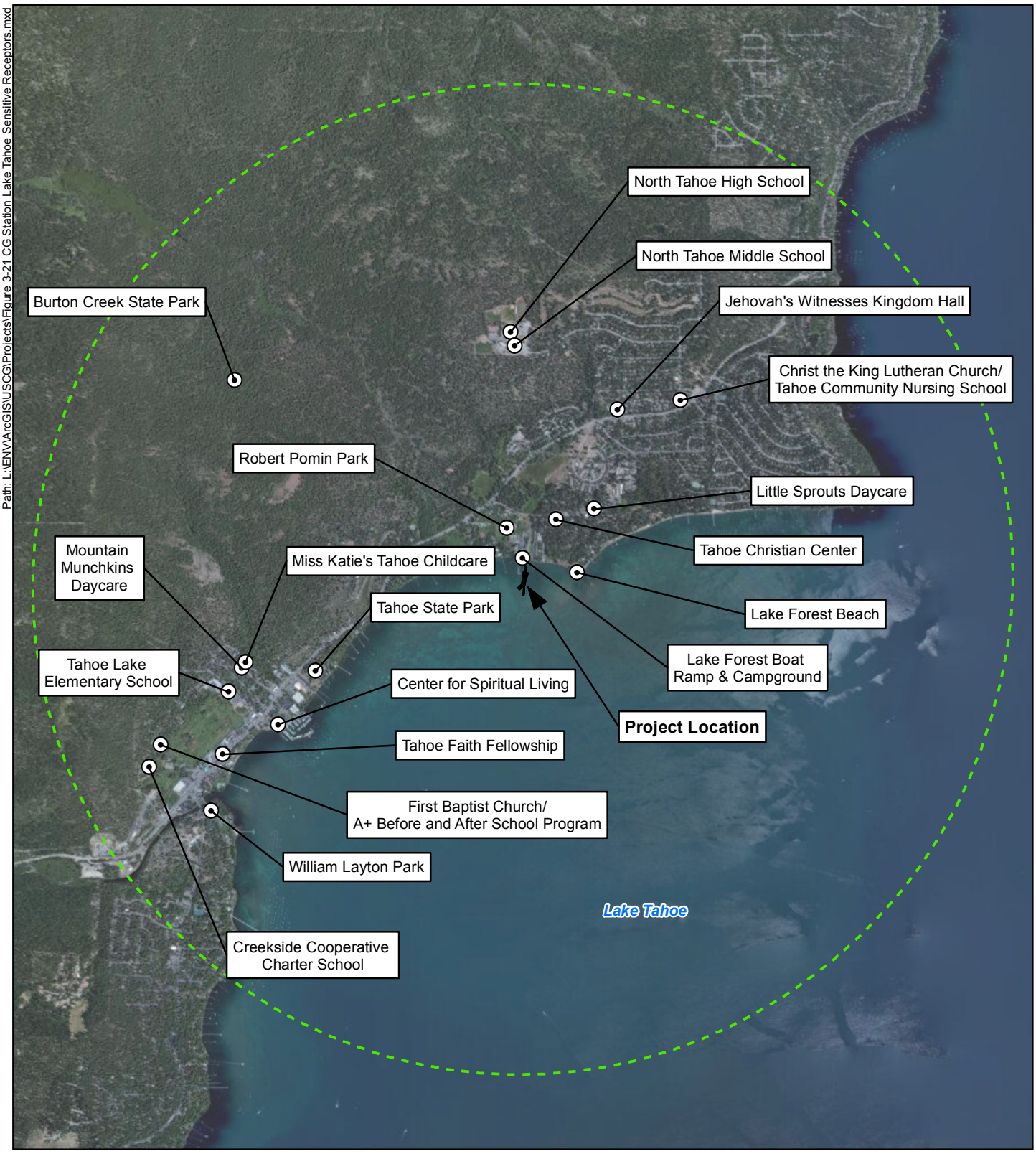
3.3.1.5 Greenhouse Gases and Climate Change

GHGs play a critical role in determining the Earth's surface temperature. A portion of the solar radiation that enters the Earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. Infrared radiation is absorbed by GHGs; as a result, infrared radiation released from the Earth that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon is known as the "greenhouse effect."

GHGs are present in the atmosphere naturally, released by natural sources and formed from secondary reactions taking place in the atmosphere, and also by human activities such as fossil-fuel combustion. The following GHGs have been identified as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO_2)
- Methane Nitrous oxide
- Hydrofluorocarbons
- Perfluorocarbons
- Sulfur hexafluoride
- Chlorofluorocarbons
- Ozone

Path: L:\ENV\ArcGIS\USCG\Projects\Figure 3-21 CG Station Lake Tahoe Sensitive Receptors.mxd



Project Location

2 Mile Radius

Sensitive Receptors

0 3,000 6,000

Feet

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project

Figure 3-21

Sensitive Receptors within 2 Miles of Project Area

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere. The GWP of a GHG is based on several factors, including the relative ability of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere. The GWP of each gas is measured relative to CO_2, the most abundant GHG, and expressed in terms of "CO_2 equivalents" (CO_2e).

GHG emissions related to human activities have been determined to likely be responsible for intensifying the greenhouse effect, leading to a trend of warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (Intergovernmental Panel on Climate Change 2014). Potential adverse effects resulting from GHG-induced climate change include sea-level rise; ocean acidification; increased frequency and intensity of climate-related natural disasters, such as drought and hurricanes; and changes in ecosystems supporting human, animal, and plant life. Impacts of GHGs are borne globally, as opposed to the more localized air quality effects of criteria air pollutants and TACs. A single project alone would not typically be expected to cause a noticeable change in the global average temperature, or in global or local climate. However, both NEPA and CEQA require that lead agencies evaluate GHG emissions on a project-level and cumulative basis, though the level of analysis (i.e., quantitative or qualitative) may vary depending on the expected magnitude of the emissions.

3.3.2 Regulatory Setting

3.3.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to air quality and GHGs and relevant to the proposed Project are identified in *Table 3-9.*

3.3.2.2 Regional and Local Regulatory Setting

At the regional level, the PCAPCD and TRPA set goals, policies, and thresholds related to air quality. The regulatory setting for each of these agencies is described in the following subsections.

Placer County Air Pollution Control District

The PCAPCD, with oversight from the CARB, has primary implementation responsibility for achieving and maintaining compliance with the NAAQS and CAAQS in Placer County. The PCAPCD is responsible for implementing strategies for air quality improvement and recommending mitigation measures for new development. It also adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs. Other PCAPCD responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen air quality complaints.

To address the LTAB's current designation as a nonattainment area for the state PM_{10} standard and a nonattainment-transitional area for the state ozone standard, the PCAPCD has established a quantitative threshold of significance of 82 pound/day for PM_{10} and ozone precursors (ROGs and NO_X) for the purposes of CEQA evaluation (PCAPCD 2017). PCAPCD requires projects to implement mitigation measures when a project's construction or operations exceed these emission thresholds. The PCAPCD has not set significance thresholds for CO or $PM_{2.5}$, because the LTAB is currently in attainment for these pollutants. The District's adopted GHG significance thresholds consist of three components: 1) a Bright-line Threshold[7] of 10,000 metric tons (MT) of carbon dioxide equivalent per year (CO_{2e}/yr) for project construction, 2) a de minimis level for the operational phase of 1,100 MT CO_2e/yr, and 3) a threshold of 26.5 MT CO_2e/yr for non-residential urban projects where GHG emissions during the operational phase would exceed the de minimis level.

[7] The Bright-line threshold is the point at which a project would be deemed to have a cumulatively considerable contribution to global climate change.

Table 3-9 Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project (Air Quality)

Jurisdiction	Regulation	Description
U.S.	Federal Clean Air Act (FCAA) (42 USC 7401 et seq.)	The FCAA requires the USEPA to set NAAQS to protect public health and welfare. Pursuant to the 1990 FCAA Amendments, USEPA classifies the attainment status of air basins (or portions thereof) for each criteria air pollutant, based on whether or not the NAAQS are achieved. In 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the FCAA, and that the USEPA has authority to regulate GHG emissions under the Act.
CA	California Clean Air Act of 1988 (CCAA) (Assembly Bill [AB] 2595)	The CCAA requires all air districts in the state to endeavor to achieve and maintain the CAAQS by the earliest practical date. Attainment plans for areas that did not demonstrate attainment of the CAAQS until after 1997 must specify emission reduction strategies and meet milestones to implement emission controls and achieve more healthful air quality. The CCAA specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and authorizes districts to regulate indirect sources. State ambient air standards are generally stricter than national standards for the same pollutants.
CA	California Global Warming Solutions Act of 2006 (AB 32)	Under AB 32, CARB is responsible for reducing statewide GHG emissions to 1990 levels by 2020. CARB adopted an AB 32 Climate Change Scoping Plan in 2008 and prepared the first Scoping Plan Update in 2014. The Scoping Plan and Update contain California's primary strategies to reduce GHG emissions by 169 million metric tons (MMT) CO_2e from the state's projected 2020 emissions level of 596 MMT CO_2e under a business-as-usual scenario. The Scoping Plan breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory, but does not directly discuss GHG emissions generated by construction activities.
CA	Senate Bill (SB) 97	Pursuant to SB 97, the state adopted amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Effective March 2010, revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address climate change impacts in the CEQA process. CEQA Guidelines section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
CA	SB 32	SB 32 (effective September 8, 2016) established a California GHG reduction target of 40 percent below 1990 levels by 2030. California is on track to meet or exceed this current target, as established in AB 32. This emission reduction target is intended to make it possible to reach the ultimate goal of reducing emissions that are 80 percent under 1990 levels by 2050.
CA	SB 375	SB 375 (effective January 1, 2009) requires CARB to develop regional reduction targets for GHG emissions, and prompted the creation of regional land use and transportation plans to reduce emissions from passenger vehicle use throughout the state. The targets apply to the regions covered by California's 18 metropolitan planning organizations (MPOs). The MPOs must develop regional land use and transportation plans and demonstrate an ability to attain the reduction targets by 2020 and 2035. The current targets for the Tahoe Region are a 7 percent reduction in per capita GHG emissions by 2020 (relative to 2005 emissions) and a 5 percent reduction by 2035.
CA	State Executive Orders (EOs)	• Under EO S-01-07 (2007) the carbon intensity of California's transportations fuels is to be reduced by at least 10 percent by 2020. • EO S-3-05 (2005) established statewide GHG targets of reducing emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. • EO B-30-15 (2015) added an intermediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030.
CA	Other	• CARB's Heavy Duty Diesel Truck Idling Rule (13 CCR 2485) prohibits heavy-duty diesel trucks from idling for longer than 5 minutes at a time (except while queuing, provided the queue is located beyond 100 feet from any homes or schools). Similarly, the CARB's Regulation for In-Use Off-Road Diesel Vehicles (13 CCR 2449) prohibits off-road diesel equipment with engines of 25 HP or more from idling more than 5 minutes at a time. • The statewide Portable Equipment Registration Program (PERP) regulates portable engines/engine-driven equipment units. Portable equipment and engines of 50 HP or more must either register with the PERP or obtain an individual permit from a local air district to operate. Once registered in the PERP, engines and equipment units may operate throughout California without the need to obtain individual air district permits.

If a jurisdiction has a qualified climate action plan (CAP) or GHG reduction plan that meets all the criteria stated in the CEQA Guidelines Section 15183.5 (b), the qualified plan can be used to determine the project's GHG impact in lieu of applying the District's adopted GHG significance thresholds. If a land use project can demonstrate consistency with the mitigation strategies identified in that jurisdiction's qualified CAP or GHG reduction plan, the project can be deemed as less than cumulatively considerable for its associated GHG impacts (PCAPCD 2017).

PCAPCD has adopted various rules to reduce emissions throughout Placer County. PCAPCD rules that are relevant to Project construction include:

Rule 202: Visible Emissions. The purpose of Rule 202 is to establish limits regarding the opacity of emissions. Construction equipment exhaust emissions are prohibited from exceeding the Rule 202 visible emissions limitations. Operators of vehicles and equipment found to exceed opacity limits are to be immediately notified by the District to cease operations and the equipment must be repaired within 72 hours.

Rule 205: Nuisance. The purpose of Rule 205 is to limit emissions of any substance that would cause a nuisance to the public.

Rule 207: Particulate Matter. The purpose of Rule 207 is to establish limits regarding the emissions of particulate matter.

Rule 218: Architectural Coatings. The purpose of Rule 218 is to limit emissions of ROGs from architectural coatings (e.g., paint, varnish) sold, manufactured, or applied within the District.

Rule 228: Fugitive Dust. The purpose of Rule 228, which applies to construction activities, is to reduce the amount of particulate matter entrained and discharged into the air by requiring actions to prevent, reduce, or minimize fugitive dust emissions. Rule 228 also controls the track-out of dirt and mud on to public roads.

In addition, because Alternatives 2 and 3 would involve modifying of the Station pier's fueling system by replacing the current fueling station with a new one at the end of the pier extension, the following PCAPCD rules would apply to Project operations for those Alternatives:

Rule 212: Storage of Organic Liquids. The purpose of Rule 212 is to limit ROG emissions from tanks storing organic liquids (e.g., gasoline).

Rule 213: Gasoline Transfer into Stationary Storage Containers. The purpose of Rule 213 is to limit ROG emissions during the transfer of gasoline into stationary storage tanks.

Rule 214: Transfer of Gasoline into Vehicle Fuel Tanks. Rule 213 limits ROG emissions during the transfer of gasoline from stationary storage tanks into the fuel tanks of motor vehicles, including boats.

TRPA

TRPA implements its authority to regulate air quality in the LTAB through the Regional Plan Goals and Policies, Code of Ordinances, and Thresholds. Pertinent goals, policies, and regulations from each of these documents are described separately below.

TRPA Regional Plan

The Air Quality Subelement of the TRPA Regional Plan (TRPA 2012) outlines the following goals and policies that promote protection of air quality in the LTAB:

Goal AQ-1: Attain and maintain air quality in the region at levels that are healthy for humans and the ecosystem, achieve and maintain environmental thresholds and do not interfere with residents' and visitors' visual experience.

Policy AQ-1.1: Coordinate with other agencies and jurisdictions to reduce emissions, exposures, and health and environmental risks when developing and implementing programs, plans, and projects

Policy AQ-1.2: Reduce or limit sources of pollutants that degrade visibility.

Policy AQ-1.3: Encourage the reduction of emissions from motor vehicles and other motorized machinery in the region.

Policy AQ-1.7: Promote the reduction of air quality impacts from construction and property maintenance activities in the region.

The TRPA Regional Plan also includes the following mitigation measure that would be applicable to the proposed Project:

> **Mitigation Measure 3.4-5: Develop and Implement a Best Construction Practices Policy to Toxic Air Contaminant (TAC) Emissions during Construction**. Within 12 months of adoption of an updated Regional Plan, TRPA will coordinate implementation of Best Construction Practices for Construction Emissions through TRPA approved plans, project-permitting, or projects/programs developed in coordination with local or other governments that requires, as a condition of project approval, implementation of feasible measures to reduce exposure of sensitive receptors to construction-related TAC emissions. Until that time, TRPA will continue the existing practice to require measures developed on a project-specific basis. Where local ordinances, rules, or regulations already require Best Construction Practices for construction emissions, no further action is necessary. Where local government ordinances, rules, or regulations do not adequately address Best Construction Practices, those practices will be implemented through local government and/or TRPA permitting activities. As a condition of approval, individual project environmental review shall demonstrate that current district-recommended BMPs are implemented to ensure sensitive receptors are not exposed to substantial TAC concentrations.

Lake Tahoe Region Sustainable Communities Program and 2017 Regional Transportation Plan

In 2014, the Lake Tahoe Region Sustainable Community Strategy was certified under the state's GHG laws: AB 32 and SB 375. The Sustainability Action Plan is the keystone of the strategy and includes the first complete GHG emissions inventory for the Lake Tahoe Basin. The inventory will help target reductions from key sources. The Action Plan also sets achievable strategies for citizens, businesses and local governments that will lead to regional sustainability. SB 375 calls for a reduction of 15 percent below 2005 levels by 2020. The Action Plan identifies measures that can be pursued to attain this level of reduction. Because the largest source of emissions is from electricity generated outside of the Tahoe Region, reductions in this source of emissions can only partially be achieved; this would occur by requiring new buildings and building retrofits in the Tahoe Region to be more energy efficient (i.e., use less energy). However, the primary emissions reduction from electricity would depend on independent electrical utility operators finding alternative fuel sources and changing the types of generating plants. The Action Plan places added emphasis on alternative modes of transportation throughout the Tahoe Region. GHG emissions from waste can be reduced by recycling, which reduces GHG emissions by lessening the need for manufacture and distribution of products. GHG emissions from fuel combustion can be achieved by making buildings more energy efficient and replacing existing appliances. Additional GHG reduction strategies for homes and businesses will be implemented in the future (TRPA 2014b). The Action Plan addresses GHG reduction from cars and light trucks through implementation of the Regional Transportation Plan Sustainable Communities Strategy (below).

As part of the Sustainable Communities Program, in 2017 TRPA adopted the *Linking Tahoe: Regional Transportation Plan and Sustainable Communities Strategy*. The projects and programs in this plan would meet the GHG reductions required under SB 375 with an estimated 8.8 percent reduction in 2020 and a 5 percent reduction in 2035 in the Tahoe Region (TRPA 2017:2-3). The Regional Transportation Plan places added emphasis on alternative modes of transportation throughout the Tahoe Region, and provides incentives for transfer of development rights from more remote land to areas of existing higher

development, to reduce additional transportation needs. The Regional Transportation Plan also includes proposed bicycle and transit connections to fill existing gaps; ferry service between South Lake Tahoe, Tahoe City, and Kings Beach; and a complete streets program in existing highly developed areas.

TRPA Code of Ordinances

Chapter 65 of the TRPA Code of Ordinances addresses air quality and transportation. Section 65.1 includes air quality control ordinances applicable to certain motor vehicles, combustion heaters, open burning, stationary emissions sources, and idling combustion engines in certain areas of the Lake Tahoe Basin. Section 65.1.6 sets thresholds for stationary emissions sources. Code Section 65.2.3.G establishes a traffic and air quality mitigation program for new development or changes in operation resulting in a long-term increase of more than 200 daily vehicle trips. The proposed Project would result in a long-term decrease of daily vehicle trips, because it would eliminate the need for the CG staff to drive to and from an off-site mooring location, and therefore the traffic and air quality mitigation requirements of Code Section 65.2 do not apply.

The following specific sections of the TRPA Code of Ordinances related to air quality would apply to the proposed Project and are noted below:

Code Section 65.1.8. Idling Restrictions

A. Duration: No person shall cause a combustion engine in a parked auto, truck, bus, or boat to idle for more than 30 consecutive minutes in the following plan areas: 070A, 080, 089A, 089B, 090, 091, and 092. The following projects and activities shall not be subject to this limitation:

    1. Activities specifically permitted, after environmental impact analysis, to idle longer than 30 minutes;

    2. Emergency vehicles, snow plows, or combustion engines required in the case of emergencies or repairs; and

    3. Vehicles in transit on public rights of way.

Jurisdictions in the basin with increased restrictions include Placer County (5 minutes) and Washoe County (15 minutes). The State of California has a requirement for commercial vehicles of more than 10,000 pounds gross weight to limit idling to 5 minutes, with exceptions for specifically designed tasks, traffic, health and safety. The State of Nevada has a 15 minute limit for vehicles of more than 14,000 pounds gross weight, except for emergency vehicles, removal of snow, specific tasks for which the vehicle is designed and required to idle to perform, safety, traffic and repair/maintenance required idling.

Code Section 33.6.2. Use of equipment of a size and type that under prevailing site conditions will do the least amount of damage to the environment may be specified as a condition of approval. Construction equipment and materials shall be restricted to the construction site boundary.

TRPA Thresholds

TRPA has developed air quality threshold standards with the goal of protecting the air quality in the Lake Tahoe region. The TRPA thresholds for air quality and current status are summarized in *Table 3-10*.

Table 3-10 TRPA Air Quality Thresholds Applicable to the Project

Category	Standard	Current Status
CO	Maintain CO concentrations at or below 6 parts per million (ppm) averaged over 8 hours.	Considerably Better than Target
Ozone	Maintain ozone concentrations at or below 0.08 ppm averaged over 1 hour.	At or Somewhat Better than Target
NO_x	Maintain NO_x emissions at or below the 1981 level.	Considerably Better than Target
Particulate Matter	Avoid exceedances of the California and federal standards for 24-hour and average annual concentrations for PM_{10} and $PM_{2.5}$.	24-Hour PM_{10} – Somewhat Worse than Target; Average Annual PM_{10} – At or Somewhat Better than Target; 24-Hour $PM_{2.5}$ – At or Somewhat Better than Target; Average Annual $PM_{2.5}$ – Considerably Better than Target
Visibility	Regional: Achieve an extinction coefficient of 25 Mm^{-1} at least 50 percent of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 97 miles).	At or Somewhat Better Than Target
	Sub-regional: Achieve an extinction coefficient of 50 Mm^{-1} at least 50 percent of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 48 miles).	Insufficient Data to Determine Status
Nitrate Deposition	Vehicle miles traveled (VMT) shall be reduced 10 percent below the 1981 levels.	At or Somewhat Better than Target
	Reduce the transport of nitrates into the basin and reduce NOx produced in the basin consistent with the water quality thresholds.	Considerably Better than Target
Odor	Reduce fumes from diesel engines to the extent possible.	Considerably Better than Target
Source: TRPA 2016b		

3.3.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on air quality in the context of NEPA, CEQA, and TRPA requirements. *Table 3-11* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the air quality-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Air emissions from the proposed Project would result mainly from the burning of diesel fuel in equipment and vehicles used during the proposed Project's construction phase. To assess the proposed Project's potential impacts on air quality, AECOM estimated the air emissions associated with Project construction using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2. Full results of the modeling are contained in *Appendix F* and summarized in *Table 3-12.* Although the exact equipment that would be used for the proposed Project has not yet been determined, conservative assumptions regarding equipment number, type, HP, and load factors were used for estimation purposes. Because watercraft emissions are not included in CalEEMod, AECOM developed a separate spreadsheet to estimate the emissions from the tugboat that would be used to move the work barge during Project construction. The spreadsheet uses the methodology from CARB's *Emissions Estimation Methodology for Commercial Harbor Craft Operating in California* (CARB 2012) and data from CARB's Harbor Craft Emission Inventory Database (CARB 2011). The estimates for tug boat emissions are also included in *Appendix G* and summarized in *Table 3-12.*

Table 3-11 Significance Determinations for the Project Alternatives (Air Quality and GHGs)

Air Quality and GHGs	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on air quality and GHGs?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Air Quality *Would the Project:* *a) Conflict with or obstruct implementation of the applicable air quality plan?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Expose sensitive receptors to substantial pollutant concentrations?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Create objectionable odors affecting a substantial number of people?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
GHGs: *Would the Project:* *a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
Will the Project result in: *a) Substantial air pollutant emissions?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Deterioration of ambient (existing) air quality?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) The creation of objectionable odors?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Increased use of diesel fuel?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for air quality?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

Table 3-12 Modeled Construction Air Emissions for the Proposed Project Alternatives

Max Daily Emissions Summary:							
		Maximum Daily* (pounds per day)					Annual (MT/yr) CO_2e
Alternative	**Emission Sources**	**ROG**	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**	
Alternative 1 – Dredging at Existing Pier	Watercraft	2.68	19.69	10.53	0.78	0.72	36
	Other Equipment	1.78	20.69	16.07	1.01	0.69	99
	Total	**4.46**	**40.38**	**26.60**	**1.79**	**1.41**	**135**
Alternative 2 – 350-foot Dog-Leg Pier Extension	Watercraft	4.52	33.21	17.85	1.34	1.24	54
	Other Equipment	3.25	24.77	17.65	1.40	1.23	51
	Total	**7.77**	**57.98**	**35.50**	**2.74**	**2.47**	**105**
Alternative 3 – 450-foot Straight Pier Extension	Watercraft	4.52	33.21	17.85	1.34	1.24	62
	Other Equipment	3.25	24.77	17.65	1.40	1.23	58
	Total	**7.77**	**57.98**	**35.50**	**2.74**	**2.47**	**120**
PCAPCD Thresholds		**82**	**82**	**NT**	**82**	**NT**	**10,000 MT/yr**

Notes: NT = no threshold (the air district is in attainment)

* Maximum Daily Emissions shown in Section 2.1, *Overall Construction*, of CalEEMod output files may not match data presented in this table for "Other Equipment Emissions" due to a bug identified in software. Emissions for each phase of construction, as presented in Section 3, *Construction Detail*, of the CalEEMod output files is accurate and is used to populate this table. These details are shown in the Calculation Spreadsheet in Appendix F along with the communication from CalEEMod Technical Support.

Source: Data modeled by AECOM in 2018.

3.3.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on air quality and GHGs?

Less-than-Significant Impact. Emissions of criteria pollutants and GHGs would result mainly from the burning of fuel in equipment and vehicles involved with dredging, dredged material disposal, pile installation, and other construction activities. This would include emissions from the excavator dredge, pile driver, a tugboat that would be used to move the work barge, other miscellaneous construction equipment, worker commuting trips, and truck trips for hauling the dredged material to the disposal site. Fugitive dust emissions are expected to be minimal during construction, because the moisture content of the dredged material would prevent it from being released to the air as dust, and vehicle trips would occur on paved roads.

As discussed in *Section 3.3.1.2*, the LTAB is currently designated as in attainment or unclassified for all NAAQS, and the relatively low emissions of criteria pollutants from Alternative 1 would not affect the NAAQS attainment status. The LTAB is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and in attainment or unclassified for all other CAAQS. To address the PM_{10} and ozone standards, the PCAPCD has established a quantitative threshold of significance of 82 pound/day for ROGs, NO_x, and PM_{10}. As shown in *Table 3-12,* the daily maximum emissions of these pollutants for Alternative 1 are well below the PCAPCD thresholds, and Alternative 1 would not substantially interfere with attainment of the CAAQS. The PCAPCD does not currently have thresholds for CO or $PM_{2.5}$, because the LTAB is currently in attainment for these pollutants. The emissions of CO or $PM_{2.5}$ from construction of Alternative 1 are relatively low and would not affect the LTAB's attainment status for these pollutants.

The PCAPCD has adopted a threshold of 10,000 MT CO_2e per year for project construction. Total GHG construction emissions for Alternative 1 would be approximately 135 MT CO_2e per year, well below the

PCAPCD's threshold. Alternative 1 also would not be inconsistent with the emission-reduction strategies outlined in the AB 32 Scoping Plan (CARB 2014).

Dredging and disposal of contaminated sediments exposes them to the air and may result in the volatilization of air pollutants, particularly ROGs, if these compounds are present in the dredged material. Typically, the concentration of air pollutants in the dredged material must be quite high for releases to air to be of concern (USACE 2003). Volatile emissions from dredged material are not regulated under the FCAA, which pertains only to point and mobile sources as defined by the Act. However, Federal OSHA air quality standards apply when workers may be exposed to inhalation or dermal contact with vapors containing certain ROGs. Laboratory testing results from sediments obtained at the Project site indicate that total petroleum hydrocarbons (TPH) as diesel were present in very small amounts that did not exceed environmental health thresholds. No polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), or pesticides were detected from sediment samples (AECOM Technical Services 2016). Therefore, dredging operations would not result in a human health hazard from inhalation of volatilized compounds or dermal contact with sediments.

Air emissions during construction of Alternative 1 would be temporary, and the total emissions for construction are relatively low, in part due to the limited duration of construction (8 weeks). The daily emissions of criteria pollutants during construction of Alternative 1 would be less than for the other two Action Alternatives. As discussed previously, the LTAB is in attainment of the NAAQS and CAAQS for CO, and Alternative 1's emissions of CO would not affect this attainment status. Total GHG emissions are somewhat higher for Alternative 1 than the two pier extension alternatives, largely due to the vehicle emissions involved with transporting the dredged material to the disposal site, but are still relatively low and less than significant.

Multiple BMPs will be implemented during construction to minimize emissions of both criteria pollutants and GHGs. In accordance with **BMP C1-7**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C1-8**, construction equipment will be kept in good repair and regularly maintained, which will improve fuel efficiency and reduce emissions. In accordance with **BMP C1-19,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, signs will be posted to remind equipment operators of the idling limit, and equipment idling within 1,000 feet of any sensitive receptor will be discouraged. In accordance with **BMP C1-20**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will be required to maintain either statewide PERP registration or a PCAPCD permit.

During operation of the pier, air emissions would primarily be limited to negligible quantities of fugitive ROG emissions related to occasional minor touch-up painting/sealing of the replacement boat lift and the floating dock, and these emissions are not expected to represent a substantial increase from those that occur under existing maintenance operations at the Station. There would be no changes to the fueling system under Alternative 1, and the CG would continue to operate it in conformance with PCAPCD requirements for vapor control. Similarly, the Station will continue to operate its two rapid response boats much as it does today, and vessel emissions are not expected to increase over baseline levels. Vehicle emissions are expected to decrease because the CG will no longer have to drive to an off-site mooring facility to access their response boats during low-water conditions or haul the boat back and forth between the Station and an alternative launch site. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile substances, thereby avoiding or minimizing ROG emissions from such releases.

There would be emissions associated with maintenance dredging, which would occur at intervals of approximately 10 to 15 years. Emissions are expected to be less for maintenance dredging than for the initial dredging because it will involve removal of loose sediments that would accumulate between dredging episodes, rather than the dense clay deposits that make up much of the dredged material to be removed

during the initial dredging. The maintenance dredging would thus take less time and involve fewer emissions from fuel consumption, etc. Maintenance dredging activities would also use the same, or substantially similar, BMPs as those used during the initial dredging to avoid and minimize emissions, and emissions from maintenance dredging would be infrequent, temporary, and less than significant.

In summary, Alternative 1 is expected to have less-than-significant impacts related to air quality from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Air Quality

Would the Project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less-than-Significant Impact. The primary air quality plans applicable to California are the State Implementation Plans (SIPs), which establish strategies for achieving attainment of the NAAQS in areas that are currently not in attainment. The LTAB is currently designated as in attainment or unclassified for all NAAQS, and therefore the SIPs are not directly applicable to the proposed Project. The emissions of criteria pollutants from Alternative 1 would not substantially affect the LTAB's continued attainment with the NAAQS.

The LTAB is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and in attainment or unclassified for all other CAAQS. The CCAA requires that an air district which has not attained the CAAQS prepare a plan to attain these standards by the earliest practical date. However, when the California legislature passed the CCAA, it recognized the difficulty in managing PM_{10}. Therefore, state law does not require attainment plans for the state PM_{10} standard. In compliance with the CCAA, the PCAPCD prepared an Air Quality Attainment Plan (AQAP) in 1991 which was designed to make progress toward attaining the state ozone standard and contained control programs/strategies for stationary emissions sources, transportation, and indirect sources.

In keeping with the goals established in the AQAP, the PCAPCD has established a significance threshold of 82 pound/day for ozone precursors (ROGs and NO_X) for the purposes of CEQA evaluation. As shown in *Table 3-12*, Emissions of ozone precursors during construction of Alternative 1 would be well below the PCAPCD's 82 pound/day threshold for these pollutants, and construction of Alternative 1 would not substantially interfere with implementation of the AQAP or attainment of the CAAQS.

Implementation of various BMPs during construction would minimize emissions of ozone precursors and other criteria pollutants. In accordance with **BMP C1-7**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C1-8**, construction equipment will be kept in good repair and regularly maintained, which will improve fuel efficiency and reduce emissions. In accordance with **BMP C1-19,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, and signs will be posted to remind equipment operators of the idling limit. In accordance with **BMP C1-20**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will require either statewide PERP registration or a PCAPCD permit.

In the long term, Alternative 1 would result in a decrease in vehicle emissions due to the elimination of trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, even

in low water conditions, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile substances, thereby avoiding or minimizing ROG emissions from such releases.

There would be emissions associated with the maintenance dredging that would occur at intervals of approximately 10 to 15 years. Emissions are expected to be less for maintenance dredging than for the initial dredging because it will involve removal of loose sediments that would accumulate between dredging episodes, rather than the dense clay deposits that make up much of the dredged material to be removed during the initial dredging. The maintenance dredging would thus take less time and involve fewer emissions from fuel consumption, etc. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant adverse impacts related to conflicting with or obstructing implementation of applicable air quality plans.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less-than-Significant Impact. The LTAB is currently designated as in attainment or unclassified for all NAAQS, and Alternative 1 would not change the current attainment status for the NAAQS. The region is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and as attainment or unclassified for all other CAAQS. Emissions of PM_{10} and ozone precursors during construction of Alternative 1 are low and well below the PCAPCD's 82 pound/day significance thresholds and would not contribute substantially to further nonattainment of the CAAQS. Implementation of **BMPs C1-7, C1-8**, **C1-19**, and **C1-20** would minimize emissions of criteria pollutants during construction and ensure compliance with the PCAPCD's standards and rules for construction emissions.

In the long term, Alternative 1 would result in a decrease in vehicle emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, Alternative 1 would enhance the CG's ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases. There would be emissions associated with infrequent maintenance dredging, but these emissions are expected to be less than for the initial dredging. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant adverse impacts related to violating air quality standards or contributing substantially to an existing or projected air quality violation.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less-than-Significant Impact. The LTAB is currently designated as in attainment or unclassified for all NAAQS, as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and as in attainment or unclassified for all other CAAQS. Projected emissions of PM_{10} and ozone precursors during construction, operations, and maintenance dredging for Alternative 1 are low and well below the PCAPCD's significance thresholds and would not contribute substantially to further nonattainment of the CAAQS. Implementation of **BMPs C1-7, C1-8**, **C1-19**, and **C1-20** would minimize emissions of criteria pollutants during construction, and the same, or substantially similar, BMPs would be used during maintenance dredging. The PCAPCD's thresholds are designed to avoid cumulative impacts potentially affecting attainment with the PM_{10} and ozone standards, and other projects in the area would be expected to implement mitigation if they exceed these standards. Therefore, Alternative 1 would have less-than-significant impacts related to cumulatively considerable net increases of any criteria air pollutant for which the Project region is non-attainment under applicable federal or state air quality standards.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact. Construction activities would involve the operation of diesel-powered equipment for various activities. CARB has identified diesel particulate matter as a TAC, and construction of Alternative 1 would lead to a short-term increase in the exposure of some sensitive receptors (e.g., occupants of residences in the Project vicinity, users of the TCPUD recreational facilities) to diesel particulate matter and other emissions. Elevated risk for lung cancer, cardiovascular disease, and other chronic health issues is typically only associated with long-term exposure to diesel exhaust. Health risk assessments for emissions, which evaluate exposure over a 70-year period, are typically only conducted for projects that would result in long-term increases in emissions. Short-term exposure to diesel exhaust at the levels expected for nearby sensitive receptors during construction is not associated with increased chronic health risks. Because construction activities would only occur over an 8-week period, and due to the highly dispersive nature of diesel exhaust (Zhu et al. 2002), exposure of sensitive receptors to hazardous pollutants during construction is considered less than significant. In addition, implementation of **BMPs C1-8, C1-19,** and **C1-20** would minimize exposure of sensitive receptors to diesel exhaust and other hazardous pollutants during construction. Emissions associated with operation of the modified pier are expected to be similar to or less than existing conditions and would not expose sensitive receptors to substantial concentrations of air pollutants. There would be diesel emissions associated with periodic maintenance dredging, but these are expected to be less than those for the initial dredging and would occur only once approximately every 10 to 15 years. In summary, Alternative 1 would have less-than-significant impacts related to exposing sensitive receptors to substantial pollutant concentrations.

e) Create objectionable odors affecting a substantial number of people?

Less-than-Significant Impact. Nearby sensitive receptors could be exposed to odors from diesel exhaust and other Project activities during the 8-week construction period and during periodic maintenance dredging. Implementation of **BMPs C1-8, C1-19,** and **C1-20** would minimize exposure of sensitive receptors to diesel exhaust, and most odors are expected to dissipate before reaching sensitive receptors. The impacts of Alternative 1 related to odor would be temporary, localized, and less than significant.

Greenhouse Gases

Would the Project:

a) Generate GHG emissions, directly or indirectly, that may have a significant impact on the environment?

Less-than-Significant Impact. The PCAPCD has adopted a threshold of 10,000 MT CO_2e per year for project construction. The total GHG construction emissions for Alternative 1 are approximately 135 MT CO_2e per year, well below the PCAPCD's threshold. **BMPs C1-7, C1-8, C1-19,** and **C1-20** would be implemented during construction to minimize GHG emissions.

In the long term, Alternative 1 would result in a decrease in vehicle GHG emissions due to the elimination of trips involved with accessing an off-site mooring location. Additionally, Alternative 1 will enhance the CG's ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions and the buildup of ozone, a GHG, in the atmosphere resulting from such releases. There would be GHG emissions associated with infrequent maintenance dredging, but these emissions are expected to be less than for the initial dredging. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant adverse impacts related to generation of GHGs that would have an impact on the environment.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions?

Less-than-Significant Impact. As discussed previously, Alternative 1's GHG emissions would be well below the PCAPCD thresholds. Alternative 1's emissions would not substantially hinder the state's ability to attain the AB 32 goals. Alternative 1 also would not be inconsistent with the emission-reduction strategies outlined in the AB 32 Scoping Plan (CARB 2014) or conflict with the other policies and regulations listed in *Table 3-9* that are relevant to GHG reduction. Finally, Alternative 1 would not be inconsistent with TRPA's Lake Tahoe Region Sustainable Community Strategy. Therefore, Alternative 1 would have a less-than-significant impact related to conflicts with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

TRPA Analysis

The TRPA analysis provides answers to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Substantial air pollutant emissions?

Less-than-Significant Impact. Almost all of the air pollutant emissions associated with Alternative 1 would occur during the 8-week construction period. These emissions would be short term and, as shown in *Table 3-12*, well below the 82 pound/day significance threshold set by the PCAPCD. Most TRPA thresholds for air pollutants (as measured in 2015) have a status of either "Considerably Better than Target" or "At or Somewhat Better than Target," and the construction emissions estimated for Alternative 1 would not substantially contribute to nonattainment of these thresholds. Implementation of various BMPs during construction would minimize emissions of criteria pollutants. In accordance with **BMP C1-7**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C1-8**, construction equipment will be kept in good repair and regularly maintained. In accordance with **BMP C1-19,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, signs will be posted to remind equipment operators of the idling limit, and equipment idling within 1,000 feet of any sensitive receptor will be discouraged. In accordance with **BMP C1-20**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will require either statewide PERP registration or a PCAPCD permit.

In the long term, Alternative 1 would result in a decrease in vehicle emissions due to the elimination of trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, including in low-water conditions, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases.

There would be emissions associated with the maintenance dredging that would occur at intervals of approximately 10 to 15 years. Emissions are expected to be less for maintenance dredging than for the initial dredging because it will involve removal of loose sediments that would accumulate between dredging episodes, rather than the dense clay deposits that make up much of the dredged material to be removed during the initial dredging. The maintenance dredging would thus take less time and involve fewer emissions from fuel consumption, etc. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant adverse impacts related to the production of substantial air pollutant emissions.

b) Deterioration of ambient (existing) air quality?

Less-than-Significant Impact. The LTAB is currently designated as in attainment or unclassified for all NAAQS, and Alternative 1 would not change the current attainment status for the NAAQS. The region is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and in attainment or unclassified for all other CAAQS. Projected emissions of PM_{10} and ozone precursors during construction of Alternative 1 are low and well below the PCAPCD's significance thresholds and would not contribute substantially to further nonattainment of the CAAQS. Implementation of **BMPs C1-7, C1-8, C1-19,** and **C1-20** would minimize emissions of criteria pollutants during construction.

In the long term, Alternative 1 would result in decreased vehicle emissions due to the elimination of trips to access the off-site mooring location during low water conditions. Additionally, after construction, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases. There would be emissions associated with infrequent maintenance dredging, but these emissions are expected to be less than for the initial dredging. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant impacts on deterioration of ambient air quality.

c) The creation of objectionable odors?

Less-than-Significant Impact. Nearby sensitive receptors could be exposed to odors from diesel exhaust and other Project activities during the 8-week construction period and during periodic maintenance dredging. Implementation of **BMPs C1-8, C1-19,** and **C1-20** would minimize exposure of sensitive receptors to diesel exhaust, and most odors are expected to dissipate before reaching sensitive receptors. The impacts of Alternative 1 related to odor would be temporary, localized, and less than significant.

d) Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?

Less-than-Significant Impact. Alternative 1 would only involve minor additions to the structure of the existing CG pier, which would not alter air movement, moisture, or temperature locally.

In terms of global or regional climate change caused by GHG emissions, a numeric significance threshold for construction-related GHG emissions has not been set by TRPA. However, the PCAPCD recommends that a significance threshold of 10,000 MT CO_2e per year be used for project construction. The total GHG construction emissions for Alternative 1 are approximately 135 MT CO_2e per year, well below the PCAPCD's recommended threshold. **BMPs C1-7, C1-8, C1-19,** and **C1-20** would be implemented during construction to minimize GHG emissions.

In the long term, Alternative 1 would result in a decrease in vehicle GHG emissions due to the elimination of trips involved with accessing an off-site mooring location during low water conditions. Additionally, Alternative 1 will enhance the CG's ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions and the buildup of ozone, a GHG, in the atmosphere resulting from such releases. There would be GHG emissions associated with infrequent maintenance dredging, but these emissions are expected to be less than for the initial dredging. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant impacts on air movement, moisture, temperature, and climate change locally or regionally.

e) Increased use of diesel fuel?

Less-than-Significant Impact. Construction activities and periodic maintenance dredging will require minor temporary increases of diesel fuel use, but Alternative 1 will not result in a significant or sustained long-term increase of diesel use. During construction and maintenance dredging, measures will be taken to reduce the consumption of diesel fuel, including ensuring that equipment is properly maintained, in accordance with **BMP C1-8**; limiting equipment idling times, in accordance with **BMP C1-19**; and using clean fuel generators or permanent power instead of temporary diesel generators, in accordance with **BMP C1-20**. Therefore, Alternative 1 would have a less-than-significant impact related to the increased use of diesel fuel.

TRPA Thresholds

Less-than-Significant Impact. TRPA currently has thresholds related to CO, NO_x, ozone, particulate matter, visibility, and VMT related to nitrate deposition (*Table 3-10*). The current status of the CO and $PM_{2.5}$ thresholds is "Considerably Better than Target" and the relatively low emissions of these pollutants from construction of Alternative 1 would not substantially contribute to degradation of the current status of these thresholds. The status of the ozone, NO_x, average annual PM_{10}, visibility, and VMT thresholds is "At or Somewhat Better than Target." The 24-hour PM_{10} threshold status is "Somewhat Worse than Target." Emissions of PM_{10}, NO_x, and other ozone precursors (i.e., ROGs) are well below the PCAPCD's threshold and would not lead to nonattainment of the thresholds for these pollutants. Alternative 1 would also not result in substantial emissions of other pollutants that would affect visibility and would not result in a substantial or long-term increase in VMT. Implementation of **BMPs C1-7, C1-8, C1-19,** and **C1-20** would minimize short-term emissions during construction.

In the long term, Alternative 1 would result in a decrease in vehicle emissions due to the elimination of trips associated with accessing an off-site mooring location during low water conditions. Additionally, Alternative 1 would enhance the CG's ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases. There would be emissions associated with infrequent maintenance dredging, but these emissions are expected to be less than for the initial dredging. Maintenance dredging activities would also use the same, or substantially similar, air-quality BMPs as those used during the initial dredging.

In summary, Alternative 1 would have less-than-significant adverse impacts on TRPA air quality thresholds.

3.3.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on air quality and GHGs?

Less-than-Significant Impact. Emissions of criteria pollutants and GHGs would result mainly from the burning of diesel fuel in equipment and vehicles during construction. This includes emissions from the pile driver, a tugboat and support boat, other miscellaneous equipment, worker commute trips, and material deliveries. Fugitive dust emissions are expected to be insignificant during construction, because Alternative 2 does not involve upland soil movement or stockpiling, and vehicle trips would occur on paved roads.

As shown in *Table 3-12*, the daily maximum emissions of ROGs, NO_X, and PM_{10} during construction of Alternative 2 would be well below the PCAPCD's 82 pound/day threshold. The emissions of CO and $PM_{2.5}$, for which the PCAPCD has not set thresholds, are also relatively low. The emissions of criteria pollutants during construction of Alternative 2 would not substantially affect the LTAB's attainment status for the NAAQS or CAAQS. Total GHG construction emissions for Alternative 2 are estimated at 105 MT CO_2e, well below the PCAPCD 10,000 MT CO_2e construction threshold. Alternative 2 would not substantially hinder the state's ability to meet AB 32 goals or conflict with the emission-reduction strategies outlined in the AB 32 Scoping Plan (CARB 2014).

Air emissions during construction of Alternative 2 would be temporary, and the total emissions for construction are relatively low, in part due to the limited duration of construction (7 weeks). The daily emissions of criteria pollutants during construction of Alternative 2 would be greater than those for Alternative 1. Alternative 2 also has the lowest total GHG emissions of the Action Alternatives, partly due to the shorter duration of construction.

Multiple BMPs will be implemented during construction to minimize emissions of both criteria pollutants and GHGs. In accordance with **BMP C2-5**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C2-6**, construction equipment will be kept in good repair and regularly maintained, which will improve fuel efficiency and reduce emissions. In accordance with **BMP C2-16,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, signs will be posted to remind equipment operators of the idling limit, and equipment idling within 1,000 feet of any sensitive receptor will be discouraged. In accordance with **BMP C2-17**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will be required to maintain either statewide PERP registration or a PCAPCD permit.

During operation of the pier, air emissions would primarily be limited to negligible quantities of fugitive ROG emissions related to use of the fueling facilities and occasional touch-up painting/sealing, and these emissions are expected to occur at a similar level to those that occur under existing operations at the Station. Because Alternative 2 would involve modification of the pier fueling system, the CG will obtain an Authority to Construct/Permit to Operate from the PCAPCD prior to construction and will comply with PCAPCD rules for storing and handling gasoline during operations. The Station will continue to operate its two rapid response boats much as it does today, and vessel emissions are not expected to increase over baseline levels. In addition, long-term vehicle emissions are expected to decrease because the CG would no longer have to drive to another site to access their response boats during low-water conditions or haul the boat back and forth between the Station and an alternative launch site. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases.

Therefore, Alternative 2 would have less-than-significant impacts related to air quality from a NEPA perspective.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Air Quality

Would the Project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less-than-Significant Impact. As discussed previously, the LTAB is currently designated as in attainment or unclassified for all NAAQS, and therefore the SIPs are not directly applicable to the proposed Project. Emissions of criteria pollutants during construction of Alternative 2 would not substantially affect the LTAB's continued attainment of the NAAQS.

The LTAB is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and in attainment or unclassified for all other CAAQS. In compliance with the CCAA, the PCAPCD prepared the AQAP in 1991 which was designed to make progress toward attaining the state ozone standard and contained control programs/strategies for

stationary emissions sources, transportation, and indirect sources. Emissions of ozone precursors during construction of Alternative 2 would be well below the PCAPCD's 82 pound/day threshold for these pollutants, and construction of Alternative 2 would not substantially interfere with implementation of the AQAP or attainment of the CAAQS.

Implementation of various BMPs during construction would minimize emissions of ozone precursors and other criteria pollutants. In accordance with **BMP C2-5**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C2-6**, construction equipment will be kept in good repair and regularly maintained, which will improve fuel efficiency and reduce emissions. In accordance with **BMP 2-16,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, and signs will be posted to remind equipment operators of the idling limit. In accordance with **BMP C2-17**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will require either statewide PERP registration or a PCAPCD permit.

In the long term, Alternative 2 would result in a decrease in vehicle emissions due to the elimination of trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, even in low water conditions, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile substances, thereby avoiding or minimizing ROG emissions from such releases.

In summary, Alternative 2 would have less-than-significant adverse impacts related to conflicting with or obstructing implementation of applicable air quality plans.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Less-than-Significant Impact. The LTAB is currently designated as in attainment or unclassified for all NAAQS, and Alternative 2 would not change the current attainment status for the NAAQS. The region is currently designated as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and as attainment or unclassified for all other CAAQS. Projected emissions of PM_{10} and ozone precursors during construction of Alternative 2 are low and well below the PCAPCD's significance thresholds and would not contribute substantially to further nonattainment of the CAAQS. Implementation of **BMPs C2-5, C2-6, C2-16,** and **C2-17** would minimize emissions of criteria pollutants during construction and ensure compliance with the PCAPCD's other standards and rules for construction emissions.

In the long term, Alternative 2 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases.

In summary, Alternative 2 would have less-than-significant adverse impacts related to violating air quality standards or contributing substantially to an existing or projected air quality violation.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less-than-Significant Impact. The LTAB is currently designated as in attainment or unclassified area for all NAAQS, as a nonattainment area for the state PM_{10} standard, nonattainment-transitional for the state ozone standard, and as in attainment or unclassified for all other CAAQS. Projected emissions of PM_{10} and

ozone precursors during construction and operation of Alternative 2 are low and well below the PCAPCD's significance thresholds and would not contribute substantially to further nonattainment of the CAAQS. The PCAPCD's thresholds are designed to avoid cumulative impacts potentially affecting attainment with the PM_{10} and ozone standards, and other projects in the area would be expected to implement mitigation if they exceed these standards. Therefore, Alternative 2 would have less-than-significant impacts related to cumulatively considerable net increases of any criteria air pollutant for which the Project region is non-attainment under applicable federal or state air quality standards.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact. Construction activities would involve the operation of diesel-powered equipment for various activities. CARB has identified diesel particulate matter as a TAC, and Project construction would lead to a short-term increase in the exposure of some sensitive receptors (e.g., occupants of residences in the Project vicinity, users of the TCPUD recreational facilities) to diesel particulate matter and other emissions. Elevated risk for lung cancer, cardiovascular disease, and other chronic health issues is typically only associated with long-term exposure to diesel exhaust. Health risk assessments for emissions, which evaluate exposure over a 70-year period, are typically only conducted for projects that would result in long-term increases in emissions. Short-term exposure to diesel exhaust at the levels expected for nearby sensitive receptors during construction is not associated with increased chronic health risks. Because construction activities would only occur over a 7-week period, and due to the highly dispersive nature of diesel exhaust (Zhu et al. 2002), exposure of sensitive receptors to hazardous pollutants during construction is considered less than significant. In addition, implementation of **BMPs C2-6, C2-16,** and **C2-17** would minimize exposure of sensitive receptors to diesel exhaust and other hazardous pollutants during construction. Operational emissions are expected to be similar to or less than existing conditions and would not expose sensitive receptors to substantial concentrations of air pollutants. In summary, Alternative 2 would have less-than-significant impacts related to exposing sensitive receptors to substantial pollutant concentrations.

e) Create objectionable odors affecting a substantial number of people?

Less-than-Significant Impact. Nearby sensitive receptors could be exposed to odors from diesel exhaust and other Project activities during the 7-week construction period. Implementation of **BMPs C2-6, C2-16,** and **C2-17** would minimize exposure of sensitive receptors to diesel exhaust, and most odors are expected to dissipate before reaching sensitive receptors. The impacts of Alternative 2 related to odor would be temporary, localized, and less than significant.

Greenhouse Gases

Would the Project:

a) Generate GHG emissions, directly or indirectly, that may have a significant impact on the environment?

Less-than-Significant Impact. GHG construction emissions for Alternative 2 are estimated at roughly 105 MT CO_2e, well below the PCAPCD's 10,000 MT CO_2e threshold for construction. Implementation of **BMPs C2-5, C2-6, C2-16**, and **C2-17** would minimize GHG emissions during construction.

In the long term, Alternative 2 would result in a decrease in GHG emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions and subsequent buildup of ozone, a GHG, in the atmosphere resulting from such releases.

In summary, Alternative 2 would have less-than-significant impacts related to generation of GHGs that would have an impact on the environment.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions?

Less-than-Significant Impact. As discussed previously, Alternative 2's GHG emissions would be well below the PCAPCD significance thresholds. Alternative 2 also would not be inconsistent with the emission-reduction strategies outlined in the AB 32 Scoping Plan (CARB 2014) or conflict with the other policies and regulations listed in *Table 3-9* that are relevant to GHG reduction. Alternative 2 also would not be inconsistent with the Lake Tahoe Region Sustainable Community Strategy. Therefore, Alternative 2 would have a less-than-significant impact related to conflicts with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Substantial air pollutant emissions?

Less-than-Significant Impact. Almost all of the air pollutant emissions associated with Alternative 2 would occur during the 7-week construction period. These emissions would be short term and below the 82 pound/day threshold set by the PCAPCD. Most TRPA thresholds for air pollutants (as of 2015) have a status of either "Considerably Better than Target" or "At or Somewhat Better than Target," and the construction emissions estimated for Alternative 2 in *Table 3-12* would not substantially contribute to nonattainment of these thresholds. Implementation of various BMPs during construction would minimize emissions of criteria pollutants. In accordance with **BMP C2-5**, a Spill Prevention and Response Plan will be implemented and new structures will not be painted or coated on site, except for minor touch ups, which will minimize fugitive ROG emissions during construction. In accordance with **BMP C2-6**, construction equipment will be kept in good repair and regularly maintained. In accordance with **BMP C2-16,** idling time for diesel-powered equipment will be limited to no more than 5 minutes, signs will be posted to remind equipment operators of the idling limit, and equipment idling within 1,000 feet of any sensitive receptor will be discouraged. In accordance with **BMP C2-17**, the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, natural gas) generators for temporary power rather than temporary diesel power generators, and portable generators or equipment with an engine of 50 HP or greater will require either statewide PERP registration or a PCAPCD permit.

In the long term, Alternative 2 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases.

In summary, Alternative 2 would have less-than-significant adverse impacts related to the production of substantial air pollutant emissions.

b) Deterioration of ambient (existing) air quality?

Less-than-Significant Impact. Estimated emissions of air pollutants during construction of Alternative 2 are low and well below the applicable PCAPCD's significance thresholds. Implementation of **BMPs C2-5, C2-6, C2-16,** and **C2-17** would minimize emissions of criteria pollutants during construction. In the long term, Alternative 2 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals,

thereby minimizing ROG emissions from such releases. Therefore, Alternative 2 would have less-than-significant adverse impacts related to the deterioration of ambient air quality.

c) The creation of objectionable odors?

Less-than-Significant Impact. Nearby sensitive receptors could be exposed to odors from diesel exhaust and other Project activities during the 7-week construction period. Implementation of **BMPs C2-6, C2-16,** and **C2-17** would minimize exposure of sensitive receptors to diesel exhaust, and most odors are expected to dissipate before reaching sensitive receptors. The impacts of Alternative 2 related to odor would be temporary, localized, and less than significant.

d) Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?

Less-than-Significant Impact. Alternative 2 would involve the addition of a 350-foot pier extension and accessory structures, which would not substantially alter local air movement, moisture, or temperature.

In terms of regional climate change caused by GHG emissions, total GHG construction emissions for Alternative 2 are estimated at roughly 105 MT CO_2e, well below the PCAPCD's 10,000 MT CO_2e construction threshold. Implementation of **BMPs C2-5, C2-6, C2-16,** and **C2-17** would minimize GHG emissions during construction. In the long term, Alternative 2 would result in a decrease in GHG operational emissions, as described above.

In summary, Alternative 2 would have less-than-significant impacts on air movement, moisture, temperature, and climate change locally or regionally.

e) Increased use of diesel fuel?

Less-than-Significant Impact. Construction activities will require a minor temporary increase of diesel fuel use, but Alternative 2 will not result in a significant or long-term increase of diesel use. During construction, measures will be taken to reduce the consumption of diesel fuel, including ensuring that equipment is properly maintained, in accordance with **BMP C2-6**; limiting equipment idling times, in accordance with **BMP C2-16**; and using clean fuel generators or permanent power instead of temporary diesel generators, in accordance with **BMP 2-17**. Therefore, Alternative 2 would have a less-than-significant impact related to the increased use of diesel fuel.

TRPA Thresholds

Less-than-Significant Impact. TRPA currently has thresholds related to CO, NO_x, ozone, particulate matter, visibility, and VMT related to nitrate deposition (*Table 3-10*). As shown in *Table 3-12,* Alternative 2 would result in emissions of CO, NO_x, and other ozone precursors, and particulate matter that are relatively low and well below the thresholds set by the PCAPCD. Alternative 2 would not result in a substantial increase in PM_{10} or other emissions that would affect visibility and would not result in a substantial increase in VMT. Implementation of **BMPs C2-5, C2-6, C2-16**, and **C2-17** would minimize short-term emissions during construction.

In the long term, Alternative 2 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases.

In summary, Alternative 2 would have less-than-significant adverse impacts on the TRPA air quality thresholds.

3.3.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 3 would have impacts to air quality similar to those of Alternative 2, though total emissions would be slightly higher, as shown in *Table 3-12*, as a result of a slightly longer construction duration (8 weeks versus 7 weeks). The level of GHG emissions during construction of Alternative 3 (120 MT/year CO_2e) would be between the levels for Alternatives 1 and 2 and well below the PCAPCD's 10,000 MT/year CO_2e construction threshold. As with the other Action Alternatives, in the long term Alternative 3 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location during low water conditions. Additionally, after construction is completed, the CG will be able to moor their response boats at the Station year round, enhancing their ability to respond quickly to accidents involving potential releases of gasoline and other volatile chemicals, thereby minimizing ROG emissions from such releases. In summary, Alternative 3 would have less-than-significant adverse impacts related to air quality.

3.3.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and no construction-related impacts to air quality due to construction activities would occur. Operations at the Station would remain unchanged, and therefore Alternative 4 would have no impacts when compared to baseline conditions. However, long-term emissions of criteria pollutants and GHGs under Alternative 4 could be higher than for the three Action Alternatives due to the fact that CG personnel would still have to drive to an off-site mooring location to access their response boats during low-water conditions and would continue to have to transport the response boats back and forth between the Station and an alternative mooring location. The CG would continue to face challenges in responding quickly to incidents on Lake Tahoe involving the potential release of air contaminants, due to delays in accessing an offsite mooring location. In addition, this alternative is not viable because it would prevent the CG from providing acceptable standards of public safety services and would not fulfill the purpose and need of the Project.

3.4 Biological Resources

The following sections provide a discussion of the affected environment, environmental regulations, and potential Project impacts related to biological resources.

3.4.1 Affected Environment

The following sections provide descriptions of the habitats and wildlife with potential to occur in or near the proposed Project site.

3.4.1.1 Aquatic Habitat

The majority of the Project Area occurs in the littoral zone of Lake Tahoe, which is the portion of the lake where enough light reaches the bottom for aquatic plants to grow. In Lake Tahoe this zone is composed of a variety of habitats ranging from gently sloping open sand to very steep rock drop offs. The biological community in the littoral zone of Lake Tahoe includes aquatic plants, benthic invertebrates, plankton, and fish.

Current ecological conditions in Lake Tahoe reflect decades of anthropogenic impacts that have altered ecological processes and biological communities. Increases in nutrient and fine sediment levels have resulted in algal growth and a decline in lake clarity since the 1960s, though the rate of decline has slowed substantially in the past 15 years, and data from recent years shows a trend toward improved clarity (measured as the vertical extinction coefficient) for deep-water areas and measured as turbidity for near-shore areas (TRPA 2016a). Additionally, introduction of non-native species that compete with or prey on native species has drastically altered aquatic communities.

Prime Fish Habitat

No federally designated critical habitat occurs in the Project Area. However, most of the aquatic portion of the Project Area is designated on TRPA maps as Prime Fish Habitat PFH for either fish spawning or feed and cover habitat (TRPA 2016a). As defined by TRPA, spawning habitat consists of areas with substrates composed primarily of small diameter gravel, while feed and cover habitat has substrates composed primarily of larger diameter cobbles, rocks, and boulders (TRPA 2016a). The portions of the Project Area designated as spawning habitat on the TRPA PFH map are limited to areas adjacent to the shoreline, and most of the Project Area is designated as feed and cover habitat (*Figure 3-22*).

The TRPA's PFH map is based on satellite data that is reasonably accurate for determining the distribution and status of potential PFH lake-wide (TRPA 2016a, Metz et al. 2006), but does not provide sufficient resolution for determining project-specific impacts. Therefore, TRPA typically requires that a shorezone project applicant perform a field verification to provide site-specific data on whether PFH occurs in a project site. To fulfill this requirement, qualified fisheries biologists performed a field verification dive survey in July 2011 to collect detailed data on the current habitat conditions in the Project Area (*Appendix C*). The biologists mapped the various substrate types in the Project Area to verify the presence and extent of PFH (*Figure 3-23*).

The field verification found that most of the lakebed that would be removed or displaced by the Project Alternatives has substrates of clay silt, and fine sand, which do not provide high-quality spawning or feed and cover habitat and would not fall under the TRPA's definition of PFH. The field verification did identify some areas of gravel, cobble, boulders, and large woody debris, indicating that some potential fish spawning and feed and cover habitats are present in the Project Area. The potential spawning habitat (i.e., gravel substrate) occurs close to shore and would not be removed, displaced, or otherwise affected by the proposed Project. Although a small amount of potential spawning habitat is present in the Project Area, substantial spawning activity is unlikely to occur in the area due to disturbance from high levels of existing boat traffic from the adjacent public boat ramp. No spawning activity was observed during the field verification survey. There is no potential spawning habitat in the areas that would be removed or displaced by the proposed Project Alternatives; only feed and cover habitat would be affected.

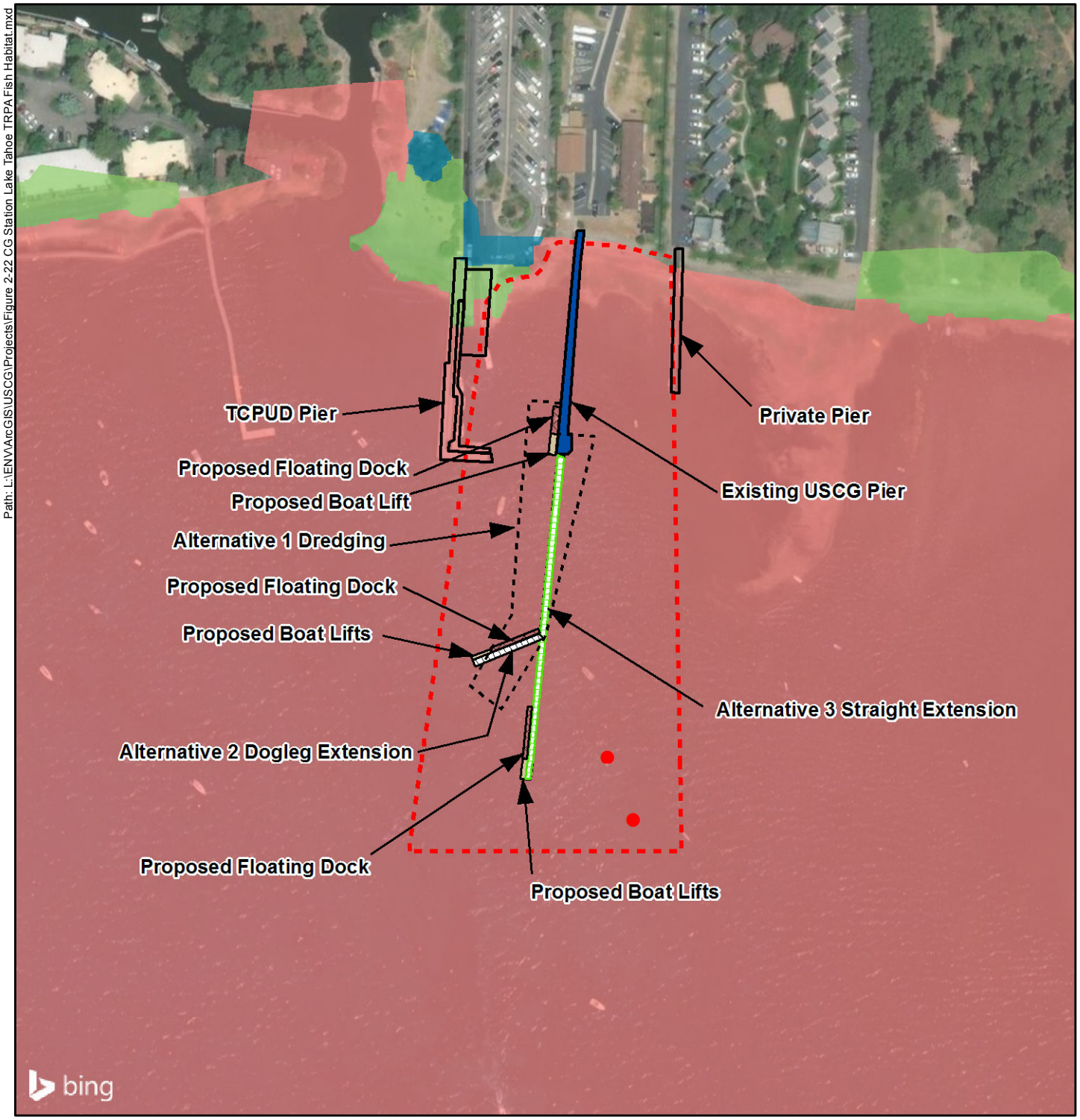
TRPA has a non-degradation threshold standard for PFH in Lake Tahoe, requiring maintenance of the equivalent of the 5,948 total acres of PFH shown on TRPA's 1997 PFH Overlay Map. As of the latest threshold evaluation (TRPA 2016a), the status of this threshold was "At or Somewhat Better than Target."

TRPA Code of Ordinances Section 84.11.B requires that impacts to PFH must be mitigated by replacement of the area of PFH removed at a ratio of 1:1.5 to achieve the non-degradation threshold. *Table 3-13* provides a summary of the amount of potential PFH in the disturbance area of each proposed Project Alternative and the amount of habitat replacement necessary to meet TRPA mitigation requirements. There is no potential spawning habitat in the areas that would be removed or displaced by the proposed Project Alternatives; only feed and cover habitat would be affected. Project impacts and proposed mitigation for PFH are described in more detail in *Section 3.4.3.*

Table 3-13 Area of PFH (in square feet) in the Long-Term Disturbance Areas of the Project Alternatives

Alternative	Total Lake-Bottom Footprint	Feed and Cover Habitat	Mitigation Required (at 1:1.5)
Alternative 1 – Dredging*	29,749	1,895	2,843
Alternative 2 – Dog-Leg Extension	12	4	6
Alternative 3 – Straight Extension	14	3	5

* To analyze potential worst-case impacts, the areas indicated for Alternative 1 include the full overdepth allowance, which also includes a 2-foot allowance for potential overdredging of side slopes. The area dredged is likely to be smaller, but the full overdepth area will be accounted for during mitigation as a conservative measure.



Existing Pier
Alternative 1 Dredging Footprint
Alternative 2 Dogleg Extension
Alternative 3 Straight Extension
Fish Habitat Study Area
Buoy

TRPA Fish Habitat
Feed-Cover
Marginal
Spawning

0 200 400
Feet

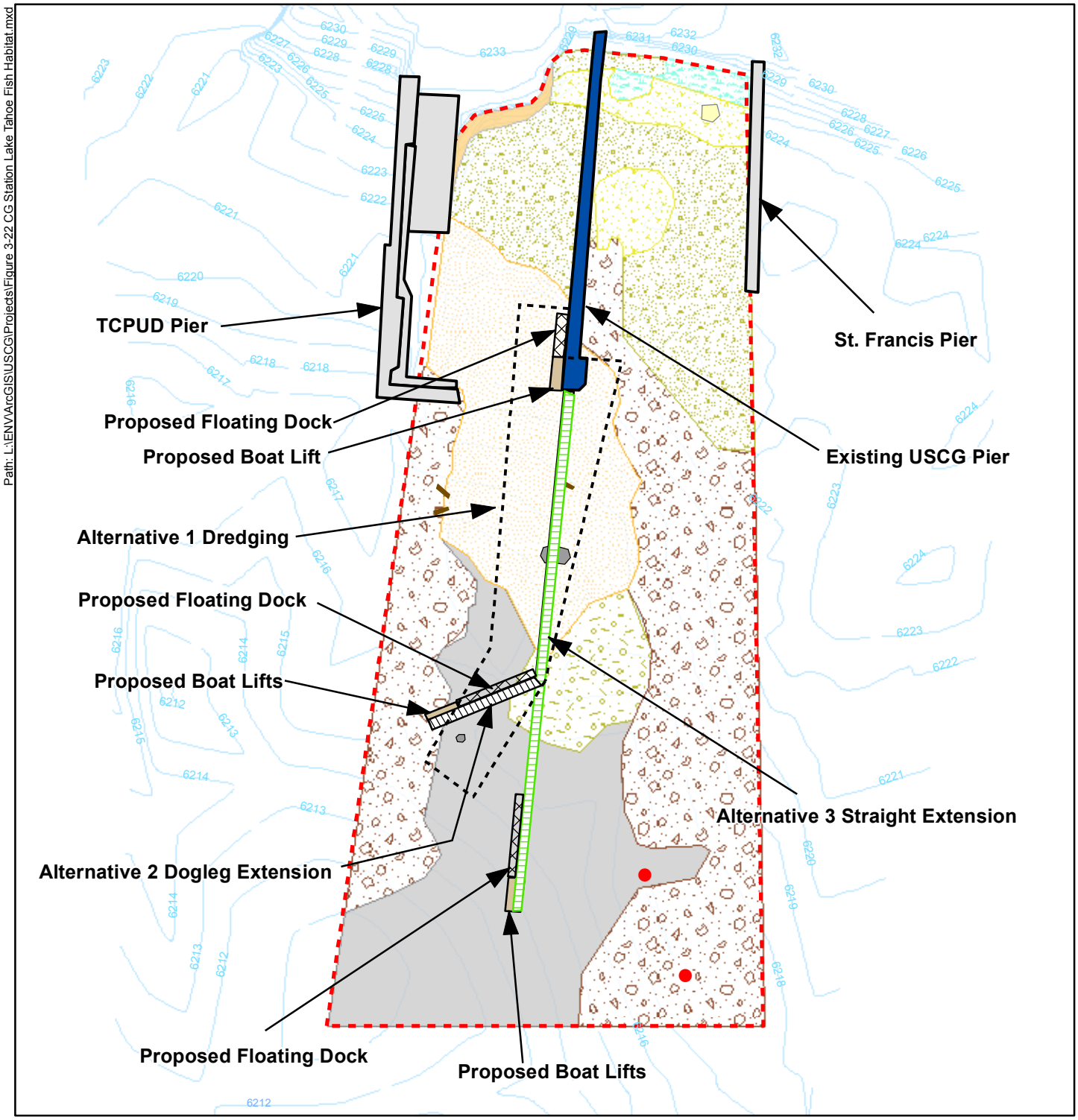
TCPUD = Tahoe City Public Utility District

REFERENCE:
TRPA 1997

CG Station Lake Tahoe Year-Round Mooring Project

Figure 3-22

TRPA Fish Habitat Map



Existing Pier
Alternative 1 Dredging Footprint
Alternative 2 Dogleg Extension
Alternative 3 Straight Extension
Fish Habitat Study Area
Buoy
Large Boulders
Large Wood Debris (>30cm)

TCPUD = Tahoe City Public Utility District

Contours
Sand with Aquatic Macrophyte Cover
Cobble
Cobble with Small Boulders
Fines
Gravel Course
Gravel, Course with Aquatic Macrophyte Cover
Lacustrine Clay Deposits

Rip Rap (Boulder, Small)
Sand

0 125 250
Feet

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 3-23
Site-Specific Survey of Fish Habitat in the Project Area

3.4.1.2 Shoreline and Upland Habitats

The shoreline at and adjacent to the Station is highly developed. The Station's main office and garage are approximately 45 feet and 80 feet north of the shoreline, respectively. A paved parking lot occupies the central portion of the Station property and extends to about 25 feet from the shoreline, and a concrete walkway connects the parking lot to the pier. A lawn and several ornamental trees of various sizes are between the Station buildings and the shoreline. The shoreline at the Station consists of a narrow band of coarse gravel and sand backed by a riprap revetment (*Figure 3*-4). The foreshore is composed of primarily rocky substrate that is exposed during low water (*Figure 3*-5*)*. Adjacent and to the west of the Station, the TCPUD parking lot/driveway occupies most of the backshore, and the TCPUD pier, boat ramp, and a riprap revetment occupy most of the shoreline. A small cluster of trees is between the TCPUD parking lot and the riprap revetment. Adjacent and to the east of the Station is the Saint Francis Lakeside condominium development, which includes a private pier and a paved parking area. There is a small group of willows along the shoreline on the Station's eastern property boundary.

3.4.1.3 Special-Status Species

For the purposes of this analysis, special-status species include those listed or proposed for listing as threatened or endangered under the federal ESA and CESA, Species of Special Concern designated by the CDFW, species identified as rare and assigned a California Rare Plant Rank (CRPR) by the CDFW and California Native Plant Society (CNPS), regionally sensitive species identified by the U.S. Forest Service (USFS) Lake Tahoe Basin Management Unit (LTBMU) and TRPA, and species otherwise protected by other state or federal regulations or tracked in the CDFW's California Natural Diversity Database (CNDDB).

To identify special-status species potentially occurring in the Project Area, AECOM conducted a search of CNDDB and CNPS Rare and Endangered Plant Inventory records in the USGS 7.5-minute quadrangle containing the Project Area as well as the five surrounding quadrangles in California. The full search results are provided in *Appendix C*. *Figure 3*-6 shows CNDDB records within 5 miles of the Project Area. *Table 3-14* lists the special-status species considered to have potential to occur in the Project vicinity, based on CNDDB and CNPS records, agency recommendations, and other available information. *Table 3-14* also includes an assessment of each species' potential to occur in the Project Area.

The following sections provide brief descriptions of the special-status species identified in *Table 3-14* as having some potential to occur in the Project Area, or which regulatory agencies require be specifically addressed in impact analyses for shorezone projects in Lake Tahoe.

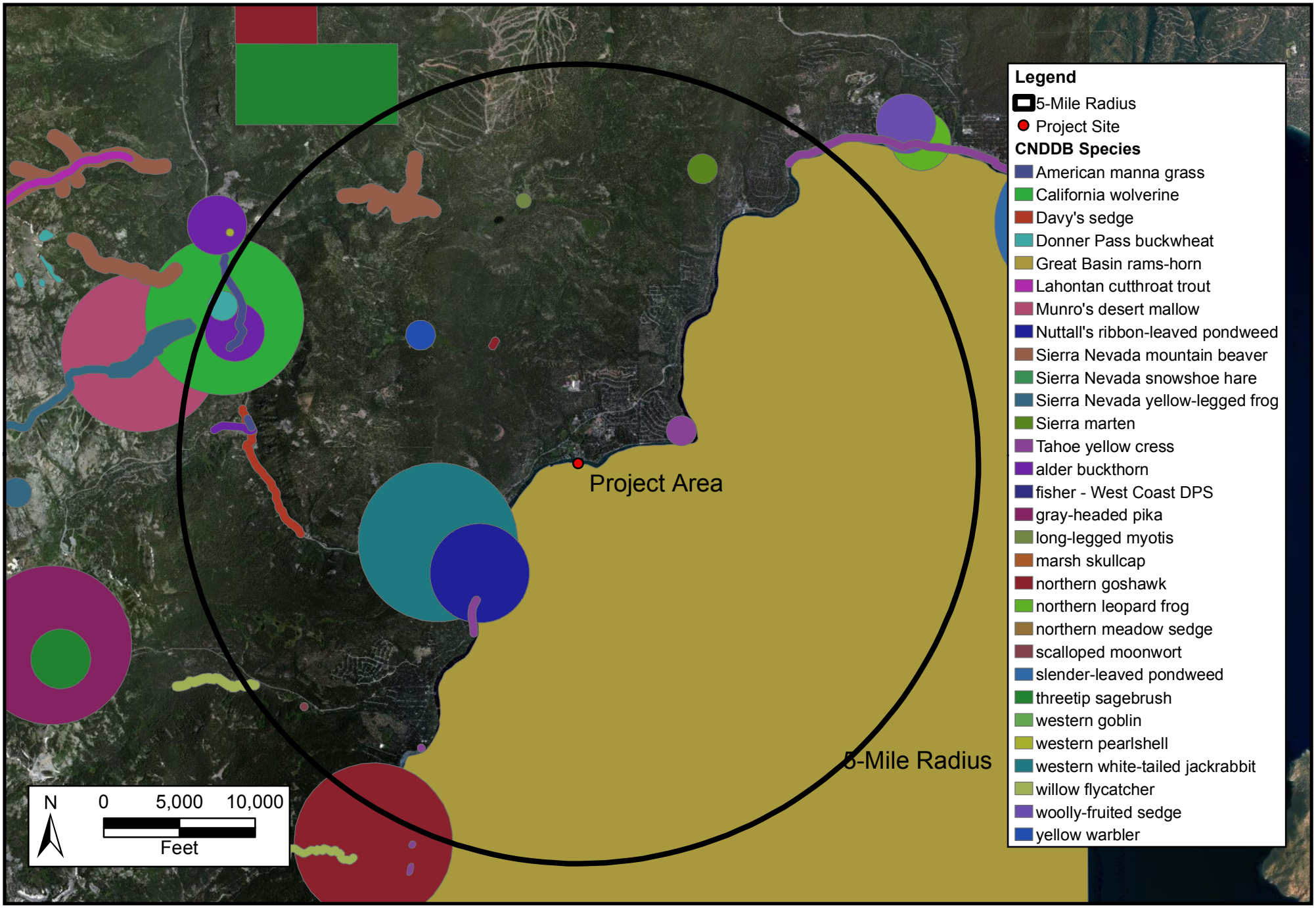
Tahoe Yellow Cress

Tahoe yellow cress (*Rorippa subumbellata*) was listed as endangered under CESA in 1982, it was identified as a candidate for listing under the ESA in 1999. In October 2015, the USFWS announced a "not warranted" finding and removed Tahoe yellow cress from the federal candidate list due to the successful implementation of the Tahoe Yellow Cress Conservation Strategy; however, it is still listed as endangered by the states of California and Nevada (TRPA 2016a). Threats to Tahoe yellow cress include recreational activities on public beaches and adjacent habitats and shorezone development. This species is also designated by the LTBMU as a Sensitive Species and by TRPA as a Special Interest Species. TRPA has established threshold standards for Tahoe yellow cress that call for maintenance of at least 26 populations of the species in the Lake Tahoe Basin. As of the latest threshold evaluations report (TRPA 2016a), the status of this threshold was "Considerably Better than Target," with 50 current population sites recorded.

Tahoe yellow cress occurs around the margins of Lake Tahoe on sandy beaches and stream mouths. Tahoe yellow cress has a strong preference for coarse sand and sandy soils in areas where there is minimal human disturbance and competition from other plant species. The availability of suitable habitat for this species correlates with lake level, with more potential habitat becoming available as the lake levels decreases (Pavlik et al. 2002). The shorezone in the Project Area does not provide good quality habitat for Tahoe yellow cress, because the foreshore at the Station has mostly rocky substrates, much of the backshore is covered by riprap, and much of both areas is occupied by competing weedy plant species and/or has been disturbed by past activities (*Figures 3-24* and 3-*25*).

Figure 3-24 Shoreline Habitat at Station (July 2011)

Figure 3-25 Foreshore Habitat at Station (August 2014)



Source:
AECOM/California Natural Diversity Database (CNDDB)

USCG Lake Tahoe Station Pier Extension
Figure 3-26
CNDDB Species Records within 5 Miles of the Action Area

Table 3-14 Special-Status Species with Potential to Occur in the Project Vicinity

Species	Status[1]					Habitat Characteristics	Potential to Occur in the Project Area
	Federal	State	CRPR	LTBMU	TRPA		
Plants							
alder buckthorn (*Rhamnus alnifolia*)	--	--	2B.2	--	--	Meadows and seeps, lower montane coniferous forest, upper montane coniferous forest, riparian scrub.	**Not expected** – No suitable habitat present.
American manna grass (*Glyceria grandis*)	--	--	2B.3	--	--	Wetlands, stream banks, lake margins	**Not expected –** The species has been recorded along the Truckee River but not in the shorezone of Lake Tahoe. It was not observed during AECOM's site surveys of the Station, and the potential habitat on site has been heavily modified.
Davy's sedge (*Carex davyi*)	--	--	1B.3	--	--	Subalpine coniferous forest, upper montane coniferous forest, elevation 1,500 to 3,200 meters.	**Not expected** – No suitable habitat present.
Donner Pass buckwheat (*Eriogonum umbellatum var. torreyanum*)	--	--	1B.2	--	--	Upper montane coniferous forest, chaparral, meadows.	**Not expected** – No suitable habitat present.
mud sedge (*Carex limosa*)	--	--	2B.2	--	--	Acidic mires, peaty lake margins.	**Not expected –** No suitable habitat present.
Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus*)	--	--	2B.2	--	--	Shallow water, ponds, lakes, streams, irrigation ditches.	**Not expected** – According to the CNDDB, this species has not been recorded in the Project vicinity since 1932.
Tahoe yellow cress (*Rorippa subumbellata*)	C	E	1B.1	S	SI	Sandy beaches and stream mouths on the shores of Lake Tahoe.	**Not expected** – Tahoe yellow cress has not been observed in or near the Project Area, including during focused site surveys conducted by AECOM (in 2011 and 2014) and TRPA (in 2010). The beach habitat in the Project Area is rocky and does not provide good quality habitat for the species.
threetip sagebrush (*Artemisia tripartita tripartita*)	--	--	2B.3	--	--	Openings in upper montane coniferous forest, rocky, volcanic soils.	**Not expected** – No suitable habitat present.
woolly-fruited sedge (*Carex lasiocarpa)*	--		2B.3	--	--	Wetlands, stream banks, lake margins	**Not expected –** There is only one recorded occurrence in the Project vicinity – from a spring near Tahoe Vista. The species was not observed during AECOM's site surveys and potential habitat on site is heavily modified.

Species	Status[1]					Habitat Characteristics	Potential to Occur in the Project Area
	Federal	State	CRPR	LTBMU	TRPA		
Invertebrates							
Great Basin rams-horn (*Helisoma newberryi*)	--	--	N/A	S	--	Soft mud of larger lakes and slow rivers where aquatic plants are present. Associated with well-oxygenated, soft substrate and clear, cold, slowly flowing water and low levels of disturbance.	**Not expected** – The CNDDB record is based on a distributional checklist published by Taylor in 1981 and applies to the entire lake. However, there have been no specific records of the species in Lake Tahoe since 1981. Additionally, the quality of the habitat for this species in the Project area is poor, due to high levels of disturbance from existing boating traffic and scarcity of aquatic plants.
Fish							
Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*)	T	--	N/A	MIS	SI	Lakes and streams of Lahontan Basin.	**Not expected** – Wild populations of this species were extirpated from Lake Tahoe in the 1930s. There was one attempt to stock the species into Lake Tahoe at Cave Rock for recreational purposes in 2011, but this is unlikely to have resulted in a self-sustaining population in the lake.
Lahontan Lake tui chub (*Siphateles bicolor pectinifer*)	--	SSC	N/A	S	--	Both deep and shallow freshwater lakes and rivers, generally with abundant aquatic vegetation.	**Low** – This species is known to occur in the shorezone of Lake Tahoe, though they have become uncommon (CDFW 2010). There are no CNDDB records for the subspecies in the Project vicinity, and none were observed during the 2012 fish habitat survey.
Amphibians							
northern leopard frog (*Lithobates pipiens*)	--	SSC	N/A	S	--	Near permanent or semi-permanent water, shoreline cover, submerged and emergent aquatic vegetation.	**Not expected** – No suitable habitat present. Presumed extirpated from the Lake Tahoe Basin (Schlesinger and Romsos 2000)
Birds							
northern goshawk (*Accipiter gentilis*)	--	SSC	N/A	S	SI	Mature coniferous forests with large trees, snags, downed logs, dense canopy cover, and an open understory for nesting.	**Not expected** – No suitable habitat present. The Project Area is not within the 0.5 mile non-disturbance buffer of any goshawk nesting sites mapped by TRPA.
willow flycatcher (*Empidonax traillii*)	--	E	N/A	S	--	Dense thickets of willow or similar deciduous trees on water's edge.	**Not expected** – No suitable habitat present.

Species	Status[1]					Habitat Characteristics	Potential to Occur in the Project Area
	Federal	State	CRPR	LTBMU	TRPA		
Mammals							
California wolverine (*Gulo gulo luteus*)	C	T	N/A	S	--	Variety of high elevation habitats, primarily coniferous forests with a near water source.	**Not expected** – No suitable habitat present.
Sierra Nevada mountain beaver (*Aplodontia rufa californica*)	--	SSC	N/A	--	--	Dense growth of small deciduous trees and shrubs, wet soil, abundance of water.	**Not expected** – No suitable habitat present.
Mammals (continued)							
western white-tailed jackrabbit (*Lepus townsendii townsendii*)	--	SSC	N/A	--	--	Sagebrush, subalpine conifer, juniper, alpine dwarf shrub and perennial grassland.	**Not expected** – No suitable habitat present.

Notes:

1. Code Designations

Federal: C = Candidate for listing under the ESA
T = Threatened (ESA)

State: E = Endangered (CESA)
T = Threatened (CESA)
SSC = Species of Special Concern (CDFW)

CRPR: 1B.1 = Rare or endangered in California and elsewhere, seriously threatened in California
1B.2 = Rare or endangered in California and elsewhere, moderately threatened in California
1B.3 = Rare or endangered in California and elsewhere, not very threatened in California
2B.2 = Rare, threatened, or endangered in California but more common elsewhere, moderately threatened in California
2B.3 = Rare, threatened, or endangered in California but more common elsewhere, not very threatened in California

LTBMU: S= Sensitive Species
MIS=Management Indicator Species

TRPA: SI = Special Interest Species

To confirm the presence or absence of Tahoe yellow cress in the Project Area, AECOM biologists performed focused surveys in July 2011 and August 2014 following the protocols provided in Appendix N of the *Conservation Strategy for Tahoe Yellow Cress* (Pavlik et al. 2002). No Tahoe yellow cress or other special-status plants were observed during the surveys, which encompassed all exposed foreshore and backshore areas in the CG property. The full survey report is provided as an attachment to the Project BA (*Appendix C*). Note that the water level in Lake Tahoe was particularly low at the time of the 2014 survey, increasing the area of shoreline habitat that could be surveyed, and still no Tahoe yellow cress was observed. A previous survey conducted by TRPA in September 2010 also found no Tahoe yellow cress at the CG property, and a survey conducted of the adjacent TCPUD boat ramp area in June 2013 also did not detect Tahoe yellow cress (Loeb 2013). Tahoe yellow cress is considered to have a low potential to occur in the Project Area because the species has not been observed during the four focused surveys conducted in or adjacent to the Project Area, there are no records of Tahoe yellow cress occurring in or in close proximity to the Project Area, and the potential habitat for the species in the Project Area is generally of poor quality.

Lahontan Cutthroat Trout

Lahontan cutthroat trout (*Oncorhyncus clarkii henshawi*) was listed as endangered under the federal ESA in 1970 and reclassified as threatened in 1975 to facilitate management and to allow for regulated angling. The species is currently not listed under CESA. It is considered to be a Management Indicator Species by the LTBMU and a Special Interest Species by TRPA.

Lahontan cutthroat trout historically occupied freshwater and alkaline lakes and major rivers and tributary streams of the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. The species currently occupies only a small fraction of its historic range. Lahontan cutthroat trout was extirpated from the Lake Tahoe Basin in the 1930s due to overharvesting, habitat degradation, and the introduction of non-native fishes which predate on, compete with, and/or hybridize with Lahontan cutthroat trout. Lahontan cutthroat trout spawn only in stream environments, typically between April and June, in riffles or the tail end of pools in relatively silt-free gravel substrate. In lake habitats, small Lahontan cutthroat trout feed largely on insects and zooplankton while adults feed on smaller fish. Unlike most freshwater fish species, Lahontan cutthroat trout tolerate relatively high alkalinity and total dissolved solid levels. Lahontan cutthroat trout evolved in the absence of other salmonid species and they are highly susceptible to hybridization and competition from introduced trout species (USFWS 2009).

Multiple attempts have been made to reintroduce the Lahontan cutthroat trout to the Lake Tahoe Basin since the 1950s. An effort was made to reintroduce the species to Lake Tahoe in the 1960s, but within a few years it was determined that the species had once again been eliminated primarily due to predation from lake trout (*Salvelinus namaycush*) and other introduced species. Most recent reintroductions have focused on waterbodies in the southern portion of the Lake Tahoe Basin where the reintroduced populations can be isolated and introduced species can be controlled. In 1989 and 1990, the CDFW and LTBMU, reintroduced Lahontan cutthroat trout into the headwaters of the Upper Truckee River near Meiss Meadows (USFS 2014). Non-native brook trout (*Salvelinus fontinalis*) were removed from the Upper Truckee River prior to reintroduction of the Lahontan cutthroat trout. Since the initial reclamation activities, annual maintenance removal efforts occurred in Meiss Meadows until 2009, after three consecutive years when no non-natives were observed. Since 2009, the Meiss Meadow population has been allowed to recover from sampling and electro-shocking effects. CDFW currently monitors the success of brook trout removal efforts through voluntary angler reporting. In 2008 the LTBMU began implementation of the Upper Truckee River Lahontan Cutthroat Trout Restoration Project downstream of the Meiss Meadow area. The objective of the effort is to facilitate natural range expansion of the Meiss Meadows population downstream by removing non-native trout.

Beginning in 2002 the USFWS began stocking the Pilot Peak strain of Lahontan cutthroat trout into Fallen Leaf Lake, approximately 1 mile south of Lake Tahoe (USFWS 2013). This effort was undertaken to reintroduce a lake form of the species in the Lake Tahoe Basin, to develop adaptive management strategies for reintroduction, and to provide opportunities for anglers. Challenges for the reintroduction effort include predation by lake trout and hybridization with rainbow trout (*Oncorhynchus mykiss*). The

reintroduction effort has resulted in multiyear survival of Lahontan cutthroat trout in Fallen Leaf Lake, increased angler catch rates of Lahontan cutthroat trout, and successful spawning in Glen Alpine Creek.

There is currently no possibility of the reintroduced populations in the Upper Truckee River or Fallen Leaf Lake moving into Lake Tahoe, due to barriers to migration. However, in 2011, the Nevada Department of Wildlife (NDOW) stocked approximately 22,000 Lahontan cutthroat trout in the southeast portion of Lake Tahoe (near Cave Rock) to provide anglers the opportunity to catch this native species. No additional stocking of the species has been conducted since 2011. NDOW's 2011 stocking was conducted to temporarily enhance recreational fishing opportunities, not to permanently reintroduce the Lahontan cutthroat trout to Lake Tahoe. Continued survival of the stocked fish is unlikely, due to predation by, hybridization with, and competition from non-native fish, and the one-time stocking was not expected to result in a self-sustaining population of the species in the lake. Lahontan cutthroat trout could occur in the Project Area in the future, if further stocking events occur, but the species is not expected to be present in the Project Area at the time of construction.

Lahontan Lake Tui Chub

Lahontan Lake tui chub (*Siphateles bicolor pectinifer*) is designated as a Sensitive species by the LTBMU and a Species of Special Concern by the CDFW. The only verified population of this taxon in California occurs in Lake Tahoe; they also occur in Pyramid Lake in Nevada.

The Lahontan Lake tui chub is one of two tui chub subspecies in Lake Tahoe – the other is the Lahontan creek tui chub (*S. b. obesus*), which is not a special-status species. The two subspecies segregate ecologically – the Lahontan Lake tui chub primarily feeds on zooplankton in the open water of the lake, while the Lahontan creek tui chub occurs in streams and lakes as a shallow-water bottom feeder. Although Lahontan Lake tui chub feed primarily in deeper waters, they also use shallow nearshore areas. Spawning occurs in nearshore areas and stream mouths over dense beds of aquatic vegetation, typically at night in May and June. Larvae concentrate in shallow, weedy nursery areas and then spread out along rocky and sandy areas along the shore as they grow. Young fish remain in the nearshore areas until winter, when they move into deeper waters offshore. As adults, they also move into the shallows at night when not feeding. Lahontan Lake tui chubs are opportunistic omnivores, feeding mostly on zooplankton, especially cladocerans and copepods, but also consuming benthic invertebrates (Moyle 2002, Miller 1951).

The current abundance of Lahontan Lake tui chub in Lake Tahoe is unknown, and the subspecies has not been studied systematically since the late 1940s. Since then, Kokanee salmon (*Oncorhynchus nerka*) and opossum shrimp (*Mysis* spp.) were introduced to the lake, both of which prey on zooplankton, leading to a virtual elimination of cladocerans, the most important prey for the Lahontan Lake tui chub. More recently largemouth bass (*Micropterus salmoides*), which prey on juvenile chubs in their near-shore rearing areas, have also become established in the lake. As a result of these factors, only small numbers of Lahontan Lake Tui chub have been collected in recent years (CDFW 2010, Moyle 2002).

There are no CNDDB records for this species within 5 miles of the Project Area and no individuals were observed during AECOM's fish habitat survey. Due to these factors, and the currently low population for Lahontan tui chub in Lake Tahoe, it is considered to have at only a low potential to occur in the Project Area.

3.4.1.4 Other Fish and Wildlife

The following sections describe other fish and wildlife species that potentially use Lake Tahoe's waters as habitat or as a food source in the Project vicinity.

Fish

A number of other native fish species are found in the littoral zone of Lake Tahoe, including Lahontan redside shiner (*Richardsonius egregius*), Lahontan speckled dace (*Rhinichthys osculus robustus*),

mountain whitefish (*Proposium williamsoni*), Paiute sculpin (*Cottus beldingii*), and Tahoe sucker (*Catostomus tahoensis*).

Species that primarily spawn in Lake Tahoe include Lahontan Lake tui chub, Lahontan redside shiner, Lahontan speckled dace, and Paiute sculpin. Mountain whitefish and Tahoe sucker also sometimes spawn in the lake, but more commonly spawn in streams. Lahontan cutthroat trout only spawn in stream environments. Most spawning of native fish species in Lake Tahoe Basin occurs from April to August, except for mountain whitefish, which spawn from October to early December (*Table 3-15*). Larval and juvenile life stages of fish species spawning in Lake Tahoe typically move into shallow nursery areas that contain cover after hatching, with the exception of Tahoe sucker fry, which take up a benthic existence along the lake bottom (Moyle 2002).

Table 3-15 Spawning Timing of Native Fish Species in Lake Tahoe

Native Fish Species	Primary Spawning Habitat	Spawning Season (by month)											
		J	F	M	A	M	J	J	A	S	O	N	D
Lahontan cutthroat trout	Streams				■	■	■	■					
Lahontan Lake tui chub	Lake				■	■	■	■					
Lahontan redside shiner	Lake					■	■	■	■				
Lahontan speckled dace	Lake					■	■	■	■				
mountain whitefish	Streams										■	■	■
Paiute sculpin	Lake					■	■	■	■				
Tahoe sucker	Streams				■	■	■	■					
Source: Adapted from Moyle 2002													

Lake Tahoe's fishery has experienced a variety of stressors over the past century including introduction of non-native species, eutrophication, algal blooms, and nearshore habitat modification. Changing environmental conditions, including elevated water temperatures and reduced ultraviolet transparency, tend to favor non-native fish populations (Ngai et al. 2010). This expansion of non-native fish populations has led to the continued decline of native fish due to competition and predation. The non-native fish species in the littoral zone of Lake Tahoe include lake trout, rainbow trout, brown trout (*Salmo trutta*), Kokanee salmon, goldfish (*Carassius auratus*), bluegill (*Lepomis macrochirus*), black crappie (*Pomixis nigromaculatus*), brown bullhead (*Ictalarus nebulosus*), carp (*Cyprinus carpio*), smallmouth bass (*Micropterus dolomieu*), and largemouth bass. Some of these species, particularly the larger salmonids, are common targets of recreational fishing.

Benthic Invertebrates

Invertebrates native to Lake Tahoe that typically occur in the shallow waters of the Project Area include worms, midges, pea clams (*Pisidium* spp.), and various snails, such as dextral pond snails (*Lymnaea* and *Fossaria* spp.), sinistral pond snails (*Phsella* spp.), and the freshwater limpet (*Ferrisia fragilis*).

There has been a significant decline in native benthic invertebrate density since the 1960s, likely due to eutrophication and the introduction of non-native species to the lake that prey on and outcompete the native benthos (Caires et al. 2013). Non-native species include the Asian clam (*Corbicula fluminea*), signal crayfish (*Pacifastacus leniusculus*), and opossum shrimp.

Birds

A variety of aquatic and riparian bird species use the waters of Lake Tahoe and the surrounding habitats for foraging and nesting. The nests and eggs of most bird species are protected under the Migratory Bird Treaty Act (MBTA) and CFGC 3503. As described in *Section 3.3.1.2, Shoreline and Upland Habitats*, the shoreline and upland portions of the Project Area are highly developed. Although there is minimal nesting

habitat in or near the Project Area, there are several small trees on the shoreline and in the CG upland property that small or medium-sized birds may use. However, nesting birds have a low potential to occur in the Project Area due to the existing high levels of noise and other human disturbance. Birds are more likely to choose the higher quality habitat of the various nearby state parks and nature preserves as nesting sites. However, birds nesting in the general vicinity may use the shallow waters of the Project Area for foraging.

TRPA has established threshold standards for several Special Interest bird species, which include the northern goshawk, osprey (*Pandion haliaetus*), bald eagle (*Haliaetus leucocephalus*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus anatum*), and waterfowl (family *Anatidae*; e.g., ducks and geese). TRPA tracks populations and/or nest sites for these species and requires non-disturbance buffers around the nest sites of some (0.5 mile for northern goshawk and bald eagle and 0.25 mile for osprey, golden eagle, and peregrine falcon). The Project Area is not within the buffer distances of the recorded nest sites of these species shown in TRPA's threshold maps (TRPA 2016a). Though no focused surveys for TRPA Special Interest bird species have been performed for the Project Area to date, none of these species, including waterfowl, were observed during the other biological surveys conducted for the Project.

Terrestrial Wildlife

Terrestrial areas would be largely unaffected by the proposed Project. Additionally most of the upland portion of the Station is composed of highly modified areas that are paved or landscaped and surrounded by fencing. Therefore the use of these areas by native terrestrial wildlife is likely to be low.

3.4.2 Regulatory Setting

3.4.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to biological resources and relevant to the proposed Project are identified in *Table 3-16*.

3.4.2.2 Regional and Local Regulatory Setting

At the regional and local level, TRPA sets goals, policies, and regulations related to biological resources in the Project vicinity.

TRPA Regional Plan

The Conservation Element of the TRPA Regional Plan (TRPA 2012) provides goals and policies for management and protection of vegetation, wildlife, and fisheries in the Lake Tahoe region. TRPA Regional Plan goals and policies relevant to the proposed Project include:

Vegetation

Goal VEG-1: Provide for a wide mix and increased diversity of plant communities in the Tahoe region.

Policy VEG-1.10: Work to eradicate and prevent the spread of invasive species.

Goal VEG-2: Provide for the protection, maintenance, and restoration of such unique ecosystems as wetlands, meadows, and other riparian vegetation.

Goal VEG-3: Conserve threatened, endangered, and sensitive plant species and uncommon plant communities of the Lake Tahoe region.

Policy VEG-3.1: Uncommon plant communities shall be identified and protected for their natural values.

Policy VEG-3.2: The population sites and critical habitat of all sensitive plant species in the Lake Tahoe region shall be identified and preserved.

Table 3-16 Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project (Biological Resources)

Jurisdiction	Regulation	Description
U.S.	ESA (7 USC 136, 16 USC 1531 et seq.)	The ESA provides protection to species listed as threatened or endangered or proposed for such listing. Section 9 prohibits the "take" of any listed species, where: • Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." where • Harass is defined as "an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering" and • Harm is defined as "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns" For projects conducted or permitted by a federal agency that could affect a federally listed species, the federal agency is required to consult with the USFWS under ESA Section 7. Section 7 requires federal agencies to ensure that actions authorized, funded, or carried out by the agency are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat.
U.S.	MBTA (16 USC 703-712)	The MBTA was enacted to ensure the protection of shared migratory bird resources. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit. The USFWS is the lead agency for administering the MBTA.
U.S.	Other	• The Bald and Golden Eagle Protection Act makes it illegal to import, export, take (including molest or disturb), sell, purchase or barter any bald eagle or golden eagle or parts thereof. • CWA Section 404 (33 USC 1251 et seq.) and Rivers and Harbors Act Section 10 (33 USC 401) regulate discharges to and work in wetlands and other jurisdictional waters of the U.S. (discussed further in *Section 3.8, Hydrology and Water Resources).* • EO 13112 requires federal agencies to use authorities to prevent introduction of invasive species, respond to and control invasions in a cost-effective and environmentally sound manner, and provide for restoration of native species and habitat conditions in invaded ecosystems.
CA	CESA (CFGC Section 2050 et seq.)	CESA provides for the protection of rare, threatened, endangered, and candidate plants and animals, as recognized by the CDFW, and prohibits the take of such species without authorization. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed species may be present in the project site and determine whether the proposed project will have a potentially significant impact on such species. Section 2018 of CESA also requires a permit to take a state-listed species through incidental or otherwise lawful activities.
CA	California Native Plant Protection Act (CFGC Section 1900 et seq.)	This Act is intended to preserve, protect, and enhance endangered or rare native plants in California. This Act includes provisions that prohibit the taking of listed rare or endangered plants from the wild. The Act directs the CDFW to establish criteria for determining what native plants are rare or endangered. Under Section 1901, a species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is in such small numbers throughout its range that it may become endangered.
CA	California Species Preservation Act (CFGC Sections 900-903)	This Act provides for the protection and enhancement of the amphibians, birds, fish, mammals, and reptiles of California.
CA	Other relevant CFGC sections	• CFGC Sections 3503 and 3503.5 prohibit the taking and possession of native birds' nests and eggs. These regulations also provide that it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nests or eggs of any such bird. • CFGC Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) designate certain species as "fully protected." Fully protected species, or parts thereof, may not be taken or possessed at any time without permission by the CDFW.

Policy VEG-3.3: The Conservation Strategy for Tahoe yellow cress in the Lake Tahoe region shall foster stewardship for this species by:

a) Providing education to landowners;

b) Providing technical and planning assistance to landowners with Tahoe yellow cress to develop stewardship plans;

c) Streamlining the Tahoe yellow cress project review process, while protecting the species and its habitat; and,

d) Support Propagation Efforts

Wildlife

Goal WL-1: Maintain suitable habitats for all indigenous species of wildlife without preference to game or non-game species through maintenance and improvement of habitat diversity.

Policy WL-1.1: All proposed actions shall consider impacts to wildlife.

Policy WL-1.2: Riparian vegetation shall be protected and managed for wildlife.

Policy WL-1.3: Non-native wildlife and exotic species shall be controlled and release of such animals into the wild shall be prohibited.

Goal WL-2: Preserve, enhance, and, where feasible, expand habitats essential for threatened, endangered, rare, or sensitive species found in the region.

Policy WL-2.1: Endangered, threatened, rare, and special interest species shall be protected and buffered against conflicting uses.

Fisheries

Goal FI-1: Improve aquatic habitat essential for the growth, reproduction, and perpetuation of existing and threatened fish resources in the Lake Tahoe region.

Policy FI-1.1: Development proposals affecting streams, lakes, and adjacent lands shall evaluate impacts to the fishery.

Policy FI-1.4: Standards for boating activity shall be established for the shallow zone of Lake Tahoe.

Policy FI-1.5: Habitat improvement projects are acceptable practices in streams and lakes.

Policy FI-1.8: Support, in response to justifiable evidence, state and federal efforts to reintroduce Lahontan cutthroat trout in appropriate remote locations.

Policy FI-1.9: Prohibit the release of non-native aquatic invasive species in the region in cooperation with public and private entities. Control or eradicate existing populations of these species and take measures to prevent accidental or intentional release of such species.

Shorezone

Policy SZ-1.9: The Agency shall regulate the placement of new piers, buoys, and other structures in the foreshore and nearshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds, and other relevant concerns.

TRPA Code of Ordinances and Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

Vegetation

The TRPA Code of Ordinances requires the protection and maintenance of all native vegetation types, and vegetation and forest health are addressed in Code Chapter 61. Code Section 61.3 provides for the protection of sensitive plants, and other uncommon and common vegetation. Section 61.3.6 establishes standards for preserving and managing sensitive plants and uncommon plant communities. Code Section 80.4.8 state that projects that have the potential to detrimentally impact sensitive or uncommon plants shall comply with the mitigation, construction, and survey measures listed in Chapter 61, subsection 61.3.6, and the Tahoe Yellow Cress Conservation Strategy. Where appropriate, TRPA will require interpretive signs to educate the public, designated trails through high-use areas, and/or fenced enclosures to protect vulnerable plant populations. Of the species and communities identified as sensitive in Section 61.3.6, the only one that occurs in the shorezone of Lake Tahoe is the Tahoe yellow cress. As discussed in *Section 3.4.1.3*, Tahoe yellow cress has not been observed in the Project Area.

Code Section 80.4.1 states that no naturally occurring vegetation shall be manipulated or disturbed except in accordance with Chapter 30 (land coverage related to site development). No planting of new vegetation, or manipulation of naturally occurring vegetation, shall be permitted in the shorezone, unless such activities comply with the standards in Chapter 30.

Wildlife

Code Chapter 62 sets standards for preserving and managing wildlife habitats, with special emphasis on protecting or increasing habitats of special significance, such as deciduous trees, wetlands, meadows, and riparian areas. Specific habitats that are protected include riparian areas and wetlands; wildlife movement and migration corridors; important habitat for any species of concern; critical habitat necessary for the survival of any species; nesting habitat for raptors and waterfowl; fawning habitat for deer; and snags and coarse woody debris. Under provisions of Code Section 62.4, TRPA special-interest species and species listed under the ESA or CESA are protected from habitat disturbance by conflicting land uses. Section 62.4 also establishes disturbance zones for certain raptor species, as discussed in *Section 3.4.1.4*.

Fisheries

Code Chapter 63 establishes policies to ensure protection of fish habitat and provide for enhancement of degraded habitat. Section 63.3.1 describes policies for protecting lake habitat, including a prohibition on the physical alteration of substrate in areas of PFH unless mitigated, requiring restoration of physically altered substrate to avoid adverse impacts to PFH, prohibiting construction in areas where spawning is actively occurring, and allowing for habitat restoration projects in nearshore or foreshore area. Section 63.4 includes prohibitions on introduction of aquatic invasive species into the Lake Tahoe region.

Code Section 80.4.4. states that all projects undertaken in areas identified as, and adversely affecting, “Spawning Habitat” or “Feeding and/or Escape Cover Habitat” on TRPA’s PFH Map, as amended or areas meeting the applicable definition for “Spawning Habitat” or possessing similar characteristics for “feeding and/or escape cover habitat” shall comply with the provisions for mitigation set forth in Section 84.11.

Code Section 84.11 contains the following mitigation requirements:

A. All projects located in spawning habitat as verified by TRPA and that have the potential to detrimentally impact spawning fish, spawning gravels, the incubating eggs, or the emerging fry

shall be subject to a case-by-case review by TRPA and the appropriate Fish and Wildlife Agency regarding the applicability of the October 1 through April 30 construction window and to determine whether project impacts can be mitigated.

B. As a condition for project approval, all permanent impacts to substrate in designated spawning habitat areas associated with new or expanded structures shall be mitigated at a ratio of 1 to 1.5 using one of the following methods, or a combination thereof, as determined appropriate by TRPA:

   1. Replacement "in-kind" with similar spawning gravels where gravels previously existed. Such replacement shall replace the equal or greater function and value either on-site or off-site.

   2. Construction of complementary habitat adjoining the remaining spawning gravels on-site, where it can be demonstrated that the complementary habitat will restore or enhance the spawning habitat by substantially increasing its function and value.

C. In addition to the mitigation obligation set forth in (B) above, any impacts to existing feeding and/or escape cover habitat shall be fully mitigated.

D. Mitigation required pursuant to this Section shall include implementation and funding of an approved monitoring and remedial action program that will ensure the effectiveness of the mitigation.

TRPA Shorezone Permitting Process

TRPA review of projects in the shorezone is governed by the *Lake Tahoe Shoreline Plan* (TRPA 2018) and associated amendments to the TRPA Code of Ordinances described generally above. This Project is an Essential Public Safety Facility and the CG is in the process of going through TRPA's current Shorezone Permitting Process. (See Section 1.5.4.7 for additional details.)

TRPA Thresholds

TRPA thresholds relevant to biological resources in the Project Area are summarized in *Table 3-17*.

Lahontan Basin Plan Prohibitions

The Lahontan Basin Plan, as amended, prohibits the discharge or threatened discharge attributable to new pier construction of wastes to significant spawning habitats in Lake Tahoe (LRWQCB 1995 and 2014a).

3.4.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on biological resources in the context of NEPA, CEQA, and TRPA requirements. Where potentially significant impacts are identified, a discussion of proposed measures to mitigate those impacts is also provided. *Table 3-18* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the biological resource-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-17 TRPA Thresholds for Biological Resources Applicable to the Project

Category	Standard	Current Status
Common Vegetation	Maintain the existing species richness of the Region by providing for the perpetuation of the following plant associations: yellow pine forest, red fir forest, subalpine forest, shrub association, sagebrush scrub vegetation, deciduous riparian, meadow associations (wet and dry), wetland associations (marsh vegetation), and cushion plant association (alpine scrub).	At or Somewhat Better than Target
	Of the total amount of undisturbed vegetation in the Tahoe Region, maintain at least 4 percent meadow and wetland vegetation in the Tahoe Region	Somewhat Worse than Target
	Of the total amount of undisturbed vegetation in the Tahoe Region, maintain at least 4 percent deciduous riparian vegetation	Considerably Worse than Target
	A non-degradation standard to preserve native communities shall apply to native deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations to be consistent with the Stream Environment Zone (SEZ) threshold	Considerably Worse than Target
	Native vegetation shall be maintained at a maximum level to be consistent with the limits defined in the *Land Capability Classification of the Lake Tahoe Region, California-Nevada, A Guide for Planning*, Bailey, 1974, for allowable impervious cover and permanent site disturbance.	Considerably Better than Target
Sensitive Plants	Maintain a minimum of 26 population sites for Tahoe yellow cress.	Considerably Better than Target
Special Interest Species	Provide a minimum of 12 northern goshawk population sites and a non-disturbance zone equivalent to the most suitable 500 acres surrounding the nest site including a 0.25-mile buffer centered on nest sites	Insufficient Data to Determine Status
	Provide a minimum of four osprey population sites and a 0.25-mile non-disturbance buffer around nest sites	Considerably Better than Target
	Provide a minimum of two bald eagle wintering population sites and a mapped non-disturbance zone around wintering population sites	Considerably Better than Target
	Provide one bald eagle nest site and a 0.5-mile non-disturbance zone around nest sites	At or Somewhat Better than Target
	Provide a minimum of four golden eagle population sites and a 0.25-mile non-disturbance zone around golden eagle nest sites	Insufficient Data to Determine Status
	Provide a minimum of two peregrine falcon population sites and a 0.25-mile non-disturbance zone around nest sites	Considerably Better than Target
	Provide a minimum of 18 waterfowl population sites and a mapped non-disturbance zone around population sites	Somewhat Worse than Target
Lake Habitat	A nondegradation standard shall apply to fish habitat in Lake Tahoe. Achieve the equivalent of 5,948 total acres of excellent habitat as indicated by the PFH Overlay Map, which may be amended based on best available science.	At or Somewhat Better than Target
Lahontan Cutthroat Trout	It shall be the policy of the TRPA Governing Board to support, in response to justifiable evidence, state and federal efforts to reintroduce Lahontan cutthroat trout.	Considerably Better than Target
Aquatic Invasive Species	Prevent the introduction of new aquatic invasive species into the Region's waters and reduce the abundance and distribution of known aquatic invasive species. Abate harmful ecological, economic, social, and public health impacts resulting from aquatic invasive species.	Insufficient Data to Determine Status
Source: TRPA 2016a		

Table 3-18 Significance Determinations for the Project Alternatives (Biological Resources)

Biological Resources	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on biological resources?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
CEQA				
Would the Project: *a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Less-than-Significant Impact	No Impact	No Impact	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No Impact	No Impact	No Impact	No Impact
TRPA				
Vegetation *Will the Project result in:* *a) Removal of native vegetation in excess of the area used for the actual development permitted by the land capability/Individual Parcel Evaluation System (IPES)?*	No Impact	No Impact	No Impact	No Impact
b) Removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

Biological Resources	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
c) *Introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) *Change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) *Reduction of the numbers of any unique, rare or endangered species of plants?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) *Removal of stream bank and/or backshore vegetation, including woody vegetation such as willows?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
g) *Removal of any native live, dead or dying trees 30 inches or greater in diameter at breast height (dbh) within TRPA's Conservation or Recreation land use classifications?*	No Impact	No Impact	No Impact	No Impact
h) *A change in the natural functioning of an old growth ecosystem?*	No Impact	No Impact	No Impact	No Impact
Wildlife: *Will the Project result in:* a) *Change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) *Reduction of the number of any unique, rare or endangered species of animals?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) *Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) *Deterioration of existing fish or wildlife habitat quantity or quality?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for biological resources?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact

3.4.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on biological resources?

Less-than-Significant Impact with Mitigation. Alternative 1 may affect biological resources, including special-status species and habitat, but it is not expected to have a significant adverse effect on these resources. No federally designated critical habitat occurs in the Project Area, and therefore the proposed Project will have no effect on critical habitat. The only federally listed fauna species of concern in the Project vicinity, as indicated by the CG's informal consultation with the USFWS, is the Lahontan cutthroat trout. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. There has only been one recent stocking of Lahontan cutthroat trout in Lake Tahoe, in 2011, when the NDOW released approximately 22,000 fish at Cave Rock, on the opposite side of the lake from the Station. Continued survival of the stocked fish is unlikely due to predation by, hybridization with, and competition from non-native fish, and the one-time stocking was not intended to result in a self-sustaining population. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat at a later date, potentially including during future maintenance dredging. Lahontan cutthroat trout spawning would not occur in the lake environment of the Project Area if the species were introduced, because the species only spawns in stream environments.

Temporary impacts to habitat for Lahontan cutthroat trout and other aquatic species during construction and maintenance dredging could include decreased water quality (from increased turbidity and accidental spills), sedimentation of habitat, and general disturbance during construction activities. Implementation of the BMPs described in *Section 2.1.1* will avoid or minimize habitat degradation and disturbance impacts during construction, particularly the minimization of the disturbance area in accordance with **BMP C1-3**; installation of turbidity barriers in accordance with **BMP C1-4**; implementation of spill prevention and response measures in accordance with **BMP C1-7**; inspection, cleaning, and maintenance of equipment in accordance with **BMP C1-8**; water quality monitoring in accordance with **BMP C1-11**; limitations on work hours and artificial lighting in accordance with **BMP C1-14**; and implementation of a WEAP in accordance with **BMP C1-24**. Use of a turbidity curtain during dredging will exclude fish from the work area, reducing the potential for physical injury or other direct impacts to fish during construction. In addition, in accordance with **BMP C1-16**, dredging would be timed to avoid the fish spawning season, further minimizing the potential for direct impacts to fish during construction.

Although no potential spawning habitat occurs in the dredging footprint or the area to be contained by the turbidity curtain, areas with predominantly gravel substrate do occur near the shore east of the existing pier (*Figure 3-23*) in the corridor where the conveyor system would be temporarily located during dredging. The dredged material would be placed on a barge to dewater (in the turbidity-curtained area) prior to placement on the conveyor, and filter fabric and fiber rolls would be placed along the path of the conveyor to minimize turbidity and sedimentation from residual dewatering that could occur as the material moves along the conveyor over the potential spawning habitat. Once the dredged material reaches northern end of the conveyor, it will be loaded into lined trucks to prevent further discharges of water from the material during transport. The total temporary lake-bottom footprint for the stands that would support the seven conveyor units would be approximately 38 square feet, roughly 13 square feet of which would be in potential spawning habitat. In accordance with **BMP C1-10**, the placement of the stands would minimize impacts to spawning habitat to the extent practicable. The conveyor stands would only be in place temporarily, during the non-spawning seasons, and are not expected to cause significant long-term disturbance to the lake-bottom habitat, because they will sit on top of, rather than being driven into, the lakebed.

Dredging operations and installation of the piles for the new boat lift would cause underwater noise, which can affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project activities, including pile driving, dredging, and drilling (*Appendix G*). The analysis shows that that the only activity with potential for hydroacoustic impacts to fish during construction of Alternative 1 would be driving the two new piles required for the replacement boat lift, because underwater sound pressure levels expected during other construction activities (i.e., dredging, spud anchoring, pre-drilling, and jetting) are well below the threshold levels for potential impacts to fish (see following paragraph).

As discussed in the hydroacoustic assessment, the Fisheries Hydroacoustic Working Group (FHWG) – whose members include the National Marine Fisheries Service (NMFS), USFWS, the Federal Highway Administration (FHWA), CDFW, and Caltrans and the Washington and Oregon Departments of Transportation – have established thresholds for determining the hydroacoustic effects of impact pile driving on listed fish species (FHWG 2008). The FHWG's threshold criteria for impact pile driving are 206 decibels (dB) peak sound pressure level for all listed fish species, 187 dB cumulative sound exposure level (SEL) for fish weighing 2 grams or more, and 183 dB cumulative SEL for fish weighing less than 2 grams.[8] There are no formally agreed upon criteria for vibratory pile driving, but the continuous non-impulsive sound generated by vibratory driving is generally considered less injurious to fish than impact driving. Caltrans suggests 220 dB cumulative SEL as a guideline for vibratory pile driving (Caltrans 2009). These thresholds indicate the limit at which sound pressure levels may cause physical injury to fish. Behavioral effects are not addressed by the FHWG criteria, but NMFS and USFWS consider a root mean square (RMS) sound level of 150 dB as the threshold for adverse behavioral effects in fish species (NMFS 2009). Behavioral effects from underwater noise may include flight and the temporary cessation of feeding or spawning behaviors. Mitigation is not typically required for sound levels that are above the behavioral effect threshold but below the FHWG thresholds (Caltrans 2009).

AECOM used the NMFS Underwater Noise Calculation Spreadsheet (NMFS 2009) to estimate sound pressure levels during Project pile driving based on the size and type of piles, method of pile driving, and sound attenuation methods used. The results of the assessment are summarized in *Table 3-19*. As shown in *Table 3-19,* the peak sound pressure levels at a 10-meter distance for both vibratory and impact pile driving are below the FHWG's 206 dB threshold (10 meters is the standard distance used by the FHWG for assessing hydroacoustic impacts). For the vibratory method, which will be used as the preferred pile driving method for the proposed Project in accordance with **BMP C1-15**, the estimated cumulative SELs for Alternative 1 are below the 220 dB threshold even immediately adjacent to the pile, conservatively assuming that each of the piles would take up to 1 hour to drive using a vibratory hammer. The range that vibratory pile driving could affect fish behavior is 22 meters. In accordance with **BMP C1-16**, pile installation would be timed to avoid the fish spawning season and would therefore not affect spawning behavior.

For unattenuated impact pile driving, more than approximately 90 strikes per day would exceed the 187-dB cumulative SEL threshold. For Alternative 1, it is expected that up to 100 strikes per day would be required, conservatively assuming that each pile would require up to 50 strikes. The use of a wood cushion block for sound attenuation is incorporated into **BMP C1-15** to ensure that the cumulative SEL remains below the threshold. With use of the wood cushion block, the maximum number of strikes per day that would result in a cumulative SEL below the threshold increases to 1,120. With the use of a wood cushion block, the range that impact pile driving may affect fish behavior is 117 meters. In accordance with **BMP C1-16**, pile installation would be timed to avoid the fish spawning season and would therefore not affect spawning behavior, and effects on foraging behavior would be temporary, localized, and less than significant.

Long-term impacts to habitat for Lahontan cutthroat trout and other fish species resulting from Alternative 1 would include direct removal and modification of up to 29,749 square feet of lake-bottom habitat (including dredging of the full overdepth allowance as a conservative case). The majority of the substrate in the dredging footprint is made up of clay, silt, and fine sand, which do not provide high quality spawning or forage and cover habitat and thus are not considered PFH by TRPA. According to the results of the fish habitat survey conducted for the proposed Project, approximately 6 percent (1,895 square feet) of the dredging footprint contains substrates that make it potentially suitable as feed and cover habitat. No potential spawning habitat would be affected. To mitigate the impact to feed and cover PFH, the CG has developed a *PFH Mitigation and Monitoring Plan* (*Appendix H*) that would be implemented for the proposed Project. Implementation of the following mitigation measure, as described in the *PFH Mitigation and Monitoring Plan*, will reduce potentially significant impacts on fish habitat to a less-than-significant level:

[8] Lahontan cutthroat trout is the only listed fish species with potential to occur in the Project vicinity. Because juvenile Lahontan cutthroat trout are expected to be 2 grams or more in weight at the time of year when Project work would take place, 187 dB is used in this analysis as the cumulative SEL threshold for hydroacoustic impacts.

Table 3-19 Predicted Underwater Sound Levels for Pile Driving (for 12-inch diameter steel pipe piles)

Pile-Driving Method	Attenuation	Assumed Average Sound Pressure Levels[1] (dB)			Maximum # of Strikes/Seconds per Day Not Exceeding Cumulative SEL Threshold[2]	Maximum # of Strikes/ Seconds per Day Expected during Project Construction[3]		Distance (m) to threshold[4]					
								Onset of Physical Injury[5]				Behavioral Changes (150 dB RMS)	
								Peak (206 dB)		Cumulative SEL[2]			
		Peak	SEL	RMS		Alt 1	Alts 2 and 3	Alt 1	Alts 2 and 3	Alt 1	Alts 2 and 3	Alt 1	Alts 2 and 3
Vibratory	Unattenuated	171	155	155	2,818,380	7,200	32,400	0	0	0	0	22	22
Impact	Unattenuated	192	167	177	90	100	500	0	1	**10**	**29**	631	631
	with Cushion Block	181	156	166	1,120	100	500	0	0	2	5	117	117

Notes:

[1] For one strike (impact driving) or 1 second (vibratory driving) at 10 meters from the pile assuming a water depth less than 5 meters. Based on Tables I.2-1 and I.2-2 in Caltrans 2009.

[2] Threshold is 187 dB for impact driving or 220 dB for vibratory driving, based on FHWG 2008 and Caltrans 2009.

[3] Conservatively assumes: 1) for Alternative 1, that installation of each of the two total piles would require up to one hour of vibratory driving and up to 50 strikes for impact driving, and 2) for Alternatives 2 and 3, that up to nine hours of continuous vibratory pile driving could occur and, for impact pile driving, that a maximum of 10 piles would be installed per day and would require 50 strikes per pile. The actual number of strikes/seconds per day would likely be less than assumed in these conservative scenarios.

[4] Assuming the expected maximum number of strikes/seconds per day shown in previous column.

[5] Potentially significant impacts are judged to be present if the distance to threshold is 10 meters or greater.

Source: Underwater sound pressure level calculations conducted by AECOM using the NMFS Underwater Noise Calculation Spreadsheet (NMFS 2009) and the practical spreading loss model, as applicable.

MM BIO-1, PFH Mitigation and Monitoring: Removal or displacement of PFH resulting from the proposed Project will be mitigated as required by TRPA. The following mitigation and monitoring protocol will be implemented:

- In consultation with TRPA, an area in the nearshore zone (i.e., between a lake-bottom elevation of 6,193 and 6,223 feet, LTD) at the Station will be designated for placing new feed and cover habitat to replace that which will be removed or displaced by the Project. Areas of the lakebed that currently have substrate types that are not considered PFH (e.g., clay) but which are adjacent to the PFH remaining on site after Project construction would be prioritized for habitat enhancement to provide habitat continuity. Littoral processes, human disturbance factors, and potential drought-induced water level fluctuations will also be considered when choosing the location of the replacement habitat to increase the likelihood that it will remain functional habitat over the long term.

- In accordance with TRPA requirements, the area of PFH permanently removed or displaced due to implementation of the proposed Project will be replaced at a ratio of 1:1.5 to ensure no net loss of habitat. For Alternative 1, 2,843 square feet of replacement PFH would be required. To accomplish the required mitigation, substrate similar to that currently present in the affected PFH (i.e., cobble and small boulders) will be placed in the area designated for habitat creation. The replacement habitat will be designed to provide equal or greater function and value as the PFH removed or displaced by the proposed Project.

- To the extent practicable, cobble, boulders, and large woody debris removed during the dredging/construction area would be recovered, separated from finer sediments, and used to create the replacement habitat. If additional material is required, it will be washed and free of invasive species or other deleterious materials. As applicable, the CG will obtain approval from the USACE under CWA Section 404 for the placement of additional fill in a water of the U.S.

- The new substrate will be placed in the designated area in an appropriate manner that minimizes lake-bottom disturbance and turbidity (e.g., lowered by excavator, cargo net, or similar equipment and/or placed by hand) and replicates the characteristics of naturally occurring habitat.

- An inspection will be conducted just after placement of the replacement substrate and then annually for 3 years thereafter to determine the effectiveness of the mitigation. The inspections will be performed by a qualified fisheries biologist, who will conduct a dive survey to determine whether the condition of the replaced substrate is suitable for providing equal or greater habitat function and value as the PFH removed or displaced by the Project (e.g., in place and not excessively silted over or infested with invasive aquatic organisms). The biologist will also observe whether fish and/or benthic prey organisms are present and using the created habitat.

- If the Project biologist determines during the annual inspection that the restored substrate is not meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, then the CG would implement corrective actions, which may include removing silt or invasive organisms, installing additional replacement substrate, or undertaking other actions agreed upon by TRPA.

- A *PFH Mitigation Monitoring Report* will be prepared annually for 3 years after Project completion and submitted to TRPA, USFWS, and CDFW. The report will include photographs of the restored habitat, a description of observations made during the monitoring, a determination of the replacement habitat's effectiveness in meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, and a description of any corrective actions taken or proposed.

- Achievement of the goals of providing replacement habitat at 1:1.5 ratio that provides equal or greater habitat function and value as the PFH removed or displaced by the Project would be subject to verification by TRPA, in consultation with USFWS and CDFW.

In addition to direct removal of habitat, Alternative 1 has the potential for long-term degradation of the habitat surrounding the dredging footprint through sedimentation or contamination from accidental spills that persist after construction ends. However, implementation of the BMPs described previously for construction would avoid and minimize these impacts through minimizing the disturbance area, preventing and controlling spills, and preventing sedimentation outside of the turbidity curtained area. Additionally, after dredging is completed, benthic organisms are expected to quickly recolonize the dredged area and the new habitat created through implementation of **MM BIO-1,** and therefore significant long-term impacts to fish prey species are not expected. In summary, Alternative 1 would not have significant short- or long-term impacts to Lahontan cutthroat trout or other fish species.

The total net over-water footprint for new structures installed for Alternative 1 would be approximately 285 square feet. Although this will provide overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, reducing the growth of aquatic plants and phytoplankton and potentially decreasing the foraging habitat value for organisms further up the food chain, including fish. However, the fish habitat survey conducted for the Project indicated that the area under the new floating dock and boat lift does not contain any macrophytic vegetation or substrate suitable for providing good quality feed and cover habitat. Therefore, the effects of shading of fish habitat would be less than significant.

Significant impacts to birds due to the proposed Project are not anticipated. No listed bird species are expected to occur in the Project Area; therefore, no effects on bird species protected under the ESA or CESA are expected. Construction activities could cause temporary disturbance to nesting birds protected under the MBTA. However, potential effects on nesting birds would be short term, localized, and less than significant. In addition, the shoreline and upland area near the Project Area is highly developed and contains only minimal potential nesting habitat. Existing disturbance levels and lack of habitat likely limit the amount of bird nesting or foraging in the Project vicinity. However, in accordance with **BMP C1-17**, if construction occurs during the nesting bird season (February 15 to August 31), a pre-construction nesting bird survey would be conducted within 14 days prior to the start of construction activities. If nests are identified within 100 feet of work or staging areas, disturbance avoidance measures would be taken in consultation with CDFW to avoid and minimize impacts to nesting birds. In addition, in accordance with **BMP C1-15**, the construction contractor would be required to take steps to reduce noise during pile driving (e.g., preferential use of a vibratory hammer, use of a cushion block if an impact hammer is used), thus reducing the potential for nesting birds to be affected by Project noise.

There is no known use of the Project Area by special-status mammal or amphibian species, and Alternative 1 would not have significant impacts on mammals or amphibians. Potential indirect impacts from noise disturbance or reduced foraging opportunities during construction would be short term, localized, and less than significant.

Alternative 1 would have less-than-significant impacts on plants. No special-status plants, including Tahoe yellow cress, have been observed in or adjacent to the Project Area, and none are considered likely to occur. The rocky beach in the Project Area does not provide good quality habitat for Tahoe yellow cress, and the species has not been observed in past focused surveys of the area. Although no Tahoe yellow cress is expected to occur in the Project Area, the CG will conduct a pre-construction Tahoe yellow cress survey, in accordance with **BMP C1-18**, to ensure that none are present at the time of construction, and impact avoidance measures would be implemented in coordination with TRPA and CDFW if any are identified in the Project Area.

Based on the results of the fish habitat survey, macrophytic aquatic vegetation is largely absent from the dredging area, and therefore significant direct impacts (e.g., removal) to aquatic plants are not expected. Degradation of aquatic plant habitat (e.g., from potential sedimentation or accidental spills) would be avoided or minimized by implementation of the water quality-related BMPs described in *Section 2.1.1* (e.g.,

use of turbidity barriers, spill prevention and response, water quality monitoring, etc.). In accordance with **BMP C1-8**, the construction contractor will be required to inspect equipment for invasive plant species prior to use in Lake Tahoe and to remove and properly dispose of these species if found. Disturbance of shoreline and upland vegetation would be avoided or minimized in accordance with **BMPs C1-3** and **C1-10**.

In the long term, Alternative 1 is expected to have beneficial impacts on water quality, as explained in more detail in *Section 3.8, Hydrology and Water Quality*, and this would also have beneficial impacts on biological resources and aquatic habitat. Alternative 1 will enhance the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources. In addition, after dredging is completed the increased depth would decrease turbidity and sedimentation of habitat potentially caused by propeller wash from vessels moving through the dredged footprint during low water conditions.

In summary, with implementation of **MM BIO-1** and the BMPs described above, Alternative 1 would have less-than-significant adverse impacts on biological resources from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for biological resources:

Would the Project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Less-than-Significant Impact with Mitigation. No state-listed species are expected to occur in the Project Area, and Alternative 1 is not expected to have impacts on species listed or proposed for listing under CESA. The primary state-listed species of concern for shorezone projects in Lake Tahoe is the Tahoe yellow cress. The rocky beach habitat in the Project Area does not provide good quality habitat for Tahoe yellow cress, and focused surveys have not identified Tahoe yellow cress, or other special-status plants, in the Project Area. Although no Tahoe yellow cress are expected to occur in the Project Area, the CG will ensure that no impacts to Tahoe yellow cress will occur by implementing **BMP C1-18**, which requires that an additional Tahoe yellow cress survey be conducted prior to construction and that impact avoidance measures be implemented, in consultation with CDFW and TRPA, if the survey identifies Tahoe yellow cress in the Project Area. Alternative 1 would not substantially modify Tahoe yellow cress habitat, and disturbance of shorezone vegetation and habitat during construction would be minimized by implementation of **BMP C1-10**.

Special-status fauna species of concern in the Project Area include Lahontan cutthroat trout and Lahontan Lake tui chub. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. There has only been one recent stocking of Lahontan cutthroat trout in Lake Tahoe, in 2011, when the NDOW released approximately 22,000 fish at Cave Rock, on the opposite side of the lake from the Station. Continued survival of the stocked fish is unlikely due to predation by, hybridization with, and competition from non-native fish, and the one-time stocking was not intended to result in a self-sustaining population. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat at a later date, including during future maintenance dredging. Lahontan cutthroat trout spawning would not occur in the lake environment of the Project Area, because the species is only spawns in stream environments. Lahontan Lake tui chub has become uncommon in Lake Tahoe and uses deeper, open water areas of the lake for most of its lifecycle and so only has a only a low potential to occur in the Project Area.

Temporary impacts to habitat for Lahontan cutthroat trout, Lahontan Lake tui chub, and other aquatic species during construction and maintenance dredging could include decreased water quality (from

increased turbidity and accidental spills), sedimentation of habitat, and increased noise and disturbance due to the presence of construction equipment. Implementation of the BMPs described in *Section 2.1.1* will avoid or minimize habitat degradation and disturbance impacts during construction, particularly the minimization of the disturbance area in accordance with **BMP C1-3**; installation of turbidity barriers in accordance with **BMP C1-4**; implementation of spill prevention and response measures in accordance with **BMP C1-7**; inspection, cleaning, and maintenance of equipment in accordance with **BMP C1-8**; water quality monitoring in accordance with **BMP C1-11**; limitations on work hours and artificial lighting in accordance with **BMP C1-14**; and implementation of a WEAP in accordance with **BMP C1-24**. Use of a turbidity curtain during dredging will exclude fish from the work area, reducing the potential for physical injury or other direct impacts to fish during construction. In addition, in accordance with **BMP C1-16**, dredging would be timed to avoid the fish spawning season, which is also the season that Lahontan Lake tui chub would be most likely to be in the Project Area, further minimizing the potential for construction impacts.

Although no potential spawning habitat occurs in the dredging footprint or the area to be contained by the turbidity curtain, areas with predominantly gravel substrate do occur near the shore east of the existing pier (*Figure 3-23*) in the corridor where the conveyor system would be temporarily located during dredging. The dredged material would be placed on a barge to dewater (in the turbidity-curtained area) prior to placement on the conveyor, and filter fabric and fiber rolls would be placed along the path of the conveyor to minimize turbidity and sedimentation from residual dewatering that could occur as the material moves along the conveyor over the potential spawning habitat. Once the dredged material reaches northern end of the conveyor, it will be loaded into lined trucks to prevent further discharges of water from the material during transport. The total temporary lake-bottom footprint for the stands that would support the seven conveyor units would be approximately 38 square feet, roughly 13 square feet of which would be in potential spawning habitat. In accordance with **BMP C1-10**, the placement of the stands would minimize impacts to spawning habitat to the extent practicable. The conveyor stands would only be in place temporarily, during the non-spawning seasons, and are not expected to cause significant long-term disturbance to the lake-bottom habitat, because they will sit on top of, rather than being driven into, the lakebed.

Dredging operations and installation of the piles for the new boat lift would cause underwater noise, which can affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project construction activities (*Appendix G*). As discussed in detail in the NEPA analysis and *Appendix G*, potential adverse hydroacoustic impacts during construction of Alternative 1 would be limited to the driving of the two boat lift piles, and then only if unattenuated impact pile driving is used. In accordance with **BMP C1-15,** vibratory pile driving would be used as the preferred method during construction, and if impact pile driving is required, due to substrate type, a wooden cushion block would be used to minimize hydroacoustic effects. In accordance with **BMP C1-16**, pile driving would be timed to avoid the fish spawning season. Hydroacoustic effects on fish species would be short term, localized, and withy implementation of these BMPs, less than significant.

Long-term impacts to potential habitat for Lahontan cutthroat trout, Lahontan Lake tui chub, and other fish species resulting from Alternative 1 would include direct removal and modification of up to 29,749 square feet of lake-bottom habitat (including dredging of the full overdepth allowance as a conservative case). Most of the substrate in the dredging footprint is made up of clay, silt, and fine sand, which do not provide high quality spawning or forage and cover habitat and thus are not considered PFH by TRPA. According to the results of the fish habitat survey conducted for the proposed Project, approximately 6 percent (1,895 square feet) of the dredging footprint contains substrates that make it potentially suitable as feed and cover habitat. No potential spawning habitat would be affected. To mitigate the impact to feed and cover PFH, the CG would implement **MM-BIO-1**, which would mitigate the loss of feed and cover habitat through replacement of the affected habitat as detailed further in the NEPA analysis and the *PFH Mitigation and Monitoring Plan* provided in *Appendix H*.

The total net over-water footprint for new structures installed for Alternative 1 would be approximately 285 square feet. Although this will provide overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, reducing the growth of aquatic plants and phytoplankton and

potentially decreasing the foraging habitat value for organisms further up the food chain, including fish. However, the fish habitat survey conducted for the Project indicated that the area under the new floating dock and boat lift does not contain any macrophytic vegetation or substrate suitable for providing good quality feed and cover habitat. Therefore, the effects of shading of fish habitat would be less than significant.

In the long term, Alternative 1 is expected to have beneficial impacts on water quality, as explained in more detail in *Section 3.8, Hydrology and Water Quality*, and this would also have beneficial impacts on aquatic habitat for special-status fish species. Alternative 1 will enhance the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources. In addition, after dredging is completed the increased depth would decrease turbidity and sedimentation of habitat potentially caused by propeller wash from vessels moving through the dredged footprint during low water conditions.

In summary, with implementation of **MM BIO-1** and the BMPs outlined above, Alternative 1 would have less-than-significant adverse impacts related to having a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Less-than-Significant Impact with Mitigation. The shoreline in the Project vicinity is highly developed, and only a small amount of native riparian vegetation is present in the Project Area. The permanent disturbance area for Alternative 1 would not directly affect riparian habitat, and temporary impacts to riparian habitat during construction due to the presence of the dredged material conveyor system would be minimized by implementation of **BMP C1-10**. Alternative 1 would not affect sensitive natural communities or habitat designated by CDFW or USFWS. Project impacts to TRPA-designated PFH would be mitigated through implementation of **MM BIO-1**.

With implementation of **MM BIO-1**, Alternative 1 would have less-than-significant impacts related to adverse effects on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less-than-Significant Impact. The USACE and USEPA define wetlands as "areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (40 CFR 230.3(t)). The proposed permanent disturbance area for Alternative 1 does not contain wetlands, as defined above, because the dredging footprint is in an area of open water that does not support wetland vegetation. Temporary impacts to shorezone areas that may support wetland vegetation during construction would be minimized by implementation of **BMP C1-10**. Therefore, Alternative 1 would have less-than-significant impacts on federally protected wetlands as defined by CWA Section 404 through direct removal, filling, hydrological interruption, or other means. Alternative 1 would require that the CG obtain USACE approval pursuant to Section 10 of the River and Harbors Act for dredging and, potentially, pursuant to CWA Section 404 for the small amount of fill (i.e., gravel and cobble) that would be placed on site for mitigation of impacts to PFH under implementation of **MM BIO-1**. The CG will obtain a USACE permit before commencement of work and will comply with conditions of the permit to avoid and minimize impacts to waters of the U.S.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less-than-Significant Impact with Mitigation. During dredging, the installation of the turbidity curtain around the work area and the general disturbance associated with the dredging activity may affect movement of fish and other aquatic organisms. However, these effects would be temporary and limited to a small localized area. In accordance with **BMP C1-16**, the dredging would be timed to avoid the fish spawning season, and fish movement in the Project Area would be expected to return to normal after the 8-week construction period ends. There is no fish spawning habitat in the proposed dredging footprint, and Alternative 1 would have no long-term effects on fish spawning sites. Alternative 1 would remove up to 1,895 square feet of feed and cover habitat that could be used as a nursery area for juvenile Lahontan Lake tui chub or other fish species. However, this impact would be mitigated through implementation of **MM BIO-1**, which would replace the affected feed and cover habitat at a 1:1.5 ratio. Alternative 1 would have no long term impacts on terrestrial wildlife movement, migration, or nursery sites. In summary, with implementation of **MM BIO-1**, Alternative 1 would have a less-than-significant impact in regard to interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impeding the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less-than-Significant Impact with Mitigation. Alternative 1 will not affect trees and would not conflict with any tree preservation policy or ordinance. The Project will comply with other local policies or ordinances protecting biological resources. These include TRPA polices for the protection of PFH, which will be addressed by implementation of **MM BIO-1**, and the conservation of Tahoe yellow cress, which will be addressed by implementation of **BMP C1-19**. With implementation of these mitigation measures, Alternative 1 would have less-than-significant impacts with regard to conflicting with local policies or ordinances protecting biological resources.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The Project Area is not covered by any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, and therefore Alternative 1 would not conflict with the provisions of any such plan.

TRPA Analysis

The TRPA analysis provides answers to the questions found in the TRPA IEC related to biological resources:

Vegetation

Will the Project result in:

a) Removal of native vegetation in excess of the area used for the actual development permitted by the land capability/IPES?

No Impact. Alternative 1 would not involve the removal of native vegetation, including vegetation in areas that are subject to TRPA's land capability/IPES systems. Therefore, Alternative 1 would have no impacts with regard to removal of native vegetation in excess of the area used for the actual development permitted by the land capability/IPES system.

b) Removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table?

Less-than-Significant Impact. The proposed dredging footprint does not support riparian or other vegetation, and Alternative 1 would have no long-term impacts with regard to removal of riparian vegetation or other vegetation associated with critical wildlife habitat. Temporary impacts to riparian vegetation during construction would be minimized through implementation of **BMP C1-10,** and any riparian vegetation temporarily disturbed by the conveyor stands is expected to quickly recover after construction ends. The new vegetation to be planted in the shorezone as scenic mitigation under **MM AES-1** would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Alternative 1 would not affect the groundwater table. In summary, Alternative 1 would have less-than-significant impacts related to removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table.

c) Introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species?

Less-than-Significant Impact. The only new vegetation involved with Alternative 1 is the small amount of new vegetation that would be planted as screening material to mitigate for impacts for scenic resources in accordance with **MM AES-1**, as discussed in *Section 3.2*. The plants used for this mitigation would be native species that are recommended in the *Home Landscaping Guide for Lake Tahoe and Vicinity* (University of Nevada Cooperative Extension 2006) as being appropriate for the local environment, and therefore would not require excessive fertilizer or water. The new vegetation would be located so as to avoid disturbance of existing native vegetation. In accordance with **BMP C1-8**, construction equipment would be inspected for invasive species prior to use, to avoid introducing invasive plants that could create a barrier to normal replenishment of existing species. Therefore, Alternative 1 would have less-than-significant impacts related to introduction of new vegetation that will require excessive fertilizer or water or provide a barrier to the normal replenishment of existing species.

d) Change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)?

Less-than-Significant Impact. The proposed long-term disturbance area for Alternative 1 supports no macrophytic vegetation, and the use of a turbidity curtain, in accordance with **BMP C1-4**, would avoid the potential sedimentation of aquatic plant habitat in surrounding areas. Micro-flora such as algae would be expected to quickly recolonize the dredging area. Temporary impacts to riparian or upland vegetation during construction would avoided or minimized through implementation of **BMP C1-10,** and any riparian vegetation temporarily disturbed by the conveyor stands is expected to quickly recover after construction ends. The new vegetation to be planted in the shorezone as scenic mitigation under **MM AES-1** would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Therefore, Alternative 1 will have less-than-significant impacts related to change in the diversity, distribution, or number of any species of plants.

e) Reduction of the numbers of any unique, rare or endangered species of plants?

Less-than-Significant Impact. Focused surveys indicate that no Tahoe yellow cress occurs in the Project Area, the potential habitat for Tahoe yellow cress in the Project Area is of poor quality, and no other special-status plants have been observed in or adjacent to the Project Area. Although no Tahoe yellow cress are expected to occur in the Project Area, the CG will ensure that no impacts to Tahoe yellow cress will occur by implementing **BMP C1-18**, which requires that an additional Tahoe yellow cress be conducted prior to construction and that impact avoidance measures be implemented, in consultation with TRPA and CDFW, if Tahoe yellow cress are identified during the pre-construction survey. With implementation of **BMP C1-18**, Alternative 1 would have less-than-significant impacts related to reduction of the numbers of any unique, rare or endangered species of plants.

f) Removal of stream bank and/or backshore vegetation, including woody vegetation such as willows?

Less-than-Significant Impact. Alternative 1 would not involve removal or disturbance of stream bank vegetation, and temporary impacts to backshore vegetation during construction would be avoided or minimized through implementation of **BMP C1-10.** The only activity with potential to have long-term effects on backshore vegetation is planting of the new screening vegetation required under **MM AES-1.** This vegetation would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Therefore, the impacts of Alternative 1 related to removal of stream bank and/or backshore vegetation, including woody vegetation such as willows, would be less than significant.

g) Removal of any native live, dead or dying trees 30 inches or greater in dbh within TRPA's Conservation or Recreation land use classifications?

No Impact. Alternative 1 would not involve removal of any trees, and no impacts to trees would occur.

h) A change in the natural functioning of an old growth ecosystem?

No Impact. The Project Area does not occur in an old growth ecosystem, and no impacts to old growth ecosystems would occur with implementation of Alternative 1.

Wildlife

Will the Project result in:

a) Change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)?

Less-than-Significant Impact. Alternative 1 is not expected to have significant adverse effects on the diversity, distribution, or numbers of local animal species. Species that use the Project Area would likely avoid the area during construction, but once construction activities are completed they would likely re-establish in the area. Short-term effects during dredging could include increased turbidity, sedimentation, displacement of prey species, potential physical injury from vessel movements, disturbance of foraging habitats, and accidental spills. Dredging would remove existing benthic organisms from the dredging area, but benthic organisms are likely to quickly recolonize after work is completed. To avoid or minimize impacts to animals and their habitat, the CG would implement measures such as minimizing the Project footprint, in accordance with **BMP C1-3**; installing a turbidity curtain around the disturbance area during construction, in accordance with **BMP C1-4**; implementing measures to prevent and control spills, in accordance with **BMP C1-7**; and avoiding in-water work during the spawning season or other sensitive life stages of special-status species, in accordance with **BMP C1-16**. With implementation of these BMPs, Alternative 1 would have less-than-significant impacts related to changing the diversity, distribution, or numbers of animal species.

b) Reduction of the number of any unique, rare or endangered species of animals?

Less-than-Significant Impact. Special-status fauna species of concern in the Project Area include Lahontan cutthroat trout and Lahontan Lake tui chub. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. There has only been one recent stocking of Lahontan cutthroat trout in Lake Tahoe, in 2011, when the NDOW released approximately 22,000 fish at Cave Rock, on the opposite side of the lake from the Station. Continued survival of the stocked fish is unlikely due to predation by, hybridization with, and competition from non-native fish, and the one-time stocking was not intended to result in a self-sustaining population. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat at a later date, including during future maintenance dredging. Lahontan cutthroat trout spawning would not occur in the lake environment of

the Project Area, because the species is only spawns in stream environments. Lahontan Lake tui chub has become uncommon in Lake Tahoe and uses deeper, open water areas of the lake for most of its lifecycle and so only has a only a low potential to occur in the Project Area during construction or maintenance dredging.

Use of a turbidity curtain during dredging will exclude special status fish species, if any are present, from the work area, reducing the potential for physical injury or other direct impacts to fish during construction. In addition, in accordance with **BMP C1-16**, dredging would be timed to avoid the fish spawning season, which is also the season that Lahontan Lake tui chub would be most likely to be in the Project Area, further minimizing the potential for construction impacts.

Dredging operations and installation of the piles for the new boat lift would cause underwater noise, which can affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project construction activities (*Appendix G*). As discussed in detail in the NEPA analysis and *Appendix G*, potential adverse hydroacoustic impacts during construction of Alternative 1 would be limited to the driving of the two boat lift piles, and then only if unattenuated impact pile driving is used. In accordance with **BMP C1-15,** vibratory pile driving would be used as the preferred method during construction, and if impact pile driving is required, due to substrate type, a wooden cushion block would be used to minimize hydroacoustic effects. Hydroacoustic effects on fish species would be short term, localized, and with implementation of these BMPs, less than significant.

In summary, Alternative 1 would have less than significant direct impacts related to reduction of the number of any unique, rare or endangered species of animals. Potential indirect impacts related to deterioration and removal of habitat for special status aquatic species are discussed below under question *d*.

c) Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?

Less-than-Significant Impact. In accordance with **BMP C1-8**, the construction contractor will be required to inspect equipment for invasive species and to remove and properly dispose of these species if found. During dredging, the use of a turbidity curtain to isolate the work area and the general disturbance associated with the dredging activity may affect migration or movement of fish and other aquatic organisms. However, these effects would be temporary and limited to a small localized area. In accordance with **BMP C1-16**, the dredging would be timed to avoid the fish spawning season, and fish movement in the Project Area would be expected to return to normal after the 8-week construction period ends. For these reasons, Alternative 1 would have a less-than-significant impact related to introduction of new species of animals into an area or result in a barrier to the migration or movement of animals.

d) Deterioration of existing fish or wildlife habitat quantity or quality?

Less-than-Significant Impact with Mitigation. Fish habitat surveys conducted by AECOM indicate that the dredging footprint is composed mostly of clay, silt and fine sand, which do not provide high quality habitat for fish or other aquatic wildlife. However, a small portion of the dredging footprint does contain substrates that make it potentially suitable for feed and cover PFH. Temporary impacts to aquatic habitat during construction and maintenance dredging could include decreased water quality (from increased turbidity and accidental spills), and general disturbance due to construction activities. Implementation of the BMPs described in *Section 2.1.1*, particularly the minimization of the disturbance area in accordance with **BMP C1-3**; installation of turbidity barriers in accordance with **BMP C1-4**; implementation of spill prevention and response measures in accordance with **BMP C1-7**; cleaning and maintenance of equipment in accordance with **BMP C1-8**; water quality monitoring in accordance with **BMP C1-11**; limitations on work hours and artificial lighting in accordance with **BMP C1-14**; and implementation of a WEAP in accordance with **BMP C1-24**, will avoid or minimize habitat degradation and disturbance impacts during construction.

Although no potential spawning habitat occurs in the dredging footprint or the area to be contained by the turbidity curtain, areas with predominantly gravel substrate do occur near the shore east of the existing pier

(*Figure 3-23*) in the corridor where the conveyor system would be temporarily located during dredging. The dredged material would be placed on a barge to dewater (in the turbidity-curtained area) prior to placement on the conveyor, and filter fabric and fiber rolls would be placed along the path of the conveyor to minimize turbidity and sedimentation from residual dewatering that could occur as the material moves along the conveyor over the potential spawning habitat. Once the dredged material reaches northern end of the conveyor, it will be loaded into lined trucks to prevent further discharges of water from the material during transport. The total temporary lake-bottom footprint for the stands that would support the seven conveyor units would be approximately 38 square feet, roughly 13 square feet of which would be in potential spawning habitat. In accordance with **BMP C1-10**, the placement of the stands would minimize impacts to spawning habitat to the extent practicable. The conveyor stands would only be in place temporarily, during the non-spawning seasons, and are not expected to cause significant long-term disturbance to the lake-bottom habitat, because they will sit on top of, rather than being driven into, the lakebed.

Long-term impacts to habitat resulting from Alternative 1 would include direct removal and modification of up to 1,895 square feet of feed and cover PFH. No spawning habitat would be removed or modified. To mitigate this impact, the CG would implement **MM BIO-1**, which would require replacement of fish habitat on site at the 1:1.5 ratio established by TRPA, as discussed in detail in the NEPA analysis and the *PFH Mitigation and Monitoring Plan* provided in *Appendix H*. For Alternative 1, this would result in creation of 2,843 square feet of replacement habitat.

The total net over-water footprint for new structures installed for Alternative 1 would be approximately 285 square feet. Although this will provide overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, reducing the growth of aquatic plants and phytoplankton and potentially decreasing the foraging habitat value for organisms further up the food chain, including fish. However, the fish habitat survey conducted for the Project indicated that the area under the new floating dock and boat lift does not contain any macrophytic vegetation or substrate suitable for providing good quality feed and cover habitat. Therefore, the effects of shading of fish habitat would be less than significant.

In the long term, Alternative 1 is also expected to have beneficial effects on aquatic habitat. Alternative 1 will enhance the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources and aquatic habitat. In addition, after dredging is completed the increased depth would decrease turbidity and sedimentation of habitat potentially caused by propeller wash from vessels moving through the dredged footprint during low water conditions.

In summary, with implementation of **MM BIO-1**, the impacts of Alternative 1 with regard to deterioration of existing fish or wildlife habitat quantity or quality would be less than significant.

TRPA Thresholds

Less-than-Significant Impact with Mitigation. As discussed in *Section 3.4.2.1*, TRPA has established a number of thresholds for biological resources (*Table 3-17),* including thresholds related to common vegetation including riparian vegetation and wetlands, sensitive plants, lake habitat, special interest species, waterfowl, Lahontan cutthroat trout, and invasive species. **BMP C1-10** would be implemented to avoid and minimize impacts to riparian vegetation during construction, and the placement of the new screening vegetation planted under **MM AES-1** would avoid disturbance to existing native vegetation. Alternative 1 would not affect wetland vegetation or other communities protected by the common vegetation threshold. For the thresholds related to sensitive plants, specifically Tahoe yellow cress, implementation of **BMP C1-18**, which requires that an additional Tahoe yellow cress survey be conducted prior to construction, will ensure that Alternative 1 does not affect the ability or the region to meet the Tahoe yellow cress threshold. The lake habitat threshold requires a non-degradation policy for PFH. Implementation of **MM BIO-1** will ensure that there is no net loss of PFH and that Alternative 1 will not affect the ability to achieve TRPA's lake habitat threshold. For the thresholds related to special interest raptor species, the proposed Project is not within the required non-disturbance buffer distances from known nest sites of northern goshawk, osprey, bald eagle, golden eagle, or peregrine falcon. The Project Area is

not in or in the vicinity of any of the 18 waterfowl population threshold sites designated by TRPA and would not have a significant effect on waterfowl populations or habitat. Although Lahontan cutthroat trout are not expected to be present in the Project area, **BMP C1-16** requires the dredging to be timed to avoid the fish spawning season. Furthermore, installation of turbidity barriers in accordance with **BMP C1-4** would exclude fish from the dredging area. In accordance with **BMP C1-8**, the construction contractor will be required to inspect equipment for invasive species and to remove and properly dispose of these species if found.

In summary, with implementation of **MM BIO-1** and the BMPs described in *Section 2.1.1*, Alternative 1 would not have a significant adverse effect on the ability of the region to meet the applicable TRPA thresholds for biological resources.

3.4.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on biological resources?

Less-than-Significant Impact with Mitigation. Alternative 2 may affect biological resources, including special-status species and habitat, but it is not expected to have a significant adverse effect on these resources. No federally designated critical habitat occurs in the Project Area, and therefore the proposed Project will have no effect on critical habitat. The only federally listed fauna species of concern in the Project vicinity, as indicated by the CG's informal consultation with the USFWS, is the Lahontan cutthroat trout. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat at a later date.

Temporary impacts to aquatic habitat during construction could include decreased water quality (from increased turbidity during pile installation and accidental spills), sedimentation of habitat, and general disturbance due to the presence of construction equipment. Implementation of the BMPs described in *Section 2.2.1*, particularly the minimization of the disturbance area, in accordance with **BMP C2-1**; installation of a turbidity curtain, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; water quality monitoring during construction, in accordance with **BMP C2-8**; limitations on work hours and artificial lighting, in accordance with **BMP C2-11**, and implementation of a WEAP, in accordance with **BMP C2-21**, will avoid or minimize habitat degradation and disturbance impacts. Use of a turbidity curtain during construction will also have the effect of excluding fish from the work area, reducing the potential for impacts to fish during construction. In addition, in accordance with **BMP C2-13**, construction would be timed to avoid the fish spawning season, further minimizing the potential for direct impacts to fish during construction.

Construction of the proposed pier extension would cause underwater noise, which can affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project activities, including pile driving and drilling (*Appendix G*). AECOM used the NMFS Underwater Noise Calculation Spreadsheet (NMFS 2009) to estimate sound levels during Project pile driving based on the size and type of piles, method of pile driving, and noise attenuation methods used. The results of the assessment are summarized in *Table 3-19*. As shown in *Table 3-19,* the peak sound pressure levels at a 10-meter distance (the standard distance used for assessing noise impacts) for both vibratory and impact pile driving are below the FHWG's 206 dB threshold. For the vibratory method, which will be used as the preferred pile driving method for the proposed Project in accordance with **BMP C2-12**, the estimated cumulative SELs for both the attenuated and unattenuated conditions are below the 220 dB threshold at 10 meters even assuming that vibratory pile driving would take place for up to 9 hours a day. The range that unattenuated vibratory pile driving may affect fish behavior is 22 meters.

For unattenuated impact pile driving, more than approximately 90 strikes per day would exceed the FHWG's 187-dB cumulative SEL threshold. Because up to 500 strikes per day are anticipated during construction of Alternative 2, the use of a wood cushion block has been incorporated into **BMP C2-12**. With use of a wood cushion block, the maximum number of strikes below the threshold increases to 1,120 strikes per day. With the use of a wood cushion block, the range that impact pile driving may affect fish behavior is 117 meters. In accordance with **BMP C2-13**, pile installation would be timed to avoid the fish spawning season and would therefore not affect spawning behavior. If pre-drilling is used to facilitate pile driving, drilling sound levels are expected to be equivalent to approximately 139 dB RMS and 129 dB SEL, which are below the NMFS guidelines for both behavioral disturbance and physical injury; pre-drilling will also decrease the sound levels when the pile is driven. With implementation of **BMPs C2-12** and **C2-13**, hydroacoustic impacts from Alternative 2 are expected to be less than significant.

Long-term impacts from Alternative 2 would include direct displacement of 12 square feet of lake-bottom habitat (i.e., footprint of the 22 piles required). However, the majority of the substrate in the area to be occupied by the proposed pier extension is made up of clay, silt and fine sand, which do not provide high quality spawning or feed and cover habitat. According to the results of the fish habitat survey conducted for the proposed Project, approximately 4 square feet of potential feed and cover habitat and no spawning habitat would be displaced by Alternative 2. To mitigate this impact, the CG would implement **MM BIO-1**, which requires the creation of replacement feed and cover habitat on site at a ratio of 1:1.5, as required by TRPA, resulting in creation of 6 square feet of replacement habitat for Alternative 2. The effectiveness of the habitat replacement would be monitored for 3 years after construction ends. Implementation of **MM BIO-1** would reduce long-term impacts to fish habitat to less than significant.

The total net over-water footprint for Alternative 2 would be approximately 2,615 square feet. Although piers provide some habitat structure and overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, potentially reducing the growth of aquatic plants and phytoplankton and decreasing the foraging habitat value for organisms further up the food chain, including fish. The connecting span for Alternative 2 would have a grated decking, which would create approximately 70 percent less shading than a solid deck, reducing the shaded footprint of the Alternative 2 to approximately 1,180 square feet. The fish habitat survey conducted for the Project indicated a general lack of aquatic plants, and only a small amount of feed and cover habitat, in the area that would be shaded by the pier extension, and adverse habitat impacts from shading are expected to be minimal. The shading impacts would also be offset by the creation of 6 square feet of replacement fish habitat in an unshaded area under implementation of **MM BIO-1**.

Significant impacts to birds due to the proposed Project are not anticipated. No listed bird species are expected to occur in or adjacent to the Project Area; therefore, no effects on bird species protected under the ESA or CESA are expected. Alternative 2 could have temporary effects during construction on nesting birds protected under the MBTA. However, potential effects on nesting birds, such as noise disturbance, prey displacement, and air pollution, would be short term and insignificant. In addition, the shoreline and upland area near the Project Area is highly developed and contains only minimal potential nesting habitat. Existing disturbance levels and lack of habitat likely limit the amount of nesting or active foraging in the Project vicinity. However, in accordance with **BMP C2-14**, if construction occurs during the nesting bird season (February 15 to August 31), a pre-construction nesting bird survey would be conducted within 14 days prior to the start of construction activities. If nests are identified, avoidance measures would be implemented in consultation with CDFW to avoid or minimize impacts. In addition, in accordance with **BMP C2-12**, the construction contractor would be required to take steps to reduce noise during pile driving (e.g., preferential use of a vibratory hammer, use of a cushion block in the case an impact hammer is used), thus reducing the potential for nesting birds to be disturbed by Project noise.

There is no known use of the Project Area by special-status mammal or amphibian species, and Alternative 2 would not have significant impacts on mammals or amphibians. Indirect impacts from noise disturbance or reduced foraging opportunities during construction would be temporary and insignificant.

Alternative 2 would have less-than-significant impacts on plants. No special-status plants, including Tahoe yellow cress, have been observed in or adjacent to the Project Area, and none are considered likely to

occur. The rocky beach in the Project Area does not provide good quality habitat for Tahoe yellow cress, and the species has not been observed in past focused surveys of the area. Additionally, disturbance of shoreline and upland vegetation would be avoided or minimized in accordance with **BMPs C2-1** and **C2-7**. Although no Tahoe yellow cress is expected to occur in the Project Area, the CG will conduct a pre-construction Tahoe yellow cress survey, in accordance with **BMP C2-15**, to ensure that none are present at the time of construction, and impact avoidance measures would be implemented in coordination with TRPA and CDFW if any are identified in the Project Area.

No macrophytic aquatic plants were observed in the proposed disturbance area during the fish habitat survey, and therefore significant direct impacts (e.g., removal) of aquatic plants are not expected. Degradation of aquatic plant habitat (e.g., from potential sedimentation or accidental spills) would be avoided or minimized by implementation of the water quality-related BMPs described in *Section 2.1.1* (e.g., implementation of turbidity curtain, spill prevention and response, water quality monitoring, etc.). In addition, under **BMP C2-6**, the construction contractor will be required to inspect equipment for invasive species prior to use in Lake Tahoe and to remove and properly dispose of these species if found.

In the long term, Alternative 2 is expected to have beneficial impacts on aquatic habitat and biological resources. After construction of the pier extension is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions, substantially enhancing the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources. In addition, after the pier extension is completed, the increased depth at the pier head would decrease turbidity and sedimentation of habitat caused by propeller wash from vessels using the pier during low water conditions.

In summary, with implementation of **MM BIO-1** and the BMPs described above, Alternative 2 would have less-than-significant adverse impacts on biological resources from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Less-than-Significant Impact with Mitigation. No state-listed species are expected to occur in the Project Area, and Alternative 2 is not expected to have impacts on species listed or proposed for listing under CESA. The primary state-listed species of concern for shorezone projects in Lake Tahoe is the Tahoe yellow cress. The rocky beach habitat in the Project Area does not provide good quality habitat for Tahoe yellow cress, and focused surveys have not identified Tahoe yellow cress, or other special-status plants, in the Project Area. Additionally, impacts to upland and vegetation would be avoided by implementation of **BMP C2-7**. Although no Tahoe yellow cress are expected to occur in the Project Area, the CG will ensure that no impacts to Tahoe yellow cress will occur by implementing **BMP C2-15**, which requires that an additional Tahoe yellow cress survey be conducted prior to construction and that impact avoidance measures be implemented, in consultation with CDFW and TRPA, if the survey identifies Tahoe yellow cress in the Project Area.

Special-status fauna species of concern in the Project Area include Lahontan cutthroat trout and Lahontan Lake tui chub. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat in the future. Lahontan Lake tui chub has become uncommon in

Lake Tahoe and uses deeper, open water areas for most of its lifecycle and so only has a only a low potential to occur in the Project Area.

Temporary impacts to habitat for Lahontan cutthroat trout, Lahontan Lake tui chub, and other aquatic species during construction could include decreased water quality (from increased turbidity and accidental spills), sedimentation of habitat, and general disturbance. Implementation of the BMPs described in *Section 2.1.1* will avoid or minimize habitat degradation and disturbance impacts during construction, particularly the minimization of the disturbance area, in accordance with **BMP C2-1**; installation of a turbidity curtain, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; water quality monitoring during construction, in accordance with **BMP C2-8**; limitations on work hours and artificial lighting, in accordance with **BMP C2-11**, and implementation of a WEAP, in accordance with **BMP C2-21**. Use of a turbidity curtain during construction will exclude fish from the work area, reducing the potential for physical injury or other direct impacts to fish during construction. In addition, in accordance with **BMP C2-13**, construction would be timed to avoid the fish spawning season, which is also the season that Lahontan Lake tui chub would be most likely to be in the Project Area, further minimizing the potential for construction impacts.

Construction of the pier extension would cause underwater noise, which could affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project construction activities (*Appendix G*). As discussed in detail in the NEPA analysis and *Appendix G*, potential adverse hydroacoustic impacts during construction of Alternative 2 would be limited to the pile driving activities, and then only if unattenuated impact pile driving is used. In accordance with **BMP C2-12,** vibratory pile driving would be used as the preferred method during construction, and if impact pile driving is required, due to substrate type, a wooden cushion block would be used to minimize hydroacoustic effects. In accordance with **BMP C2-13**, pile installation would be timed to avoid the fish spawning season. Hydroacoustic effects on fish species would be short term, localized, and withy implementation of these BMPs, less than significant.

Long-term impacts to potential habitat for Lahontan cutthroat trout, Lahontan Lake tui chub, and other fish species resulting from Alternative 2 would include direct displacement of 12 square feet of lake-bottom habitat (i.e., footprint of the 22 piles required). However, the majority of the substrate in the area to be occupied by the proposed pier extension is made up of clay, silt and fine sand, which do not provide high quality spawning or feed and cover habitat. According to the results of the fish habitat survey conducted for the proposed Project, approximately 4 square feet of potential feed and cover habitat and no spawning habitat would be displaced by Alternative 2. To mitigate this impact, the CG would implement **MM BIO-1**, which requires the creation of replacement feed and cover habitat on site at a ratio of 1:1.5, as required by TRPA, resulting in creation of 6 square feet of replacement habitat for Alternative 2. The effectiveness of the habitat replacement would be monitored for 3 years after construction ends. Implementation of **MM BIO-1** would reduce long-term impacts to fish habitat to less than significant.

The total net over-water footprint for Alternative 2 would be approximately 2,615 square feet. Although piers provide some habitat structure and overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, potentially reducing the growth of aquatic plants and phytoplankton and decreasing the foraging habitat value for organisms further up the food chain, including fish. The connecting span for Alternative 2 would have a grated decking, which would create approximately 70 percent less shading than a solid deck, reducing the shaded footprint of the Alternative 2 to approximately 1,180 square feet. The fish habitat survey conducted for the Project indicated a general lack of aquatic plants, and only a small amount of feed and cover habitat, in the area that would be shaded by the pier extension, and adverse habitat impacts from shading are expected to be minimal. The shading impacts would also be offset by the creation of 6 square feet of replacement fish habitat in an unshaded area under implementation of **MM BIO-1**.

In the long term, Alternative 2 is expected to have beneficial impacts on aquatic habitat and biological resources. After construction of the pier extension is completed, the CG will be able to moor their response

boats at the Station year round, including in low water conditions, substantially enhancing the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources. In addition, after the pier extension is completed, the increased depth at the pier head would decrease turbidity and sedimentation of habitat caused by propeller wash from vessels using the pier during low water conditions.

In summary, with implementation of **MM BIO-1** and the BMPs outlined above, Alternative 2 would have less-than-significant adverse impacts related to having a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Less-than-Significant Impact with Mitigation. The shoreline in the Project vicinity is highly developed, and only a small amount of native riparian vegetation is present in the Project Area. With implementation of **BMP C2-7**, Alternative 2 would avoid impacts to riparian and upland vegetation. Alternative 2 would not affect sensitive natural communities or habitat designated by CDFW or USFWS. Project impacts to TRPA-designated PFH would be mitigated through implementation of **MM BIO-1**.

With implementation of **MM BIO-1** and the BMPs described in *Section 2.1.1*, Alternative 2 would have less-than-significant impacts related to adverse effects on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. The USACE and USEPA define wetlands as follows: "Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." (40 CFR 230.3(t)). The proposed disturbance area of Alternative 2 does not contain wetlands, as defined above, because the disturbance area is in an area of open water that does not support wetland vegetation. Therefore, Alternative 2 will not have a substantial adverse effect on federally protected wetlands as defined by CWA Section 404 through direct removal, filling, hydrological interruption, or other means. Alternative 2 would require that the CG obtain USACE approval pursuant to Section 10 of the River and Harbors Act for work in navigable waters of the U.S. and pursuant to CWA Section 404 for the small amount of fill (i.e., gravel and cobble) that would be placed on site for mitigation of impacts to PFH under implementation of **MM BIO-1**. The CG will obtain a USACE permit before commencement of work and will comply with conditions of the permit to avoid and minimize impacts to waters of the U.S.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less-than-Significant Impact. During construction, the use of a turbidity curtain to isolate the work area and the general disturbance associated with construction activity may affect movement of fish and other aquatic organisms. However, these effects would be temporary and limited to a small localized area. Fish movement in the Project Area would be expected to return to normal after the 7-week construction period ends. In accordance with **BMP C2-13**, construction would be timed to avoid the fish spawning season and other sensitive life stages. After construction, the addition of 22 new piles into the littoral zone is not expected to result in a significant impediment to fish movement. The Project is not expected to affect movement or migration of terrestrial wildlife or impede the use of native wildlife nursery sites. For these reasons, Alternative 2 would have a less-than-significant impact related to interfering substantially with the

movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impeding the use of native wildlife nursery sites.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less-than-Significant Impact with Mitigation. Alternative 2 would not affect trees and would not conflict with any tree preservation policy or ordinance. The Project will comply with other local policies or ordinances protecting biological resources. These include TRPA polices for the protection of PFH, which will be addressed by implementation of **MM BIO-1**, and the conservation of Tahoe yellow cress, which will be addressed by implementation of **BMP C2-15**. With implementation of this mitigation measure and BMPs, Alternative 2 would have less-than-significant impacts with regard to conflicting with any local policies or ordinances protecting biological resources.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The Project Area is not covered by any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, and therefore Alternative 2 would not conflict with the provisions of any such plan.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Vegetation

Will the Project result in:

a) Removal of native vegetation in excess of the area used for the actual development permitted by the land capability/IPES?

No Impact. The proposed disturbance area for Alternative 2 supports no native vegetation, and Alternative 2 will not involve the removal of vegetation in upland areas that are subject to TRPA's land capability/IPES systems. Therefore, Alternative 2 would have no impacts with regard to removal of native vegetation in excess of the area used for the actual development permitted by the land capability/IPES system.

b) Removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table?

Less-than-Significant Impact. The proposed construction footprint does not support riparian or other vegetation, and Alternative 2 would have no long-term impacts with regard to removal of riparian vegetation or other vegetation associated with critical wildlife habitat. Temporary impacts to riparian vegetation during construction would avoided through implementation of **BMP C2-7**. The new vegetation to be planted in the shorezone as scenic mitigation under **MM AES-1** would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Alternative 2 would not affect the groundwater table. In summary, Alternative 2 would have less-than-significant impacts related to removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table.

c) Introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species?

Less-than-Significant Impact. The only new vegetation involved with Alternative 2 is the new screening that would be planted to mitigate impacts on scenic resources in accordance with **MM AES-1**, as discussed in *Section 3.2*. The plants used for this mitigation would be native species that are recommended in the *Home Landscaping Guide for Lake Tahoe and Vicinity* (University of Nevada Cooperative Extension 2006) as being appropriate for the local environment, and therefore would not require excessive fertilizer or water. The new vegetation would be located so as to avoid disturbance of existing native vegetation. In accordance with **BMP C2-6**, construction equipment would be inspected for invasive species prior to use, to avoid introducing invasive plants that could create a barrier to normal replenishment of existing species. Therefore, Alternative 2 would have less-than-significant impacts related to introduction of new vegetation that will require excessive fertilizer or water or provide a barrier to the normal replenishment of existing species.

d) Change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)?

Less-than-Significant Impact. The proposed long-term disturbance area for Alternative 2 supports no macrophytic vegetation, and the use of a turbidity curtain, in accordance with **BMP C2-3**, would avoid the potential sedimentation of aquatic plant habitat in surrounding areas. Micro-flora such as algae would be only minimally affected in the 12 square feet of lakebed displaced by the new piles. Temporary impacts to riparian or upland vegetation during construction would avoided through implementation of **BMP C2-7**. The new vegetation to be planted in the shorezone as scenic mitigation under **MM AES-1** would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Therefore, Alternative 2 will have less-than-significant impacts related to change in the diversity, distribution, or number of any species of plants.

e) Reduction of the numbers of any unique, rare or endangered species of plants?

Less-than-Significant Impact. Focused surveys indicate that no Tahoe yellow cress occurs in the Project Area, the potential habitat for Tahoe yellow cress in the Project Area is of poor quality, and no other special-status plants have been observed in or adjacent to the Project Area. Additionally, through implementation of **BMP C2-7**, impacts to shoreline vegetation will be avoided. Although no Tahoe yellow cress are expected to occur in the Project Area, the CG will ensure that no impacts to Tahoe yellow cress will occur by implementing **BMP C2-15**, which requires that an additional Tahoe yellow cress survey be conducted prior to construction and that impact avoidance measures be implemented, in consultation with TRPA and CDFW, if Tahoe yellow cress are identified during the pre-construction survey. With implementation of **BMPs C2-7** and **C2-15**, Alternative 2 would have less-than-significant impacts related to reduction of the numbers of any unique, rare or endangered species of plants.

f) Removal of stream bank and/or backshore vegetation, including woody vegetation such as willows?

Less-than-Significant Impact. Alternative 2 would not involve removal or disturbance of stream bank vegetation, and temporary impacts to backshore vegetation during construction would be avoided or minimized through implementation of **BMP C2-7.** The only activity with potential to have long-term effects on backshore vegetation is planting of the new screening vegetation required under **MM AES-1.** This vegetation would be located so as to avoid disturbance of existing native vegetation and would result in a net increase in native vegetation in the shorezone. Therefore, the impacts of Alternative 2 related to removal of stream bank and/or backshore vegetation, including woody vegetation such as willows, would be less than significant.

g) Removal of any native live, dead or dying trees 30 inches or greater in dbh within TRPA's Conservation or Recreation land use classifications?

No Impact. Alternative 2 would not involve removal of any trees, and no impacts to trees would occur.

h) A change in the natural functioning of an old growth ecosystem?

No Impact. The Project Area does not occur in an old growth ecosystem, and no impacts to old growth ecosystems would occur with implementation of Alternative 2.

Wildlife

Will the Project result in:

a) Change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)?

Less-than-Significant Impact. Alternative 2 is not expected to significantly change the diversity, distribution, or numbers of local animal species. Species that use the Project Area would likely avoid the area during construction, but once construction activities are completed they would likely re-establish in the area. Short-term effects during construction could include increased turbidity during pile installation, sedimentation, displacement of prey species, potential physical injury from vessel movements, disturbance of foraging habitats, and accidental spills. Pile installation will displace some benthic organisms, but the amount of habitat loss (12 square feet) is minimal. To avoid or minimize impacts to animals and their habitat, the CG would implement measures such as minimizing the Project footprint, in accordance with **BMP C2-1**; installing a turbidity curtain around the disturbance area during construction, in accordance with **BMP C2-3**; implementing measures to prevent and control spills, in accordance with **BMP C2-5**; avoiding in-water work during the spawning season or other sensitive life stages of special-status species, in accordance with **BMP C2-13**; and implementation of a WEAP, in accordance with **BMP C2-21**. With implementation of these BMPs, Alternative 2 would have less-than-significant impacts related to changing the diversity, distribution, or numbers of animal species.

b) Reduction of the number of any unique, rare or endangered species of animals?

Less-than-Significant Impact. Special-status fauna species of concern in the Project Area include Lahontan cutthroat trout and Lahontan Lake tui chub. The presence of Lahontan cutthroat trout in the Project Area during construction is not expected, because there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout using the Project Area for feed and cover habitat at a later date. Lahontan Lake tui chub has become uncommon in Lake Tahoe and uses deeper, open water areas of the lake for most of its lifecycle and so only has a only a low potential to occur in the Project Area during construction.

Use of a turbidity curtain during construction will exclude special status fish species, if any are present, from the work area, reducing the potential for physical injury or other direct impacts to fish during construction. In addition, in accordance with **BMP C2-13**, construction would be timed to avoid the fish spawning season, which is also the season that Lahontan Lake tui chub would be most likely to be in the Project Area, further minimizing the potential for construction impacts.

Construction of the pier extension would cause underwater noise, which could affect fish behavior and, at higher levels, cause physical injury or mortality. To assess potential hydroacoustic impacts on fish, AECOM prepared an analysis of underwater sound levels expected during various Project construction activities (*Appendix G*). As discussed in detail in the NEPA analysis and *Appendix G*, potential adverse hydroacoustic impacts during construction of Alternative 2 would be limited to the pile driving activities, and then only if unattenuated impact pile driving is used. In accordance with **BMP C2-12,** vibratory pile driving would be used as the preferred method during construction, and if impact pile driving is required, due to substrate type, a wooden cushion block would be used to minimize hydroacoustic effects. In accordance with **BMP C2-13**, pile installation would be timed to avoid the fish spawning season. Hydroacoustic effects on fish species would be short term, localized, and with implementation of these BMPs, less than significant.

In summary, Alternative 2 would have less than significant direct impacts related to reduction of the number of any unique, rare or endangered species of animals. Potential indirect impacts related to deterioration and removal of habitat for special status aquatic species are discussed below under question *d*.

c) Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?

Less-than-Significant Impact. In accordance with **BMP C2-6**, the construction contractor will be required to inspect equipment for invasive species prior to use in Lake Tahoe and to remove and properly dispose of these species if found. During construction, the use of a turbidity curtain to isolate the work area and the general disturbance associated with the construction activity may affect migration or movement of fish and other aquatic organisms. However, these effects would be temporary and limited to a small localized area. Movement of animals in the Project Area would be expected to return to normal after the 7-week construction period ends. In accordance with **BMP C2-13**, the construction would be timed to avoid the fish spawning season and other sensitive life stages. After construction, the addition of 22 new piles into the littoral zone is not expected to result in a significant impediment to fish movement. For these reasons, Alternative 2 would have a less-than-significant impact related to introduction of new species of animals into an area or result in a barrier to the migration or movement of animals.

d) Deterioration of existing fish or wildlife habitat quantity or quality?

Less-than-Significant Impact with Mitigation. The Project site is in an area mapped by TRPA as PFH for spawning and feed and cover. Fish habitat surveys conducted by AECOM indicate that the proposed disturbance footprint is composed mostly of clay, silt, and fine sand, which do not provide high quality fish habitat. However, a very small portion of the disturbance footprint (approximately 4 square feet) does contain substrates that make it potentially suitable for feed and cover habitat. Temporary impacts to aquatic habitat during construction could include decreased water quality due to increased potential for turbidity during pile installation, sedimentation of habitat, and accidental spills and increased noise and disturbance due to the presence of construction equipment. Implementation of BMPs during construction, including the use of a turbidity curtain, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; water quality monitoring during construction, in accordance with **BMP C2-8**; and implementation of a WEAP, in accordance with **BMP C2-21,** will avoid or minimize temporary impacts to habitat during construction.

Long-term impacts from Alternative 2 would include displacement of 4 square feet of PFH through installation of piles for the pier extension. To mitigate this impact, the CG will implement **MM BIO-1**, which includes replacement of fish habitat on site at the 1:1.5 ratio established by TRPA. The Project would have less-than-significant impacts on upland habitat, mostly resulting in temporary disturbance from construction noise, air pollution, etc. With implementation of **MM BIO-1**, Alternative 2 would have less-than-significant impacts related to the deterioration of existing fish or wildlife habitat quantity or quality.

The total net over-water footprint for Alternative 2 would be approximately 2,615 square feet. Although piers provide some habitat structure and overhead cover for fish, over-water structures can also limit the amount of sunlight falling into the water, potentially reducing the growth of aquatic plants and phytoplankton and decreasing the foraging habitat value for organisms further up the food chain, including fish. The connecting span for Alternative 2 would have a grated decking, which would create approximately 70 percent less shading than a solid deck, reducing the shaded footprint of the Alternative 2 to approximately 1,180 square feet. The fish habitat survey conducted for the Project indicated a general lack of aquatic plants, and only a small amount of feed and cover habitat, in the area that would be shaded by the pier extension, and adverse habitat impacts from shading are expected to be minimal. The shading impacts would also be offset by the creation of 6 square feet of replacement fish habitat in an unshaded area under implementation of **MM BIO-1**.

In the long term, Alternative 2 is expected to have beneficial impacts on aquatic habitat and biological resources. After construction of the pier extension is completed, the CG will be able to moor their response

boats at the Station year round, including in low water conditions, substantially enhancing the CG's ability to respond quickly to accidents involving potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing the impacts of such releases on biological resources. In addition, after the pier extension is completed, the increased depth at the pier head would decrease turbidity and sedimentation of habitat caused by propeller wash from vessels using the pier during low water conditions.

In summary, with implementation of **MM BIO-1**, the impacts of Alternative 2 with regard to deterioration of existing fish or wildlife habitat quantity or quality would be less than significant.

TRPA Thresholds

Less-than-Significant Impact with Mitigation. As discussed in *Section 3.4.2.1*, TRPA has established a number of thresholds for biological resources (*Table 3-17),* including thresholds related to common vegetation including riparian vegetation and wetlands, sensitive plants, lake habitat, special interest species, waterfowl, Lahontan cutthroat trout, and invasive species. **BMP C2-7** would be implemented to avoid impacts to riparian vegetation during construction, and the placement of the new screening vegetation planted under **MM AES-1** would avoid disturbance to existing native vegetation. Alternative 2 would not affect wetland vegetation or other communities protected by the common vegetation threshold. For the thresholds related to sensitive plants, specifically Tahoe yellow cress, implementation of **BMP C2-15**, which requires that an additional Tahoe yellow cress be conducted prior to construction and that avoidance measure are implemented if the species is found in the Project Area, will ensure that Alternative 2 does not affect the ability or the region to meet the Tahoe yellow cress threshold. The lake habitat threshold requires a non-degradation policy for PFH. Implementation of **MM BIO-1** will ensure that there is no net loss of PFH and that Alternative 2 will not affect the ability to achieve TRPA's lake habitat threshold. For the thresholds related to special interest raptor species, the Project Area is not within the required non-disturbance buffer distances from known nest sites of northern goshawk, osprey, bald eagle, golden eagle, or peregrine falcon. The Project Area is not in or in the vicinity of any of the 18 waterfowl population threshold sites designated by TRPA and would not have a significant effect on waterfowl populations or habitat. Although Lahontan cutthroat trout are not expected to be present in the Project area, **BMP C2-13** requires in-water work to be timed to avoid the fish spawning season. Furthermore, installation of turbidity barriers in accordance with **BMP C2-3** would exclude fish from the dredging area. In accordance with **BMP C2-6**, the construction contractor will be required to inspect equipment for invasive species and to remove and properly dispose of these species if found.

In summary, with implementation of **MM BIO-1**, Alternative 2 would not have a significant adverse effect on the ability of the region to meet the applicable TRPA thresholds for biological resources.

3.4.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact with Mitigation. Alternative 3 would have impacts to biological resources similar to those of Alternative 2, though some impacts would be slightly greater because the pier extension for Alternative 3 would be 100 feet longer and require 4 additional piles when compared to Alternative 2. Compared to Alternative 2, Alternative 3 would have a larger lake-bottom footprint (14 square feet versus 12 square feet), a larger shaded footprint (1,330 square feet versus 1,180 square feet), and a longer construction duration of (8 weeks versus 7 weeks). However, much of the additional area covered by Alternative 3 is low quality habitat (clay, silt, and fine sand substrates), and Alternative 3 has slightly less impact on PFH than Alternative 2 (3 square feet versus 4 square feet). The same BMPs and mitigation measures that apply to Alternative 2 would also apply to Alternative 3, which would reduce impacts to a less-than-significant level.

3.4.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and no impacts to biological resources would occur. However, this alternative does not fulfill the purpose and need of the proposed Project and would prevent the CG from providing acceptable standards of public safety service. It would also hinder the CG's ability to respond to incidents on the lake that could result in discharges of

deleterious materials to aquatic habitat and may result in continued high levels of turbidity and sedimentation resulting from vessels passing through the Project area or using the Station pier during low water conditions.

3.5 Cultural Resources

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to cultural resources.

3.5.1 Affected Environment

Cultural resources include prehistoric resources, Native American ethnographic resources, and historic resources. Cultural resources are most commonly found in upland areas, particularly the edges of waterbodies and stream mouths where humans tend to congregate, but may also be found in underwater environments. Submerged cultural resources may include prehistoric remains, inundated campsites and settlements, historic shore installations, and ship and aircraft wrecks.

Cultural resources are the physical remains of changing human technological and social systems that adapt to environmental conditions and human social needs. Therefore, understanding the potential significance of a cultural resource requires contextual information. Following is a brief summary of the prehistoric, ethnographic, and historic-period contexts of the Project vicinity.

3.5.1.1 Prehistoric Setting

The Lake Tahoe Basin has been an area of continual human occupation for at least 8,000 to 9,000 years. Robert Heizer and Albert Elsasser were the first researchers to propose a chronological sequence of past cultures in the Lake Tahoe Basin based on site locations and technological differences in the archaeological record (Heizer and Elsasser 1953). This initial attempt at a chronological sequence contained only two main cultural phases. The earlier of the two was named the Martis Complex, after the Martis Valley located east of Truckee, and dated from 5,000 to 1,300 years before present (B.P.). Among the defining characteristics of the Martis Complex was a heavy reliance on tools made of basalt and the presence of milling stones and slabs for processing seeds. The second cultural manifestation, called the King's Beach Complex, dated from 1300 B.P. to 150 B.P. and was characterized by the use of tools made of chert and obsidian, bedrock mortars, and small projectile points.

Research conducted during subsequent decades has led to a more refined, though not necessarily always well defined, chronological cultural sequence (Elston et al. 1976; Hull 2007; Moratto 1984). The current and most widely accepted sequence contains six phases, each defined by temporally diagnostic projectile points:

- Tahoe Reach Phase (circa [ca.] 10,000 to 8000 B.P.)—Great Basin Stemmed Series projectile points
- Spooner Phase (ca. 8000 to 5000 B.P.)—various large basalt projectile points
- Early Martis Phase (ca. 5000 to 3000 B.P.)—Martis Contracting Stem and Split Stem projectile points
- Late Martis Phase (ca. 3000 to 1300 B.P.)—Martis Corner Notched, Elko Corner Notched, and Elko Eared points
- Early Kings Beach Phase (ca. 1300 to 800 B.P.), typified by Rosegate and Gunther Series points
- Late Kings Beach Phase (ca. 800 to 150 B.P.), marked by Desert Side-notched and Cottonwood Series projectile points

Prehistoric human population and land use varied with changes in climate in the Lake Tahoe region. A cold, wet climate and the presence of glaciers dominated the region in the Late Pleistocene period, up until about 10,000 B.P. In the Early Holocene (ca. 10,000 to 7000 B.P.) the glaciers retreated, in response to a general warming and drying trend, and humans started moving into the area, though populations were sparse. The Middle Holocene (ca. 7000 to 4000 B.P.) was marked by a warm, dry climate and frequent

drought. Lake Tahoe's water level dropped substantially during this period, as evidenced by the remains of submerged tree stumps found as deep as 20 feet below the present lake level, dating from between 6300 and 4800 BP (Lindstrom 1990). Lake Tahoe fell below its natural rim, cutting off flows to the Truckee River, and other smaller lakes and streams dried up completely. Humans may have been drawn to Lake Tahoe during this period because it was one of the few remaining year-round sources of water in the area, but populations were still low and artifacts from this period are uncommon. In the Late Holocene (4000 to present) somewhat cooler and wetter conditions returned and Lake Tahoe returned to its present level. The human population in the region increased as native peoples moved into the highlands for seasonal gathering, fishing, and hunting. Most archaeological artifacts found in the region are from this period.

3.5.1.2 Ethnographic Setting

There is evidence of American Indian occupation of the Lake Tahoe region since at least 8,000 to 9,000 B.P. The Project Area falls within the Washoe cultural territory, which included about 4,000 square miles surrounding Lake Tahoe, with flexible boundaries extending from Honey Lake in the north to Sonora Pass in the south and from just west of the Sierra Nevada crest to the Virginia and Pinenut Ranges in the east. The Washoe are part of an ancient Hokan-speaking population which predates and has subsequently been surrounded by Numic-speaking peoples such as the Northern Paiute. The Martis and later phases, as described in the previous section, are typically attributed to the Washoe. Lake Tahoe was the heart of Washoe territory and the lake and its tributaries provided the Washoe with important resources including fish and native plants. There was extensive interaction among the Washoe and their neighbors. The Washoe, Northern Paiute, Miwok, and Maidu engaged in cooperative practices of trade, intervisiting, and intermarriage. The Washoe are unique in that they span both the California and Great Basin cultural areas. Their strategic geographical position afforded them an opportunity to serve as a crossroads for the transfer of trade goods between the Great Basin and California.

The traditional Washoe lifestyle was based on the seasonal acquisition of various plant and animal foods as they became available over the course of the year across a range of altitudes and environments. With the spring thaw, younger people traveled from lower elevation areas to Lake Tahoe to fish, and carried fish down to the older people and children still in the winter camps in the valleys along the eastern foothills of the Sierra. In summer, most Washoe gathered at Lake Tahoe, living in large fishing camps near stream mouths during the period when Lahontan cutthroat trout, mountain whitefish, and Tahoe sucker made spawning runs into the Lake Tahoe tributaries. Many Washoe families camped in the surrounding high country during the warmer months of the year, hunting game and collecting edible and medicinal roots, seeds, and marsh plants. In the fall, people started to move to the lower elevations to harvest pinenuts and acorns for winter storage and follow game as it moved to the lower elevations prior to winter. During the winter months, activities were centered on the home and included the repair and fabrication of clothing and utilitarian equipment. Some hunting and fishing activities still occurred into the winter months. (Washoe Tribe of Nevada and California 2011).

One Washoe fishing camp, named *wO'thanamln*, was located at the mouth of Burton Creek, approximately ¼ mile west of the Project Area (Scott 1957, as cited in USACE 2009).[9] Another fishing camp, called *diphEhkwO'tha*, was near Dollar Point, approximately 1 ½ miles east of the Project Area. TRPA's *Lake Tahoe Shorezone Ordinance Amendments EIS* (TRPA 2004) identifies both of these campsites as among 56 sites located on littoral parcels around the lake that TRPA deemed culturally, historically, or archaeologically significant.

[9] Although Burton Creek currently flows into Star Harbor, which is approximately 310 feet west of the Station pier, the historical location of Burton Creek's mouth, as shown in USGS topographical maps, was approximately ¼ mile west of the Station. Star Harbor currently receives flows from Burton, Barton, and Polaris Creeks, the courses of which were all modified when Star Harbor was constructed. The historical mouth of Barton/Polaris Creek, which roughly corresponds to the current entrance to Star Harbor, has not been identified as a significant Washoe fishing campsite, though gathering activities at the *wO'thanamln* camp likely extended into the Barton/Polaris Creek area.

The California Gold Rush and discovery of the Comstock Lode brought an influx of Euro-American settlers into the Washoe's territory in the mid-19th century. By the 1850s, Euro-Americans had permanently occupied the Washoe's land and changed traditional Washoe lifeways. Mining, lumbering, grazing, commercial fishing, tourism, and the growth of settlements disrupted traditional Native American relationships to the land. As hunting and gathering activities were increasingly restricted over time, the Washoe were forced into dependency on the Euro-American settlers. Washoes became increasingly involved in the Euro-American economy, surviving by trading goods and services to the Euro-American population. In exchange, Washoes arranged for camping privileges on traditional lands with access to what resources remained. Washoes were employed as ranch hands, domestic laborers, construction workers, laundry workers, basket weavers, commercial fishermen, and guides for backcountry sportsmen.

The Washoe's requests for the establishment of a reservation and compensation for lost resources were ignored by the federal government into the early 20th century. Under the Dawes Act of 1887, Washoe lands were broken up into individual allotments; however, the allotted sections were typically barren lands with no access to water. The better lands were taken by Euro-Americans. In 1917, the Washoe Tribe began reacquiring a small part of their traditional lands with the establishment of the Carson, Reno-Sparks, and Dresslerville Colonies. Under the Indian Reorganization Act, the colonies in the Carson Valley area gained federal recognition in 1936, and in 1966 the Washoe colonies consolidated to become the Washoe Tribe of Nevada and California. In 1951, the Tribe presented a case to the Indian Claims Commission asking for $43.8 million for land, fishing and hunting rights, minerals, and timber that had been taken from the tribe. The case was finally settled in 1970, when the tribe was awarded $5 million. The re-acquisition of additional Tribal lands continued through the 1970s, and the Tribe currently owns more than 64,300 acres.

As of 2011, the Washoe Tribe had approximately 1,600 tribal members governed by a 12-member tribal council that consists of representatives of the Carson, Dresslerville, Stewart, Woodfords, and Reno-Sparks Colonies, as well as non-reservation areas (Washoe Tribe of Nevada and California 2011). The Tribe has developed a Comprehensive Land Use Plan (Washoe Tribe of Nevada and California 1994) that identifies the goals of reestablishing a presence in the Tahoe region and revitalizing Washoe heritage and cultural knowledge, including the protection of traditional properties in the cultural landscape. The Tribe has also developed a Comprehensive Economic Development Strategy (Washoe Tribe of Nevada and California 2011) to guide the Tribe's economic and community development activities.

3.5.1.3 Historic Setting

The explorers John Fremont and Charles Pruess were the first known Euro-Americans to view Lake Tahoe in 1844. Prior to the 1849 Gold Rush in California, however, exploration in the Lake Tahoe Basin was fairly limited. The earliest known Euro-American use of the Tahoe City area was the trail known as "Scott's Route" that followed the northern shore of Lake Tahoe. This unimproved path connected the Eagle Station trading post (present-day Carson City) to Lake Tahoe, the Truckee River Outlet, Squaw Valley, and Fork House on the Iowa Hill-Michigan Bluff Trail (California State Parks 2005). The development of the Comstock Lode near Virginia City, Nevada, beginning in 1859, brought thousands of miners to the Lake Tahoe region. When the mining boom started there was an immediate need for building materials. Tahoe City emerged as a lumber center supplying the Comstock Mines near Virginia City. The first survey for Tahoe City was made in 1863, and after the completion of the Central Pacific Railroad as far as Truckee, a wagon road was constructed connecting Truckee and Lake Tahoe. Between the 1860s and 1890s, the region prospered as lumber towns developed around various mills.

With the end of the silver boom in Nevada, the demand for lumber declined rapidly, and only towns that developed as tourist centers were able to survive and continue to prosper. Some early settlers had recognized the potential of Lake Tahoe as a resort location and established retreats and lodges in the area. William Pomin constructed the Tahoe House in Tahoe City in 1864, and in 1871 AJ. Bayley opened his Grand Central Hotel. After the decline of the lumber industry, Lake Tahoe developed as a resort, with tourists coming from San Francisco and elsewhere to vacation along the lake shore. By the 1930s, roads to the Lake Tahoe Basin from California were paved, and both summer and winter tourism intensified. The legalization of gambling in Nevada in 1931 became a significant economic factor in the Lake Tahoe Basin, although the northern shore was never as significant a gaming center as the southern shore. Large ski

resorts were developed beginning in the 1950s, and in 1960 Tahoe hosted the Winter Olympics, resulting in the winter sports industry assuming a prominent place, along with gaming, in the economy of the Lake Tahoe Basin.

The first Euro-American settlement of the Lake Forest area came around 1859, when Homer D. Burton laid claim to 320 acres surrounding the lakeside meadowlands along what is now known as Burton Creek, which is located west of the Project Area (Van Etten 1987, as cited in USACE 2009). Burton named his Island Farm after a small hill exposed during low-water periods on the terminal end of a marshy spit of land (Scott 1973, as cited in USACE 2009). At Island Farm, Burton cultivated vegetables, buckwheat, and hay. Two of Tahoe's first sailing vessels were placed in service by Burton in 1859-60. Lake Forest was a refueling stop for lake steamers, and a large wharf in the Project vicinity was used as an over-water cache for cordwood, which was harvested nearby and skidded to the wharf by teams of horses. By 1871, Burton added a lakefront resort to his holdings and named it “Burton’s Island Farm and Hotel.” The Hotel could accommodate upwards of 30 guests (Scott 1957, as cited in USACE 2009).

In 1884, Burton sold his farm to Antone Russi, a dairyman. Russi died in the 1890s, and his widow married dairyman Frank X. Walker, who then took over the farm. The Walker family located their living quarters, corrals and milk house on the edge of the meadow near the present junction of SR 28 and Lake Forest Road and successfully managed a dairy business there for two decades. In 1910, Walker sold the portion of his property currently occupied by the Lake Forest neighborhood to George Briggs. The property then went through a series of owners and subdivisions over the 20th Century as the number of residences grew. Commercial activity in Lake Forest peaked in the middle of the middle of the 20th Century, when establishments in the community included the Snyder Lumber Company office and lumberyard, a grocery store, restaurant, and post office, which operated between 1947 and 1951. In 1954, the alignment of SR 28, which had formerly run along the current path of Lake Forest Road, was moved to its current location, bypassing the Lake Forest commercial district (Scott 1957, as cited in USACE 2009). The CG constructed a timber pier at the Station site in 1967, which was replaced by the current steel pier in 2001.

3.5.1.4 Cultural Records Reviews

At the request of AECOM, staff at the North Central Information Center, at California State University – Sacramento, conducted a cultural resources records search in May 2012. The records search consisted of a review of the California Historic Resources Information System (CHRIS) Inventory to identify recorded cultural resource sites and previous cultural resource studies within a ½-mile radius of the Project Area. The results of the records search are provided in *Appendix I.*

The records search indicated that no cultural resources have been previously documented in or adjacent to the proposed Project Area. There have been four cultural resources recorded within a ½ mile of the proposed Project Area. Site P-31-414 (CA-PLA-288) is a pre-historic lithic scatter recorded in 1977 and again in September 1988, but not evaluated for significance. The location and materials listed in the recordation form suggest that they may be the remains of a temporary campsite or stone tool-making workshop. Site P-31-415 (CA-PLA-289) comprises another pre-historic lithic scatter first recorded in 1977, re-recorded in 1988, and again in 2004. Site P-31-2931 (CA-PLA-2011-H) is a residence, the C.T. Bliss-C. W. Merrill House, recorded in 2003 and determined eligible for the NRHP for its architectural significance. The fourth site is P-31-5451(CA-PLA-2430), a lithic scatter consisting of basalt debitage that was also recorded in 2003. The records search also indicated that 13 cultural resources overview reports have been completed for areas within a ½ mile of the proposed Project.

At the request of AECOM, the NAHC conducted a records search of their Sacred Lands File in July 2015. The records search indicated that there are no known Native American cultural resources in the immediate Project Area. The NAHC also provided a list of Native American organizations and individuals who may have knowledge of cultural resources in the Project vicinity. The list included the THPO of the Washoe Tribe of Nevada and California and two other individuals. The CG is currently engaged in consultation with the Native American contacts from the NAHC’s list, and comments from these contacts (if any) will be considered and addressed in the Final EA.

3.5.2 Regulatory Setting

3.5.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to cultural resources and relevant to the proposed Project are identified in *Table 3-20*.

Table 3-20 Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project (Cultural Resources)

Jurisdiction	Regulation	Description
U.S.	Archaeological and Historic Preservation Act (AHPA)	The AHPA provides for the preservation of historical and archaeological data that might be irreparably lost or destroyed as a result of any alteration of the terrain caused as a result of a federal construction project or federally licensed project, activity, or program. This Act requires federal agencies to notify the Secretary of the Interior when they find that any federally permitted activity or program may cause irreparable loss or destruction of significant scientific, prehistoric, historical, or archaeological data.
U.S.	Archaeological Resources Protection Act (ARPA)	The ARPA states that archaeological resources on public or Indian lands are an accessible and irreplaceable part of the nation's heritage and: • Establishes protection for archaeological resources to prevent loss and destruction due to uncontrolled excavations and pillaging; • Encourages increased cooperation and exchange of information between government authorities, the professional archaeological community, and private individuals having collections of archaeological resources prior to the enactment of this Act; • Establishes permit procedures to permit excavation or removal of archaeological resources (and associated activities) located on public or Indian land; and • Prohibits excavation, removal, damage, or other alteration or defacing of archaeological resources and provides for monetary rewards to be paid to individuals furnishing information leading to the finding of a civil violation or conviction of a criminal violator.
U.S.	NHPA (16 USC 470 et seq.)	The NHPA and its implementing regulation, Protection of Historic Properties (36 CFR 800) present a general policy of supporting and encouraging the preservation of prehistoric and historic resources by directing federal agencies to consider potential impacts on historic resources from their undertakings. Section 106 of the NHPA requires federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in, the NRHP. The California Office of Historic Preservation, within the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level in California and advises federal agencies regarding potential effects on historic properties. The Office of Historic Preservation also maintains the California Historic Resources Information System. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions, including commenting on federal undertakings.
U.S.	Native American Graves Protection and Repatriation Act (NAGPRA) (Public law 101-601; 25 USC 3001-3013	The NAGPRA was enacted to address the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony. NAGPRA requires that Indian tribes be consulted whenever archeological investigations encounter, or are expected to encounter, Native American cultural items or when such items are unexpectedly discovered on federal or tribal land.

Jurisdiction	Regulation	Description
U.S.	Abandoned Shipwreck Act of 1987 (43 USC 2101–2106).	Under this Act, states have the responsibility for management of living and nonliving resources in state waters and submerged lands, including certain abandoned shipwrecks. The National Park Service has issued guidelines that are intended to: maximize the enhancement of cultural resources; foster a partnership among sport divers, fishermen, archeologists, sailors, and other interests to manage shipwreck resources of the states and the U.S.; facilitate access and use by recreational interests; and recognize the interests of individuals and groups engaged in shipwreck discovery and salvage. Specific provisions of the Act's guidelines include procedures for locating and identifying shipwrecks, methods for determining which shipwrecks are historic, and preservation and long-term management of historic shipwrecks.
U.S.	EO 11593, Protection and Enhancement of the Cultural Environment	EO 11593 requires that federal agencies: 1) administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations, 2) initiate measures necessary to direct their policies, plans and programs in such a way that federally owned sites, structures, and objects of historical, architectural or archaeological significance are preserved, restored, and maintained for the inspiration and benefit of the people, and 3), in consultation with the Advisory Council on Historic Preservation, institute procedures to assure that federal plans and programs contribute to the preservation and enhancement of non-federally owned sites, structures and objects of historical, architectural or archaeological significance.
CA	CEQA (PRC Section 21000 et seq.)	CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources that meet significance criteria qualifying them as unique, important, listed on the California Register of Historic Resources (CRHR), or eligible for listing on the CRHR. CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant effects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate these impacts.
CA	AB 52	AB 52, signed in September 2014, is intended to protect tribal cultural resources through the CEQA process. It requires that lead agencies undertaking CEQA review must, upon request of a California Native American tribe, begin tribal consultation prior to the release of a ND, MND, or EIR for a project. AB 52 applies to projects for which a lead agency issues a Notice of Preparation of an EIR or Notice of Intent to adopt a ND or MND on or after July 1, 2015.
CA	Health and Safety Code Section 7050.5	This code states that if human remains are exposed during construction, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.998. The Coroner has 24 hours to notify the NAHC if the remains are determined to be of Native American descent. The NAHC will contact most likely descendants, who may recommend how to proceed.

3.5.2.2 Regional and Local Regulatory Setting

TRPA Regional Plan

At a regional and local level, TRPA sets goals, policies, and regulations protecting cultural resources in the Project vicinity. The Cultural Subelement of the TRPA Regional Plan includes the following goals and policies applicable to the proposed Project:

Goal C-1: Identify and preserve sites of historical, cultural, and architectural significance in the region.

Policy C-1.1: Historical or culturally significant landmarks in the region shall be identified and protected from indiscriminate damage or alteration.

TRPA Code of Ordinances and the Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

Chapter 67 of the TRPA Code of Ordinances contains the majority of TRPA's requirements for cultural resources. Section 67.6 provides criteria for eligibility as a historic resource. Section 67.3 of the TRPA Code requires the protection of eligible historic resources. Such resources may not be demolished, disturbed, removed, or significantly altered unless TRPA has approved a resource protection plan to protect the historic resource. Section 67.3.3 requires that the resource protection plan be prepared by a qualified professional and states that the plan may provide for surface or subsurface recovery of data and artifacts and recordation of structural and other data. Section 67.3.4 requires that resources be protected during construction. Grading, operation of equipment, or other soil disturbance is prohibited in areas where a designated historic resource is present or could be damaged, except in accordance with a TRPA-approved resource protection plan.

In addition to Chapter 67, Section 33.3.7 of the TRPA Code of Ordinances addresses the discovery of historic resources during grading and excavation activities. This section requires project-related excavation to cease and project proponents to notify TRPA if construction contractors encounter resources that appear to be 50 years old or older. In the event of such a discovery, TRPA suspends excavation and consults with appropriate federal, state, or local entities to determine the significance of the resource, if any.

Code Section 80.4.6. provides that projects that may impact historical/cultural resources must comply with the mitigation, construction, and survey measures in Chapter 67. Where appropriate, TRPA will require signage to educate the public that explains the importance of the historical/cultural resources and the sensitivity to disturbances. However, in lieu of the above, at mapped historical Washoe Indian resource sites, TRPA will, in coordination with the Washoe Tribe, provide educational materials to property owners aimed at encouraging protection of the resources associated with the sites. Adequate setbacks from TRPA's designated, mapped, or eligible (pursuant to Chapter 67) historic sites, including submerged sites, will be established in consultation with an qualified archaeologist, and if a Washoe site, the Washoe tribe.

3.5.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on cultural resources in the context of NEPA, CEQA, and TRPA requirements.

Table 3-21 provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the cultural resource-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-21 Significance Determinations for the Project Alternatives (Cultural Resources)

Cultural Resources	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on cultural resources?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project: *a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC §21074?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
a) Will the Project result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Is the proposed Project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Is the property associated with any historically significant events and/or sites or persons?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Does the Project have the potential to cause a physical change which would affect unique ethnic cultural values?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Will the Project restrict historic or pre-historic religious or sacred uses within the potential impact area?	No Impact	No Impact	No Impact	No Impact

3.5.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on cultural resources?

Less-than-Significant Impact. As the lead federal agency for the NHPA Section 106 process, the CG has determined that no historic properties are likely to be affected by the proposed Project based on the criteria in the NHPA implementing regulations (36 CFR 800.4(d)(1)). According to the results of the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, no cultural resources have been previously documented in or adjacent to the Project Area. All ground-disturbing activities for Alternative 1 would take place in submerged areas, where there is a relatively low probability of encountering cultural materials. Artifacts are most likely to be found in shoreline and upland areas, and the shoreline of Lake Tahoe has not changed significantly during the last 4,000 years, the time of heaviest human occupation of the Tahoe region. There is evidence that the shoreline of Lake Tahoe was lower during the Middle Holocene (ca. 7000 to 4000 B.P.), and there could be submerged campsites and artifacts from that period in areas currently under water. However, human populations in the Tahoe region were low during the Middle Holocene and artifacts from the period are uncommon. According to the CHRIS Inventory search, there are no records of submerged archaeological artifacts within ½ mile of the Project Area. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which would have removed any submerged artifacts that may have occurred in the dredged area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

As required by Section 106 of the NHPA, the CG is engaged in consultation with the SHPO, as well as the THPO for the Washoe Tribe of Nevada and California, on the determination that no historic resources would be affected by the Project. If the CG receives comments from the SHPO and THPO, they will be considered and addressed in preparing the final environmental document.

In the unlikely event that buried cultural resources are discovered during dredging, **BMP C1-21** would be implemented. In accordance with **BMP C1-21**, ground-disturbing activities would cease within a 30-foot radius of the find, and the CG would consult a qualified archaeologist for recommended procedures. Any necessary investigation and treatment will be completed before Project activities continue in the vicinity of the find. If the find is related to tribal cultural resources, the THPO for the Washoe Tribe of Nevada and California will be contacted and invited to consult with the hired professional archaeologist or monitor any further necessary treatment or investigation. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. If cultural resources are found, the TRPA would also be informed in writing.

In summary, no historic properties are likely to be affected by the proposed Project, and with the implementation of **BMP C1-21,** Alternative 1's potential impacts on cultural resources would be less than significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Less-than-Significant Impact. No historical resources are likely to be affected by the proposed Project. As indicated by the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, there are no historical resources, as defined by CEQA Guidelines Section 15064.5, known to exist in or adjacent to the Project Area, and none are considered likely to occur in the disturbance footprint of Alternative 1. All ground-disturbing activities for Alternative 1 would take place in submerged areas, where there is a low probability of encountering historical resources. Artifacts are most likely to be found in shoreline and upland areas, and the shoreline of Lake Tahoe has not changed significantly during the last 4,000 years, the time of heaviest human occupation of the Tahoe region. There is evidence that the shoreline of Lake Tahoe was lower during the Middle Holocene (ca. 7000 to 4000 B.P.), and there could be submerged campsites and artifacts from that period in areas currently under water. However, human populations in the Tahoe region were low during the Middle Holocene and artifacts from the period are uncommon. There are no records of submerged cultural resources within ½ mile of the proposed Project. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which would have removed any buried cultural artifacts that may have occurred in that area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

As required by Section 106 of the NHPA, the CG is engaged in consultation with the SHPO, as well as the THPO for the Washoe Tribe of Nevada and California, on the determination that no historic resources would be affected by the Project. If the CG receives comments from the SHPO and THPO, they will be considered and addressed in preparing the final environmental document.

In the unlikely event that buried historical resources are discovered during Project activities, **BMP C1-21** would be implemented. Ground-disturbing activities would cease within a 30-foot radius of the find and the CG would consult a qualified archaeologist for recommended procedures. Any necessary investigation and treatment will be completed before Project activities continue in the vicinity of the find. If the find is related to tribal cultural resources, the Washoe Tribe of Nevada and California will be contacted and invited to consult with the hired professional archaeologist and to monitor any further necessary treatment or investigation. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on the treatment of the burial site. If cultural resources are found, TRPA would also be informed in writing.

In summary, no historical resources are likely to be affected by the Project, and with the implementation of **BMP C1-21,** Alternative 1 would have less than significant potential impacts with regard to causing a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less-than-Significant Impact. No archaeological resources are likely to be affected by the Project. There are no archaeological resources, as defined by CEQA Guidelines Section 15064.5, known to exist in or adjacent to the Project Area, and none are likely to occur in the disturbance footprint of Alternative 1. In the unlikely event that buried archaeological resources are discovered during Project activities, **BMP C1-21** would be implemented. Ground-disturbing activities would cease in the area of the find and the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately and the County Coroner would be notified and procedures required by state law would be followed. TRPA would also be informed if archaeological resources are found. With the implementation of **BMP C1-21**, Alternative 1 would have less than significant potential impacts with regard

to causing a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less-than-Significant Impact. Based on geotechnical studies conducted for the Station (Holdredge & Kull Consulting Engineers 2009) and the adjacent TCPUD boat ramp area (Marvin Davis & Associates 2013) and a review of the Geologic Map of the Lake Tahoe Basin (Saucedo 2005), the area to be dredged is composed of recent sediments and Holocene-aged lacustrine deposits. Although there could be remnants of Holocene-aged organisms in the lacustrine deposits, paleontological resources are typically not considered unique or significant under CEQA unless they are pre-Holocene and are particularly well-preserved, rare, or otherwise important to the body of paleontological knowledge. A review of the University of California Museum of Paleontology (UCMP) online database did not indicate the presence of previously discovered unique paleontological resources in the Project vicinity. Holocene-aged lacustrine deposits are relatively common in the Lake Tahoe Basin, and no unique geologic features are known to occur in the Project disturbance area. For these reasons, Alternative 1 will have less-than-significant impacts related to destruction of a unique paleontological resource or site or unique geologic feature.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less-than-Significant Impact. There is no evidence suggesting the likely presence of human remains in the Project Area. In the unlikely event that human remains are discovered, **BMP C1-21** would be implemented. Ground-disturbing work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site.

e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC §21074?

A search of the NAHC's Sacred Lands File did not indicate the presence of known tribal cultural resources in the Project vicinity. The Project Area is approximately ¼ mile east of a former Washoe fishing campsite, as identified on TRPA maps. However, the proposed Project is not likely to have any effect on cultural resources associated with this campsite, and **BMP C1-21** would be implemented in the unlikely event that cultural resources are found during construction. With implementation of **BMP C1-21** Alternative 1 would have less than significant potential impacts in regard to tribal cultural resources as defined in PRC §21074.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to cultural resources:

a) Will the Project result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building?

Less-than-Significant Impact. Based on the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, there are no known significant archaeological or historical sites, structures, objects, or buildings in or adjacent to the Project Area. All ground-disturbing activities for Alternative 1 would take place in submerged areas, where there is a low probability of encountering cultural materials. Artifacts are most likely to be found in shoreline and upland areas, and the shoreline of Lake Tahoe has not changed significantly during the last 4,000 years, the time of heaviest human occupation of the Tahoe region. There is evidence that the shoreline of Lake Tahoe was lower during the Middle Holocene (ca. 7000 to 4000 B.P.), and there could be submerged campsites and artifacts from that period in areas currently under water. However, human populations in the Tahoe region were low during the Middle Holocene and artifacts from the period are uncommon. There are no records of submerged cultural resources within ½ mile of the proposed Project. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which

would have removed any buried cultural artifacts that may have occurred in the dredged area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

Therefore, no archaeological or historic resources are likely to be affected by the proposed Project. In the unlikely event that buried archaeological or historical resources are discovered during Project activities, **BMP C1-21** would be implemented. Ground-disturbing activities would cease within 30 feet of the find, and the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. If cultural resources are found, TRPA would also be informed in writing. With implementation of **BMP C1-21**, Alternative 1 would have less than significant potential impacts with regard to alterations or adverse effects on significant archaeological or historical sites, structures, objects, or buildings.

b) Is the proposed Project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records?

Less-than-Significant Impact. The Project is not located on a property with any known cultural, historical, and/or archaeological resources. The Project Area is approximately ¼ mile east of the historical mouth of Burton Creek, which the TRPA Shorezone Ordinance Amendments EIS (TRPA 2004) identifies as a culturally and archaeologically significant Washoe fishing campsite. No artifacts associated with this campsite have been found in or adjacent to the Project Area. All ground-disturbing activities for Alternative 1 would take place in submerged areas, where there is a low probability of encountering cultural materials. There are no records of submerged cultural resources within ½ mile of the proposed Project.

In the unlikely event that buried cultural resources are discovered during Project activities, **BMP C1-21** would be implemented. Ground-disturbing activities would cease within 30 feet of the find, and the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. If cultural resources are found, TRPA would also be informed in writing. With implementation of **BMP C1-21**, Alternative 1 would have less than significant potential impacts to cultural, historical, and/or archaeological resources.

c) Is the property associated with any historically significant events and/or sites or persons?

Less-than-Significant Impact. The Project is not located on property associated with any historically significant events, sites, or persons. The historical mouth of Burton Creek, a Washoe fishing campsite, is approximately ¼ mile west of the Project Site. The Project Area is also in the vicinity of a wharf that served as a refueling stop for lake steamers in the late 1800s. There are no records of historically significant materials associated with the Washoe campsite or wharf having been found in or adjacent to the Project Area, and Alternative 1 is unlikely to affect materials associated with these sites. In the unlikely event that cultural materials are found during construction**, BMP C1-21** will be implemented. With the implementation of **BMP C1-21**, the Project's potential impacts on historically significant sites would be less than significant.

d) Does the Project have the potential to cause a physical change which would affect unique ethnic cultural values?

Less-than-Significant Impact. The Project Area is not known to have unique ethnic cultural values, and a search of the NAHC's Sacred Lands File did not indicate the presence of known tribal cultural resources in the Project vicinity. The Project Area is approximately ¼ mile east of a former Washoe fishing campsite, as identified on TRPA maps. However, the proposed Project is not likely to have any effect on cultural resources associated with this campsite, and **BMP C1-21** would be implemented in the unlikely event that cultural resources are found during construction. With implementation of **BMP C1-21** Alternative 1 would

have less than significant potential impacts in regard to causing a physical change which would affect unique ethnic cultural values.

e) Will the Project restrict historic or pre-historic religious or sacred uses within the potential impact area?

No Impact. A search of the NAHC's Sacred Lands File did not indicate the presence of known tribal sacred uses in the Project vicinity, and there are no other known historic or pre-historic religious or sacred uses of the Project Area. Therefore, Alternative 1 would have no impact with regard to restricting religious or sacred uses in the potential impact area.

3.5.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on cultural resources?

Less-than-Significant Impact. As the lead federal agency for the NHPA Section 106 process, the CG has determined that no historic properties are likely to be affected by the proposed Project based on the criteria in the NHPA implementing regulations (36 CFR 800.4(d)(1)). According to the results of the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, no cultural resources have been previously documented in or adjacent to the Project Area. All ground-disturbing activities for Alternative 2 would take place in submerged areas, where there is a relatively low probability of encountering cultural materials, as explained in the analysis for Alternative 1. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which would have removed any submerged artifacts that may have occurred in the dredged area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

As required by Section 106 of the NHPA, the CG is engaged in consultation with the SHPO, as well as the THPO for the Washoe Tribe of Nevada and California, on the determination that no historic resources would be affected by the Project. If the CG receives comments from the SHPO and THPO, they will be considered and addressed in preparing the final environmental document.

In the unlikely event that buried cultural resources are discovered during dredging, **BMP C2-18** would be implemented. In accordance with **BMP C2-18**, ground-disturbing activities would cease within a 30-foot radius of the find, and the CG would consult a qualified archaeologist for recommended procedures. Any necessary investigation and treatment will be completed before Project activities continue in the vicinity of the find. If the find is related to tribal cultural resources, the THPO for the Washoe Tribe of Nevada and California will be contacted and invited to consult with the hired professional archaeologist or monitor any further necessary treatment or investigation. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. If cultural resources are found, the TRPA would also be informed in writing.

In summary, no historic properties are likely to be affected by the Project, and with the implementation of **BMP C2-18,** Alternative 2's potential impacts on cultural resources would be less than significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Less-than-Significant Impact. No historical resources are likely to be affected by the proposed Project. As indicated by the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, there are no historical resources, as defined by CEQA Guidelines Section 15064.5, known to exist in or adjacent to the Project Area, and none are likely to occur in the disturbance footprint of Alternative 2. All ground-disturbing activities for Alternative 2 would take place in submerged areas, where there is a low probability of encountering cultural materials, as explained in the analysis for Alternative 1. There are no records of submerged cultural resources within ½ mile of the proposed Project. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which would have removed any buried cultural artifacts that may have occurred in the dredged area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

As required by Section 106 of the NHPA, the CG is engaged in consultation with the SHPO, as well as the THPO for the Washoe Tribe of Nevada and California, on the determination that no historic resources would be affected by the Project. If the CG receives comments from the SHPO and THPO, they will be considered and addressed in preparing the final environmental document.

In the unlikely event that buried historical resources are discovered during Project activities, **BMP C2-18** would be implemented. Ground-disturbing activities would cease within a 30-foot radius of the find and the CG would consult a qualified archaeologist for recommended procedures. Any necessary investigation and treatment will be completed before Project activities continue in the vicinity of the find. If the find is related to tribal cultural resources, the Washoe Tribe of Nevada and California will be contacted and invited to consult with the hired professional archaeologist and to monitor any further necessary treatment or investigation. If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on the treatment of the burial site. If cultural resources are found, TRPA would also be informed in writing.

In summary, no historical resources are likely to be affected by the proposed Project, and with the implementation of **BMP C2-18,** Alternative 2 would have less than significant potential impacts with regard to causing a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Less-than-Significant Impact. No archaeological resources are likely to be affected by the proposed Project. There are no archaeological resources, as defined by CEQA Guidelines Section 15064.5, known to exist in or adjacent to the Project Area, and none are likely to occur in the disturbance footprint of Alternative 2. In the unlikely event that buried archaeological resources are discovered during Project activities, **BMP C2-18** would be implemented. Ground-disturbing activities would cease in the area of the find and the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately and the County Coroner would be notified and procedures required by state law would be followed. TRPA would also be informed if archaeological resources are found. With the implementation of **BMP C2-18**, Alternative 2 would have less than significant potential impacts with regard to causing a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less-than-Significant Impact. Based on geotechnical studies conducted for the Station (Holdredge & Kull Consulting Engineers 2009) and the adjacent TCPUD boat ramp area (Marvin Davis & Associates 2013) and a review of the Geologic Map of the Lake Tahoe Basin (Saucedo 2005), the areas where piles would be installed for the pier extension are composed of recent sediments and Holocene-aged lacustrine deposits. Although there could be remnants of Holocene-aged organisms in the lacustrine deposits, paleontological resources are typically not considered unique or significant under CEQA unless they are pre-Holocene and are particularly well-preserved, rare, or otherwise important to the body of paleontological knowledge. A review of the UCMP online database did not indicate the presence of previously discovered unique paleontological resources in the Project vicinity. Holocene-aged lacustrine deposits are relatively common in the Lake Tahoe Basin, and no unique geologic features are known to occur in the Project disturbance area. For these reasons, Alternative 2 will have less-than-significant impacts related to destruction of a unique paleontological resource or site or unique geologic feature.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Less-than-Significant Impact. There is no evidence suggesting the likely presence of human remains in the Project Area. In the unlikely event that human remains are discovered, **BMP C2-18** would be implemented. Ground-disturbing work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site.

e) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC §21074?

A search of the NAHC's Sacred Lands File did not indicate the presence of known tribal cultural resources in the Project vicinity. The Project Area is approximately ¼ mile east of a former Washoe fishing campsite, as identified on TRPA maps. However, the proposed Project is not likely to have any effect on cultural resources associated with this campsite, and **BMP C1-21** would be implemented in the unlikely event that cultural resources are found during construction. With implementation of **BMP C1-21** Alternative 1 would have less than significant potential impacts in regard to tribal cultural resources as defined in PRC §21074.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to cultural resources:

a) Will the Project result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building?

Less-than-Significant Impact. Based on the CHRIS Inventory and NAHC Sacred Lands File records searches and other historical research conducted for the Project, there are no known significant archaeological or historical sites, structures, objects, or buildings in or adjacent to the Project Area. All ground-disturbing activities for Alternative 2 would take place in submerged areas, where there is a low probability of encountering cultural materials, as explained in the analysis for Alternative 1. There are no records of submerged cultural resources within ½ mile of the proposed Project. In addition, much of the proposed dredging footprint has been previously disturbed during past dredging for the adjacent TCPUD pier, which would have removed any buried cultural artifacts that may have occurred in the dredged area. There are no known shipwrecks or other historical-era artifacts in the Project Area, and no evidence of shipwrecks or other cultural materials was observed during the dive surveys conducted to assess fish habitat in the Project Area.

Therefore, no archaeological or historic resources are likely to be affected by the proposed Project. In the unlikely event that buried archaeological or historical resources are discovered during Project activities, **BMP C2-18** would be implemented. Ground-disturbing activities would cease within 30 feet of the find, and

the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. With implementation of **BMP C2-18**, Alternative 2 would have less than significant potential impacts with regard to alterations or adverse effects on significant archaeological or historical sites, structures, objects, or buildings.

b) Is the proposed Project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records?.

Less-than-Significant Impact. The Project is not located on a property with any known cultural, historical, and/or archaeological resources. The Project Area is approximately ¼ mile east of the historical mouth of Burton Creek, which the TRPA Shorezone Ordinance Amendments EIS (TRPA 2004) identifies as a culturally and archaeologically significant Washoe fishing campsite. No artifacts associated with this campsite have been found in or adjacent to the Project Area. All ground-disturbing activities for Alternative 2 would take place in submerged areas, where there is a low probability of encountering cultural materials, as explained previously in the NEPA analysis. There are no records of submerged cultural resources within ½ mile of the proposed Project.

In the unlikely event that buried cultural resources are discovered during Project activities, **BMP C2-18** would be implemented. Ground-disturbing activities would cease within 30 feet of the find, and the CG would consult a qualified archaeologist for recommended procedures. If human remains are discovered, work would stop immediately, and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the NAHC, which would contact the most likely descendants for consultation on treatment of the burial site. If cultural resources are found, TRPA would also be informed in writing. With implementation of **BMP C2-18**, Alternative 2 would have less than significant potential impacts to cultural, historical, and/or archaeological resources.

c) Is the property associated with any historically significant events and/or sites or persons?

Less-than-Significant Impact. The Project is not located on property associated with any historically significant events, sites, or persons. As discussed previously, the historical mouth of Burton Creek, a Washoe fishing campsite, is approximately ¼ mile west of the Project Site. The Project Area is also in the vicinity of a wharf that served as a refueling stop for lake steamers in the late 1800s. There are no records of cultural materials associated with the Washoe campsite or wharf having been found in or adjacent to the Project Area, and Alternative 2 is unlikely to affect materials associated with these sites. In the unlikely event that cultural materials are found during construction**, BMP C2-18** will be implemented. With the implementation of **BMP C2-18**, the Project's potential impacts on historically significant sites would be less than significant.

d) Does the Project have the potential to cause a physical change which would affect unique ethnic cultural values?

Less-than-Significant Impact. The Project Area is not known to have unique ethnic cultural values, and a search of the NAHC's Sacred Lands File did not indicate the presence of known tribal cultural resources in the Project vicinity. As discussed previously, the Project Area is approximately ¼ mile east of a former Washoe fishing campsite. However, the proposed Project is not likely to have any effect on cultural resources associated with this campsite, and **BMP C2-18** would be implemented in the unlikely event that cultural resources are found during construction. With implementation of **BMP C2-18** Alternative 2 would have less than significant potential impacts in regard to causing a physical change which would affect unique ethnic cultural values.

e) Will the Project restrict historic or pre-historic religious or sacred uses within the potential impact area?

No Impact. There are no known historic or pre-historic religious or sacred uses of the Project Area, and Alternative 2 would have no impact with regard to restricting religious or sacred uses in the potential impact area.

3.5.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 2 would be substantially similar to Alternative 3 in terms of ground disturbance, except that Alternative 3 would involve installing four additional piles in the lake bed. The area where those additional piles would be installed has no known cultural resources or unique paleontological resources or geologic features, and, similar to Alternative 2, **BMP C2-18** would be implemented in the unlikely event that cultural resources are discovered during construction. With implementation of **BMP C2-18**, Alternative 3 would have less than significant potential impacts on cultural resources.

3.5.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and Alternative 4 would have no impact on cultural resources. However, Alternative 4 would not meet the public health and safety purpose and need of the proposed Project, and CG emergency response times would continue to be adversely affected during low-water conditions.

3.6 Geology, Soils, and Land

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to geology, soils, and land.

3.6.1 Affected Environment

Project construction would occur in the shorezone of Lake Tahoe. The lake-bottom substrate in the Project disturbance area is composed primarily of clay, silt, and fine sand, though there are also some areas of gravel, cobble, and small boulders in the Project Area.

The littoral zone of Lake Tahoe comprises the area along the shoreline where the action of waves and currents can cause the transport of sediment along or perpendicular to the shore. The littoral zone in the Project Area is made up of a relatively flat, gradually sloping bedrock shelf extending from the shoreline to approximately 2 miles offshore, where the lake bottom drops off steeply from approximately 60 feet to approximately 600 feet at the bottom of the shelf edge. The movement of sediments in the littoral zone, referred to as “littoral drift,” can lead to areas of erosion or deposition. Factors that influence littoral drift include wave and longshore current direction and energy, wind, water depth, and the presence of geologic or manmade barriers.

Wave and longshore current energy is relatively low in the littoral zone of Lake Tahoe, and therefore littoral transport is relatively limited (Osborne et al. 1985). The transport of sediments in the littoral zone of Lake Tahoe is restricted to many small, discrete cells generally separated by subterranean geomorphic barriers. The littoral cell in the Project vicinity extends along roughly 3 miles of shoreline from Tahoe City to Dollar Point. The sediments in this cell are primarily derived from the volcanic source rock common in the northwest part of the Lake Tahoe Basin, and most sediments are made up of medium-grained sand with an grain sizes ranging from 0.06 to 0.50 millimeter (Loeb 2013, Harrison 2012). According to Osborne et al. (1985), the sand transport zone along the northern shoreline of Lake Tahoe may extend to a depth of 20 to 25 feet below the lake surface, and the net direction of littoral sediment transport in the Project vicinity is generally west to east. There is also a general onshore to offshore movement of finer-grained sediments in the littoral zone of Lake Tahoe. In the vicinity of the Station, the outflow of water and sediment from the mouth of Star Harbor, combined with the general longshore transport of sediment from west to east, results in a depositional regime along portions of the shoreline east of Star Harbor, as evidenced by the spit offshore of Lake Forest Beach that is visible during low water.

TRPA identifies eight Shorezone Tolerance District classifications along the shoreline of Lake Tahoe. The Project Area is located with Plan Area 006 – Fish Hatchery. According to the Plan Area Statement for Plan Area 006 (TRPA 2002), the shorezone in the Project vicinity is classified as a Shorezone Tolerance District 1. The TRPA Code of Ordinances indicates that in Shorezone Tolerance District 1: "The beach that forms the shoreline in these districts is a low sandy barrier that separates the lake proper from marshes and wetlands. Generally, the shorezone is ecologically fragile and any substantial use or alteration can lead to excessive sedimentation, beach erosion, and water turbidity."

Lake Tahoe is situated in an intermountain basin between the Sierra Nevada and the Carson Range. Lake Tahoe formed in a graben, a depressed block of land between two parallel faults. In this case, the graben is bound on the east and west by a series of discontinuous, generally east and west dipping normal faults. The northern end of the Lake Tahoe Basin was closed by a combination of faulting and repeated episodes of volcanic activity and glacial advances during the late Pliocene and early Pleistocene, blocking the basin outlet and allowing Lake Tahoe to form (Saucedo 2005).

A review of the Geologic Map of the Lake Tahoe Basin (Saucedo 2005) indicates that the geologic unit underlying the Station property is composed of Miocene-aged (5 to 23 million years old) volcanic rocks, including undivided andesitic and dacitic lahars, flows, breccia and volcaniclastic sediments. There are several other geologic units mapped in the near vicinity of the Project Area. The area west of the mouth of Star Harbor is underlain by Holocene-aged (0 to 11,700 years old) lacustrine deposits composed of thin-bedded sandy silt and clay. The area just to the east of the Station is underlain by Pliocene- to Pleistocene-aged (5 million to 11,700 years old) volcanic rocks, including basalt flows, flow breccia, and basaltic ash, that are remnants of a maar (i.e., shallow volcanic crater).

A geotechnical investigation was conducted for the Project in 2009 by Holdredge & Kull Consulting Engineers (*Appendix J*). The investigation included drilling a boring to a depth of 41 feet below ground surface (i.e., to an elevation of approximately 6,192 feet, LTD) in the upland area between the Station office and the shoreline. Laboratory tests were performed for selected soil samples. Soil encountered during the boring generally consisted of soft to hard fat clay with varying amounts of sand, consistent with lacustrine deposits. The fat clay contained thin interbedded layers of elastic silt and fine sand. No weak or highly compressible soil conditions were encountered, indicating that the site would be suitable for conventional pile construction techniques (Holdredge & Kull Consulting Engineers 2009).

A geotechnical investigation was also conducted for the adjacent TCPUD boat ramp repair and maintenance dredging project (Marvin Davis & Associates 2013). The investigation indicated that the substrate in the area to be dredged for the TCPUD project is composed of a thin layer of alluvial deposits comprising slightly silty fine sand extending to an elevation of approximately 6,218, LTD. Below this surface sediment layer is a much thicker layer of dense lacustrine deposits composed of thin-bedded silts, clays, and fine sands. According to the geotechnical report for the TCPUD project, the thickness of the lacustrine layer in the vicinity is generally greater than 50 feet.

The northern Sierra Nevada is a seismically active region, and there is some potential for ground motion caused by earthquakes to occur at the Project site. However, the Project Area is not in an area mapped by the state as an Alquist-Priolo earthquake fault zone and therefore surface fault rupture is unlikely. The site-specific geotechnical report prepared for the Project (Holdredge & Krull Consulting Engineers, 2009) indicates that the potential for seismic hazards such as surface fault rupture, liquefaction, and lateral spreading is low for the Project Area.

According to the USGS Quaternary Faults and Folds Database (USGS 2014), there are no historically active faults (i.e., active in the last approximately 150 years) in the Project vicinity. The closest faults that have been active in the last 11,700 years are the North Tahoe Fault (approximately 4 miles southeast of the Project Area), the West Tahoe Fault (6 miles south) and the Incline Village Fault (7 miles northeast). The southern portion of the West Tahoe Fault has been zoned under the Alquist-Priolo Act (California Geological Survey 2016). Various faults associated with the West Tahoe-Dollar Point Fault Zone that have been active in the past 1.6 million years are located closer to the Project Area, including one fault branch approximately 240 feet southwest of the existing pier at its closest point. However, that particular fault

branch has not shown any substantial activity for at least 750,000 years (USGS 2014) and is not expected to pose a significant risk of ground rupture or strong ground shaking.

3.6.2 Regulatory Setting

3.6.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to geology, soils, and land and relevant to the proposed Project are identified in *Table 3-22.*

Table 3-22 Federal and State Laws, Regulations and Policies Potentially Applicable to the Project (Geology, Soils, and Land)

Jurisdiction	Regulation	Description
U.S.	Earthquake Hazards Reduction Act of 1977 (42 USC 7704)	The U.S. Congress passed the Earthquake Hazards Reduction Act in 1977 to "reduce the risks to life and property from future earthquakes in the United States" through the establishment and maintenance of an effective earthquake hazards and reduction program.
U.S.	Historic Sites Act of 1935 (16 USC 461-467)	The Historic Sites Act establishes a national registry of natural landmarks and protects "outstanding examples of major geological features."
CA	Alquist-Priolo Earthquake Fault Zoning Act (PRC 2621-2630)	This Act requires that "sufficiently active" and "well-defined" earthquake fault zones be delineated by the State Geologist and prohibits locating structures for human occupancy across the trace of an active fault.
CA	California Seismic Hazards Mapping Act (PRC 2690 et seq.)	The Seismic Hazards Mapping Act is intended to reduce damage resulting from earthquakes. The Alquist-Priolo Act addresses surface fault rupture; the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The state is charged with identifying and mapping areas at risk for these hazards, and cities and counties are required to regulate development in mapped Seismic Hazard Zones (SHZs). Cities and counties are prohibited from issuing development permits for sites in SHZs unless site-specific geotechnical investigations have been carried out and measures to reduce potential damage have been incorporated into the development plans.

3.6.2.2 Regional and Local Regulatory Setting

TRPA Regional Plan

The Shorezone Subelement of the TRPA Regional Plan includes the following goals and policies related to soils and littoral processes:

Goal SZ-1: Provide for the appropriate shorezone uses of Lake Tahoe, Cascade Lake, and Fallen Leaf Lake while preserving their natural and aesthetic qualities.

Policy SZ-1.4: Class 1 capability shorezones shall be managed consistent with the goals and policies of the Stream Environment Zone Subelement.

Policy SZ-1.9: The TRPA shall regulate the placement of new piers, buoys, and other structures in the foreshore and nearshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds and other relevant concerns.

The Soils Subelement of the Regional Plan also states the following goals and policies:

Goal S-1: Minimize soil erosion and the loss of soil productivity.

Policy S.1-4: TRPA shall develop specific policies to limit land disturbance and reduce soil and water quality impacts of disturbed areas.

TRPA Code of Ordinances and the Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan. Code Chapter 84 regulates the placement of new piers, buoys, and other structures in the nearshore and foreshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds, and other relevant concerns. The TRPA Code sections that are related to geology and soils and are relevant to the proposed Project include:

Code Section 33.6.2. Use of equipment of a size and type that under prevailing site conditions will do the least amount of damage to the environment may be specified as a condition of approval. Construction equipment and materials shall be restricted to the construction site boundary.

Code Section 80.3.2. A. TRPA must analyze and make environmental findings demonstrating that the project will not adversely affect littoral processes.

Code Section 80.3.2. A.F. Construction and access techniques will be used to minimize disturbance to the ground and vegetation.

Code Section 84.4.3.A.9. Applications for new piers and pier extensions that include floating piers or floating portions longer than 25 feet must submit a site-specific littoral drift and wave analysis which evaluates the sediment movement along the lake bottom during low, mid, and high lake levels. The lake level condition with the greatest effect on littoral transport and backshore stability shall be used to design the floating pier section so that wave heights are not reduced by more than 50 percent and the floating pier section is no greater than 50 percent of the length of the site-specific design wavelength.

Code Section 84.4.3.B.2.h. To permit free circulation of water, piers shall be floating, or shall be built on an open piling foundation, but in no case shall a pier be supported on a foundation that is less than 90 percent open.

TRPA Shorezone Permitting Process

TRPA review of projects in the shorezone is governed by the *Lake Tahoe Shoreline Plan* (TRPA 2018) and associated amendments to the TRPA Code of Ordinances described generally above. This Project is an Essential Public Safety Facility and the CG is in the process of going through TRPA's current Shorezone Permitting Process. (See Section 1.5.4.7 for additional details.)

TRPA Thresholds

The TRPA thresholds for soil conservation are related either to limiting impervious cover in upland areas or preservation of SEZ lands. All permanent disturbance for the proposed Project Alternatives will occur entirely within Lake Tahoe, so the proposed Project would not affect impervious cover in upland areas of SEZs. Therefore, the TRPA thresholds related to impervious cover and SEZs are not applicable to the proposed Project.

3.6.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on geology, soils, and land in the context of NEPA, CEQA, and TRPA requirements. Where potentially significant impacts are identified, a discussion of proposed measures to mitigate those impacts is also provided.

*Table 3-23*provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-23 Significance Determinations for the Project Alternatives (Geology, Soils, and Land)

Geology, Soils, and Land	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on geology, soils, or land?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project: *a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:* *i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
ii) Strong seismic ground shaking?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
iii) Seismic-related ground failure, including liquefaction?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
iv) Landslides?	No Impact	No Impact	No Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	No Impact	No Impact	No Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	No Impact	No Impact	No Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	No Impact	No Impact	No Impact	No Impact

Geology, Soils, and Land	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
TRPA				
Land: *Will the Project result in:* *a) Compaction or covering of the soil beyond the limits allowed in the land capability or IPES?*	No Impact	No Impact	No Impact	No Impact
b) A change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Unstable soil conditions during or after completion of the Project?	Less-than-Significant Impact	No Impact	No Impact	No Impact
d) Changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) The continuation of or increase in wind or water erosion of soils, either on or off the site?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) Changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
g) Exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for geology or soils?*	No Impact	No Impact	No Impact	No Impact

3.6.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on geology, soils, or land?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and therefore is not at significant risk of seismically induced ground rupture. The site-specific geotechnical report prepared for the Project (*Appendix J*) indicates that the soil profile of the Project site has low potential for liquefaction and lateral spreading. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone that lies approximately 240 feet to the southwest of the existing pier at its closest point, but there has been no substantial movement of this fault in the past 750,000 years (USGS 2014). Although there is some potential for seismic ground shaking in the Project Area due to possible earthquakes on other faults in the region, the existing Station pier was constructed according to applicable seismic design criteria, and Alternative 1 would not negatively affect the structural integrity of the pier or otherwise increase risks from seismic activity in the Project vicinity. According to the Project geotechnical report (*Appendix J)* and other available geologic data, Alternative 1 would not be located on

an unstable geologic unit or soil. Therefore, the impacts of Alternative 1 related to geological hazards would be less than significant.

All permanent disturbance associated with Alternative 1 occurs entirely in the shorezone of Lake Tahoe, and no long-term impacts to upland soils would occur. The only construction activities associated with Alternative 1 with potential to temporarily affect shoreline and upland soils are the placement of the stands for the conveyor system and potential upland staging of construction equipment and materials. In accordance with **BMP C1-10**, the conveyor stands will be placed in a manner that minimizes disturbance of soil and vegetation, and other staging and use of construction equipment in upland areas will be limited to paved areas, which are beyond the backshore boundary.

The proposed dredging and pile installation would have the potential to affect littoral processes, including erosion and deposition, in the shorezone by changing the bathymetry and thereby the movement of water and sediment. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess these potential impacts to littoral processes, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height and orbital velocity and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study used various models developed by the USACE Engineering Research and Development Center.

The littoral drift modeling showed that Alternative 1 would have the potential to decrease the heights and orbital velocities of waves somewhat as they passed over the dredged area, and would affect wave heights and velocities over a larger area than the two pier extension alternatives. However, under typical wave conditions, these changes would not affect wave action at the shoreline and therefore would not affect shoreline erosion or deposition caused by wave action.[10] Additionally, Alternative 1 would have less effect on long-shore current velocities than the pier extension alternatives, and long-shore currents appear to play a larger role in littoral transport in the Project vicinity than wave action, as evidenced by the spit, formed by long-shore currents, occurring offshore of Lake Forest Beach. Although Alternative 1 would have less effect on long-shore transport than the other Action Alternatives, it would increase the deposition out of the water column of fine particles transported by long-shore currents by roughly 7 to 13 percent. However, the area over which this increase in deposition would occur would be limited largely to the dredging footprint. Additionally, given the typically low suspended sediment concentrations in Lake Tahoe, this would not represent a significant amount of additional material deposited or a significant change to littoral conditions. In addition, the littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes potentially caused by Alternative 1 would not significantly affect general conditions in the shorezone. Therefore, long-term impacts of Alternative 1 on littoral processes and soils would be less than significant.

In summary, Alternative 1 would not cause significant impacts to geology and soils.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

[10] Also note that the analyses in the littoral drift study provided in *Appendix K* were based on an earlier version of Alternative 1 that had a dredging footprint that extended 35 feet closer to the shoreline and included a floating dock that was 35 feet longer. The reduction of the disturbance footprint is expected to result in a reduction of impacts to littoral drift, and the study's overall conclusion that dredging would not cause significant impacts to littoral processes remains valid for the current design.

Would the Project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

Less-than-Significant Impact. The only new structures that would be added for Alternative 1 are the replacement boat lift and the floating dock, which would not increase exposure of people or structures to seismic risk. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and is not at significant risk for ground rupture. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone that runs underneath the Project Area, but the fault is approximately 240 feet southwest of the new boat lift at its closest point and there has been no substantial movement of this fault in the past 750,000 years (USGS 2014). The presence of this and other nearby faults is not expected to represent a significant risk of ground rupture at the Project site.

ii) Strong seismic ground shaking?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and the fault approximately 240 feet southwest of the Station has not been active in the last 750,000 years. A large magnitude earthquake on one of the other active faults in the Project region could result in seismic ground shaking at the Project site. However, the existing Station pier was constructed according to applicable seismic design criteria, and Alternative 1 would not affect the structural integrity of the pier or otherwise increase risks from seismic activity in the Project vicinity. Therefore, this impact would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. According to the geotechnical report prepared for the Project (*Appendix J*), the soil profile of the Project site indicates a low potential for liquefaction or other seismic-related ground failure. Therefore, this impact would be less than significant.

iv) Landslides?

No Impact. The Project disturbance area occurs entirely in the shorezone of Lake Tahoe in an area of gradual elevation change, where there is no potential for landslides.

b) Result in substantial soil erosion or the loss of topsoil?

Less-than-Significant Impact. The permanent disturbance area for Alternative 1 occurs entirely in the shorezone of Lake Tahoe, and no long-term impacts to upland soils would occur. The only construction activities associated with Alternative 1 with potential to affect shoreline and upland soils are the placement of the stands for the conveyor system and potential upland staging of construction equipment and materials. In accordance with **BMP C1-10**, the conveyor stands will be placed in a manner that minimizes disturbance of soil and vegetation, and other staging and use of construction equipment in upland areas will be limited to paved areas, which are beyond the backshore boundary.

The proposed dredging and pile installation would have the potential to affect littoral processes, including erosion, in the shorezone by changing the bathymetry and thereby the movement of water and sediment. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess these potential impacts to littoral processes, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height and orbital velocity and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study used various models developed by the USACE Engineering Research and Development Center.

The littoral drift modeling showed that Alternative 1 would have the potential to decrease the heights and orbital velocities of waves somewhat as they passed over the dredged area, and would affect wave heights and velocities over a larger area than the two pier extension alternatives. However, under typical wave conditions, these changes would not affect wave action at the shoreline and therefore would not affect shoreline erosion or deposition caused by wave action.[11] Additionally, Alternative 1 would have less effect on long-shore current velocities than the pier extension alternatives, and long-shore currents appear to play a larger role in littoral transport in the Project vicinity than wave action, as evidenced by the spit, formed by long-shore currents, occurring offshore of Lake Forest Beach. Although Alternative 1 would have less effect on long-shore transport than the other Action Alternatives, it would increase the deposition out of the water column of fine particles transported by long-shore currents by roughly 7 to 13 percent. However, the area over which this increase in deposition would occur would be limited largely to the dredging footprint. Additionally, given the typically low suspended sediment concentrations in Lake Tahoe, this would not represent a significant amount of additional material deposited or a significant change to littoral conditions. In general, the changes to littoral processes caused by Alternative 1 would lead to a slight decrease in erosion and a slight increase in deposition in the local area; however, these changes would be minor, and the slight increase in deposition in the Project vicinity is not expected to lead to a noticeable increase in erosion elsewhere. The littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes potentially caused by Alternative 1 would not significantly affect general conditions in the shorezone.

In summary, the impacts of Alternative 1 related to soil erosion or the loss of topsoil would be less than significant.

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*

No Impact. According to the Project geotechnical report (*Appendix J*) and other available geologic data, Alternative 1 would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed Project. Therefore, Alternative 1 would have no impacts related to increased potential for landslide, lateral spreading, subsidence, liquefaction, or collapse due to unstable soils.

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

No Impact. According to the Project geotechnical report (*Appendix J*) and other available geologic data, Alternative 1 would not be located on expansive soil and would have no impact related to creating substantial risks to life or property due to being located on such soils.

e) *Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?*

No Impact. Alternative 1 does not involve the installation of a septic system or alternative waste water disposal system and would have no impact related to such systems.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

[11] Also note that the analyses in the littoral drift study provided in *Appendix K* were based on an earlier version of Alternative 1 that had a dredging footprint that extended 35 feet closer to the shoreline and included a floating dock that was 35 feet longer. The reduction of the disturbance footprint is expected to result in a reduction of impacts to littoral drift, and the study's overall conclusion that dredging would not cause significant impacts to littoral processes remains valid for the current design.

Will the Project result in:

a) Compaction or covering of the soil beyond the limits allowed in the land capability or IPES?

No Impact. The permanent disturbance area for Alternative 1 occurs entirely in the shorezone of Lake Tahoe, and Alternative 1 would involve no impacts to the upland areas at the Station that are subject to TRPA's land capability or IPES system requirements.

b) A change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions?

Less-than-Significant Impact. Alternative 1 would not involve changes to upland topography or ground surface relief features. As discussed below under question *f,* Alternative 1 would have minor impacts on littoral processes in and around the dredging footprint, but the effects are not expected to extend to the shoreline or otherwise affect the topography of the foreshore or backshore. Alternative 1 would affect lake-bottom bathymetry in the dredging footprint, where depths would be changed by up to 7 feet in some areas (including dredging of the full overdepth allowance as a worst case), but impacts would be localized and elevation changes throughout most of the dredging footprint would be more in the range of 1 to 2 feet. In accordance with **BMP C1-3** dredging will be kept to the minimum area necessary to achieve the target channel width, depth, and gradient and overdepth dredging will be minimized to the extent practicable. In summary, the impacts of Alternative 1 on topography would be less than significant.

c) Unstable soil conditions during or after completion of the Project?

Less-than-Significant Impact. According to the Project geotechnical report (*Appendix J*), the soils in the Project Area are generally stable. However, the Project Area is in TRPA Shorezone Tolerance District 1, indicating that the shorezone is ecologically fragile and potentially prone to erosion. However, the backshore at the Station is armored with riprap to prevent excessive erosion.

During construction, the only activity potentially affecting the shoreline and backshore would be placement of the stands for the conveyor system. In accordance with **BMP C1-10**, these stands will be placed in a manner that minimizes disturbance of soil and vegetation, and other staging and use of construction equipment in upland areas will be limited to paved areas, which are beyond the backshore boundary.

The permanent disturbance area for Alternative 1 occurs entirely within Lake Tahoe, and no long-term impacts to upland soil stability would occur. As discussed below under question *f,* Alternative 1 would have minor impacts on the littoral processes in the Project Area, but these are not expected to extend to the shoreline or otherwise affect the stability of shorezone soils. In summary, the impacts of Alternative 1 on soil stability during or after completion of the Project would be less than significant.

d) Changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet?

Less-than-Significant Impact. Alternative 1 would not result in grading or other soil disturbance in upland areas. Alternative 1 would involve dredging of the lake bottom in the dredging footprint to an elevation of 6,215 feet, LTD. This would result in a reduction of the current lake-bottom elevation by up to 7 feet in the northern portion of the dredging footprint (including dredging of the full overdepth allowance as a worst case). However, the elevation change is likely to be only 1 to 2 feet throughout most of the footprint. In addition, the two new piles for the replacement boat lift will be installed to a depth of up to 30 feet below the mudline. However, the area affected by these piles will be negligible, and their installation would not result in significant impacts to soil erosion or deposition. Therefore, Alternative 1 would have less-than-significant impacts related to changes in undisturbed soil or native geological substructures or grading in excess of 5 feet.

e) The continuation of or increase in wind or water erosion of soils, either on or off the site?

Less-than-Significant Impact. Alternative 1 would not involve grading or other permanent soil disturbance in upland areas. As discussed under question *c,* the only activity potentially affecting the shoreline erosion during construction would be placement of the stands for the conveyor system. In accordance with **BMP C1-10**, these stands will be placed in a manner that minimizes disturbance of soil and vegetation, and other staging and use of construction equipment in upland areas will be limited to paved areas, which are beyond the backshore boundary. Therefore, the impacts of Alternative 1 related to erosion of backshore or upland soils would be less than significant.

As discussed below under question *f,* Alternative 1 would involve impacts in littoral processes in and adjacent to the dredging footprint, but these impacts are expected to be less than significant and would not lead to an increase in erosion.

In summary, Alternative 1 would have less-than-significant impacts related to continuation or increase in wind or water erosion of soils, either on or off site.

f) Changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake?

Less-than-Significant Impact. The proposed dredging and pile installation would have the potential to affect littoral processes, including erosion and deposition, in the shorezone by changing the bathymetry and thereby the movement of water and sediment. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess these potential impacts to littoral processes, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height and orbital velocity and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study used various models developed by the USACE Engineering Research and Development Center.

The littoral drift modeling showed that Alternative 1 would have the potential to decrease the heights and orbital velocities of waves somewhat as they passed over the dredged area, and would affect wave heights and velocities over a larger area than the two pier extension alternatives. However, under typical wave conditions, these changes would not affect wave action at the shoreline and therefore would not affect shoreline erosion or deposition caused by wave action.[12] Additionally, Alternative 1 would have less effect on long-shore current velocities than the pier extension alternatives, and long-shore currents appear to play a larger role in littoral transport in the Project vicinity than wave action, as evidenced by the spit, formed by long-shore currents, occurring offshore of Lake Forest Beach, just east of the Project Area. Although Alternative 1 would have less effect on long-shore transport than the other Action Alternatives, the modeling indicates it would increase the deposition out of the water column of fine particles transported by long-shore currents by roughly 7 to 13 percent. However, the area over which this increase in deposition would occur would be limited largely to the dredging footprint. Additionally, given the typically low suspended sediment concentrations in Lake Tahoe and the small size of the particles that would be deposited, this would not represent a significant amount of additional material deposited or a significant change to littoral conditions. In addition, the littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes potentially caused by Alternative 1 would not significantly affect general conditions in the shorezone. Therefore, Alternative 1 would have a less-than-significant impact related to changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake.

[12] Also note that the analyses in the littoral drift study provided in *Appendix K* were based on an earlier version of Alternative 1 that had a dredging footprint that extended 35 feet closer to the shoreline and included a floating dock that was 35 feet longer. The reduction of the disturbance footprint is expected to result in a reduction of impacts to littoral drift, and the study's overall conclusion that dredging would not cause significant impacts to littoral processes remains valid for the current design.

g) Exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and is not at significant risk of seismically induced ground rupture. The site-specific geotechnical report prepared for the Project (*Appendix J*) indicates that the soil profile of the Project site has low potential for liquefaction and lateral spreading. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone running underneath the Project Area, but the fault is approximately 240 feet southwest of the Station pier at its closest point and there has been no substantial movement of this fault in the past 750,000 years (USGS 2014). Although there is some potential for seismic ground shaking in the Project Area due to possible earthquakes on other faults in the region, the existing Station pier was constructed according to applicable seismic design criteria, and Alternative 1 would not affect the structural integrity of the pier or otherwise increase risks from seismic activity in the Project vicinity. As discussed under question *f*, Alternative 1 would not have significant impacts on littoral processes or soil stability that would increase backshore erosion. In summary, Alternative 1 would have less-than-significant impacts related to exposing people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards.

TRPA Thresholds

No Impact. As discussed in *Section 3.6.2.2*, the TRPA thresholds for soil conservation focus on limiting impervious cover in upland areas and preserving and restoring SEZ lands. Alternative 1 would not involve an increase in impervious area in upland areas and would have no impact on TRPA thresholds for impervious cover. Therefore, the TRPA thresholds related to impervious cover are not applicable to the proposed Project.

The TRPA does not consider the dredging footprint to be in SEZ lands (D. Landry, personal communication), it is entirely within the lakezone of Lake Tahoe, and therefore Alternative 1 would not adversely affect SEZ lands.

3.6.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on geology, soils, or land?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and therefore is not at significant risk of seismically induced ground rupture. The site-specific geotechnical report prepared for the Project (*Appendix J*) indicates that the soil profile of the Project site has low potential for liquefaction and lateral spreading. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone that runs underneath the Project Area, but there has been no substantial movement of this fault in the past 750,000 years (USGS 2014). Although there is some potential for ground shaking in the Project Area due to possible earthquakes on other faults in the region, the proposed pier extension would be constructed according to applicable seismic design criteria. According to the Project geotechnical report (*Appendix J*) and other available geologic data, Alternative 2 would not be located on a geologic unit or soil that is unstable. Alternative 2 would not increase the exposure of people or property to risks from seismic or other geological hazards.

The disturbance area for Alternative 2 would occur entirely in the shorezone of Lake Tahoe, and no impacts to upland soils would occur. In accordance with **BMP C2-7,** staging of construction equipment and materials will be limited to paved upland areas or the floating barge and upland staging areas will be delineated with construction boundary fencing to prevent impacts to adjacent soils.

The proposed piles and floating dock have the potential to affect littoral processes, including erosion and deposition, by affecting waves and currents in the shorezone. In conformance with the design standards for piers in Section 84.4.3.B.2.h of the TRPA Code of Ordinances, the pier extension would be built on an

open piling foundation to permit free circulation of water and minimize interference with littoral processes. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess potential impacts to sediment transport in the shorezone, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height, orbital velocity, and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study concluded that Alternative 2 would have less impact than Alternative 1 on wave heights and orbital velocities, but more impact in terms of decreasing long-shore current speeds, which appear to play a greater role in littoral transport in the Project vicinity. Overall, the model indicates that Alternative 2 would be likely to result in a slight increase in deposition in the local area. However, as is the case with all three Action Alternatives, the potential impacts from Alternative 2 on littoral processes overall would be minor and less than significant. In addition, the littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes that would take place with implementation of Alternative 2 would not significantly affect the general conditions in the littoral zone.

In summary, Alternative 2 would not cause significant impacts to geology and soils.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone that runs underneath the Project Area, but there has been no substantial movement of this fault in the past 750,000 years (USGS 2014), and the presence of this fault and other nearby faults is not expected to represent a significant risk of rupture at the Project site.

ii) Strong seismic ground shaking?

Less-than-Significant Impact. The Project Area is not in or adjacent to an active fault zone. A large magnitude earthquake on one of the other active faults in the Project region could result in seismic ground shaking at the Project site. However, the pier would be constructed according to applicable seismic design criteria, and Alternative 2 would not increase risks from seismic activity in the Project vicinity. Therefore, this impact would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. According to the geotechnical report prepared for the Project (*Appendix J*), the soil profile of the Project site indicates a low potential for liquefaction or other seismic-related ground failure. Therefore, this impact would be less than significant.

iv) Landslides?

No Impact. The Project disturbance area occurs entirely in the shorezone of Lake Tahoe, where there is a gradual change in topography and no potential for landslides.

b) Result in substantial soil erosion or the loss of topsoil?

Less-than-Significant Impact. The disturbance area for Alternative 2 occurs entirely in the shorezone of Lake Tahoe and no impacts to topsoil or other upland soils would occur.

The proposed piles and floating dock have the potential to affect littoral processes, including erosion, by affecting waves and currents in the shorezone. In conformance with the design standards for piers in Section 84.4.3.B.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water and minimize interference with littoral processes. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess potential impacts to sediment transport in the shorezone, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height, orbital velocity, and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study concluded that Alternative 2 would have less impact than Alternative 1 on wave heights and orbital velocities, but more impact in terms of decreasing long-shore current speeds, which appear to play a greater role in littoral transport in the Project vicinity. Overall, the model indicates that Alternative 2 would be likely to result in a slight increase in deposition in the local area, and this minor change is not expected to result a noticeable increase in erosion elsewhere. As is the case with all three Action Alternatives, the potential impacts from Alternative 2 on littoral processes overall would be minor and less than significant. In addition, the littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes that would take place with implementation of Alternative 2 would not significantly affect the general conditions in the littoral zone.

In summary, Alternative 2 would have less-than-significant impacts related to soil erosion or loss of topsoil.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

No Impact. According to the Project geotechnical report (*Appendix J*) and other available geologic data, Alternative 2 would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed Project. Therefore, Alternative 2 would have no impacts related to increased potential for landslide, lateral spreading, subsidence, liquefaction, or collapse due to unstable soils.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

No Impact. According to the Project geotechnical report (*Appendix J*) and other available geologic data, Alternative 2 would not be located on expansive soil and would have no impact related to creating substantial risks to life or property due to being located on such soils.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. Alternative 2 does not involve the installation of a septic system or alternative waste water disposal system and would have no impact related to such systems.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Compaction or covering of the soil beyond the limits allowed in the land capability or IPES?

No Impact. The disturbance area for Alternative 2 occurs entirely in the shorezone of Lake Tahoe, and Alternative 2 would involve no impacts to the upland areas at the Station that are subject to TRPA's land capability or IPES system requirements.

b) A change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions?

Less-than-Significant Impact. Alternative 2 would not change the topography or ground surface relief features of upland areas. As discussed under question *f,* Alternative 2 may have some potential to affect bathymetry in the shorezone by affecting littoral processes, but these changes would be less than significant.

c) Unstable soil conditions during or after completion of the Project?

No Impact. Alternative 2 would not be in an area with unstable soil, or that would become unstable as a result of the proposed Project, and therefore Alternative 2 would have no impacts related to soil instability.

d) Changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet?

Less-than-Significant Impact. Alternative 2 would not result in grading or other soil disturbance in upland areas. Alternative 2 would involve installation of 22 piles into the bed of Lake Tahoe to a depth of up to 30 feet below the mudline. However, the overall lake-bottom footprint of Alternative 2 is relatively small (12 square feet), and Alternative 2 would have less-than-significant impacts related to changes in undisturbed soil or native geological substructures or grading in excess of 5 feet.

e) The continuation of or increase in wind or water erosion of soils, either on or off the site?

Less-than-Significant Impact. Alternative 2 would not result in grading or other soil disturbance in upland areas and therefore would not increase erosion of upland soils.

As discussed below under question *f,* Alternative 2 may have some potential to affect erosion in the shorezone by affecting littoral processes, but these changes would be less than significant. Therefore, Alternative 2 would have less-than-significant impacts related to continuation or increase in wind or water erosion of soils, either on or off site.

f) Changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake?

Less-than-Significant Impact. The proposed piles and floating dock have the potential to affect littoral processes, including erosion and deposition, by affecting waves and currents in the shorezone. In conformance with the design standards for piers in Section 84.4.3.B.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water and minimize interference with littoral processes. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess potential impacts to sediment transport in the shorezone, AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift (wave height, orbital velocity, and long-shore current velocity). The results of the littoral drift study are provided in *Appendix K*. The study concluded that Alternative 2 would have less impact than Alternative 1 on wave heights and orbital velocities, but more impact in terms of decreasing long-shore current speeds, which appear to play a greater role in littoral transport in the Project vicinity. Overall, the model indicates that Alternative 2 would be likely to result in a slight increase in deposition in the local area. However, as is the case with all three Action Alternatives, the potential impacts from Alternative 2 on littoral processes overall would be minor

and less than significant. In addition, the littoral zone in the Project vicinity is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the minor changes in littoral processes that would take place with implementation of Alternative 2 would not significantly affect the general conditions in the littoral zone.

In summary, the impacts of Alternative 2 in relation to deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral process which may modify the channel of a river or stream or the bed of a lake would be less than significant.

g) Exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards?

Less-than-Significant Impact. The Project Area is not in or adjacent to a mapped Alquist-Priolo Earthquake Fault Zone and therefore is not at significant risk of seismically induced ground rupture. The site-specific geotechnical report prepared for the Project (*Appendix J*) indicates that the soil profile of the Project site has low potential for liquefaction and lateral spreading. There is a fault branch associated with the West Tahoe-Dollar Point Fault Zone that runs underneath the southwest portion of the Project Area, but there has been no substantial movement of this fault in the past 750,000 years (USGS 2014). Although there is some potential for seismic ground shaking in the Project Area due to possible earthquakes on other faults in the region, the proposed pier extension would be constructed according to applicable seismic design criteria, and Alternative 2 would not increase the exposure of people or property to risks from seismic hazards. As discussed previously, Alternative 2 would not have significant impacts on littoral processes or soil stability that would increase backshore erosion. Therefore, in summary, Alternative 2 would have less-than-significant impacts related to exposing people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards.

TRPA Thresholds

No Impact. As discussed in *Section 3.6.2.2*, the TRPA thresholds for soil conservation focus on limiting impervious cover in upland areas and preserving and restoring SEZ lands. Alternative 2 would not involve an increase in impervious area in upland areas and would have no impact on TRPA thresholds for impervious cover. Therefore, the TRPA thresholds related to impervious cover are not applicable to the proposed Project.

The TRPA does not consider the area where the pier extension piles would be installed to be in SEZ lands (D. Landry, personal communication), because it is entirely within the lakezone of Lake Tahoe, and therefore the Project would not adversely affect SEZ lands.

3.6.3.3 Alternative 3: Straight Extension with Dolphins

Alternative 3 would have similar types of impacts to Alternative 2, though the quantity or degree would differ in some cases. Alternative 3 would not occur in or adjacent to an Alquist-Priolo fault zone and would not be expected to increase the exposure of people or property to seismic hazards. Alternative 3 would involve the installation of 4 more piles than Alternative 2 but would not significantly affect native geological substructures.

The disturbance area for Alternative 3 occurs entirely in the shorezone of Lake Tahoe, and no impacts to upland soils would occur. The proposed piles and floating dock have the potential to affect littoral processes, including erosion and deposition, by affecting waves and currents in the shorezone, but as with Alternative 2, these impacts would be less than significant. The littoral drift study conducted for the Project (*Appendix K*) required by TRPA Code of Ordinances Section 84.4.3.A.9 concluded that Alternative 3 would have less impact on littoral drift than Alternative 2, despite having more piles, because the orientation of those piles relative to the predominant wind, wave, and current directions would result in less impact to waves and currents than Alternative 2. In addition, the littoral zone near the Station is generally a low energy environment where littoral transport is relatively limited (Osborne et al. 1985), and the relatively

minor changes in littoral processes that would take place with implementation of Alternative 3 would not significantly affect the general conditions in the littoral zone.

In summary, Alternative 3 would not cause significant impacts to geology, soils, and littoral drift.

3.6.3.4 Alternative 4: No Action

No Impact. Under Alternative 4, no modification of or addition of new structures to the littoral zone of Lake Tahoe would occur; and no impacts related to geological hazards, soil erosion, or changes to littoral drift would occur. However, Alternative 4 would not meet the public health and safety purpose and need of the proposed Project, and CG emergency response times would continue to be adversely affected during low-water conditions.

3.7 Hazards, Hazardous Materials, and Risk of Upset

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to hazards, hazardous materials, and risk of upset.

3.7.1 Affected Environment

For purposes of this section, the term “hazardous materials” refers to both hazardous substances and hazardous wastes. A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Chemical and physical properties that cause a substance to be considered hazardous include toxicity, ignitability, corrosivity, and reactivity.

A hazardous material is defined by federal regulations as “a substance or material that…is capable of posing an unreasonable risk to health, safety, and property when transported in commerce” (49 CFR 171.8). Section 25501 of the California Health and Safety Code defines a hazardous material as follows:

> Hazardous material means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Section 25141(b) of the California Health and Safety Code defines a hazardous waste as waste that:

> …because of its quantity, concentration, or physical, chemical, or infectious characteristics: 1) Cause[s], or significantly contribute[s] to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness. 2) Pose[s] a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed.

Common hazardous materials include petroleum-based fuels, lubricants, solvents, some paints and other coatings, and some cleaning products. The existing Station pier includes a fueling station at the southern end of the pier and fuel lines running underneath the pier. The Station has two aboveground fuel storage tanks in the upland area: a 100-gallon diesel tank and a 500-gallon gasoline tank. Operations and maintenance activities at the Station require small quantities of hazardous materials and generate small amounts of hazardous wastes. Typical operations at the Station include refueling and equipment maintenance, which involve lubricants, solvents, cleaning products, etc. and generate small amounts of hazardous wastes, such as oily rags. The Station is classified as a Small Quantity Generator of hazardous

waste by the USEPA, indicating that the facility generates between 220 pounds and 2,200 pounds of hazardous waste in any calendar month and stores less than 13,200 pounds of hazardous waste at any time.

The Station personnel manage hazardous materials and waste in accordance with a variety of applicable regulations and guidelines, including OSHA regulations, CG instructions (principally the CG *Safety and Environment Health Manual*, Commandant Instruction 5100.47A), and local facility policies and procedures. These regulations and the associated protocols, protective equipment, and training ensure that CG operations and shore activities are safely conducted.

AECOM reviewed the California Department of Toxic Substances Control (DTSC) (DTSC 2018) online EnviroStor database, the SWRCB's (2018) GeoTracker database, and TRPA files to determine if there have been historical releases of hazardous materials at or near the Station. No relevant records were found on Envirostor. GeoTracker records indicate there have been two leaking underground storage tank (LUST) cases related to the Station in the past. The status of both LUST cases is listed on GeoTracker as "Completed – Case Closed."

The first LUST case (LRWQCB Case #6T0261A) is listed in GeoTracker as being closed as of August 6, 1997. No further documentation on this case was found on GeoTracker. However, additional records obtained during a TRPA file review indicate that one 500-gallon diesel tank, associated with a sewage lift station, was removed from the area just north of the Station garage in 1994. During the tank removal, a water line was broken and the area was subsequently flooded by a combination of domestic wastewater and stormwater runoff. Water and soil samples collected from the excavation indicated elevated levels of petroleum hydrocarbons. Most of the hydrocarbons detected were in the motor oil, rather than diesel, range – indicating that the primary source of the hydrocarbons may have been the stormwater runoff rather than a leak from the tank. Subsequent to the discovery of hydrocarbons in the excavation soil and water, further site investigation, remediation, and monitoring activities were conducted, and in August 1997 the LRWQCB and Placer County Department of Health and Human Services issued letters stating that all work required to comply with state and county regulations for closure of the tank had been completed (Placer County DHHS 1997, LRWQCB 1997).

The second LUST case (LRWQCB Case #6T0270A) is listed in GeoTracker as being closed as of June 28, 1999. The GeoTracker record for this case includes a closure letter from the LRWQCB indicating that no further action related to the LUST case was required. The closure letter indicates that a 4,000-gallon underground fuel oil tank and affected soil were removed from the Station and disposed of in October 1997 (LRWQCB 1999). Petroleum hydrocarbons were detected in groundwater in the tank pit, but groundwater samples from monitoring wells on site did not contain petroleum hydrocarbons or related contaminants, and therefore the LRWQCB did not consider the LUST site as posing a threat to water quality. The agency closure letters from both LUST cases are included in *Appendix L*. The documentation for both LUST cases did not indicate that Lake Tahoe or other surface waters were affected. No other evidence of historical releases of hazardous materials at or near the Station was identified during the database and file reviews.

There have been no known historical releases of hazardous materials in or adjacent to the Project disturbance area. Sediment samples were collected at the adjacent TCPUD boat launch facility prior to the dredging and boat ramp expansion that occurred there in 2014 and tested for diesel, gasoline, and oil. No petroleum hydrocarbons were detected in the sediment at the TCPUD facility (Marvin Davis & Associates 2013).

Laboratory test results from sediments obtained at the Project site indicate that TPH as diesel are present in very small amounts that do not exceed environmental health thresholds. No PAHs, PCBs, or pesticides were detected from sediment samples (AECOM Technical Services 2016). Laboratory test results from water samples obtained at the Project site (elutriate testing) indicate that arsenic and lead are present at levels that exceed the applicable water quality standards. However, most available studies suggest that there is no significant transfer of metal concentrations into the dissolved phase during dredging. For comparison purposes, the total elutriate result for lead (13.9 micrograms per liter [µg/L]) was well below the LRWQCB stormwater effluent limits to surface discharges entering Lake Tahoe (0.5 mg/L). The lead

concentrations were also below the USEPA drinking water maximum contaminant level (MCL) of 15 µg/L. Arsenic has been found in trace amounts in groundwater in the Lake Tahoe Hydrological Unit, which can be used for drinking water in the region, and the dissolved elutriate result was below the USEPA drinking water MCL of 10 µg/L. There were no detections of butyltins, pesticides, or PCBs in the elutriate sample results. Results for TPH in the elutriate sample were detected above the laboratory limits for the diesel range but were well below the water quality standard. Eight PAHs were detected above the laboratory limits in the elutriate sample, but all were below their respective water quality standards (AECOM Technical Services 2016).

As one of the primary emergency response agencies for Lake Tahoe, the CG shares responsibility for coordinating spill response on the lake as well as serving as search and rescue responder for damaged or submerged vessels that could release fuel and other hazardous substances to the lake. Quick response times are crucial for the CG in fulfilling these roles in avoiding and minimizing hazardous substance releases. Spill response equipment is kept at the Station, and the Station staff is trained in spill response procedures. The Lake Tahoe Geographic Response Plan, created through collaboration between federal, state, and local agencies, including the CG, DTSC, TRPA, and local Sherriff's Departments, provides guidelines for mitigating hazardous materials emergencies in the Lake Tahoe watershed.

3.7.2 Regulatory Setting

Federal and state laws and regulations pertaining to hazards, hazardous materials, and risk of upset that are relevant to the proposed Project are identified in *Table 3-24*.

Table 3-24 Federal and State Laws Regulations and Policies Potentially Applicable to the Project (Hazards, Hazardous Materials, and Risk of Upset)

Jurisdiction	Regulation	Description
U.S.	CWA (33 USC 1251 et seq.)	The CWA is comprehensive legislation that seeks to protect the nation's water from pollution by setting water quality standards for surface water and by limiting the discharge of hazardous materials and other effluents into waters of the U.S.
U.S.	California Toxics Rule (40 CFR 131)	In 2000, the USEPA issued numeric water quality criteria for priority toxic pollutants and other water quality standards to be applied to inland surface waters, enclosed bays, and estuaries in California. USEPA issued this rule based on the determination that numeric criteria are necessary in California to protect human health and the environment.
U.S.	Hazardous Materials Transportation Act (49 USC 5901)	This Act delegates authority to the U.S. Department of Transportation (USDOT) to develop and implement regulations pertaining to the transport of hazardous materials and wastes by all modes of transportation. Additionally, the USEPA's Hazardous Waste Manifest System is a set of forms, reports, and procedures for tracking hazardous waste from a generator's site to the disposal site. Applicable federal regulations are contained primarily in CFR Titles 40 and 49.
U.S.	National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300)	The NCP is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Public Law 99 through 499; and by CWA section 311(d), as amended by the Oil Pollution Act of 1990, Public Law 101 through 380. The NCP outlines requirements for responding to both oil spills and releases of hazardous substances. It also provides a comprehensive system for reporting, spill containment, and cleanup. The NCP established the National Response Team, which is co-chaired by the CG and USEPA. The CG has primary responsibility for oversight of response for oil spills in coastal zones and the USEPA has primary responsibility for inland waters.

Jurisdiction	Regulation	Description
U.S.	Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)	The RCRA authorizes the USEPA to control hazardous waste from "cradle-to-grave," which encompasses its generation, transportation, treatment, storage, and disposal. RCRA's 1984 Federal Hazardous and Solid Waste Amendments include provisions for waste minimization, phasing out land disposal of hazardous waste, and corrective action for releases. DTSC is the primary authority enforcing the RCRA hazardous waste requirements in California.
U.S.	Toxic Substances Control Act (TSCA) (15 USC 2601–2692)	The TSCA authorizes the USEPA to require reporting, record-keeping, testing requirements, and restrictions related to chemical substances and/or mixtures. It also addresses production, importation, use, and disposal of specific chemicals, such as PCBs, asbestos-containing materials, lead-based paint, and petroleum.
U.S.	Other	• The Act to Prevent Pollution from Ships (1980) requires ships in U.S. waters, and U.S. ships wherever located, to comply with International Convention for the Prevention of Pollution from Ships. • Navigation and Navigable Waters regulations (33 CFR) include requirements pertaining to prevention and control of releases of materials from vessels.
CA	CCR Title 22, Division 4.5, Chapter 11	This chapter of the CCR contains regulations for the classification of hazardous wastes. A waste is considered a hazardous waste if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe chemical burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3 of this statute. Article 4 lists specific hazardous wastes, and Article 5 identifies specific waste categories, including RCRA hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes.
CA	Hazardous Materials Release Response Plans and Inventory Act of 1985 (Health and Safety Code, Division 20, Chapter 6.95)	The Hazardous Materials Release Response Plans and Inventory Act, also known as the Business Plan Act, requires businesses that use hazardous materials to prepare a hazardous materials business plan that describes their facilities, hazardous materials inventories, emergency response plans, and employee training programs. Statewide, the DTSC has primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the state.
CA	Emergency Services Act (Government Code 8550 et seq.)	Under the Emergency Services Act, the state developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services.
CA	Cal-OSHA Standards	Worker exposure to contaminated soils, vapors, or groundwater is subject to monitoring and personal safety equipment requirements established in the Cal-OSHA regulations in CCR Title 8. The primary intent of the Title 8 requirements is to protect workers, but compliance with some of these regulations would also reduce potential hazards to non-construction workers and Project area occupants because required controls related to site monitoring, reporting, and other activities would be in place.
CA	Other	• California Harbors and Navigation Code specifies a state policy to "promote safety for persons and property in and connected with the use and equipment of vessels," and regulates discharges from vessels in waters of the State of California to prevent adverse impacts on the aquatic environment. • Hazardous Waste Control Act (CCR Title 26) defines requirements for proper management of hazardous materials. • Porter-Cologne Water Quality Control Act (California Water Code, Sections 13000 et seq.) restricts disposal of wastes that could impact ground and surface water quality. The Porter-Cologne Act is discussed further in *Section 3.9, Hydrology and Water Quality.*

3.7.2.1 Tahoe Regional Planning Agency

TRPA Regional Plan

The Natural Hazards and Water Quality Subelements of the TRPA Regional Plan include the following goals and policies related to hazards, hazardous materials, and risk of upset that are relevant to the proposed Project:

Goal NH-1: Risks from natural hazards (e.g., flood, fire, avalanche, earthquake, and seiche) will be minimized.

Policy NH-1.3: Inform residents and visitors of the wildfire hazard associated with occupancy in the region. Encourage use of fire resistant materials and fire preventative techniques when constructing structures, especially in the highest fire hazard areas. Manage forest fuels to be consistent with state laws and other goals and policies of this Plan.

Policy NH-1.4: TRPA will encourage public safety agencies to prepare disaster plans.

Policy WQ-2.5: TRPA shall cooperate with other agencies with jurisdiction in the Lake Tahoe region in the preparation, evaluation, and implementation of toxic and hazardous spill control plans.

TRPA Code of Ordinances and the Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

The following portions of the TRPA Code of Ordinances regulate hazards, hazardous materials, and risk of upset in the Lake Tahoe region:

Code 60.1.3.D: Prohibition of Toxic or Hazardous Waste Discharge – The discharge of toxic or hazardous waste to Lake Tahoe, other lakes in the region, their tributaries, the groundwaters of the Tahoe region, the lands of the Tahoe region, or the Truckee River in the Tahoe region is prohibited.

Code 60.1.6: Spill Control – All persons handling, transporting, using, or storing toxic or hazardous substances shall comply with the applicable requirements of federal and state law regarding spill prevention, reporting, recovery, and clean-up. Sewage collection, conveyance, and treatment districts shall have sewage spill contingency, prevention, and detection plans approved by the state agency of appropriate jurisdiction and submitted to TRPA for review and approval within 3 years of the effective date of the Regional Plan.

Code 80.3.2.E: Hazardous Materials – Measures will be taken to prevent spills or discharges of hazardous materials [in the lakezone and shorezone].

3.7.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on hazards, hazardous resources, and risk of upset in the context of NEPA, CEQA, and TRPA requirements.

Table 3-25 provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-25 Significance Determinations for the Project Alternatives (Hazards, Hazardous Materials, and Risk of Upset)

Hazards, Hazardous Materials, and Risk of Upset	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact related to hazards, hazardous materials, or risk of upset?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project: *a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	Less-than-Significant Impact	No Impact	No Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No Impact	No Impact	No Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	No Impact	No Impact	No Impact	No Impact
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	No Impact	No Impact	No Impact	No Impact
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No Impact	No Impact	No Impact	No Impact

Hazards, Hazardous Materials, and Risk of Upset	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
Risk of Upset: *Will the Project result in:* *a) Involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Involve possible interference with an emergency evacuation plan?	No Impact	No Impact	No Impact	No Impact

3.7.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact related to hazards, hazardous materials, or risk of upset?

Less-than-Significant Impact. Alternative 1 is not expected to result in significant impacts related to hazards, hazardous materials, and risk of upset. Hazardous materials used during construction would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. Hazardous materials and wastes associated with the proposed Project would be stored, handled, and disposed of in accordance with federal, state, and local laws and CG standards. Several of the BMPs discussed in *Section 2.1.1*, including pre-construction utility clearance in accordance with **BMP C1-2**; installation of a turbidity curtain (which would include a floating boom) around the dredging area in accordance with **BMP C1-4**; implementation of spill prevention and response measures in accordance with **BMP C1-7**; cleaning and maintenance of equipment in accordance with **BMP C1-8**; and proper staging of equipment and materials in accordance with **BMP C1-10**; would minimize the risk of the release of hazardous materials during construction and facilitate rapid containment and clean up should a release occur.

Dredging could expose buried sediments containing hazardous materials from historical releases and cause these contaminants to be re-suspended in the water column or otherwise released into the environment. There are no known historical releases of hazardous materials in or near the Project Area that are considered likely to have contaminated the sediments in the dredging area, and recent sediment sampling at the adjacent TCPUD facility did not detect any contaminants in sediments at that site (Marvin Davis & Associates 2013). The results of sediment and water samples collected at the Project site indicate there are no human health or water quality constituents of concern (COC) present at levels that would exceed the respective thresholds (AECOM Technical Services 2016). In accordance with **BMP C1-1**, all dredged materials will be transported to an appropriately licensed off-site disposal facility. Use of a turbidity curtain around the dredging area and filter fabric and fiber rolls along the conveyor belt, in accordance with **BMP C1-4**, would prevent sediments from spreading outside the dredging area, and a double turbidity curtain may be used if required by TRPA. Additionally, in accordance with **BMP C1-11**, a Water Quality Monitoring Plan would be implemented, which will include continuous visual monitoring, collecting turbidity readings every 2 hours, and analyzing weekly water samples.

Once construction is complete, operations would remain largely unchanged, other than periodic maintenance dredging, which would use hazardous material BMPs similar to those outlined above for construction. The CG would continue to manage hazardous waste at the Station in accordance with applicable federal, state and local regulations and CG protocols. Additionally, Alternative 1 would substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

In summary, with implementation of the BMPs described above, Alternative 1 would have less-than-significant adverse impacts related to hazards and hazardous materials from the perspective of NEPA and would have beneficial impacts on the control of accidental releases in the future.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) related to hazards and hazardous materials:

Would the Project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less-than-Significant Impact. Hazardous materials used during construction of Alternative 1 would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. Alternative 1 would also involve the transport and disposal of dredged material at an appropriately licensed facility in accordance with **BMP C1-1**. Hazardous materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. Implementation of the construction BMPs described in *Section 2.1.1*, including the installation of a turbidity curtain (which would include a floating boom) around the work area, in accordance with **BMP C1-4**; implementation of spill prevention and response measures, in accordance with **BMP C1-7**; cleaning and maintenance of equipment, in accordance with **BMP C1-8**; proper staging of equipment and materials, in accordance with **BMP C1-10**, would avoid or minimize the hazards to the public and environment resulting from the transport, use, and disposal of hazardous materials.

Dredging could expose buried sediments containing hazardous materials from historical releases and cause these contaminants to be re-suspended in the water column or otherwise released into the environment. There are no known historical releases of hazardous materials in or near the Project Area that are considered likely to have contaminated the sediments in the dredging area, and recent sediment sampling at the adjacent TCPUD facility did not detect any contaminants in sediments at that site (Marvin Davis & Associates 2013). The results of sediment and water samples collected at the Project site indicate there are no human health or water quality COCs present at levels that would exceed the respective thresholds (AECOM Technical Services 2016). In accordance with **BMP C1-1**, all dredged materials will be transported to an appropriately licensed off-site disposal facility. Use of a turbidity curtain around the dredging area and filter fabric and fiber rolls along the conveyor belt, in accordance with **BMP C1-4**, would prevent sediments from spreading outside the dredging area, and a double turbidity curtain may be used if required by TRPA. Additionally, in accordance with **BMP C1-11**, a Water Quality Monitoring Plan would be implemented, which will include continuous visual monitoring, collecting turbidity readings every 2 hours, and analyzing weekly water samples.

Once construction is complete, operations at the Station would remain largely unchanged, other than periodic maintenance dredging, which would use hazardous material BMPs similar to those outlined above for construction. The CG would continue to manage hazardous waste at the Station in accordance with applicable federal, state and local regulations and CG protocols. Additionally, Alternative 1 will improve the

CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby avoiding or minimizing the impacts of such releases.

In summary, Alternative 1 would have a less-than-significant impact related to the transport, use, and disposal of hazardous materials.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less-than-Significant Impact. Hazardous materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. In accordance with **BMP C1-1**, sediments from dredging would be disposed of at a properly licensed facility. Implementation of the other BMPs described in *Section 2.1.1*, including pre-construction utility clearance in accordance with **BMP C1-2**; the installation of a turbidity curtain (which would include a floating boom) around the work area, in accordance with **BMP C1-4**; implementation of spill prevention and response measures in accordance with **BMP C1-7**; cleaning and maintenance of equipment in accordance with **BMP C1-8**; proper staging of equipment and materials in accordance with **BMP C1-10**, would avoid or minimize the hazards to the public and environment resulting from upset and accident conditions involving the release of hazardous materials during construction.

Once construction is complete, operations at the Station would remain largely unchanged, other than periodic maintenance dredging, which would use the hazardous material BMPs similar to those outlined above for construction. The CG would continue to manage hazardous waste at the Station in accordance with applicable federal, state and local regulations and CG protocols. Additionally, Alternative 1 would improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases

In summary, with implementation of the BMPs described above, Alternative 1 would have less-than-significant adverse impacts related to the potential accidental release of hazardous materials and would have beneficial impacts on the control of accidental releases in the future.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?

Less-than-Significant Impact. The Project Area is not within ¼ mile of an existing or proposed school. The nearest schools are the North Tahoe High School/Middle School (2945 Polaris Road, Tahoe City) and the Tahoe Community Nursery School (3125 North Lake Boulevard, Tahoe City), both of which are approximately 0.9 mile from the Project Area. The haul route for trucks transporting the dredged materials does come within ¼ mile of two schools: Tahoe Lake Elementary School, at 375 Grove Street, Tahoe City, and Squaw Valley Academy, at 235 Squaw Valley Road, Olympic Valley. In accordance with **BMP C1-1**, dredged sediments would be handled in accordance with applicable regulations and disposed of at a properly licensed facility. In addition, in accordance with **BMP C1-9**, dredged materials will be transported off site in lined trucks to avoid discharges during transportation. With implementation of these BMPs, Alternative 1 would have a less-than-significant impact in relation to handling hazardous waste within ¼ mile of an existing or proposed school.

d) Be located on a site included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. As discussed previously in the Environmental Setting, there were two cases of LUSTs at the Station. Both cases were closed (in 1997 and 1999, respectively), following remedial actions and test results demonstrating that COCs were either not present in soil or groundwater, or the levels of COCs were below the respective human health and/or water quality thresholds. Therefore, the proposed Project would have no impact related to Cortese List site hazards.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The Project Area is not in an airport land use plan or within 2 miles of an airport. The nearest airport is the Truckee Tahoe Airport, approximately 9 miles north of the Project Area. Therefore, Alternative 1 would have no impacts related to airport safety hazards.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The Project Area is not in the vicinity of a private airstrip, and therefore Alternative 1 would have no impacts related to private airstrip safety hazards.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The CG is a first responder for emergencies on Lake Tahoe and is a collaborating agency on the Lake Tahoe Geographic Response Plan, which provides guidelines for emergency response for hazardous materials incidents occurring in the Lake Tahoe watershed. During the 8-week construction period, the Station's response boats would continue to be kept at the Tahoe City Marina and would continue to be available for emergency response. After dredging, it will be possible for the Station's response boats to be kept at the Station pier year round, significantly enhancing the CG's ability to consistently provide emergency support within the CG search and rescue response time standards and to provide rapid emergency evacuation for passengers of disabled vessels. Therefore, Alternative 1 would have no adverse impacts related to impairing implementation of emergency response or evacuation plans, and in the long term it would have a beneficial impact on emergency response and evacuation.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less-than-Significant Impact. The Project would occur in the shorezone of Lake Tahoe, where wildland fires are less of a concern than in upland areas, and the new structures added to the pier would be largely composed of fire resistant materials. In accordance with **BMP C1-10**, the upland use of construction equipment would be largely limited to paved areas, and, in accordance with **BMP C1-19**, vehicle idling times would be limited to 5 minutes or less. Both BMPs would reduce the potential for construction vehicles to cause a fire. Additionally, in accordance with **BMP C1-7,** a Spill Prevention and Response Plan will be implemented during construction, thereby reducing the potential for fire hazards related to fuel spill. With implementation of these BMPs, Alternative 1 would result in less-than-significant impacts related to wildland fire hazards.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to risk of upset:

Will the Project:

a) Involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions?

Less-than-Significant Impact. Hazardous substances used during construction of Alternative 1 would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. Hazardous materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. Implementation of the BMPs described in *Section 2.1.1*, including pre-construction utility clearance, in

accordance with **BMP C1-2**; the installation of a turbidity curtain (which would include a floating boom) around the work area, in accordance with **BMP C1-4**; implementation of spill prevention and response measures, in accordance with **BMP C1-7**; cleaning and maintenance of equipment, in accordance with **BMP C1-8**, proper staging of equipment and materials, in accordance with **BMP C1-10**, would avoid or minimize the risk of a release of hazardous substances from accident or upset conditions.

Alternative 1 also involves the handling and transport of dredged material, and in accordance with **BMP C1-1**, dredge sediments would be handled in accordance with applicable regulations and disposed of at a properly licensed facility

Once construction is complete, operations at the Station would remain largely unchanged, other than periodic maintenance dredging, which would use the hazardous material BMPs similar to those outlined above for construction. The CG would continue to manage hazardous waste at the Station in accordance with applicable federal, state and local regulations and CG protocols. Additionally, Alternative 1 would substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

In summary, with implementation of the BMPs described above, Alternative 1 would have less-than-significant adverse impacts related to the potential accidental release of hazardous materials and would have beneficial impacts on the control of accidental releases in the future because the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe would be improved.

b) Involve possible interference with an emergency evacuation plan?

No Impact. The CG is a first responder for emergencies on Lake Tahoe and is a collaborating agency on the Lake Tahoe Geographic Response Plan, which provides guidelines for emergency response for hazardous materials incidents occurring in the Lake Tahoe watershed. During dredging, the Station's response boats would continue to be kept at the Tahoe City Marina and would continue to be available for emergency response. After dredging, it will be possible for the Station's response boats to be kept at the Station pier year round, significantly enhancing the CG's ability to consistently provide emergency support within the CG search and rescue response time standards and to provide rapid emergency evacuation for passengers of disabled vessels. Therefore, Alternative 1 would have no adverse impacts related to interference with emergency evacuation plans and would, in the long term, have a beneficial impact on emergency response and evacuation.

3.7.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact related to hazards, hazardous materials, or risk of upset?

Less-than-Significant Impact. Alternative 2 is not expected to result in significant impacts related to hazards, hazardous materials, and risk of upset. Hazardous materials used during construction and would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. Hazardous materials and wastes associated with Alternative 2 would be stored, handled, and disposed of in accordance with federal, state, and local laws and CG standards. Several of the BMPs discussed in *Section 2.2.1*, including conducting pre-construction utility clearance in accordance with **BMP C2-2**; the installation of a turbidity curtain (which would include a floating boom) around the construction area in accordance with **BMP C2-3**; implementation of spill prevention and response measures in accordance with **BMP C2-5**; cleaning and maintenance of equipment in accordance with **BMP C2-6**; and proper staging of construction equipment and materials in accordance with **BMP C2-7**, would minimize the risk of releases of hazardous materials during construction and facilitate rapid containment and clean up should a release occur.

Once construction is complete and the pier is again operational, the CG would implement an operations phase Fueling Plan in accordance with **BMP O2-1** and continue to manage hazardous waste in accordance with applicable federal, state and local regulations and CG protocols. Additionally, after construction of the pier extension is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions. This will substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

In summary, with implementation of the BMPs described above, Alternative 2 would have less-than-significant adverse impacts related to hazards, hazardous materials, and risk of upset and would have beneficial impacts on the control of accidental releases in the future.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less-than-Significant Impact. Hazardous materials used during construction of Alternative 2 would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. These materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. Implementation of the BMPs described in *Section 2.2.1*, including the installation of a turbidity curtain (which would include a floating boom) around the construction area, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; proper staging of construction equipment and materials, in accordance with **BMP C2-7**; and implementation of an operations-phase Fueling Plan, in accordance with **BMP O2-1**, would avoid or minimize the hazards to the public and environment resulting from the transport, use, and disposal of hazardous materials. Therefore, Alternative 2 would have a less-than-significant impact related to the transport, use, and disposal of hazardous materials.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less-than-Significant Impact. Hazardous materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. Implementation of the BMPs described in *Section 2.2.1*, including conducting pre-construction utility clearance, in accordance with **BMP C2-2**; the installation of a turbidity curtain (which would include a floating boom) around the construction area, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; proper staging of construction equipment and materials, in accordance with **BMP C2-7**; and implementation of an operations-phase Fueling Plan, in accordance with **BMP O2-1**, would avoid or minimize the hazards to the public and environment resulting from upset and accident conditions involving the release of hazardous materials.

After construction of the pier extension is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions. This will substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

In summary, with implementation of the BMPs described above, Alternative 2 would have less-than-significant adverse impacts related to the potential accidental release of hazardous materials and would have beneficial impacts on the control of accidental releases in the future.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?

No Impact. The Project Area is not within ¼ mile of an existing or proposed school. The nearest schools are the North Tahoe High School (2945 Polaris Road, Tahoe City) and the Tahoe Community Nursery School (3125 North Lake Boulevard, Tahoe City), both of which are approximately 0.9 mile from the Project Area. Therefore, Alternative 2 would have no impacts related to handling hazardous materials within ¼ mile of an existing or proposed school.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. As discussed previously in the Environmental Setting, there were two cases of LUSTs at the Station. Both cases were closed (in 1997 and 1999, respectively), following remedial actions and test results demonstrating that COCs were either not present in soil or groundwater, or the levels of COCs were below the respective human health and/or water quality thresholds. Therefore, the proposed Project would have no impact related to Cortese List site hazards.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The Project Area is not in an airport land use plan or within 2 miles of an airport. The nearest airport is the Truckee Tahoe Airport, approximately 9 miles north of the Project Area. Therefore, Alternative 2 would have no impacts related to airport safety hazards.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

No Impact. The Project Area is not in the vicinity of a private airstrip, and therefore Alternative 2 would have no impacts related to private airstrip safety hazards.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The CG is a first responder for emergencies on Lake Tahoe and is a collaborating agency on the Lake Tahoe Geographic Response Plan, which provides guidelines for emergency response for hazardous materials incidents occurring in the Lake Tahoe watershed. During the 7-week construction period, the Station's response boats would continue to be kept at the Tahoe City Marina and would continue to be available for emergency response. After construction of the pier extension, it will be possible for the Station's response boats to be kept at the Station pier year round, significantly enhancing the CG's ability to consistently provide emergency support within the CG search and rescue response time standards and to provide rapid emergency evacuation for passengers of disabled vessels. Therefore, Alternative 2 would have no adverse impacts related to impairing implementation of emergency response or evacuation plans, and would, in the long term, have a beneficial impact on emergency response and evacuation.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Less-than-Significant Impact. Project activities would occur primarily in Lake Tahoe, where wildland fires are less of a concern than in upland areas, and the new structures added to the pier would be largely composed of fire resistant materials. In accordance with **BMP C2-7**, the use of construction equipment will be limited to the work barge and paved areas, and, in accordance with **BMP C2-16**, vehicle idling times

would be limited to 5 minutes or less. Both BMPs will reduce the potential for construction vehicles to cause a fire. Additionally, in accordance with **BMP C2-5**, a Spill Prevention and Response Plan will be implemented during construction, and, in accordance with **BMP O2-1**, a Fueling Plan will be implemented operations, thereby reducing the potential for fire hazards related to fuel spill. With implementation of these BMPs, Alternative 2 would result in less-than-significant impacts related to wildland fire hazards.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Risk of Upset:

Will the Project:

a) Involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions?

Less-than-Significant Impact. Hazardous materials used during construction of Alternative 2 would be largely limited to fuel and lubricants used for construction equipment. Construction may also involve small amounts of solvents, paints or other coatings, and/or cleaning products. These materials would be handled, stored, used, and disposed of in accordance with applicable regulations and CG protocols. Implementation of the BMPs described in *Section 2.2.1*, including conducting pre-construction utility clearance, in accordance with **BMP C2-2**; the installation of a turbidity curtain (which would include a floating boom) around the construction area, in accordance with **BMP C2-3**; implementation of spill prevention and response measures, in accordance with **BMP C2-5**; cleaning and maintenance of equipment, in accordance with **BMP C2-6**; proper staging of construction equipment and materials, in accordance with **BMP C2-7**; and implementation of an operations phase Fueling Plan, in accordance with **BMP O2-1**, would avoid or minimize the risk of a release of hazardous substances from accident or upset conditions.

After construction of the pier extension is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions. This will substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

In summary, with implementation of these BMPs discussed above, Alternative 2 would have less-than-significant adverse impacts related to the potential for release of hazardous substances due to an accident or upset and would have beneficial impacts on the control of accidental releases in the future.

b) Involve possible interference with an emergency evacuation plan?

No Impact. The CG is a first responder for emergencies on Lake Tahoe and is a collaborating agency on the Lake Tahoe Geographic Response Plan, which provides guidelines for emergency response for hazardous materials incidents occurring in the Lake Tahoe watershed. During construction of the pier extension, the Station's response boats would continue to be kept at the Tahoe City Marina and would continue to be available for emergency response. After construction, it will be possible for the Station's response boats to be kept at the Station pier year round, significantly enhancing the CG's ability to consistently provide emergency support within the CG search and rescue response time standards and to provide rapid emergency evacuation for passengers of disabled vessels. Therefore, Alternative 2 would have no adverse impacts related to interference with emergency evacuation plans and would, in the long term, have a beneficial impact on emergency response and evacuation.

3.7.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 3 would have similar impacts related to hazards, hazardous materials, and risk of upset as Alternative 2. Due to the fact that the straight extension would be 100 feet

longer than the dog-leg extension and the construction schedule for Alternative 3 would be 1 week longer, slightly more fuel, lubricants, solvents, paints, coatings, and cleaning products would potentially be required for Alternative 3 than for Alternative 2. However, adverse impacts related to hazards, hazardous materials, and risk of upset would still be less than significant with implementation of the proposed BMPs. Similar to Alternatives 1 and 2, after construction of the pier extension is completed, the CG will be able to moor their response boats at the Station year round, including in low water conditions. This will substantially improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials affecting Lake Tahoe, thereby minimizing or avoiding the impacts of such releases.

3.7.3.4 Alternative 4: No Action

No Impact. Under Alternative 4, no dredging or construction would take place at the Station, and the hazardous materials associated with those activities would not be used. Operations of the existing pier, including fueling and maintenance activities, would continue as they currently do and would comply with applicable hazardous materials regulations and CG protocols. Alternative 4 would have no impacts when compared to baseline conditions. However, the CG would continue to have to drive to an off-site mooring location to access their boats after receiving a call for assistance on the lake, and therefore the CG's ability to respond quickly to emergencies involving the release, or potential release, of hazardous materials to Lake Tahoe would continue to be adversely affected, likely resulting in more severe impacts from such releases than those that would occur if the CG had consistent year-round access to the Station pier.

3.8 Hydrology and Water Quality

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to water quality.

3.8.1 Affected Environment

3.8.1.1 Surface Water

The Project Area is on the northwestern shore of Lake Tahoe, a large freshwater lake in the Sierra Nevada. Lake Tahoe is the largest alpine lake in North America and one of the clearest large alpine lakes in the world. The USEPA and SWRCB have designated Lake Tahoe as an Outstanding National Resource Water, a designation which requires no further degradation of the water quality of the lake. The lake is an important drinking water source for the Tahoe region, including Reno, Nevada, and it is also valued for its aesthetics, recreation opportunities, and wildlife habitat.

Many different agencies and organizations work together to facilitate protection of Lake Tahoe and its resources. TRPA, created by a bi-state compact between California and Nevada, is responsible for protecting the environment of the Lake Tahoe Basin through land-use regulation and planning and has developed water quality goals, policies, and threshold standards for the region. The LRWQCB also regulates water quality in the California portion of Lake Tahoe. In accordance with the federal CWA, the LRWQCB has established beneficial uses, water quality objectives, and discharge prohibitions for Lake Tahoe in the Lahontan Basin Plan (LRWQCB 1995, updated 2015). The Basin Plan designates the following beneficial uses for Lake Tahoe:

- municipal and domestic water supply,
- agricultural supply,
- groundwater recharge,
- navigation,
- water contact recreation,
- noncontact water recreation,
- commercial and sport fishing,
- cold freshwater habitat,
- wildlife habitat,
- preservation of biological habitats of special significance,
- migration of aquatic organisms, and

- spawning habitat.

The various regulations and standards for water quality in Lake Tahoe are meant to prevent further degradation and restore the clarity of the lake. Between 1968 and 2010, the transparency of the lake, measured as annual average Secchi depth, declined by 38 feet. Clarity in Lake Tahoe is impaired by excess anthropogenic inputs of fine sediments and nutrients, particularly nitrogen and phosphorus, which stimulate algae growth. As a result of the reduction in clarity, California designated Lake Tahoe as water-quality limited and placed it on its CWA Section 303(d) list of impaired waters in 1998. Nevada included Lake Tahoe on its 303(d) list in 2002. As a result of the 303(d) impaired water body designations, the LRWQCB and the Nevada Division of Environmental Protection (NDEP) have developed total maximum daily load (TMDL) thresholds for nitrogen, phosphorus, and fine sediment inputs to Lake Tahoe. The LRWQCB approved Basin Plan amendments to establish the Lake Tahoe TMDL and an implementation plan for associated changes to urban stormwater regulations in November 2010 (Resolution No. R6T-2010-0058). USEPA approved the Lake Tahoe TMDL in August 2011. Partly as a result of the TMDL thresholds and other regulations to protect water quality, lake transparency has shown a trend towards improvement since 2000. Progress towards the TRPA clarity threshold goal is assessed with the 5-year average Secchi depth, because of high interannual variability. In 2015, the 5-year average Secchi depth increased to 73.1 feet (22.3 meters), the fifth consecutive year of improvement (TRPA 2016a).

Most precipitation in the Lake Tahoe Basin falls between October and May. Seasonal snowmelt creates annual streamflow peaks in May or June. The minimum streamflow occurs during the summer and fall. The timing and amount of precipitation and the mix of snow and rain can vary substantially from year to year, producing significant year-to-year variability in streamflow and lake levels. Due to recent drought conditions, water levels in Lake Tahoe have been well below average in recent years, as shown in *Figure 1-1*. Annual precipitation in the Tahoe area in 2014 was only 61 percent of average and drought conditions persisted into 2015. April snowpack in the Tahoe Basin in 2015 was the lowest recorded in 100 years of record keeping, breaking the record set the previous year. The lake level has been below its natural rim since October 2014, except for a brief period in May 2015, stopping the outflow of Lake Tahoe water to the Truckee River. Lake Tahoe did not mix to its full depth for the third consecutive year in 2014, due to warm water temperatures. This lack of deep mixing also led to the highest nitrate-nitrogen levels on record (UC Davis TERC 2015).

Other surface waters in the Project vicinity include Star Harbor, which is a human-made impoundment located just west of the TCPUD boat launch facilities. Star Harbor receives flows from Burton, Barton, and Polaris Creeks. These three creeks collectively drain watersheds of approximately 3,200 acres to the north and northwest of the Station.

In 2016, AECOM Technical Services prepared a sampling and analysis report that included both sediment and water samples in the Project area where dredging is proposed. Laboratory test results from sediments obtained at the Project site indicate that TPH as diesel are present in very small amounts that do not exceed environmental health thresholds. No PAHs, PCBs, or pesticides were detected from sediment samples (AECOM Technical Services 2016). Laboratory test results from water samples obtained at the Project site (elutriate testing) indicate that arsenic and lead are present at levels that exceed the applicable water quality standards. However, most available studies suggest that there is no significant transfer of metal concentrations into the dissolved phase during dredging. For comparison purposes, the total elutriate result for lead (13.9 µg/L) was well below the LRWQCB stormwater effluent limits to surface discharges entering Lake Tahoe (0.5 mg/L). The lead concentrations were also below the USEPA drinking water MCL of 15 µg/L. Arsenic has been found in trace amounts in groundwater in the Lake Tahoe Hydrological Unit, which can be used for drinking water in the region, and the dissolved elutriate result was below the USEPA drinking water MCL of 10 µg/L. There were no detections of butyltins, pesticides, or PCBs in the elutriate sample results. Results for TPH in the elutriate sample were detected above the laboratory limits for the diesel range but were well below the water quality standard. Eight PAHs were detected above the laboratory limits in the elutriate sample, but all were below their respective water quality standards (AECOM Technical Services 2016).

3.8.1.2 Groundwater

The Tahoe Valley groundwater basin consists of three alluvial sub-basins surrounding the California side of Lake Tahoe, referred to as the Tahoe Valley South, West, and North sub-basins. The Project Area is in the Tahoe Valley – West sub-basin. The principal source of groundwater in the Tahoe Valley – West sub-basin is from Tertiary and Quaternary age glacial, fluvial, and lacustrine sediments, collectively referred to as basin-fill deposits. The Tahoe Valley – West sub-basin occupies an elongated, approximately 10-mile-long structural basin, in which these basin-fill deposits have accumulated. It is bounded on the east by the western shore of the Lake, and on the west by the Sierra Nevada, with an approximate north-south boundary that lies about ½ mile west of Dollar Point and 2 miles west of Meeks Bay (California Department of Water Resources 2003). The Lahontan Basin Plan lists the beneficial uses of the Tahoe Valley – West groundwater basin as municipal and domestic water supply and agricultural supply.

3.8.2 Regulatory Setting

3.8.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to this issue area and relevant to the proposed Project are identified in *Table 3-26.*

Table 3-26 Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project (Hydrology and Water Quality)

Jurisdiction	Regulation	Description
U.S.	CWA (33 USC 1251 et seq.)	The CWA is comprehensive legislation that seeks to protect the nation's water from pollution by setting water quality standards for surface water and by limiting the discharge of effluents into waters of the U.S. These water quality standards are promulgated by the USEPA and enforced in California by the SWRCB and the nine RWQCBs. CWA sections applicable to the proposed Project include: • Section 401 (33 USC 1341) requires certification from a state water control agency that a project affecting water resources is in compliance with established effluent limitations and water quality standards. Applicants for federal approvals (e.g., USACE permits) are required to obtain this certification. • Section 404 (33 USC 1344) requires authorization from the USACE for the discharge of dredged or fill material into waters of the U.S.
U.S.	Rivers and Harbors Act (33 USC 401)	Section 10 of the Rivers and Harbors Act requires authorization from the USACE for certain activities affecting navigable waters of the U.S., including construction of structures in or over a water body, dredge and fill activities, and other actions affecting the course, location, or condition of a water body.
U.S.	Safe Drinking Water Act (SDWA) (42 USC 300 et seq.)	The SDWA is implemented by the USEPA and is the primary federal regulation controlling drinking water quality in public water systems in the U.S. The SDWA authorizes the USEPA to establish and enforce guidelines for drinking water to protect against both naturally occurring and human-made contaminants in drinking water sources, including watersheds, rivers, lakes, reservoirs, springs, and groundwater wells.
CA	Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.)	The Porter-Cologne Act is the principal law governing water quality in California. The Act established the SWRCB and nine RWQCBs, which have primary responsibility for protecting water quality and beneficial uses of state waters. Section 13240 of the Act requires each RWQCB to prepare and adopt a Basin Plan that establishes water quality objectives to protect beneficial uses and an implementation program for achieving those objectives. Porter-Cologne also implements many provisions of the CWA, including issuance of Section 401 WQCs to applicants for federal approvals. If the SWRCB or a RWQCB imposes conditions on a WQC, those conditions must be included in the federal permit.

3.8.2.2 Regional and Local Regulatory Setting

LRWQCB

The Lahontan Basin Plan, adopted in 1995 identifies the beneficial uses, water quality objectives, effluent limitations, and waste discharge prohibitions for surface water and groundwater in the California portion of the Lake Tahoe Basin. The Lahontan Basin Plan also incorporates pertinent water quality thresholds and regulations developed by TRPA and other federal and state agencies. The LRWQCB made significant amendments to the Basin Plan in October 2014, and these amendments are reflected in the following discussion. The proposed Project would be required to meet the provisions of the Lahontan Basin Plan, as amended, for the protection and enhancement of Lake Tahoe. In addition to complying with Basin Plan provisions, the proposed Project would also be required to obtain a CWA Section 401 WQC from the LRWQCB, as discussed in *Section 1.5.4.3*.

Water Quality Objectives and Effluent Limitations

The Lahontan Basin Plan contains water quality objectives for various parameters for surface waters. The water quality objectives potentially relevant to the proposed Project include the following:

- *Algal Growth Potential* – For Lake Tahoe, the mean algal growth potential at any point in the Lake shall not be greater than twice the mean annual algal growth potential at the limnetic reference station.

- *Biological Indicators* – For Lake Tahoe, algal productivity and the biomass of phytoplankton, zooplankton, and periphyton shall not be increased beyond the levels recorded in 1967-71, based on statistical comparison of seasonal and annual means.

- *Biostimulatory Substances* – Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect the water for beneficial uses.

- *Chemical Constituents* – Waters shall not contain concentrations of chemical constituents in excess of the primary or secondary MCLs for drinking water specified in CCR Title 22, Chapter 15. Waters also shall not contain concentrations of chemical constituents in amounts that adversely affect the water for other designated beneficial uses.

- *Clarity* – For Lake Tahoe, the vertical extinction coefficient shall be less than 0.08 per meter when measured below the first meter. When water is too shallow to determine a reliable extinction coefficient, the turbidity shall not exceed 3 NTUs. In addition, turbidity shall not exceed 1 NTU in shallow waters not directly influenced by stream discharges.

- *Floating Materials* – Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances shall not be altered.

- *Oil and Grease* – Waters shall not contain oils, greases, waxes or other materials in concentrations that result in a visible film or coating on the water surface or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses. For natural high quality waters, the concentration of oils, greases, or other film or coat generating substances shall not be altered.

- *Sediment* – The suspended sediment load and discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses.

- *Settleable Materials* – Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses.

- *Suspended Materials* – Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affect the water for beneficial uses.

- *Taste and Odor* – Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors to fish or other edible products of aquatic origin, that cause nuisance, or that adversely affect the water for beneficial uses. For naturally high quality waters, the taste and odor shall not be altered.

- *Toxicity* – All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

- *Transparency* – For Lake Tahoe, the annual average Secchi disk deep water transparency shall not be decreased below 29.7 meters, the levels recorded in 1967-71.

- *Turbidity* – Waters shall be free of changes in turbidity that cause nuisance or adversely affect the water for beneficial uses. Increases in turbidity shall not exceed natural levels by more than 10 percent.

The Lahontan Basin Plan also contains numerical effluent limitations for certain constituents in discharges to surface waters in the Lake Tahoe hydrologic unit (HU), as indicated in *Table 3-27*.

Table 3-27 LRWQCB Effluent Limitations for Surface Discharges

Constituent	Maximum Concentration
Total Nitrogen as N	0.5 mg/L
Total Phosphate as P	0.1 mg/L
Total Iron	0.5 mg/L
Turbidity	20 NTU
Grease and Oil	2.0 mg/L
Source: LRWQCB 1995	

Waste Discharge Prohibitions and Exemptions

The LRWQCB has the authority to “specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted” (California Water Code Section 13243). Under this authority, the LRWQCB has developed discharge prohibitions for the entire region and for the Lake Tahoe HU specifically. The Basin Plan, as amended, specifies the following waste discharge prohibitions applicable to surface waters, 100-year floodplains, and spawning habitat in the Lake Tahoe HU:

1. The discharge attributable to human activities of any waste or deleterious material to surface waters of the Lake Tahoe HU is prohibited.

2. The discharge attributable to human activities of any waste or deleterious material to land below the high-water rim of Lake Tahoe or in the 100-year floodplain of any tributary to Lake Tahoe is prohibited.

3. The discharge or threatened discharge attributable to new pier construction of wastes to significant spawning habitats or to areas immediately offshore of stream inlets in Lake Tahoe is prohibited.

The LRWQCB may grant an exemption to the first prohibition listed above if all of the following findings can be made:

- The discharge of waste will not, individually or collectively, directly or indirectly, adversely affect beneficial uses, and
- There is no reasonable alternative to the waste discharge, and
- All applicable and practicable control and mitigation measures have been incorporated to minimize potential adverse impacts to water quality and beneficial uses.

Additionally, the LRWQCB may grant exemptions to the second prohibition listed above for the Lake Tahoe HU for public service facilities if all of the following findings can be made:

- The project is necessary for public health, safety or environmental protection;
- There is no reasonable alternative, including spans, that avoids or reduces the extent of encroachment;
- The impacts are fully mitigated; and
- Wetlands are restored in an amount at least 1.5 times the area of wetland disturbed or developed. Certain wetlands may require restoration of greater than 1.5 times the area disturbed or developed.

The LRWQCB has also determined that certain types of low-threat discharges, including installation of pier piles, are exempt from the waste discharge prohibitions outlined in the Basin Plan, subject to the following conditions:

- For proposed discharges to surface water, the applicant must provide information supporting why discharge to land is not practicable.
- The discharge must not adversely affect the beneficial uses of the receiving water.
- The discharge must comply with all applicable water quality objectives.
- Best practicable treatment or control of the discharge shall be implemented to ensure that pollution or nuisance will not occur.

In addition to the general conditions for low-threat discharges listed above, pile installation must meet the following additional criterion:

- Piles must be driven. Where the lakebed contains clayey or silty substrate, caissons, turbidity curtains, or other BMPs must be used to limit generated turbidity to smallest area practicable.

Dredging Restrictions

The LRWQCB reviews all proposed dredging in the California portion of the Lake Tahoe Basin and does not permit dredging unless the practices, waste discharge prohibitions, and exemption criteria described in the Lahontan Basin Plan are followed. For regulatory purposes, the LRWQCB and TRPA divide dredging activities into two categories – maintenance and new dredging. Maintenance dredging involves removal of accumulated sediment within approved limits of previously dredged areas. New dredging is removal of sediments outside of previously approved maintenance dredging limits. Under the Memorandum of

Understanding (MOU) between LRWQCB and TRPA, both agencies are responsible for review, permitting, and enforcement of new dredging in the California portion of Lake Tahoe. In accordance with TRPA guidelines, permits for new dredging require that a project be found to be beneficial to existing shorezone conditions and water quality and clarity (TRPA also applies the same conditions to the placement of new structures or other fill in Lake Tahoe). Dredged material may be disposed of inside or outside of the Lake Tahoe Basin, but the LRWQCB sets effluent limitations for discharges of dredged material based on the numbers in *Table 3-27* and on appropriate receiving water standards.

The LRWQCB and TRPA guidelines for dredging are based in part on the findings of the 1996 report *Impacts of Marina Dredging on Lake Tahoe Water Quality* (Tahoe Research Group 1996), and the agencies recommend that dredging practices and BMPs contained in the report are followed to the extent practicable. The recommended practices from the report that are applicable to the proposed Project include conducting elutriate testing as part of the pre-dredging sampling program and using turbidity curtains, implementing operational controls, and conducting turbidity monitoring during dredging.

Requirements for Pier Construction

Discharges from pier construction in spawning and stream mouth habitats in Lake Tahoe are prohibited by the Lahontan Basin Plan. Pier construction projects must also meet the following conditions:

- The disturbance of lakebed materials should be kept to a minimum during construction. Best practicable control technology should be used to keep suspended earthen materials out of the lake. (This may involve techniques such as installation of pilings in caissons.)

- No petroleum products, construction wastes, litter or earthen materials should enter surface waters. All construction waste products should be removed from the Project site and dumped at a legal point of disposal. Any mechanical equipment operating in the lake should be cleaned and maintained prior to use.

- No wood preservatives should be used on wood which will be in contact with lake water.

- The pier owner should ensure that the project contractor is aware of these and any other applicable conditions.

TRPA

TRPA regulates water quality in the region through the Regional Plan goals and policies, the Code of Ordinances, and threshold standards.

TRPA Regional Plan

The Water Quality Subelement of the TRPA Regional Plan contains the following water quality goals and policies potentially applicable to the proposed Project:

Policy WQ-1.4: Require that development and other activities in the Lake Tahoe region mitigate anticipated water quality impacts.

Policy WQ-1.5: Support the Tahoe TMDL programs in California and Nevada and the TMDL pollutant/stormwater load reduction plans for each local government in the region.

Policy WQ-2.7: Reduce the impacts of motorized watercraft on water quality.

Goal WQ-3: Reduce or eliminate non-point sources of pollutants which affect, or potentially affect, water quality in the Tahoe region in a manner consistent with the Lake Tahoe TMDL, where applicable.

Policy WQ-3.1: Reduce loads of sediment, nitrogen, and phosphorus to Lake Tahoe and meet water quality thresholds for tributary streams, surface runoff, and groundwater.

Policy WQ-3.11: Require all persons who own land and all public agencies which manage public lands in the Lake Tahoe region to install and maintain BMP improvements in accordance with the TRPA BMP Manual. BMP requirements shall protect vegetation from unnecessary damage; restore the disturbed soils and be consistent with fire defensible space requirements. As an alternative, area wide water quality treatment facilities and funding mechanisms may be implemented in lieu of certain site specific BMPs where area-wide treatments can be shown to achieve equal or greater water quality benefits.

Policy WQ-3.12: Projects shall be required to meet TRPA BMP requirements as a condition of approval for all projects.

In addition, the Natural Hazards Subelement of the Regional Plan contains the following policy related to development in floodplains.

Policy NH-1.2: Prohibit additional development, grading, and filling of lands within the 100-year floodplain and in the area of wave run-up except for public recreation facilities, public service facilities, necessary crossings, restoration facilities, and as otherwise necessary to implement the goals and policies of the Plan. Require all facilities in the 100-year floodplain and area of wave run-up to be constructed and maintained to minimize impacts on the floodplain.

TRPA Code of Ordinances and Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

Chapter 60 of the TRPA Code of Ordinances contains standards for water quality. Code 60.1.3 contains limits for discharges to surface waters that are identical to the LRWQCB limits shown in *Table 3-27* with the exception that the TRPA limits include a limit of 250 mg/L for suspended sediment in place of the LRWQCB's 20 NTU limit for turbidity. Code 60.1.6 outlines requirements for spill prevention, reporting, recovery, and clean-up. Code Section 60.3 requires measures to prevent contamination of sources of drinking water and protect the public health relating to drinking water. Code Section 60.4 outlines BMP requirements.

TRPA regulates filling and dredging through Code Chapter 84. Under the MOU between LRWQCB and TRPA, both agencies are responsible for review, permitting and enforcement of any new dredging in the California portion of the Lake Tahoe region. Portions of Code Chapter 84 that are specifically applicable to the proposed Project as related to water quality are listed below:

Code Section 84.4.3.A. 9. Applications for new piers and pier extensions that include floating piers or floating portions longer than 25 feet must submit a site-specific littoral drift and wave analysis which evaluates the sediment movement along the lake bottom during low, mid, and high lake levels. The lake level condition with the greatest effect on littoral transport and backshore stability shall be used to design the floating pier section so that wave heights are not reduced by more than 50 percent and the floating pier section is no greater than 50 percent of the length of the site-specific design wavelength.

Code Section 84.9.A. There shall be no fill placed in the lakezone or shorezone, except as otherwise associated with approved bypass dredging, shoreline protective structures, or beach replenishment projects, or otherwise found by TRPA to be beneficial to existing shorezone conditions or water quality and clarity.

Code Section 84.9.B. New dredging shall be permitted in association with the following facilities only where previous approved uses exist, provided all environmental impacts shall be mitigated:

1. Legally existing marinas in areas previously dredged;
2. Essential public health and safety facilities; and
3. Public boat ramps, provided the applicant demonstrates that new dredging shall increase the functionality of the boat ramp.

Code Section 84.9.C. Maintenance dredging shall be allowed according to the following provisions:

1. The maintenance dredging is in a facility that has been previously legally dredged;
2. The applicant demonstrates that dredging is necessary to maintain an existing use; and
3. The maintenance dredging is limited to the previously dredged footprint.

Code Section 84.9.3.A. Maintenance dredging shall comply with TRPA's approved dredging BMPs and shall include the installation of all upland BMPs pursuant to Chapter 60, Resource Management and Protection.

Code Section 84.9.3.D. Where dredging, other than bypass dredging, is permitted, spoil materials shall not be deposited in the lakezone or shorezone, in wetlands, or in the 100-year floodplain of any tributary to a lake except as provided under subsection 84.9.2.A of this Section, but shall be deposited in an approved upland location.

Code Section 84.9.3.E. No dredging, filling, or other project may be permitted which results in the permanent siltation of spawning habitat. Disturbances shall not occur between May 1 and September 30. Temporary siltation associated with construction activities may be permitted provided that the spawning area disturbed is subsequently restored within 60 days or before May 1 when the spawning season begins, whichever is sooner.

Code Section 84.9.3.F. New fill and dredging in the shorezone or lakezone shall comply with federal, state, and regional requirements for ensuring protection of Lake Tahoe's water quality and clarity and Outstanding National Resource Water designation, including but not limited to the USACE federal standards for new dredging and applicable state permit requirements under sections 404 and 401, respectively, of the CWA.

This Project is an Essential Public Safety Facility, and therefore would be processed by TRPA under Code of Ordinances Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders.

TRPA Thresholds

TRPA thresholds relevant to water quality in the Project Area are summarized in *Table 3-28*.

Table 3-28 TRPA Thresholds for Water Quality Applicable to the Project

Category	Subcategory	Standard	Current Status
Pelagic Lake Tahoe	Nitrogen loading	Reduce dissolved inorganic nitrogen loading from all sources by 25 percent of 1973–1981 annual average	Not Reported.
	Phytoplankton primary productivity	Maintain annual mean phytoplankton primary productivity at or below 52 grams carbon per square meter per year.	Considerably Worse than Target
	Secchi depth	The annual average deep water transparency as measured by Secchi disk shall not be decreased below 29.7 meters (97.4 feet), the average levels recorded between 1967 and 1971 by the University of California, Davis.	Somewhat Worse than Target
	Pollutant loading	Reduce the loading of dissolved phosphorus, iron, and other algal nutrients from all sources as required to achieve ambient standards for primary productivity and transparency.	Not Reported
	Pollutant loading	Reduce dissolved inorganic nitrogen loads from surface runoff by approximately 50 percent, from groundwater approximately 30 percent, and from atmospheric sources approximately 20 percent of the 1973-81 annual average.	Not Reported
Littoral Lake Tahoe	Nitrogen loading	Reduce dissolved inorganic nitrogen loading from all sources by 25 percent of 1973–1981 annual average.	Not Reported
	Pollutant loading	Reduce the loading of dissolved inorganic nitrogen, dissolved phosphorus, iron, and other algal nutrients from all sources to meet the 1967–1971 mean values for phytoplankton primary productivity and periphyton biomass in the littoral zone.	Not Reported
	Nearshore turbidity	Decrease sediment load as required to attain turbidity values not to exceed 3 NTUs. In addition, turbidity shall not exceed 1 NTU in shallow waters of the Lake not directly influenced by stream discharges.	At or Somewhat Better than Target
	Pollutant Loading	Reduced dissolved inorganic nitrogen loads from surface runoff by approximately 50 percent, from groundwater approximately 30 percent, and from atmospheric sources approximately 20 percent of the 1973–1981 annual average.	Not Reported
Surface Runoff	Nutrient concentrations	Achieve a 90 percentile concentration value for dissolved inorganic nitrogen of 0.5 mg/L, for dissolved phosphorus of 0.1 mg/L, and for dissolved iron of 0.5 mg/L in surface runoff directly discharged to a surface water body in the Lake Tahoe Basin.	Insufficient Data to Determine Status
	Sediment concentrations	Achieve a 90 percentile concentration value for suspended sediment of 250 mg/L.	Insufficient Data to Determine Status
	Total annual nutrient and suspended sediment loads	Reduce total annual nutrient and suspended sediment load to achieve loading thresholds for littoral and pelagic Lake Tahoe.	Insufficient Data to Determine Status
Source: TRPA 2016a			

3.8.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on hydrology and water quality in the context of NEPA, CEQA, and TRPA requirements. Where potentially significant impacts are identified, a discussion of proposed measures to mitigate those impacts is also provided. *Table 3-29* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the water quality-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-29 Significance Determinations for the Project Alternatives (Hydrology and Water Quality)

Hydrology and Water Quality	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on hydrology or water quality?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project: *a) Violate any water quality standards or waste discharge requirements?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	No Impact	No Impact	No Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) Otherwise substantially degrade water quality?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	No Impact	No Impact	No Impact	No Impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

Hydrology and Water Quality	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
j) Inundation by seiche, tsunami, or mudflow	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
Will the Project result in: *a) Changes in currents, or the course or direction of water movements?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year 1-hour storm runoff (approximately 1 inch per hour) cannot be contained on the site?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Alterations to the course or flow of 100-year flood waters?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Change in the amount of surface water in any water body?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) Alteration of the direction or rate of flow of groundwater?	No Impact	No Impact	No Impact	No Impact
g) Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	No Impact	No Impact	No Impact	No Impact
h) Substantial reduction in the amount of water otherwise available for public water supplies?	No Impact	No Impact	No Impact	No Impact
i) Exposure of people or property to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
j) The potential discharge of contaminants to the groundwater or any alteration of groundwater quality?	Less-than-Significant Impact	No Impact	No Impact	No Impact
k) Is the Project located within 600 feet of a drinking water source?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for water quality?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact

3.8.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on hydrology or water quality?

Less-than-Significant Impact. Adverse impacts to water quality from Alternative 1 would be primarily limited to the 8-week construction phase. The primary impacts to water quality during dredging and installation of the boat lift piles would be caused by the disturbance of lakebed sediment. Some of the disturbed sediments would become temporarily suspended in the water column during dredging, increasing turbidity and releasing nutrients into the water. In addition, the presence of construction equipment and materials in the lake would present a risk for accidental spills of fuel or other petroleum products that could affect water quality. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

Multiple BMPs would be implemented to avoid and minimize water quality impacts during construction. The primary BMPs to address water quality include the following:

- Employing proper dredged material handling and disposal methods, in accordance with **BMP C1-1**;
- Completing pre-construction utility clearance, in accordance with **BMP C1-2**;
- Minimizing the disturbance area, in accordance with **BMP C1-3**;
- Requiring use of turbidity barriers, in accordance with **BMP C1-4**, including a turbidity curtain around the construction area (which would not be removed until post-construction turbidity returns to background levels) and filter fabric and fiber rolls along the conveyor belt;
- Prohibiting work during periods of high wind and wave action severe enough to potentially cause a breach of the turbidity curtain, in accordance with **BMP C1-5**;
- Ensuring that the dredge operator is familiar with and skilled in operational controls to minimize turbidity, in accordance with **BMP C1-6**;
- Implementing a Spill Prevention and Response Plan, in accordance with **BMP C1-7**, which would include proper handling and storage of petroleum products and other hazardous materials and provision of spill control and cleanup materials on site for prompt cleanup of spills, among other measures;
- Inspecting, maintaining, and cleaning construction equipment prior to use, in accordance with **BMP C1-8**, including steam cleaning all mechanical equipment that will be submersed in Lake Tahoe;
- Limiting the handling and dewatering of dredged materials over the lake to areas confined by turbidity barriers, in accordance with **BMP C1-9**;
- Limiting the staging and use of construction equipment and materials to paved upland areas and areas contained by turbidity barriers and securing materials subject to wind or stormwater displacement, in accordance with **BMP C1-10**;
- Implementing a Water Quality Monitoring Plan, in accordance with **BMP C1-11**, which will include continuous visual monitoring, collecting turbidity readings every 2 hours, and analyzing weekly water samples for TN and TP levels;
- Prohibiting the use of flocculants, in accordance with **BMP C1-12**;

- Keeping the work area free of trash and litter, in accordance with **BMP C1-13**; and,
- Implementing a WEAP for construction personnel, in accordance with **BMP C1-24**.

Implementation of these BMPs would substantially reduce impacts to water quality. In addition, construction impacts to water quality would be localized and temporary.

After construction is completed, operations of the modified pier would remain largely unchanged from existing conditions, and no adverse water quality impacts are expected during regular operations. Maintenance dredging would be required once every 10 to 15 years to maintain sufficient depth at the pier head. Impacts of maintenance dredging on water quality are expected to be less than those described for new dredging, because the material to be removed during maintenance dredging will likely be smaller in volume and composed primarily of loose alluvial sand deposits that would accumulate between dredging episodes, rather than the dense, fine-grained lacustrine clays that comprise much of the material that would be removed during the first dredging episode. The sandy alluvial material would take less time to dredge than the lacustrine clay and would settle out of the water column more quickly, resulting in less turbidity. Similar water-quality-related BMPs would be implemented during maintenance dredging, and the CG would obtain appropriate regulatory approvals and comply with relevant regulatory requirements for maintenance dredging. Impacts from maintenance dredging would occur only infrequently and would be temporary, localized, and less than significant.

Alternative 1 would also have long-term beneficial effects on water quality in Lake Tahoe, as required by TRPA Code of Ordinances Section 84.15.3. With year-round mooring capabilities at the modified pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe, thereby minimizing or avoiding the water quality impacts of such releases. After dredging is completed, the increased depth in the Project Area would also decrease turbidity caused by propeller wash from vessels moving through the dredged area during low water conditions, resulting in an improvement in lake clarity in the Project vicinity.

In terms of hydrology, the presence of the turbidity curtain during dredging would have minor impacts on water movement in the Project Area during construction. However, these impacts would be short term, localized, and less than significant. In the long term, the change in site bathymetry due to dredging and the presence of the boat lift piles and floating dock would have some effect on the movement of water and sediment in the Project Area. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess the proposed Project's potential long-term impacts on littoral processes, AECOM conducted a study to model the Project's effects on hydrodynamic parameters including wave height and velocity and long-shore current velocity (*Appendix K)*. The modeling showed that Alternative 1 would not have substantial effects on wave or current patterns or littoral processes in the Project Area. Therefore, the impacts of Alternative 1 on hydrology would be less than significant.

In summary, during construction and infrequent maintenance dredging, adverse impacts to water quality and hydrology would be temporary, localized, and less than significant. In the long term, Alternative 1 would have beneficial impacts on water quality and no significant adverse impacts on hydrology. Therefore, Alternative 1 would have less-than-significant adverse impacts on hydrology and water quality from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Violate any water quality standards or waste discharge requirements?

Less-than-Significant Impact with Mitigation. As discussed above in the NEPA analysis, adverse impacts to water quality have potential to occur during the 8-week construction period for Alternative 1. The primary impacts to water quality during construction would be caused by the disturbance of lakebed sediment, which would increase turbidity levels and release nutrients into the waters of Lake Tahoe. In addition, the presence of construction equipment and materials in the lake would present a risk for accidental spills of fuel or other petroleum products that could affect water quality. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

As discussed previously in the NEPA analysis, multiple BMPs would be implemented to avoid and minimize the potential for water quality violations during construction. In accordance with **BMP C1-1**, dredged material will be disposed of at an appropriately licensed facility. In accordance with **BMP 1-2**, utility clearance would be conducted prior to dredging to avoid accidental discharges from broken utility lines. Multiple BMPs would be implemented during construction to avoid and minimize impacts to water quality, including requiring use of turbidity barriers in accordance with **BMP C1-4**; prohibiting work during periods of high wind or wave action in accordance with **BMP C1-5**; implementing a Spill Prevention and Response plan in accordance with **BMP C1-7**; inspecting, cleaning, and maintaining construction equipment prior to use in accordance with **BMP C1-8**; and limiting the handling and dewatering of dredged materials over the lake to areas confined by turbidity barriers in accordance with **BMP C1-9**, among others. In accordance with **BMP C1-11**, water quality monitoring would be conducted during dredging to confirm that the proposed Project is in compliance with water quality standards and effluent limitations, and corrective actions would be implemented to maintain compliance if required based on results of the monitoring.

After construction is completed, operations of the modified pier would remain largely unchanged, and normal operations are not expected to result in the violation of water quality standards or waste discharge requirements. Maintenance dredging would be required once every 10 to 15 years to maintain sufficient depth to provide year-round mooring capabilities. Impacts of maintenance dredging on water quality are expected to be less than those described for new dredging, because the material to be removed during maintenance dredging will likely be smaller in volume and composed primarily of loose alluvial sand deposits that would accumulate between dredging episodes, rather than the dense, fine-grained lacustrine clays that comprise much of the material that would be removed during the first dredging episode. The sandy alluvial material would take less time to dredge than the lacustrine clay and would settle out of the water column more quickly, resulting in decreased turbidity impacts. Similar water-quality-related BMPs would be implemented during maintenance dredging, and the CG would obtain appropriate regulatory approvals and comply with relevant regulatory requirements for maintenance dredging. Impacts from maintenance dredging would occur only infrequently and would be temporary, localized, and less than significant.

In addition, Alternative 1 would have long-term beneficial effects on water quality in Lake Tahoe. With year-round mooring capabilities at the modified pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe, thereby minimizing or avoiding water quality impacts from such releases. The consistent ability to moor boats at the Station pier would cut down CG response times by up to 40 minutes. The CG provides emergency response services lakewide, responding to an average of more than 150 incidents on the lake per year, and is the only agency with on-site staff available to respond 24 hours a day, 365 days a year. The CG also plays a vital role in coordinating and assisting the efforts of other emergency response agencies on the lake. Allowing consistent use of the Station pier would result in a substantial benefit for emergency and spill response capabilities in the region. Because recreational vessels on the lake carry up to 350 gallons of fuel (up to 2,000 gallons for commercial vessels), as well as other deleterious material that could be spilled into the lake in the event of an accident, the enhanced ability to respond to incidents rapidly has to potential to avoid or minimize substantial impacts to water quality in the case of such an

incident. Dredging and the addition of the floating dock to the pier will also allow the CG to tow disabled boats back to the Station where a leak or spill can more easily be contained by methods such as a containment boom. Additionally, the increased depth in the Project Area after dredging would decrease turbidity caused by propeller wash from vessels moving through the dredged area during low water conditions, resulting in an improvement in lake clarity in the Project vicinity.

The Project will require a CWA Section 401 WQC from the LRWQCB to certify that it is in compliance with the applicable water quality standards, effluent limitations, and discharge prohibitions contained in the Basin Plan. The Basin Plan prohibits discharges of waste or deleterious material to surface waters of the Lake Tahoe HU, unless the LRWQCB makes the findings required for an exemption from this discharge prohibition. Although the dredged material will be disposed of outside of the Lake Tahoe HU, the disturbance and resuspension of lake bed sediments and incidental dewatering of dredged materials during implementation of Alternative 1 would be considered a discharge of waste of deleterious material subject to this discharge prohibition and thus would require an exemption from the LRWQCB. A discussion of the required findings for the exemption and their applicability to Alternative 1 is provided below:

- *The discharge of waste will not, individually or collectively, directly or indirectly, adversely affect beneficial uses.*

  Alternative 1's potential adverse effects on the beneficial uses designated for Lake Tahoe would be limited to the construction phase and infrequent maintenance dredging. To avoid and minimize adverse effects on beneficial uses, Alternative 1 would include implementation of the water-quality-related BMPs listed previously in the NEPA analysis for water quality, as well as the other BMPs listed in *Section 2.1.1* relevant to other beneficial uses such as habitat, recreation, and navigation. Similar measures would be implemented during maintenance dredging. Alternative 1 would also include the implementation of **MM-BIO-1** to mitigate for impacts to the beneficial use of the Project Area as fish habitat. With incorporation of these measures, Alternative 1's adverse impacts to Lake Tahoe's designated beneficial uses would be temporary, localized, and less than significant. As explained previously, Alternative 1 would also have positive impacts on beneficial uses related to water quality in the long term.

- *There is no reasonable alternative to the waste discharge.*

  This Draft EA/IS/EA analyzes three potential alternatives that would meet the purpose and need for the proposed Project – to provide year-round mooring capabilities at the Station pier to improve the CG's ability to provide essential public safety services. As discussed in *Section 3.2*, *Aesthetics, Scenic Resources, and Community Design,* the two pier extension alternatives considered in this document are impracticable due to conflicts with the TRPA's scenic quality regulations. As discussed in *Section 2.6*, *Alternatives Considered but Eliminated from Detailed Analysis,* the CG considered several other alternatives, including monopile pier extension designs and moving the Station to an alternative site, but these alternatives were also found to be impracticable because they would have greater environmental impacts than the alternatives that are considered in detail in this EA. Therefore, there is no reasonable alternative to the proposed waste discharge that meets the purpose and need for the proposed Project.

- *All applicable and practicable control and mitigation measures have been incorporated to minimize potential adverse impacts to water quality and beneficial uses.*

  All applicable and practicable control and mitigation measures have been incorporated into the Project to minimize potential adverse impacts to water quality and beneficial uses to a less-than-significant level. The LRWQCB and TRPA were consulted during the writing of this Draft EA/IS/EA, and typical control and mitigation measures recommended by both the agencies for in-water work in Lake Tahoe were incorporated into the Project BMPs and mitigation measures. The Project applicant conducted a pre-dredging sampling program, which determined that there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016). In accordance with LRWQCB guidance, applicable

recommendations from *Impacts of Marina Dredging on Lake Tahoe Water Quality* (Tahoe Research Group 1996) were also incorporated into the BMPs for Alternative 1, including proper disposal of dredged materials at an appropriately licensed facility (**BMP C1-1**), implementing the use of turbidity curtains (**BMP C1-4**), prohibiting dredging in inclement weather (**BMP C1-5**), ensuring the dredge operator is familiar with operational controls to reduce turbidity (**BMP C1-6**), and conducting water quality monitoring (**BMP C1-11**) during dredging.

The Lahontan Basin Plan also prohibits the discharge of waste or deleterious material to land below the high-water rim of Lake Tahoe; therefore, Alternative 1 would require an exemption from this discharge prohibition. A discussion of the required findings and their applicability to Alternative 1 is provided below:

- *The project is necessary for public health, safety, or environmental protection:*

  The public health and safety purpose and need for the proposed Project are explained in *Section 1.2, Purpose and Need.* Implementation of the proposed Project will allow the CG year-round mooring capability at the Station pier, including during low-water conditions. This is necessary to provide essential emergency, search and rescue, law enforcement, and boating safety services to the boating public and agencies that use Lake Tahoe without the delays that are currently involved with accessing an off-site mooring location during low-water conditions.

- *There is no reasonable alternative, including spans, that avoids or reduces the extent of encroachment:*

  As discussed previously, the CG has considered multiple alternative approaches to meeting the purpose and need for the proposed Project, and there is no reasonable alternative that avoids or reduces the extent of encroachment while still meeting that purpose and need.

- *The impacts are fully mitigated:*

  As discussed above, all practicable BMPs have been incorporated into the Project to avoid and minimize potential adverse impacts, and additional measures will be implemented to mitigate potentially significant impacts that remain after incorporation of those BMPs. **MM AES-1** and **MM BIO-1** will be implemented to minimize impacts to scenic and biological resources, respectively, to a less-than-significant level.

- *Wetlands are restored in an amount at least 1.5 times the area of wetland disturbed or developed. Certain wetlands may require restoration of greater than 1.5 times the area disturbed or developed:*

  As discussed in *Section 3.4, Biological Resources*, no areas meeting the regulatory definition of "wetlands" are present in Alternative 1's permanent disturbance area, due to the lack of aquatic vegetation. Therefore, no wetland mitigation will be required.

The Lahontan Basin Plan also prohibits the discharge or threatened discharge attributable to new pier construction of wastes to significant spawning habitats or to areas immediately offshore of stream inlets in Lake Tahoe. The only activities involved with Alternative 1 that might be considered "new pier construction" are the installation of boat lift, which would replace the existing lift, and the addition of the 35-foot floating dock. As indicated by the Fish Habitat Survey conducted for the proposed Project, substrate suitable for spawning is not present in the area where these structures would be located, or elsewhere in the area contained by the turbidity curtain. The new structures also would not be located immediately offshore of stream inlets into Lake Tahoe – the new structures would be more than 340 feet from the mouth of Star Harbor, which, although heavily modified, is the current inlet to Burton and Barton/Polaris Creeks. In accordance with **BMP C1-16**, in-water work would not occur during the spawning season, unless written permission is obtained from the CDFW and TRPA, and the new structures would not substantially interfere with fish access to or use of nearby stream inlets. Therefore, the prohibition on discharges to significant spawning habitats or stream inlets does not apply to Alternative 1. Project impacts to non-spawning fish habitat (i.e., feed and cover habitat) would be addressed by implementation of **MM BIO-1**.

In summary: 1) Alternative 1 would include implementation of multiple water-quality BMPs during construction and maintenance dredging to avoid violations of water quality standards and effluent limitations; 2) in the long term, Alternative 1 would have beneficial impacts on water quality; 3) with the implementation of **MMs AES-1** and **BIO-1**, the impacts of Alternative 1 would be fully mitigated, and 4) Alternative 1 would meet the criteria for exemption from the relevant Basin Plan discharge prohibitions. Therefore, with incorporation of the proposed BMPs and mitigation measures, the impacts of Alternative 1 related to violation of water quality standards and waste discharge requirements would be less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

No Impact. Alternative 1 would not involve groundwater extraction or affect groundwater recharge.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less-than-Significant Impact. During construction, multiple BMPs will be implemented to avoid and minimize turbidity and subsequent siltation in the shorezone of Lake Tahoe. The disturbance area would be limited to the minimize necessary to complete the Project (**BMP C1-3**), turbidity barriers would be employed to avoid siltation outside of the work area (**BMP C1-4**), and handling of dredged material over the lake would be limited to areas confined by these turbidity barriers (**BMP C1-9**). Additionally, work would be prohibited during inclement weather severe enough to potentially cause a breach of the turbidity curtain (**BMP C1-5**), and the dredge operator would be familiar with and skilled in operational controls to prevent the spread of turbidity outside the curtained area (**BMP C1-6**). To avoid erosion during construction, staging and use of construction equipment and materials in upland areas will be limited to paved surfaces (other than a portion of the conveyor system, the stands for which would be placed in a manner that minimizes disturbance of soil and vegetation), and upland staging areas will be centralized and delineated with construction boundary fencing as needed to minimize impacts to soils and vegetation (**BMP C1-10**).

The permanent disturbance area for Alternative 1 occurs entirely within Lake Tahoe, and the proposed Project would have no long-term impacts on drainage patterns of upland areas, streams, or rivers. However, the change in bathymetry and presence of the two boat lift piles in the Project Area could influence littoral processes, including erosion and deposition, in the shorezone of Lake Tahoe. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess the proposed Project's potential impacts on littoral processes, AECOM conducted a study to model the proposed Project's effects on the hydrodynamic parameters that drive littoral drift (*Appendix K)*. As discussed in greater detail in *Section 4.3.3.1*, the littoral drift study concluded that Alternative 1 would not have a significant impact on littoral processes, including shorezone erosion or siltation on- or off-site.

In summary, Alternative 1 would have less-than-significant impacts related to alteration of existing drainage patterns in a manner which would result in substantial erosion or siltation on- or off-site.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less-than-Significant Impact. The permanent disturbance area for Alternative 1 occurs entirely within Lake Tahoe, and the proposed Project would have no long-term impacts on drainage patterns of upland areas, streams, or rivers. Alternative 1 would involve removing up to 5,041 CY of material (including the full overdepth allowance) from the bed of Lake Tahoe, increasing the amount of flood water that can be contained on site proportionally. The only permanent structures to be placed in the floodplain are the two piles for the replacement boat lift, which will not substantially influence drainage patterns or increase the

risk of flooding. Therefore, Alternative 1's adverse impacts related to altering the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increasing the rate or amount of surface runoff in a manner which would result in flooding on- or off-site would be less than significant.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less-than-Significant Impact. During construction, various BMPs would be implemented to avoid discharges of polluted or sediment-laden runoff to the Station's stormwater drainage system. In accordance with **BMP C1-4**, filter fabric and fiber rolls will be used along the path of the conveyor system. In accordance with **BMP C1-8,** construction equipment will be monitored for leaks and cleaned and maintained as needed. In accordance with **BMP C1-9,** any dredged material spilled onto the ground or pavement during truck loading will be cleaned up in a manner that minimizes discharges to storm drains or the lake, temporary stormwater BMPs will be installed in storm drains in the Station parking lot to further avoid discharges to the stormwater system during dredged material transfer and loading, and the dredged material will be transported off site in lined trucks to avoid discharges during transportation. In accordance with **BMP C1-10,** staged materials subject to stormwater displacement will be secured. Construction impacts related to polluted runoff to stormwater drainage systems would be temporary and, with the implementation of these BMPs, less than significant.

After construction, the permanent disturbance area for Alternative 1 would occur entirely within the lakezone of Lake Tahoe, and normal operations of the modified pier would not affect stormwater runoff or stormwater drainage systems. During infrequent maintenance dredging, BMPs similar to those described above would be implemented to avoid impacts related to runoff to stormwater drainage systems. In summary, the impacts of Alternative 1 related to creating polluted runoff or exceeding the capacity of stormwater drainage systems would be less than significant.

f) Otherwise substantially degrade water quality?

Less-than-Significant Impact. Alternative 1's adverse water quality impacts would be limited to the construction phase and infrequent maintenance dredging episodes. With implementation of the BMPs described previously, impacts to water quality during construction and maintenance dredging would be temporary, localized, and less than significant. In the long term, Alternative 1's effects on water quality are expected to be largely beneficial. In summary, Alternative 1 would have less-than-significant impacts related to degradation of water quality.

g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. Alternative 1 does not involve the construction of housing.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less-than-Significant Impact. The only permanent structures to be placed in the 100-year flood hazard area for Alternative 1 are the two h-piles for the replacement boat lift, which would not substantially impede or direct flood flows. Therefore, the impacts of Alternative 1 related to flood flows would be less than significant.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less-than-Significant Impact. Workers would be present in the floodplain during construction, but work would not be conducted during inclement weather or high wave and/or wind action (**BMP C1-5**), which would avoid exposure of people to flood-related hazards during construction. In the long term, the only new permanent structures to be added for Alternative 1 are the boat lift, which would replace the existing boat

lift, and the floating dock. Operations at the modified pier would continue largely unchanged, including continued implementation of proper safety procedures during periods of high flood risk. Therefore, the impacts of Alternative 1 related to the exposure of people or structures to flood hazards would be less than significant.

j) Inundation by seiche, tsunami, or mudflow

Less-than-Significant Impact. Workers would be present in the lake zone during construction, but appropriate safety procedures would be followed during work (such as instructing construction workers to immediately move to high ground following an earthquake), and exposure of people to water-related hazards such as seiches during construction would be short term and less than significant.

In the long term, the only new permanent structures to be added for Alternative 1 are the boat lift, which would replace the current lift, and the floating dock. Operations at the modified pier would continue largely unchanged, including continued implementation of appropriate safety procedures following an earthquake, and the new boat lift would not substantially increase the exposure to people of seiches. The proposed Project would not be in an area at risk for tsunamis or mudflows. Therefore, the impacts of Alternative 1 related to the exposure of people or property to water-related hazards such as seiche, tsunami, or mudflow would be less than significant.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Changes in currents, or the course or direction of water movements?

Less-than-Significant Impact. The presence of the turbidity curtain during dredging would have minor impacts on water movement in the Project Area during construction. However, these impacts would be short term, localized, and less than significant. In the long term, the change in site bathymetry due to dredging and the presence of the boat lift piles would have some effect on water movement in the Project Area. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess the proposed Project's potential long-term impacts on hydrology and littoral processes, AECOM conducted a study to model the Project's effects on hydrodynamic parameters including wave height and velocity and long-shore current velocity (*Appendix K)*. As discussed in more detail in *Section 4.3.3.1*, the modeling showed that Alternative 1 would not have substantial effects on wave or current patterns in the Project Area. Therefore, Alternative 1 would have a less-than-significant impact on currents or the course or direction of water movements.

b) Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year 1-hour storm runoff (approximately 1 inch per hour) cannot be contained on the site?

Less-than-Significant Impact. Alternative 1 would involve removing up to 5,041 CY of material from the bed of Lake Tahoe (including dredging of the full overdepth allowance), increasing the amount of surface water that can be contained on site proportionally. The only permanent structures to be placed in the floodplain are the two piles for the replacement boat lift, which will not substantially influence drainage patterns or the amount of surface water that can be contained onsite. Alternative 1 would not have permanent impacts on the absorption rates, drainage patterns, or rate and amount of surface water runoff of upland portions of the site. Therefore, the adverse impacts of Alternative 1 related to changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year 1-hour storm runoff cannot be contained on the site would be less than significant.

c) Alterations to the course or flow of 100-year flood waters?

Less-than-Significant Impact. The only new structures to be placed in the 100-year floodplain for Alternative 1 would be the two h-piles that would support the replacement boat lift. The change in site bathymetry due to dredging would not have significant adverse effects on the course or flow of flood waters. Therefore, Alternative 1 would have less-than-significant impacts related to alterations to the course or flow of 100-year flood waters.

d) Change in the amount of surface water in any water body?

Less-than-Significant Impact. Alternative 1 would not involve the extraction or use of surface water. Alternative 1 would involve removing up to 5,041 CY of material from the bed of Lake Tahoe (including dredging of the full overdepth allowance) and installing two h-piles for the replacement boat lift; neither of these changes will substantially change the amount of surface water in Lake Tahoe. Therefore, the impacts of Alternative 1 related to changes in the amount of surface water in any water body would be less than significant.

e) Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?

Less-than-Significant Impact. Impacts to water quality from Alternative 1 would be primarily limited to the 8-week construction phase. The primary impact to water quality during dredging would be increased turbidity resulting from the suspension of dredged sediments in the water column. In addition, increased turbidity may also lead to releases of nutrients, decreases in dissolved oxygen, and increases in surface water temperature. The presence of construction equipment in the lakezone could also increase the risk of accidental spills of fuel and other petroleum products. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

As described previously in the NEPA analysis, multiple BMPs would be implemented to avoid and minimize the potential for impacts to surface waters during construction. In accordance with **BMP C1-1**, dredged material will be disposed of at an appropriately licensed facility. In accordance with **BMP 1-2**, utility clearance would be conducted prior to dredging to avoid discharges from utility lines. Multiple BMPs would be implemented during construction to avoid and minimize impacts to surface waters, including use of turbidity barriers in accordance with **BMP C1-4**; prohibiting work during periods of high wind or wave action in accordance with **BMP C1-5**; implementing a Spill Prevention and Response plan in accordance with **BMP C1-7**; inspecting, cleaning, and maintaining construction equipment in accordance with **BMP C1-8**; and limiting the handling and dewatering of dredged materials over the lake to areas confined by turbidity barriers in accordance with **BMP C1-9**, among others. In accordance with **BMP C1-11**, water quality monitoring would be conducted during dredging to confirm that the proposed Project is in compliance with water quality standards and effluent limitations for turbidity and nutrient parameters, and corrective actions would be implemented to maintain compliance if required based on results of the monitoring.

After construction is completed, operations of the modified pier would remain largely unchanged, and water quality impacts are not expected during normal operations. Maintenance dredging would be required once every 10 to 15 years to maintain sufficient depth. Impacts of maintenance dredging on water quality are expected to be less than those described for new dredging, because the material to be removed during maintenance dredging will likely be smaller in volume and composed primarily of loose alluvial sand deposits that would accumulate between dredging episodes, rather than the dense, fine-grained lacustrine clays that comprise much of the material that would be removed during the first dredging episode. The sandy alluvial material would take less time to dredge than the lacustrine clay and would settle out of the water column more quickly, resulting in decreased turbidity impacts. BMPs similar to those used during construction would be implemented during maintenance dredging, and the CG would seek appropriate regulatory approvals and comply with relevant regulatory requirements for maintenance dredging. Therefore, water quality impacts during maintenance dredging would be less than significant.

In addition, Alternative 1 would have long term beneficial impacts on water quality. With year-round access to their pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe, thereby minimizing or avoiding the water quality impacts of such releases. The consistent ability to moor boats at the Station pier would cut down CG response times by up to 40 minutes. The CG provides emergency response services lakewide, responding to an average of more than 150 incidents on the lake per year, and is the only agency with on-site staff available to respond 24 hours a day, 365 days a year. The CG also plays a vital role in coordinating and assisting the efforts of other emergency response agencies on the lake. Allowing consistent use of the Station pier would result in a substantial benefit for emergency and spill response capabilities in the region. Because recreational vessels on the lake carry up to 350 gallons of fuel (up to 2,000 gallons for commercial vessels), as well as other deleterious material that could be spilled into the lake in the event of an accident, the enhanced ability to respond to incidents rapidly has to potential to avoid or minimize substantial impacts to water quality in the case of such an incident. Dredging and the addition of the floating dock to the pier will also allow the CG to tow disabled boats back to the Station where a leak or spill can more easily be contained by methods such as a containment boom. Additionally, the increased depth in the Project Area after dredging would decrease turbidity caused by propeller wash from vessels moving through the dredged area during low water conditions, resulting in an improvement in lake clarity in the Project vicinity.

In summary, during construction and infrequent maintenance dredging, adverse impacts to surface water quality would be localized, short-term, and less than significant and in the long term Alternative 1 is expected to have beneficial effects on water quality. Therefore, Alternative 1 would have less-than-significant impacts related to discharges to surface waters, or in alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity.

f) Alteration of the direction or rate of flow of groundwater?

No Impact. Alternative 1 would not result in the alteration of the direction or rate of flow of groundwater.

g) Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?

No Impact. Alternative 1 would not involve groundwater extraction or discharge or interception of an aquifer by cuts or excavations. The proposed Project would have no impacts related to the change in the quantity of groundwater in the Project vicinity.

h) Substantial reduction in the amount of water otherwise available for public water supplies?

No Impact. Alternative 1 does not involve substantial water use and would not substantially reduce the amount of water otherwise available for public water supplies.

i) Exposure of people or property to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches?

Less-than-Significant Impact. Workers would be present in the lake zone during construction, but work would not be conducted during inclement weather or high wave and/or wind action, in accordance with **BMP C1-5**. Appropriate safety procedures would be followed during work (such as instructing construction workers to immediately move to high ground following an earthquake), and exposure of people to water-related hazards during construction would be short term and less than significant. In the long term, the only new permanent structures to be added for Alternative 1 are the replacement boat lift and the floating dock. Operations at the modified pier would continue largely unchanged, including continued implementation of proper safety procedures during period of high flood or seiche risk. Therefore, the impacts of Alternative 1 related to the exposure of people or property to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches would be less than significant.

j) The potential discharge of contaminants to the groundwater or any alteration of groundwater quality?

Less-than-Significant Impact. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016). In accordance with **BMP C1-1,** dredged materials will be disposed of at an appropriately licensed facility. Therefore, Alternative 1 would have less-than-significant impacts related to the potential discharge of contaminants to groundwater or other alterations of groundwater quality.

k) Is the Project located within 600 feet of a drinking water source?

Less-than-Significant Impact. The Lahontan Basin Plan designates municipal and domestic drinking water supply as a beneficial use for all of Lake Tahoe, and the lake is a source of drinking water for both public and private water systems. The TCPUD, which provides public drinking water in the Project vicinity, procures most of its water supply from groundwater wells and does not have any active surface water intakes in the Project vicinity. There are also no other known active public or private water intakes within 600 feet of the Project Area. As discussed previously, during construction and infrequent maintenance dredging, Alternative 1 would have impacts on the water quality of Lake Tahoe, but these impacts would be short term and localized and, with the implementation various water quality BMPs discussed previously, would not have significant impacts on drinking water supplies obtained from Lake Tahoe. In the long term, Alternative 1 would have beneficial impacts on the water quality of Lake Tahoe. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016). As discussed previously, **BMP C1-1** would be implemented to ensure that dredged materials will be disposed of at an appropriately licensed facility. Therefore, with implementation of the proposed BMPs, Alternative 1 would have less-than-significant adverse impacts on drinking water sources.

TRPA Thresholds

Less-than-Significant Impact with Mitigation. The impacts of Alternative 1 on water quality would be limited to the construction phase and infrequent maintenance dredging, and these impacts would be short term, localized, and less than significant. Implementation of the various water quality BMPs outlined in the NEPA Analysis section, including use of a turbidity curtain (**BMP C1-4**), a spill prevention and response plan (**BMP C1-7**), and water quality monitoring during construction (**BMP C1-11**), among others, would ensure that fine sediment, nutrient, and pollutant concentrations in Lake Tahoe do not substantially increase and that TRPA's water quality thresholds are not compromised during construction and maintenance dredging.

To meet water quality thresholds, TRPA does not permit new dredging unless it is found to be beneficial to shorezone conditions and water quality and clarity. As discussed previously, Alternative 1 would benefit water quality and clarity thresholds in Lake Tahoe in the long term by improving the CG's capability to respond to incidents that could result in the release of pollutants to the lake, reducing turbidity from boat traffic in the dredged area during low water conditions, and increasing deposition of fine particles in the Project Area. In addition, compensatory mitigation for fish habitat will be implemented at a 1:1.5 ratio in accordance with **MM BIO-1**; TRPA and the LRWQCB have instituted the 1:1.5 mitigation ratio for this requirement to ensure that there is a net benefit to the affected resources and ensure that projects affecting these resources meet the threshold requirements.

In summary, Alternative 1's adverse impacts on TRPA water-quality thresholds would be less than significant, and Alternative 1 would have beneficial effects on water-quality thresholds in the long term.

3.8.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on hydrology or water quality?

Less-than-Significant Impact. Impacts to water quality from Alternative 2 would be largely limited to the proposed Project's construction phase. The primary impacts to water quality during construction would be caused by the disturbance of lakebed sediment during pile installation. Some of the disturbed sediments would become temporarily suspended in the water column during construction, increasing turbidity and releasing nutrients into the water. In addition, the presence of construction equipment and materials in the lake would present a risk for accidental spills of fuel or other petroleum products that could affect water quality. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

Multiple BMPs would be implemented to avoid and minimize water quality impacts during construction. The primary BMPs to address water quality include the following:

- Minimizing the disturbance area, in accordance with **BMP C2-1**;
- Completing pre-construction utility clearance, in accordance with **BMP C2-2**;
- Requiring use of a turbidity curtain, which would not be removed until post-construction turbidity returns to background levels, in accordance with **BMP C2-3**;
- Prohibiting work during periods of high wind and wave action severe enough to potentially cause a breach of the turbidity curtain, in accordance with **BMP C2-4**;
- Implementing a Spill Prevention and Response Plan, in accordance with **BMP C2-5**, which would include proper handling and storage of petroleum products and other hazardous materials and provision of spill control and cleanup materials on site for prompt cleanup of spills, among other measures.
- Inspecting, maintaining, and cleaning construction equipment prior to use, in accordance with **BMP C2-6**, including steam cleaning all mechanical equipment that will be submersed in Lake Tahoe.
- Limiting the staging and use of construction equipment and materials to paved upland areas and areas contained by turbidity barriers and securing materials subject to wind or stormwater displacement, in accordance with **BMP C2-7**.
- Implementing a Water Quality Monitoring Plan in accordance with **BMP C2-8**, which will include continuous visual monitoring, collecting turbidity readings every 2 hours, and weekly water samples for TN and TP.
- Prohibiting use of flocculants in accordance with **BMP C2-9**.
- Keeping the work area free of trash and litter, in accordance with **BMP C2-10**; and,
- Implementing a WEAP for construction personnel, in accordance with **BMP C2-21**.

Implementation of these BMPs would substantially reduce impacts to water quality. In addition, construction impacts would be localized and temporary.

After construction is completed, operations of the modified pier would remain largely unchanged. In accordance with **BMP O2-1**, a Fueling Plan would be implemented during pier operations of the new fueling station to minimize fuel spills and resulting impacts to water quality. Alternative 2 would also have long-term beneficial effects on water quality in Lake Tahoe. With year-round mooring capabilities at the modified pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe. The CG will be able to respond more quickly to distress calls from damaged or sinking vessels that could otherwise cause substantial releases of fuel and other substances to the waters of the lake, and the CG would be able to bring damaged vessels back to the pier, where releases could be more easily contained by methods such as a containment boom. After construction is completed, the increased depth at the pier head would also decrease turbidity caused by propeller wash from vessels moving using the pier low water conditions.

In terms of hydrology, the presence of the turbidity curtain during construction would have minor impacts on water movement in the Project Area during construction. However, these impacts would be short term, localized, and less than significant. In the long term, the presence of the pier extension piles and floating dock would have some effect on water movement in the Project Area. In conformance with the design standards for piers in Section 84.4.3.B.2.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water and minimize interference with littoral processes. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess the proposed Project's potential long-term impacts on hydrology and littoral processes, AECOM conducted a study to model the Project's effects on hydrodynamic parameters including wave height and velocity and long-shore current velocity (*Appendix K)*. As discussed in more detail in *Section 4.3.3.1*, the modeling showed that Alternative 2 would not have substantial effects on wave or current patterns in the Project Area. Therefore, the impacts of Alternative 2 on hydrology would be less than significant.

In summary, during construction of Alternative 2, adverse impacts to water quality and hydrology would be temporary, localized, and less than significant. In comparison to Alternative 1, Alternative 2 would disturb less area of lakebed and therefore cause less turbidity and siltation, and impacts would occur over a slightly shorter construction period (7 weeks versus 8 weeks). Alternative 2 also would not have water quality impacts associated with maintenance dredging. However, both alternatives would include implementation of the same water-quality-related BMPs, and water quality impacts for both alternatives would be substantially similar (i.e., short-term, localized, and less than significant). Like Alternative 1, Alternative 2 would have beneficial impacts on water quality and no significant adverse impacts on hydrology in the long term. In summary, Alternative 2 would have less-than-significant adverse impacts on hydrology and water quality from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Violate any water quality standards or waste discharge requirements?

Less-than-Significant Impact with Mitigation. As discussed above in the NEPA analysis, adverse impacts to water quality have potential to occur during the 7-week construction period for Alternative 2. The primary impacts to water quality during construction would be caused by the disturbance of lakebed sediment, which would increase turbidity levels and release nutrients into the waters of Lake Tahoe. In addition, the presence of construction equipment and materials in the lake would present a risk for accidental spills of fuel or other petroleum products that could affect water quality. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

As discussed previously in the NEPA analysis, multiple BMPs would be implemented to avoid and minimize the potential for water quality violations during construction: conducting utility clearance prior to construction to avoid accidental discharges from broken utility lines in accordance with **BMP 2-2**; requiring use of a turbidity curtain in accordance with **BMP C2-3**; prohibiting work during periods of high wind or wave action in accordance with **BMP C2-4**; implementing a Spill Prevention and Response plan in accordance with **BMP C2-5**; and inspecting, cleaning, and maintaining construction equipment prior to use in accordance with **BMP C2-6**, among others. In accordance with **BMP C2-8**, water quality monitoring would be conducted during construction to confirm that the proposed Project is in compliance with water quality standards and effluent limitations, and corrective actions would be implemented to maintain compliance if required based on results of the monitoring.

After construction is completed, operations of the modified pier would remain largely unchanged, and normal operations are not expected to result in the violation of water quality standards or waste discharge requirements. In accordance with **BMP O2-1**, a Fueling Plan would be implemented during operation of the new fueling station to minimize fuel spills and resulting impacts to water quality. Alternative 2 would also have long-term beneficial effects on water quality in Lake Tahoe. With year-round mooring capabilities at the modified pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe. The CG will be able to respond more quickly to distress calls from damaged or sinking vessels that could otherwise cause substantial releases of fuel and other substances to the waters of the lake, and the CG would be able to bring damaged vessels back to the pier, where releases could be more easily contained by methods such as a containment boom. After construction is completed, the increased depth at the pier head would also decrease turbidity caused by propeller wash from vessels moving using the pier low water conditions.

The Project will require a CWA Section 401 WQC from the LRWQCB to certify that it is in compliance with the applicable water quality standards, effluent limitations, and discharge prohibitions contained in the Basin Plan. The Basin Plan prohibits discharges of waste or deleterious material to surface waters and 100-year floodplains in the Lake Tahoe HU unless the LRWQCB makes the findings required for an exemption from these discharge prohibitions. The Basin Plan indicates that certain types of low-threat discharges, including installation of pier piles, are exempt from the waste discharge prohibitions outlined in the Basin Plan, subject to certain conditions. A discussion of the required exemption findings and their applicability to Alternative 2 is provided below:

- *For proposed discharges to surface water, the applicant must provide information supporting why discharge to land is not practicable.*

  The Station pier is in the surface waters of Lake Tahoe, and avoiding discharges to surface waters while still meeting the purpose and need of the proposed Project is not practicable.

- *The discharge must not adversely affect the beneficial uses of the receiving water.*

  All applicable and practicable BMPs and mitigation measures have been incorporated into the Project to minimize potential adverse impacts to beneficial uses to a less-than-significant level. Adverse impacts to water quality would be localized and limited to the construction period. **MM BIO-1** would be implemented to fully mitigate impacts to beneficial uses related to fish habitat.

- *The discharge must comply with all applicable water quality objectives.*

  All applicable and practicable BMPs and mitigation measures have been incorporated into the Project to ensure compliance with applicable water quality objectives and effluent limitations. In accordance with **BMP C2-8**, water quality monitoring would be conducted during construction to ensure that applicable water quality objectives and effluent limitations are met during construction, and corrective actions will be taken, if needed based on the results of the monitoring, to maintain compliance with those objectives and limitations.

- *Piles must be driven. Where the lakebed contains clayey or silty substrate, caissons, turbidity curtains, or other BMPs must be used to limit generated turbidity to smallest area practicable.*

  Piles would be driven, and turbidity curtains would be installed around the work area to limit generated turbidity to the smallest area practicable in accordance with **BMP C2-3**.

The Lahontan Basin Plan also prohibits the discharge or threatened discharge attributable to new pier construction of wastes to significant spawning habitats or to areas immediately offshore of stream inlets in Lake Tahoe. As indicated by the Fish Habitat Survey conducted for the proposed Project, significant spawning habitat is not present in the area where the proposed pier extension would be located, due to lack of suitable spawning substrate. The pier extension would also not be located "immediately offshore" of stream inlets into Lake Tahoe (at its closest point, the extension would be more than 350 feet from the mouth of Star Harbor). In accordance with **BMP C2-13**, in-water work would not occur during the spawning season, unless written permission is obtained from the CDFW and TRPA, and after the pier extension is constructed it would not substantially interfere with fish access to or use of nearby stream inlets. Therefore, the prohibition on discharges to significant spawning habitats or stream inlets does not apply to Alternative 2. Project impacts to non-spawning fish habitat (i.e., feed and cover habitat) would be mitigated by implementation of **MM BIO-1**.

In summary: 1) Alternative 2 would implement multiple water-quality BMPs during construction to avoid violations of water quality standards and effluent limitations; 2) in the long term, Alternative 2 would have beneficial impacts on water quality; 3) with the implementation of **MMs AES-1** and **BIO-1**, the Project's impacts would be fully mitigated, and 4) Alternative 2 would meet the criteria for exemption from the relevant Basin Plan discharge prohibitions. Therefore, with incorporation of the proposed BMPs and mitigation measures, the impacts of Alternative 2 related to violation of water quality standards and waste discharge requirements would be less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

No Impact. The proposed Project would not involve groundwater extraction or affect groundwater recharge.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less-than-Significant Impact. During construction, various BMPs will be implemented to avoid and minimize erosion and siltation in the shorezone of Lake Tahoe. In accordance with **BMP C2-1**, the disturbance area would be limited to the minimize necessary to complete the Project; in accordance with **BMP C2-3**, a turbidity curtain would be installed around the work area; and in accordance with **BMP C2-4**, work would be prohibited during periods of high wind and wave action severe enough to potentially cause a breach of the turbidity curtain. In accordance with **BMP C1-10**, to avoid erosion, staging and use of construction equipment and materials in upland areas will be limited to paved surfaces, and upland staging areas will be centralized and delineated with construction boundary fencing as needed to minimize impacts to soils and vegetation.

The permanent disturbance area for Alternative 2 occurs entirely within Lake Tahoe, and the proposed Project would have no long-term impacts on upland drainage patterns or streams or rivers. However, the presence of the pier extension and floating dock could influence littoral processes, including erosion and deposition, in the shorezone of Lake Tahoe. In conformance with the design standards for piers in Section 84.4.3.B.2.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water and minimize interference with littoral processes. As required by TRPA Code of Ordinances Section 84.4.3.A.9, to assess the proposed Project's potential impacts on

littoral processes, AECOM conducted a study to model the proposed Project's effects on the hydrodynamic parameters that drive erosion and deposition (*Appendix K)*. As discussed in greater detail in *Section 4.3.3.2*, the littoral drift study concluded that Alternative 2 would not have a significant impact on littoral processes, including shorezone erosion or siltation on- or off-site.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less-than-Significant Impact. Alternative 2 would involve placing 22, 10-inch-diameter piles in the 100-year floodplain, but these piles would not substantially alter water movement or increase the risk of flooding. Therefore, the impacts of Alternative 2 related to altering the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increasing the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, would be less than significant.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less-than-Significant Impact. During construction, various BMPs would be implemented to avoid discharges of polluted runoff to the Station's stormwater drainage system. In accordance with **BMP C2-6,** construction equipment will be monitored for leaks and cleaned and maintained as needed. In accordance with **BMP C2-7,** staged materials subject to stormwater displacement will be secured. Construction impacts related to polluted runoff to stormwater drainage systems would be temporary and, with the implementation of these BMPs, less than significant.

After construction, the permanent disturbance area for Alternative 2 would occur entirely within the lakezone of Lake Tahoe, and normal operations of the modified pier would not affect stormwater drainage systems. In accordance with **BMP O2-1**, a Fueling Plan would be implemented for the new fueling station to avoid contact between stormwater and the stored fuel.

In summary, the impacts of Alternative 2 related to creating polluted runoff or exceeding the capacity of stormwater drainage systems would be less than significant.

f) Otherwise substantially degrade water quality?

Less-than-Significant Impact. Water quality impacts for Alternative 2 would primarily be limited to the construction phase. With implementation of the BMPs described previously, impacts to water quality during construction would be temporary, localized, and less than significant. In the long term, the proposed Project's effects on water quality are expected to be beneficial. In summary, Alternative 2 would have less-than-significant impacts related to substantial degradation of water quality.

g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The Project would not involve the construction of housing.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less-than-Significant Impact. Alternative 2 would involve placing 22, 10-inch-diameter piles in the 100-year flood hazard area. In conformance with the design standards for piers in Section 84.4.3.B.2.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water. Therefore, Alternative 2 would have less-than-significant impacts related to impeding or redirecting flood flows.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Less-than-Significant Impact. Workers would be present in the floodplain during construction, but work would not be conducted during inclement weather or high wave and/or wind action, in accordance with **BMP C2-4**, which would avoid exposure of people to flood-related hazards during construction.

Alternative 2 would involve the placement of a 350-foot-long pier extension and accessory structures in the 100-year flood hazard area. However, the pier extension would be designed to withstand flooding, appropriate safety procedures would be followed during periods of high flood risk, and operation of the modified pier would not substantially increase the exposure of people to flood hazards compared to current conditions. Therefore, the proposed Project would not result in increased exposure of people or structures to significant risk of loss, injury, or death involving flooding.

j) Inundation by seiche, tsunami, or mudflow?

Less-than-Significant Impact. Workers would be present in the lake zone during construction, but appropriate safety procedures would be followed during work (such as instructing construction workers to immediately move to high ground following an earthquake), and exposure of people to water-related hazards such as seiches during construction would be short term and less than significant.

Alternative 2 would involve the placement of a 350-foot-long pier extension and accessory structures in an area potentially at risk for seiches. However, operations at the pier would continue largely unchanged, including the continued implementation of appropriate safety procedures following an earthquake, and the pier extension would not substantially increase the exposure of people to seiches. The proposed Project would not be in an area at risk for tsunamis or mudflows. Therefore, the impacts of Alternative 2 related to the exposure of people or property to water-related hazards such as seiche, tsunami, or mudflow would be less than significant.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Changes in currents, or the course or direction of water movements?

Less-than-Significant Impact. The 350-foot pier extension and accessory structures to be added under Alternative 2 would not significantly affect the direction of water movements. In conformance with the design standards for piers in Section 84.4.3.B.2.h of the TRPA Code of Ordinances, the pier extension would be built on an open piling foundation to permit free circulation of water. In addition, as discussed in more detail in *Section 4.3.3.2*, the littoral drift study conducted for the proposed Project (*Appendix K*) concluded that the proposed pier extension and accessory structures would not have a significant effect on currents in the Project Area. Therefore, Alternative 2 would have a less-than-significant impact related to changes in currents or the course or direction of water movements.

b) Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year 1-hour storm runoff (approximately 1 inch per hour) cannot be contained on the site?

Less-than-Significant Impact. Alternative 2 would involve placing 22, 10-inch-diameter piles in the bed of Lake Tahoe, but these piles would not substantially affect Lake Tahoe's capacity to contain storm runoff. Alternative 2 would not affect the absorption rates, drainage patterns, or rate and amount of surface water runoff of upland portions of the site. Therefore, the adverse impacts of Alternative 2 related to changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20-year 1-hour storm runoff cannot be contained on the site would be less than significant.

c) Alterations to the course or flow of 100-year flood waters?

Less-than-Significant Impact. Alternative 2 would involve placing 22, 10-inch-diameter piles in the 100-year floodplain, but these piles would not substantially affect the course or flow of 100-year flood waters. Alternative 2 would not affect the course or flow of 100-year flood waters in upland portions of the site. Therefore, the adverse impacts of Alternative 2 related to alterations of the course or flow of 100-year flood waters would be less than significant.

d) Change in the amount of surface water in any water body?

Less-than-Significant Impact. Alternative 2 would not involve the extraction or use of surface water. Alternative 2 would involve placing 22, 10-inch-diameter piles in Lake Tahoe, which will not substantially change the amount of surface water in Lake Tahoe. Therefore, the impacts of Alternative 2 related to changes in the amount of surface water in any water body would be less than significant.

e) Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?

Less-than-Significant Impact. Impacts to water quality from Alternative 2 would be primarily limited to the 7-week construction phase. The primary impacts to water quality during construction would be caused by the disturbance of lakebed sediment, which would increase turbidity levels and release nutrients into the waters of Lake Tahoe. In addition, the presence of construction equipment and materials in the lake would present a risk for accidental spills of fuel or other petroleum products that could affect water quality. Based on the results of sediment and water testing obtained from the Project site, there are no COCs present in either sediment or water that would exceed human health or environmental threshold levels (AECOM Technical Services 2016).

As discussed previously in the NEPA analysis, multiple BMPs would be implemented to avoid and minimize the potential for discharges into surface waters during construction Such as conducting a utility clearance prior to construction to avoid accidental discharges from broken utility lines in accordance with **BMP C2-2**; requiring use of a turbidity curtain in accordance with **BMP C2-3**; prohibiting work during periods of high wind or wave action in accordance with **BMP C2-4**; implementing a Spill Prevention and Response plan in accordance with **BMP C2-5**; and inspecting, cleaning, and maintaining construction equipment prior to use in accordance with **BMP C2-6**, among others. In accordance with **BMP C2-8**, water quality monitoring would be conducted during construction to confirm that the proposed Project is in compliance with surface water quality standards, and corrective actions would be implemented to maintain compliance if required based on results of the monitoring.

After construction is completed, operations of the modified pier would remain largely unchanged, and water quality impacts are not expected during operations. In accordance with **BMP O2-1**, a Fueling Plan would be implemented to minimize spills and resulting impacts to water quality during operation of the new fueling station. In addition, Alternative 2 would have long term beneficial impacts on water quality. With year-round access to their pier, the CG will be able to provide quicker response times for emergencies involving spills or potential releases of hazardous substances to the waters of Lake Tahoe. After construction is completed, the increased depth at the new pier head would also decrease turbidity caused by propeller wash from vessels using the pier during low water conditions.

In summary, during construction, adverse impacts to surface water quality would be temporary, localized, and less than significant, and in the long term Alternative 2 would have beneficial effects on water quality. Therefore, Alternative 2 would have less-than-significant adverse impacts related to discharge into surface waters, or in alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity.

f) Alteration of the direction or rate of flow of groundwater?

No Impact. Alternative 2 would not result in the alteration of the direction or rate of flow of groundwater.

g) Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?

No Impact. Alternative 2 would not involve groundwater additions or withdrawals or interception of an aquifer by cuts or excavations. The proposed Project would have no impacts related to the change in the quantity of groundwater in the Project vicinity.

h) Substantial reduction in the amount of water otherwise available for public water supplies?

No Impact. Alternative 2 does not involve substantial water use and would not substantially reduce the amount of water otherwise available for public water supplies.

i) Exposure of people or property to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches?

Less-than-Significant Impact. Workers would be present in the floodplain during construction, but work would not be conducted during inclement weather or high wave and/or wind action, in accordance with **BMP C2-4**, which would avoid exposure of people to flood-related hazards during construction. Workers would also follow appropriate safety precautions after an earthquake, such as moving to high ground, to avoid exposure to seiches. Exposure of people to water related hazards such as flooding, wave action, or seiches during construction would be temporary and less than significant.

Alternative 2 would involve the placement of a 350-foot-long pier extension and accessory structures in an area potentially at risk for flooding, wave action, and seiches. However, the pier extension would be designed to withstand water-related hazards, and operations of the modified pier will continue largely unchanged, including continued implementation of proper safety procedures during periods of high risk for flooding or seiche. Therefore, Alternative 2 would not substantially increase the exposure of people to water-related hazards compared to current conditions.

In summary, Alternative 2 would have less-than-significant impacts related to increased exposure to water-related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches.

j) The potential discharge of contaminants to the groundwater or any alteration of groundwater quality?

No Impact. The proposed Project would not involve discharge of contaminants to groundwater or other alterations of groundwater quality.

k) Is the Project located within 600 feet of a drinking water source?

Less-than-Significant Impact. The Lahontan Basin Plan designates municipal and domestic drinking water supply as a beneficial use for all of Lake Tahoe, and the lake is a source of drinking water for both public and private water systems. The TCPUD, which provides public drinking water in the Project vicinity, procures most of its water supply from groundwater wells and does not have any active surface water intakes in the Project vicinity. There are also no other known active public or private water intakes within 600 feet of the Project Area. As discussed previously, during construction, Alternative 2 would have impacts on the water quality of Lake Tahoe, but these impacts would be short term and localized and, with the implementation of the proposed water quality BMPs, would not have significant impacts on drinking water supplies obtained from Lake Tahoe. In the long term, Alternative 2 would have beneficial impacts on the water quality of Lake Tahoe. Alternative 2 would have no impact on groundwater that is used as a drinking water source. Therefore, with implementation of the proposed BMPs, Alternative 2 would have less-than-significant adverse impacts on drinking water sources.

TRPA Thresholds

Less-than-Significant Impact with Mitigation. The impacts of Alternative 2 on water quality would be primarily limited to the construction phase, and these impacts would be short term, localized, and less than

significant. Implementation of the BMPs outlined in the NEPA Analysis section, including use of a turbidity curtain, in accordance with **BMP C2-3**; a spill prevention and response plan, in accordance with **BMP C2-5**; and water quality monitoring during and construction, in accordance with **BMP C2-8**, among others would ensure that fine sediment, nutrient, and pollutant concentrations in Lake Tahoe do not substantially increase and that water quality thresholds are not compromised during the construction phase.

To meet water quality thresholds, TRPA does not permit the placement of new structures in Lake Tahoe unless it is found to be beneficial to shorezone conditions or water quality and clarity. As discussed previously, Alternative 2 would benefit water quality and clarity thresholds in Lake Tahoe in the long term by improving the CG's capability to respond to incidents that could result in the release of pollutants to the lake and reducing turbidity from boats using the pier during low water conditions. In addition, compensatory mitigation for fish habitat will be implemented at a 1:1.5 ratio in accordance with **MM BIO-1**; TRPA and the LRWQCB have instituted the 1:1.5 mitigation ratio to ensure that there is a net benefit to the affected resources and ensure that projects affecting fisheries resources meet the threshold requirements.

3.8.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact with Mitigation. Alternative 3 would have similar impacts related water quality and hydrology as Alternative 2. The duration of construction for Alternative 3 is 8 weeks, compared to 7 weeks for Alternative 2, and Alternative 3 would involve the installation of four additional piles. Therefore, the potential for water quality impacts related to construction would be slightly higher for Alternative 3. However, Alternative 3 would involve implementation of the same BMPs and mitigation measures as Alternative 2, which would substantially avoid and minimize potential water quality impacts. During construction, the impacts of Alternative 3 on water quality and hydrology would be temporary, localized, and less than significant. The same Basin Plan exemption findings made for Alternative 2 under question *a* in the CEQA analysis would also apply to Alternative 2, and Alternative 3 would similarly meet the exemption requirements for a low-threat discharge.

In the long term, Alternative 3 would have a beneficial impact on water quality in Lake Tahoe by improving the CG's capability to respond to incidents that could result in the release of pollutants to the lake and reducing turbidity from boats using the pier during low water conditions. According to the littoral drift study prepared for the Project (*Appendix K*), Alternative 3 would have slightly less impacts on hydrodynamic parameters and littoral processes than Alternative 2 and these impacts would be less than significant. In summary, Alternative 3's overall impacts on hydrology and water quality would be less than significant with implementation of the proposed BMPs and mitigation measures.

3.8.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and no construction-related water quality or hydrology impacts would occur. Operations at the Station would remain unchanged, and therefore Alternative 4 would have no impacts when compared to baseline conditions. However, the CG's ability to respond to incidents that could result in the release of pollutants to the lake would continue to be compromised during low-water conditions, which would have potential adverse effects on the water quality of Lake Tahoe.

3.9 Noise and Vibration

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project noise impacts on the human environment. Noise impacts to biological resources are addressed in *Section 3.4, Biological Resources*.

3.9.1 Affected Environment

The following sections provide a general discussion of the basics of sound, noise, acoustics, and vibration, as well as a description of the existing noise conditions in the Project Area.

3.9.1.1 Basics of Environmental Acoustics

Sound and Noise

Sound is vibration that propagates as mechanical pressure waves through a medium such as air or water and is audible by humans or other animals. Noise is defined as sound that is unwanted (e.g., loud, unexpected, or annoying). Loudness is a subjective measure of the perception of sound by the human ear. The amplitude and frequency (pitch) of pressure waves generated by a sound source determine the perceived loudness of that source. A logarithmic scale is used to describe sound pressure level in terms of dB. The threshold of human hearing is approximately 0 dB. A doubling of sound energy corresponds to an increase of 3 dB due to the logarithmic scale used to describe sound levels. In other words, when two sources at a given location are each producing sound of the same loudness, the resulting sound level at a given distance from that location is approximately 3 dB higher than the sound level produced by only one of the sources.

The perceived loudness of sounds is dependent on multiple factors, including sound pressure level and frequency. However, within the usual range of environmental sound levels, perception of loudness is relatively predictable and can be approximated by frequency filtering using the A-weighting standard, which accounts for the fact that the human ear is less sensitive to low frequencies. There is a strong correlation between A-weighted sound levels (expressed as dBA) and human response to noise. For this reason, the A-weighted sound level has become the standard descriptor for environmental noise assessment. Noise levels reported in the impact analysis portion of this section are in terms of A-weighed sound levels.

In typical noisy environments, noise-level changes of 1–2 dB are generally not perceptible by the healthy human ear; however, people can begin to detect 3-dB increases in noise levels. An increase of 5 dB is generally perceived as distinctly noticeable, and a 10-dB increase is generally perceived as a doubling of loudness. Sound attenuates (decreases) with distance. Sound from a point source propagates uniformly outward in a spherical pattern, and the sound level attenuates at a rate of 6 dB for each doubling of distance.

The following are definitions of the sound level descriptors used in the environmental noise analysis:

- **Equivalent sound level (L_{eq}):** The energy average sound level over a period of time, typically over a 1-hour period (indicated as L_{eq}[h]). To determine the L_{eq}, the instantaneous noise levels occurring over the specified period of time are converted to relative energy values. From the sum of the relative values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In environments that experience high sound level events, such as pile driving strikes, the L_{eq} can be heavily influenced by the magnitude and number of individual high sound level events.

- **Day-night noise level (L_{dn}):** The 24-hour L_{eq} with a 10-dBA penalty applied to noise events occurring between 10 p.m. and 7 a.m. to account for the fact that noise during normal sleeping hours is a potential source of human disturbance – i.e., 10 dBA is added to noise events during nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards.

- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, but with an additional 5 dBA penalty added to noise events that occur between 7 p.m. and 10 p.m. to account for human disturbance during hours that are typically used for relaxation.

Negative Effects of Noise on Humans

Excessive exposure to noise can result in adverse psychological and physical responses in humans (e.g., annoyance and anger, hearing loss and other health effects), in addition to interfering with concentration, communication, relaxation, and sleep and diminishing the quality of life. Although most adverse noise effects may be classified as annoying, some (e.g., interfering with the ability to hear a warning signal) may

be considered dangerous. Physical damage to the human auditory system from excessive noise exposure can lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to very high noise levels over a short period. Both gradual and traumatic hearing loss be permanent. Noise may also be a contributor to diseases associated with stress, such as anxiety, hypertension, and heart disease. The degree to which noise contributes to such diseases depends on exposure time and the frequency, bandwidth, and amplitude of the noise (Caltrans 2013).

No standardized criteria have been developed for assessing construction noise impacts on humans. However, the Federal Transit Administration (FTA) recommends impact thresholds of 90 dBA (L_{eq}[h]) for residential land uses and 100 dBA for commercial and industrial land uses (FTA 2006).[13]

Groundborne Vibration

Groundborne vibration is caused by pressure waves radiated through the ground. Potential sources of ground-borne vibration during construction include activities such as blasting, pile-driving, rock drilling, jackhammering, and operating heavy earth-moving equipment. Adverse impacts from construction-related groundborne vibration are much less common than those from airborne noise, but vibration can cause annoyance, interference with sensitive instrumentation, and, at higher levels, damage to structures and triggering of landslides. The vibration of buildings can also cause rumbling sounds to be audible inside the affected structure. Sensitive receptors for vibration can include facilities with sensitive instrumentation (e.g., laboratories), historic or fragile buildings, residences, hotels, churches, schools, hospitals, and nursing homes. Groundborne vibration typically does not adversely affect people who are outdoors because the shaking and noise caused by vibration are generally perceptible only inside buildings (FTA 2006).

Groundborne vibration is typically described in terms of peak particle velocity (PPV), measured in inches per second (in/sec), or RMS vibration velocity level (L_v), measured in vibration decibels (VdB). PPV, which indicates the maximum velocity experienced by any point in a structure during a vibration event, is generally used for evaluating the potential for building damage. The FTA's thresholds for potential damage to structures are provided in Table 3-30.

Table 3-30 Construction Vibration Damage Criteria for Structures

Structure Type	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.5
Engineered concrete and masonry (no plaster)	0.3
Non-engineered timber and masonry buildings	0.2
Buildings extremely susceptible to vibration damage	0.12
Source: FTA 2006	

L_v, which provides an average vibration velocity over time, typically a 1-second period, is generally used for evaluating human disturbance. The background L_v in residential areas is usually around 50 VdB. The L_v threshold of perception for humans is approximately 65 VdB. The FTA's impact criteria for frequent vibration events (more than 70 events per day) are 72 VdB for residences and other buildings where people sleep and 75 VdB for institutional land uses with primarily daytime uses. Similar to airborne sound,

[13] Because noise and vibration are often a significant concern for transportation projects, transportation agencies such as the FTA, FHWA, and Caltrans are at the forefront for setting criteria for noise and vibration, and their criteria are often used as guidelines by other agencies. Although the proposed Project will receive no funding or approvals from the FTA, its noise and vibration criteria are used as general guidelines for determining the Project's potential impacts in this analysis.

groundborne vibration amplitudes decrease with distance, approximately 6 to 9 VdB for each doubling of distance (FTA 2006).

3.9.1.2 Existing Noise Conditions

Existing sound levels at the Station and the surrounding area are typical of pier areas, though somewhat higher during the summer months when the TCPUD public boat launch facilities are more heavily used. Typical existing noise sources include the engines of boats and other watercraft; human voices; sporting activities at the Pomin Park athletic field and playground; traffic noise from nearby roadways and parking areas; occasional maintenance activities at the CG Station; and natural sounds from wind, waves, and birds. No site-specific measurements of the existing ambient sound levels have been collected for the Station area. Typical background sound levels (L_{dn}) for small town residential areas are approximately 50 dB (FTA 2006) though the sound level would be expected to be higher adjacent to a boat launch facility. Sound levels from motorboats and other watercraft vary according to type, HP, and age, but the California Department of Boating and Waterways and TRPA both require that boats under operation produce no more than 82 dBA at a distance of 50 feet.

Sensitive noise receptors are, in general, those areas of human habitation or substantial use where the intrusion of noise has the potential to adversely impact the occupancy, use, or enjoyment of the environment. These can include residences, schools, hospitals, churches, and other institutions and places of business requiring low levels of noise. Parks and other recreation areas may also be considered sensitive noise receptors depending on their setting and use. Facilities used for active recreation and in developed areas are not typically considered sensitive noise receptors. Therefore, users of the TCPUD Lake Forest boat ramp and Pomin Park are not considered sensitive receptors for purpose of this noise assessment. *Figure 3-21*, in *Section 3.3*, shows the locations of potential sensitive receptors in the Project vicinity. Excluding the TCPUD facilities, the closest sensitive noise receptors to the Project Area are inhabitants of the St. Francis Lakeside condominiums, which are approximately 140 feet east of the proposed Project's truck loading/staging area and 320 feet northeast of the northern edge of the dredging/pier construction area.

3.9.2 Regulatory Setting

3.9.2.1 Federal and State Regulatory Setting

Beyond the general requirement of NEPA and CEQA to analyze a project's noise and vibration impacts, there are no federal or state regulations governing community or environmental noise/vibration exposure that are relevant to the proposed Project. For occupational noise exposure, OSHA and Cal-OSHA have set noise exposure limits and requirements for noise monitoring and hearing protection for workers. Both OSHA and Cal-OSHA criteria limit worker exposure to a time-weighted average (TWA) of 90 dBA over an 8-hour work shift. Furthermore, if the 8-hour TWA exceeds 85 dBA, the employer must institute noise conservation and monitoring programs and provide hearing protection at no cost to the worker. Both OSHA and Cal-OSHA limit worker exposure to impulsive or impact noise sources, such as pile driving, to 140 dB peak sound pressure level. The CG also has adopted similar policies, as outlined in the CG *Safety and Environment Health Manual*, Commandant Instruction M5100.47A, that establish limits for noise exposure for CG staff.

3.9.2.2 Regional and Local Regulatory Setting

TRPA Requirements

TRPA noise policies are outlined in the Noise Subelement of the TRPA Regional Plan, Chapter 68 of the Code of Ordinances, various Plan Area Statements, and other documents describing the TRPA threshold standards for noise. In accordance with Section 68.9 of the TRPA Code of Ordinances, the TRPA noise regulations and thresholds do not apply to TRPA-approved construction activities, provided such activities occur between the hours of 8:00 a.m. and 6:30 p.m. The only increases in noise levels associated with the Project would occur during construction, and Project construction activities would be limited to the hours

between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C1-14**. Therefore, the proposed Project would be exempt from TRPA noise regulations and would have no impact on TRPA noise thresholds.

Placer County Requirements

The County's noise ordinance is found in Article 9.36.030 of the Placer County Code, which states that construction activities are exempt from the Noise Ordinance, if construction activities take place between the hours of 6:00 a.m. and 8:00 p.m. Monday through Friday and 8:00 a.m. and 8:00 p.m. Saturday and Sunday. This is provided that construction equipment is fitted with factory installed muffling devices and maintained in good working order.

3.9.3 Environmental Impacts and Mitigation Measures

This section addresses the proposed Project's noise and vibration impacts on the human environment. Noise impacts on biological resources are addressed in *Section 3.4, Biological Resources*. The following sections describe the potential noise and vibration impacts of the proposed Project Alternatives in the context of NEPA, CEQA, and TRPA requirements. *Table 3-31* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the noise-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-31 Significance Determinations for the Project Alternatives (Noise and Vibration)

Noise	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact related to noise?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project result in: *a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	No Impact	No Impact	No Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	No Impact	No Impact	No Impact

Noise	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	No Impact	No Impact	No Impact
TRPA				
Will the Project result in: *a) Increases in existing CNEL beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan?*	No Impact	No Impact	No Impact	No Impact
b) Exposure of people to severe noise levels?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold?	No Impact	No Impact	No Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for noise?*	No Impact	No Impact	No Impact	No Impact

The typical airborne sound levels for construction equipment used in the following analyses are listed below in *Table 3-32*. The table also provides a usage factor that indicates the percentage of time each piece of equipment would operate at or near full power during a typical hour of construction. The usage factors used are based on those provided in the FHWA's *Roadway Construction Noise Model User's Guide* (FHWA 2006) but adjusted where needed to account for the particular conditions expected during construction of the proposed Project.

Table 3-32 Typical Sound Levels for Construction Equipment

Equipment Type	Typical Sound Level (dBA) at 50 feet	Usage Factor
Pile Driver (Impact)	101	30%
Pile Driver (Vibratory)	96	30%
Tugboat/Support Boat	87	40%
Augur Drill Rig/Rock Drill	85	30%
Crane	85	20%
Excavator Dredge	85	80%
Pneumatic Tool	85	50%
Dump Truck	84	40%
Flatbed Truck	84	30%
Generator	82	100%
Air Compressor	81	40%
Conveyor	73	100%
Welder/Torch	73	40%
Pickup Truck	55	40%
Sources: FTA 2006, FHWA 2006, LSA Associates 2006, USACE and Port of Los Angeles 2009		

The sound levels provided in *Table 3-32* are for a point 50 feet from the source. For determining sound levels for receptors at distances beyond 50 feet, the following formula is used:

$L_R = L_{50} + (10 \times \log[UF]) - (20 \times \log[D/50])$, where:

L_R = sound level at the receptor,

UF = usage factor

L_{50} = typical sound level at 50 feet (from *Table 3-32*), and

D = distance between the sound source and the receptor

For general noise assessments, the FTA recommends that the combined typical sound level is calculated for the two loudest pieces of equipment used during a construction phase. This provides a reasonable estimate for the L_{eq} for that phase, because the operation of additional pieces of equipment with similar or lower sound levels will not significantly change the total sound level. The calculation used to determine the combined sound level for the two loudest pieces of equipment is as follows:

$L_C = 10 \times \log(10^{(L_{1st}/10)} + 10^{(L_{2nd}/10)})$, where:

L_C = combined sound level at 50 feet,

L_{1st} = typical sound level of loudest piece of equipment at 50 feet (from *Table 3-32*), and

L_{2nd} = typical sound level of second loudest piece of equipment at 50 feet

To determine whether potentially significant noise impacts to sensitive receptors may occur, the combined L_{eq} for the two loudest pieces of equipment is determined at the distance to the receptor using the two formulas provided above. The result is then compared to the FTA impact thresholds (90 dBA for residential land uses and 100 dBA for commercial and industrial land uses) to determine whether potentially significant impacts could occur.

Typical vibration levels for construction equipment used in the following analyses are provided in *Table 3-33*.

Table 3-33 Typical Vibration Levels for Construction Equipment

Equipment/Activity Type	PPV (in/sec) at 25 feet	L_V (VdB) at 25 feet
Pile Driver (Impact)	0.644	104
Pile Driver (Vibratory)	0.170	93
Augur/Drill Rig	0.089	87
Loaded Trucks	0.076	86
Dredging	<0.004	<68
Sources: FTA 2006, Ports North 2014.		

The vibration levels provided in *Table 3-33* are for a point 25 feet from the source. For determining PPV levels for structures at distances beyond 50 feet, the following formula is used:

$PPV_R = PPV_{25} \times (25/D)^{1.5}$, where:

PPV_R = the PPV at the receptor,

PPV_{25} = typical PPV at 25 feet (from *Table 3-33*), and

D = distance between the vibration source and receptor

To determine the potential for damage to a structure, the estimated PPV value at the distance to the structure, determined from the equation above, are compared to the FTA thresholds shown above in *Table 3-33*.

Similarly, for determining the L_v for human-occupied structures at distances beyond 50 feet, the following formula is used:

$L_{vR} = L_{v25} - 30 \log(D/25)$, where:

L_{vR} = L_v at the receptor,

L_{v25} = typical L_v at 25 feet (from *Table 3-33*), and

D = distance between the vibration source and receptor

To determine the potential for human disturbance from vibration, the estimated L_v value at the distance to the receptor, determined from the equation above, are compared to the FTA thresholds (72 VdB for residences and 75 VdB for institutional land uses).

3.9.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact related to noise?

Less-than-Significant Impact. Increases in sound levels would occur temporarily during dredging and installation of the new boat lift and floating dock due to the operation of construction equipment and vehicles over the course of the 8-week construction period. Most of the construction period would be taken up by dredging activities, which would involve the use of a barge-mounted mechanical excavator, a tugboat to move the work barge, a conveyor system to transport the dredged material to the truck loading area, and dump trucks for dredged material disposal. The nearest sensitive noise receptors to the dredging activity would be the inhabitants of the condominiums in the southwest portion the St. Francis Lakeside complex. The closest condominium is approximately 320 feet from the northernmost boundary of the dredging area. Using the typical construction sound levels and assessment methodology outlined above, the average sound level (L_{eq}) at the closest condominium during dredging-related activities was estimated at approximately 75 dBA, well below the 90 dBA impact threshold for residential areas.

Installation of the proposed boat lift and floating dock would involve the use of barge-mounted pile driving equipment (for the two boat lift piles) and miscellaneous power tools. Pile driving would be the construction activity with the greatest potential to cause noise impacts, and, of the two potential pile driving methods, impact pile driving has the highest sound levels. If an impact pile driver is used during installation of the boat lift, the typical sound level at the nearest St. Francis Lakeside condominium would be approximately 80 dBA, well below the 90 dBA threshold. In accordance with **BMP C1-15,** vibratory pile driving will be used as the preferred pile installation method, to reduce noise impacts, unless an impact hammer is required due to substrate type. With use of a vibratory pile driver, the sound level at the condominium would decrease to approximately 76 dBA. Alternative 1 would involve substantially less pile driving than Alternatives 2 and 3 and therefore has less potential to cause adverse community or occupational noise effects than the other Action Alternatives. To further avoid occupational noise impacts, the construction contractor would follow OSHA and Cal-OSHA requirements, as applicable, for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, in accordance with **BMP C1-15.**

TRPA and Placer County noise standards do not apply to construction activities, provided that the activities are approved by TRPA and take place between certain hours (8:00 a.m. to 6:30 p.m. for TRPA, and 6:00 a.m. and 8:00 p.m. for Placer County). In accordance with **BMP C1-14**, construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m. and therefore would not be subject to TRPA or Placer County noise standards. Limiting construction to these hours will also minimize noise impacts by avoid work during the portions of the day when people are more sensitive to noise. Other BMPs that will

help minimize community noise exposure include **BMP C1-8**, which requires construction equipment and vehicles to be kept in good repair, and **BMP C1-19**, which would require equipment and vehicle idling time to be limited to 5 minutes or less. Overall, the temporary increases in noise in the Project vicinity during construction would be short term, localized, and less than significant.

In the long term, Alternative 1 would not change the number or type of response boats that the Station has historically used at the Station, and operations at the modified pier would continue largely unchanged from current conditions. The CG response boats would operate from the Station year round after dredging is completed, rather than only intermittently, as is currently the case. However, the boats would meet CG, state, and local requirements for watercraft sound levels and would not cause an overall increase in noise levels compared to existing boat traffic in the area. Also, noise currently associated with transporting the boats between the Station and an off-site mooring location during low-water conditions would be avoided. Therefore, operation of the modified pier is not expected to result in increased noise levels.

Groundborne vibration would be generated during construction of Alternative 1, but vibration effects on sensitive receptors would be minimal, short-term, and localized. Impact pile driving is the construction activity that would produce the highest levels of groundborne vibration. At the nearest condominium, the estimated PPV during impact pile driving would be approximately 0.013 in/sec, well below the impact threshold for both typical timber/masonry construction (0.2 in/sec) and extremely sensitive buildings (0.12 in/sec). In terms of L_v, the measure used to determine annoyance impacts for humans occupants, the vibration levels at the condominium during impact pile driving would be approximately 70 VdB, below the 72 VdB threshold for residential land uses. Pile driving would be limited to the hours between 8:00 a.m. and 6:30 p.m., when people are less sensitive to vibration. Additionally, vibratory pile driving would be used as the preferred pile installation method unless impact pile driving is required due to substrate type. With use of a vibratory hammer, the PPV and L_v levels at the nearest condominium would be reduced to approximately 0.003 in/sec and 59 VdB, respectively, which is below the level of human perception. No increases in groundborne vibration are anticipated during operations at the modified pier.

In summary: 1) noise and vibration levels during construction of Alternative 1 are expected to be below the applicable impact thresholds, 2) there would be no increase in noise or vibration during operations of the modified pier, and 3), overall noise and vibration impacts from Alternative 1 would be short term, localized, and less than significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less-than-Significant Impact. TRPA noise standards do not apply to construction activities, provided that the activities are approved by TRPA and take place between 8:00 a.m. and 6:30 p.m. Similarly, the Placer County noise ordinance does not apply to construction activities occurring between 6:00 a.m. and 8:00 p.m.. In accordance with **BMP C1-14**, construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m. and therefore would not be subject to TRPA or Placer County noise standards. As discussed in the NEPA analysis, construction sound levels at the nearest sensitive noise receptors would not exceed the FTA's 90 dBA impact threshold for residential land use (which is being used as a general guideline for this analysis although the Project is not subject to FTA oversight). In accordance with **BMP C1-15,** the construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, as needed. There would be no increase in noise levels during operation of the modified pier compared to existing levels. Therefore, Alternative 1 would have less-than-significant impacts related to

exposure of persons or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact. Groundborne vibration would be generated during construction of Alternative 1, but vibration effects on sensitive receptors would be minimal, temporary, and localized. Pile driving, particularly using an impact hammer, is the construction activity expected to cause the highest levels of vibration during construction. Alternative 1 would only involve a small amount of pile driving, much less than the other Action Alternatives. As discussed in the NEPA analysis, the estimated vibration levels at the nearest sensitive receptors during impact pile driving would be below the impact thresholds for both structural damage and human annoyance. Additionally, in accordance with **BMP C1-15,** vibratory pile driving would be used as the preferred pile installation method unless impact pile driving is required, and with use of a vibratory hammer the vibration levels at the nearest sensitive receptor would be below the level of human perception. Pile driving and other construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., when people are less sensitive to vibration. There would be no increase in groundborne vibration or noise during operations of the modified pier. In summary, the impacts of Alternative 1 related to groundborne vibration and noise would be short term, localized, and less than significant.

c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?

No Impact. An increase in noise would occur only during the 8-week construction period. After construction is completed, operations of the modified pier will continue largely unchanged. The CG response boats would operate from the Station year round after dredging is completed, rather than only intermittently, as is currently the case. However, the boats would meet CG, state, and local requirements for watercraft sound levels and would not cause an overall increase in noise levels when compared with existing boat traffic. Also noise associated with transporting the boats between the Station and an off-site mooring location during low-water conditions would be avoided. Therefore, no permanent increase in ambient noise levels is expected with implementation of Alternative 1.

d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Less-than-Significant Impact. Increases in ambient noise levels in the Project vicinity would occur temporarily during construction activity due to the operation of equipment and vehicles over the course of the 8-week construction period. The nearest sensitive noise receptors to the dredging activity would be the inhabitants of the condominiums in the southwest portion the St. Francis Lakeside complex. The closest condominium is approximately 320 feet from the northernmost boundary of the dredging area. Using the typical equipment sound levels and assessment methodology outlined above, the average sound levels (L_{eq}) at the closest condominium were estimated at approximately 75 dBA during dredging-related activities, 80 dBA during impact pile driving, and 76 dBA during vibratory pile driving. All of these estimated L_{eq} levels would be well below the 90 dBA impact threshold for residential areas.

Construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C1-14**, to avoid the portions of the day when people are more sensitive to noise. Vibratory pile driving will be used as the preferred pile installation method, in accordance with **BMP C1-15**, to minimize noise impacts during pile driving. Alternative 1 would also involve substantially less pile driving than Alternatives 2 and 3 and therefore has less potential for noise impacts. In accordance with **BMP C1-8**, construction equipment and vehicles would be kept in good repair, and in accordance with **BMP C1-19**, equipment and vehicle idling time would be limited to 5 minutes or less, minimizing equipment and vehicle noise during construction. The temporary increase in ambient noise levels in the Project vicinity during construction would be short term, localized, and less than significant. There would be no increase in noise levels during operation of the modified pier compared to existing ambient levels, and overall, Alternative 1 would have less-than-significant impacts related to increases of ambient noise levels.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project is not in an airport land use plan area or within 2 miles of a public or public use airport and would have no noise impacts related to such airports.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project is not in the vicinity of a private airstrip and would have no noise impacts related to such airstrips.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Increases in existing CNEL beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan?

No Impact. According to Section 68.9 of the TRPA Code of Ordinances, TRPA-approved construction projects operating between the hours of 8:00 a.m. and 6:30 p.m. are exempt from CNEL standards. The only increases in noise levels associated with the Project would occur during construction, and Project construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C1-14**. The CG will obtain approval for the Project from TRPA prior to the start of construction. Because the Project would be exempt from the CNEL standards, Alternative 1 would have no impacts related to increases in CNELs beyond those permitted in the applicable Plan Area Statement, Community Plan, or Master Plan.

b) Exposure of people to severe noise levels?

Less-than-Significant Impact. TRPA regulations do not define a threshold for what constitutes a "severe noise level," so the FTA's 90 dBA L_{eq} threshold for residential land uses and OSHA's 140 dB threshold for single impulsive noise events were used to determine whether the Project could expose people to severe noise levels. As detailed in the NEPA analysis, typical sound levels at the nearest sensitive noise receptors, the St. Francis Lakeside condominiums, would not exceed the 90 dBA L_{eq} impact threshold for residential land use during construction of Alternative 1. For the single impulsive noise event threshold, the only place where peak noise levels could reach 140 dB is the area within 0.5 foot from the point of impact during impact pile driving, and therefore no people are expected to be exposed to noise levels above that threshold during construction. In accordance with **BMP C1-15,** the construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, as needed, to avoid exposing construction workers to severe noise levels. Severe noise levels are not expected during operations of the modified pier. In summary, Alternative 1 would have less-than-significant impacts related to exposure of people to severe noise levels with implementation of **BMP C1-15**.

c) Single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold?

No Impact. According to Section 68.9 of the TRPA Code of Ordinances, TRPA-approved construction projects occurring between the hours of 8:00 a.m. and 6:30 p.m. are exempt from the TRPA single event noise thresholds. The only increases in noise levels associated with the Project would occur during construction, and Project construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C1-14**. The CG will obtain approval for the Project from TRPA prior to

the start of construction. Because the Project would be exempt from the single event noise standards, Alternative 1 would have no impacts related to single noise even levels greater than those set forth in the TRPA noise thresholds.

3.9.3.1 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact related to noise?

Less-than-Significant Impact. Increases in sound levels would occur temporarily during construction of the pier extension due to the operation of equipment and vehicles over the course of the 7-week construction period. Construction of the pier extension would involve the use of a barge-mounted crane and pile driving equipment, a tugboat to move the work barge, welding equipment, various power tools, and possibly a drill rig if pre-drilling is required. Similar to Alternative 1: 1) the nearest sensitive noise receptors would be the inhabitants of the condominiums in the southwest portion the St. Francis Lakeside complex, and 2) pile driving would be the construction activity with the greatest potential to cause noise impacts, particularly if impact pile driving occurs. The closest condominium is approximately 350 feet northeast of the northernmost (i.e., nearest) piles to be installed. If an impact pile driver used is during construction, the typical sound level (L_{eq}) at the nearest condominium would be approximately 79 dBA when the piles at the northern end of the pier extension are being installed. This level is well below the 90-dBA threshold for residential land uses, and sound levels will decrease as work proceeds further toward the southern end of the extension – when piles are driven at the far end of the pier head, the L_{eq} at the closest condominiums would be only 74 dBA if impact pile driving is used.

In accordance with **BMP C2-12,** vibratory pile driving will be used as the preferred pile installation method, to reduce noise impacts, unless an impact hammer is required due to substrate type. With use of a vibratory pile driver, the sound level at the closest condominium would decrease to approximately 75 dBA when the closest piles are driven and 70 dBA when the piles at the far end of the pier head are installed. Although Alternative 2 would involve substantially more pile driving than Alternative 1, the typical sound levels at the nearest sensitive noise receptor are expected to be well below the 90 dBA threshold throughout construction, and no significant community noise impacts are expected. To address occupational noise impacts, the construction contractor would follow OSHA and Cal-OSHA requirements, as applicable, for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, in accordance with **BMP C2-12.**

TRPA and Placer County noise standards do not apply to construction activities, provided that the activities are approved by TRPA and take place between certain hours (8:00 a.m. to 6:30 p.m. for TRPA, and 6:00 a.m. and 8:00 p.m. for Placer County). In accordance with **BMP C2-11**, construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m. and therefore would not be subject to TRPA or Placer County noise standards. Limiting construction to these hours will also minimize noise impacts by avoid work during the portions of the day when people are more sensitive to noise. Other BMPs that will help minimize community noise exposure include **BMP C2-6**, which requires construction equipment and vehicles to be kept in good repair, and **BMP C2-16**, which would require equipment and vehicle idling time to be limited to 5 minutes or less. Overall, the temporary increases in noise in the Project vicinity during construction of the pier extension would be short term, localized, and less than significant.

In the long term, the number and type of response boats that the Station uses would not change as a result of Alternative 2, and operations would continue largely unchanged from current conditions. The CG response boats would operate from the Station year round after dredging is completed, rather than only intermittently, as is currently the case. However, the boats would meet CG, state, and local requirements for watercraft sound levels and would not cause an overall increase in noise levels compared to existing boat traffic in the area. Also, noise associated with transporting the boats between the Station and an off-site mooring location during low-water conditions would be avoided. Therefore, operation of the modified pier is not expected to result in increased noise levels.

Groundborne vibration would be generated during construction of Alternative 2, but vibration effects on sensitive receptors would be minimal, temporary, and localized. Impact pile driving is the construction activity that would produce the highest levels of groundborne vibration. At the nearest condominium, the estimated PPV during impact pile driving would be approximately 0.012 in/sec when the closest piles are being installed, and the PPV would decrease to 0.004 in/sec as work moves to the southern end of the extension. These levels are well below the impact threshold for both typical timber/masonry construction (0.2 in/sec) and extremely sensitive buildings (0.12 in/sec). In terms of L_v, the measure used to determine annoyance impacts for humans occupants, the vibration levels at the condominium during impact pile driving would be approximately 70 VdB for the closest piles, declining to 62 VdB as work moves to the south. These levels are below the 72 VdB threshold for residential land uses. Pile driving would be limited to the hours between 8:00 a.m. and 6:30 p.m., when people are less sensitive to vibration. Additionally, vibratory pile driving would be used as the preferred pile installation method unless impact pile driving is required due to substrate type. With use of a vibratory hammer, the PPV levels at the closest condominium would range between 0.001 and 0.003 in/sec, depending on distance to the pile, and L_v levels would range from 50 to 59 VdB, well below the threshold of human perception. No increases in groundborne vibration are anticipated during operations at the modified pier.

In summary, 1) noise and vibration levels during construction of Alternative 2 are expected to be below the applicable impact thresholds, 2) there would be no increase in noise or vibration during operations of the modified pier, and 3), overall noise and vibration impacts from Alternative 2 would be short term, localized, and less than significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less-than-Significant Impact. TRPA noise standards do not apply to TRPA-approved construction activities, provided that they take place between 8:00 a.m. and 6:30 p.m. Similarly, the Placer County noise ordinance does not apply to construction activities occurring between 6:00 a.m. and 8:00 p.m. In accordance with **BMP C2-11**, construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m. and therefore would not be subject to TRPA or Placer County noise standards. As discussed in the NEPA analysis, construction sound levels at the nearest sensitive noise receptors would not exceed the FTA's 90-dBA impact threshold for residential land use (which is being used as a general guideline for this analysis although the Project is not subject to FTA oversight). In accordance with **BMP C2-12,** the construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, as needed. There would be no increase in noise levels during operation of the modified pier compared to existing levels. Therefore, Alternative 2 would have less-than-significant impacts related to exposure of persons or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact. Groundborne vibration would be generated during construction of Alternative 2, but vibration effects on sensitive receptors would be minimal, temporary, and localized. Pile driving, particularly using an impact hammer, is the construction activity expected to cause the highest levels of vibration during construction. As discussed in the NEPA analysis, the estimated vibration levels at the nearest sensitive receptors during impact pile driving would be below the impact thresholds for both structural damage and human annoyance. Additionally, vibratory pile driving would be used as the preferred pile installation method unless impact pile driving is required, and with use of a vibratory hammer

the vibration levels at the nearest sensitive receptor would be below the level of human perception. Pile driving and other construction activities also would be limited to the hours between 8:00 a.m. and 6:30 p.m., when people are less sensitive to vibration. There would be no increase in groundborne vibration or noise during operations of the modified pier. In summary, the impacts of Alternative 2 related to groundborne vibration and noise would be short term, localized, and less than significant.

c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?

No Impact. An increase in noise would occur only during the 7-week construction period. After construction is completed, operations of the modified pier will continue largely unchanged. The CG response boats would operate from the Station year round after dredging is completed, rather than only intermittently, as is currently the case. However, the boats would meet CG, state, and local requirements for watercraft sound levels and would not cause an overall increase in noise levels. Also noise associated with transporting the boats between the Station and an off-site mooring location during low-water conditions would be avoided. Therefore, no permanent increase in ambient noise levels is expected with implementation of Alternative 2.

d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Less-than-Significant Impact. Increases in ambient noise levels in the Project vicinity would occur temporarily during construction activity due to the operation of equipment and vehicles over the course of the 7-week construction period. The nearest sensitive noise receptors to the dredging activity would be the inhabitants of the condominiums in the southwest portion the St. Francis Lakeside complex. The closest condominium is approximately 350 feet from the northernmost (i.e., nearest) piles to be installed. Using the typical equipment sound levels and assessment methodology outlined previously, the average sound levels (L_{eq}) at the closest condominium were estimated at between 74 and 75 dB (varying with distance from the pile) if an impact hammer is used and between 70 and 75 dBA if a vibratory hammer is used. All of these estimated L_{eq} levels would be well below the 90 dBA impact threshold for residential areas.

Construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C2-11**, to avoid the portions of the day when people are more sensitive to noise. Vibratory pile driving will be used as the preferred pile installation method, in accordance with **BMP C2-12**, to minimize noise impacts during pile driving. In accordance with **BMP C2-6**, construction equipment and vehicles would be kept in good repair, and in accordance with **BMP C2-16**, equipment and vehicle idling time would be limited to 5 minutes or less, minimizing equipment and vehicle noise during construction. The temporary increase in ambient noise levels in the Project vicinity during construction would be short term, localized, and less than significant. There would be no increase in noise levels during operation of the modified pier compared to existing ambient levels, and overall, Alternative 2 would have less-than-significant impacts related to increases of ambient noise levels.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project is not in an airport land use plan area or within 2 miles of a public or public use airport and would have no noise impacts related to such airports.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project is not in the vicinity of a private airstrip and would have no noise impacts related to such airstrips.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Increases in existing CNELs beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan?

No Impact. According to Section 68.9 of the TRPA Code of Ordinances, TRPA-approved construction projects operating between the hours of 8:00 a.m. and 6:30 p.m. are exempt from CNEL standards. The only increases in noise levels associated with the Project would occur during construction, and Project construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C2-11**. The CG will obtain approval for the Project from TRPA prior to the start of construction. Because the Project would be exempt from the CNEL standards, Alternative 2 would have no impacts related to increases in CNELs beyond those permitted in the applicable Plan Area Statement, Community Plan, or Master Plan.

b) Exposure of people to severe noise levels?

Less-than-Significant Impact. TRPA regulations do not define a threshold for what constitutes a "severe noise level," so the FTA's 90-dBA L_{eq} threshold for residential land uses and OSHA's 140-dB threshold for single impulsive noise events were used to determine whether the Project could expose people to severe noise levels. As discussed previously, typical sound levels at the nearest sensitive noise receptors, the St. Francis Lakeside condominiums, would not exceed the 90-dBA L_{eq} impact threshold for residential land use during construction of Alternative 2. For the single impulsive noise event threshold, the only place where peak noise levels could reach 140 dB is the area within 0.5 foot from the point of impact during impact pile driving, and therefore no people are expected to be exposed to noise levels above that threshold during construction. In accordance with **BMP C2-12,** the construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, as needed, to avoid exposing construction workers to severe noise levels. Severe noise levels are not expected during operations of the modified pier. In summary, Alternative 2 would have less-than-significant impacts related to exposure of people to severe noise levels with implementation of **BMP C2-12**.

c) Single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold?

No Impact. According to Section 68.9 of the TRPA Code of Ordinances, TRPA-approved construction projects occurring between the hours of 8:00 a.m. and 6:30 p.m. are exempt from the TRPA single event noise thresholds. The only increases in noise levels associated with the Project would occur during construction, and Project construction activities would be limited to the hours between 8:00 a.m. and 6:30 p.m., in accordance with **BMP C2-11**. The CG will obtain approval for the Project from TRPA prior to the start of construction. Because the Project would be exempt from the single event noise standards, Alternative 2 would have no impacts related to single noise even levels greater than those set forth in the TRPA noise thresholds.

3.9.3.2 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 3 would have similar noise impacts to Alternative 2. Construction activities would occur for 8 weeks, versus 7 weeks for Alternative 2, and Alternative 3 would involve driving 4 additional piles. However, the additional work would take place further from the shoreline and would cause only minimal sound level increases for sensitive receptors. Alternative 3 would include the same noise-minimizing BMPs as Alternative 2. Construction activities would be limited to between 8:00 a.m. and 6:30 p.m., and therefore would not be subject to TRPA and Placer County noise restrictions. Vibratory pile driving will be used as the preferred pile installation, to minimize noise impacts, unless an

impact hammer is required due to substrate type. The construction contractor will follow OSHA and Cal-OSHA requirements for occupational noise exposure and the provision of worker hearing protection during pile driving and other noise-producing activities, as required. Construction equipment and vehicles will be kept in good repair and idling time would be limited to 5 minutes or less. Construction-related impacts would be temporary, short-term, and less than significant, and noise increases are not expected during operation of the modified pier. In summary, the noise impacts from Alternative 3 would be short term, localized, and less than significant.

3.9.3.3 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place and operations at the Station would continue unchanged. Therefore, there would be no increase in noise over existing levels, and no noise impacts would occur. However, Alternative 4 would not meet the public health and safety purpose and need of the proposed Project, and CG emergency response times would continue to be adversely affected during low-water conditions.

3.10 Recreation

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to recreation.

3.10.1 Affected Environment

The economy of the Lake Tahoe region relies heavily on tourism, which is largely driven by the variety of recreational activities available during all seasons of the year. Recreational activities in the lake itself include boating, sport fishing, water skiing, wake boarding, jet skiing, kayaking, canoeing, paddle boarding, and other water sports. Although most of these activities are allowed year round, most water sports are more common during the summer months.

The TCPUD's public boat ramp and pier are adjacent to the west of the CG Station. The TCPUD facility operates year round and is one of the most heavily used public launching facilities in the area, with an estimated 120,000 users annually (Boesch 2014). The TCPUD boat ramp is one of only three public boat ramp facilities along the northern shore of Lake Tahoe (the others are the North Tahoe Public Utility District [NTPUD] National Avenue boat ramp in Tahoe Vista and the NTPUD Coon Street boat ramp in Kings Beach). The TCPUD boat ramp facility consists of a boat launch ramp, a boat trailer queuing area, a car parking area, and a 280-foot L-shaped multiple-use pier and floating dock to the west and south of the boat ramp. Maintenance dredging (to a lakebed elevation of 6219 feet, LTD) and construction to widen the boat ramp were completed at the TCPUD facility in winter 2014-15. The TCPUD facilities also include a campground and sports fields.

The entrance channel to Star Harbor, a private facility used by some recreational boaters, is approximately 310 feet west of the existing CG pier, just west of the TCPUD Lake Forest facilities. A 345-foot-long L-shaped private home-owners association pier, associated with the Star Harbor condominiums is on the western side of the entrance channel, approximately 400 feet from the existing CG pier. Maintenance dredging of the Star Harbor entrance channel to an elevation of 6,219 feet, LTD, was completed in fall 2015.

There is also a 200-foot-long private home-owner's association pier, associated with the Saint Francis Lakeside condominiums, approximately 140 feet east of the Station pier. Six private buoys (not associated with the Station) are between 450 and 700 feet south of the existing Station pier.

The most common game fish species in Lake Tahoe include lake trout, brown trout, rainbow trout, and Kokanee salmon. Fishing is allowed year round in Lake Tahoe between 1 hour before sunrise and 2 hours after sunset, with a limit of five fish per day. As discussed in *Section 3.4*, most of the potential fish habitat in the Project Area is of marginal quality, few fish were observed during the fish habitat survey, and the

species observed were not significant game species. Fishing activity in the immediate Project Area is minimal, due to the heavy boat traffic from the TCPUD boat ramp.

3.10.2 Regulatory Setting

3.10.2.1 Federal and State Regulatory Setting

There are no federal or state regulations related to recreation that are applicable to the proposed Project.

3.10.2.2 Regional and Local Regulatory Setting

TRPA Regional Plan

The Recreation Element of the TRPA Regional Plan includes the following goals and policies for recreation that are relevant to the proposed Project:

Goal R-1: Encourage opportunities for dispersed recreation when consistent with environmental values and protection of the natural resources.

Goal R-2: Provide high-quality recreational opportunities.

Policy R-2.3: Nearshore/foreshore structures should be appropriately located to minimize impacts to recreational boating and top line fishing.

Goal R-3: Provide a fair share of the total basin capacity for outdoor recreation.

Goal R-4: Provide for the appropriate type, location, and rate of development of outdoor recreational uses.

In addition, the Land Use Element of the Regional Plan includes the following policies related to recreation:

Policy LU-1.1: The primary function of the region shall be as a mountain recreation area with outstanding scenic and natural values.

Policy LU-2.6: Uses of the bodies of water within the region shall be limited to outdoor water-dependent uses required to satisfy the goals and policies of the Regional Plan.

TRPA goals, policies, and regulations for protecting the scenic quality of public recreation areas are discussed in *Section 3.2.*

TRPA Thresholds

TRPA's adopted threshold standards for recreation are based on statements of policy rather than numerical standards. The first Recreation Policy Statement states: "It shall be the policy of the TRPA Governing Body in development of the Regional Plan to preserve and enhance the high-quality recreational experience including preservation of high-quality undeveloped shorezone and other natural areas. In developing the Regional Plan, the staff and Governing Body shall consider provisions for additional access, where lawful and feasible, to the shorezone and high-quality undeveloped areas for low density recreational uses."

This Policy Statement is evaluated by determining whether the TRPA has sufficiently adopted policies, ordinances, and programs in support of the Policy Statement. In addition, TRPA reviews recreational user surveys and assesses the amount of public land acquired and the availability of additional amenities that provide public access for low density recreational uses, such as trails and trailheads. This threshold standard has been implemented and is in attainment. Recent user surveys show that the majority of recreational users (86 percent) are very satisfied with their recreational experience. The region has seen a consistent increase in the amount of public land available for low-density recreational use, and the number of amenities that provide access to that land (TRPA 2016a).

The second Recreation Policy Statement states: "It shall be the policy of the TRPA Governing Body in development of the Regional Plan to establish and ensure a fair share of the total basin capacity for outdoor recreation is available to the general public." The status of this threshold standard is evaluated by reviewing the degree to which the Regional Plan and TRPA programs support implementation of the Policy Statement, as well as an assessment of three additional evaluation criteria. The three criteria used to evaluate the status of the Policy Statement are: 1) cumulative accounts of "persons at one time" (PAOT) allocations, which are estimates of the number of users a recreation site can support at one time, 2) facility development for recreation projects that do not require PAOT assignments, and 3) public acquisition of lands that support recreation purposes. This Threshold Standard has been implemented and is in attainment. In general, the evaluation criteria indicate an increase in recreational development that is consistent with the Policy Statement's direction, that a fair share of resource capacity be available for public recreation (TRPA 2016a).

3.10.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on recreation in the context of NEPA, CEQA, and TRPA requirements. *Table 3-34* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the recreation-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-34 Significance Determinations for the Project Alternatives (Recreation)

Recreation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on recreation?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No Impact	No Impact	No Impact	No Impact
TRPA				
Does the Project: *a) Create additional demand for recreation facilities?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Create additional recreation capacity?	No Impact	No Impact	No Impact	No Impact
c) Have the potential to create conflicts between recreation uses, either existing or proposed?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) Result in a decrease or loss of public access to any lake, waterway, or public lands?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA Thresholds: *Would the Project have significant impacts on attainment of TRPA thresholds for recreation?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

3.10.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on recreation?

Less-than-Significant Impact. Alternative 1 may affect water-based recreation during dredging. The presence of the turbidity curtain around the dredging area would temporarily obstruct boaters and other recreational users launching from and returning to the TCPUD boat ramp and pier or otherwise passing through the Project Area. In accordance with **BMP C1-3**, the Project disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational users of the Project Area. The turbidity curtain would be approximately 30 feet from the southeastern end of the TCPUD pier at its closest point. This is expected to leave enough room for boats to access the TCPUD boat launch, though the rate of boat traffic through the area may be reduced slightly as a result of boats having to slow down to navigate through the 30-foot corridor. In accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season, thereby reducing impacts to recreational users. Project-related construction associated with Alternative 1 is expected to take approximately 8 weeks. The proposed Project would occur on CG land, which is not accessible to the public, and therefore would have no impact on parking for recreational users at the adjacent TCPUD pier. All construction materials and equipment (with the exception of the barge and associated dredging operations), including construction worker personnel vehicles, would be stored and staged on-site on CG land. In accordance with **BMP C1-23,** a Traffic Management Plan will be prepared, subject to review and approval by TRPA, and implemented during construction. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts. There are several alternative public boat launch sites on the northern shore of Lake Tahoe, including the NTPUD National Avenue boat ramp in Tahoe Vista (approximately 6.6 miles from the TCPUD boat ramp), that could accommodate the temporary overflow from the TCPUD facility. Adverse impacts to these facilities and their users would be temporary, short-term, and less than significant with implementation of **BMP C1-16.** Fishing would also be temporarily limited to the turbidity-curtained area, though the fish habitat in most of the Project Area is of marginal quality and fishing activity in the immediate Project Area is minimal. As discussed in *Section 3.4,* the proposed Project's impacts to fish and fish habitat would be less than significant with implementation of **MM BIO-1** and the various BMPs discussed in *Section 4.1.3.1*, and no long-term impacts to recreational fisheries are expected.

After dredging is completed, navigation for recreational users in the immediate Project vicinity would be improved due to the increased depth of the approach channel to the CG and TCPUD facilities. The proposed dredging for Alternative 1 would complement the maintenance dredging that was recently completed at the TCPUD facility, providing increased depth throughout the area between the CG and TCPUD piers. The addition of the 8-foot-wide boat lift and floating dock to the western side of the CG pier would not interfere with recreationists using the TCPUD boat launch facilities. In addition, Alternative 1 would enhance the CG's ability to provide emergency search and rescue and recreational boater safety services to the recreational users of Lake Tahoe. The Project would not result in an increase in population in the region and would not increase the demand for recreational facilities.

In summary, Alternative 1's short-term impacts on recreation would be temporary, localized, and less than significant, and in the long term Alternative 1 would have beneficial effects on recreation in Lake Tahoe.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less-than-Significant Impact. The Project would not result in an increase in population in the region or an increase in demand for local recreational facilities. During dredging, there may be an increase in the use of other boat launch facilities on the northern shore of Lake Tahoe due to potential impacts on lake access (through a 30-foot-wide corridor in the water adjacent to the Project work area during dredging) from the TCPUD facility; however, impacts to these facilities and their users would be short term (approximately 8 weeks). In addition, in accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season. Therefore, Alternative 1 would have less-than-significant impacts related to increases in demand for existing recreational facilities.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Impact. The Project does not involve the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Does the Project:

a) Create additional demand for recreation facilities?

Less-than-Significant Impact. The Project would not result in an increase in population in the region or an increase in demand for local recreational facilities. During dredging, there may be an increase in the use of other boat launch facilities on the northern shore of Lake Tahoe due to potential impacts on lake access (through a 30-foot-wide corridor in the water adjacent to the Project work area during dredging) from the TCPUD facility, but these impacts would be temporary and short-term (approximately 8 weeks). In addition, in accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season. Therefore, Alternative 1 would have less-than-significant impacts related to increases in demand for existing recreational facilities.

b) Create additional recreation capacity?

No Impact. The Project does not involve the creation of additional recreation capacity.

c) Have the potential to create conflicts between recreation uses, either existing or proposed?

Less-than-Significant Impact. During dredging, Alternative 1 may temporarily affect recreational users of the TCPUD boat ramp and pier, who would have to navigate around the dredging area to access the lake. In accordance with **BMP C1-3**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational users of the Project Area. During dredging, the turbidity curtain would be approximately 30 feet from the southeastern end of the TCPUD pier at its closest point. This is expected to leave enough room for boats to access the boat launch, though the rate of boat traffic through the area may be reduced slightly as a result of boats having to slow down to navigate through the 30-foot corridor. In accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season, thereby reducing impacts to recreational users of Lake Tahoe. In summary, temporary impacts to recreational users during dredging would be less than significant with implementation of the BMPs described above.

After dredging is completed, navigation for recreational users in the immediate Project vicinity would be improved due to the increased depth of the approach channel to the CG and TCPUD facilities. The proposed dredging for Alternative 1 would complement the maintenance dredging that was recently completed at the TCPUD facility, providing increased depth throughout the area between the CG and TCPUD piers. The addition of the 8-foot-wide boat lift and floating dock to the western side of the CG pier would not interfere with recreationists using the TCPUD boat launch facilities. In addition, Alternative 1 would enhance the CG's ability to provide search and rescue and other public safety services to the recreational users of Lake Tahoe. The Project would not result in an increase in population in the region and would not increase the demand for recreational facilities. In summary, Alternative 1's long-term adverse impacts to recreation would be less than significant.

d) Result in a decrease or loss of public access to any lake, waterway, or public lands?

Less-than-Significant Impact. Alternative 1 may affect public access to Lake Tahoe from the TCPUD facility during dredging, but impacts would be short term, temporary, and less than significant. In accordance with **BMP C1-3**, the Project disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational users of the Project Area. During dredging, the turbidity curtain would be approximately 30 feet from the southeastern end of the TCPUD pier at its closest point, providing sufficient room for boaters to pass through the area. In accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season, which would also avoid work during the peak summer water recreation season and minimize potential impacts to recreational users of Lake Tahoe. Project-related construction associated with Alternative 1 is expected to take approximately 8 weeks. The proposed Project would occur on CG land, which is not accessible to the public, and therefore would have no impact on parking for recreational users at the adjacent TCPUD pier. All construction materials and equipment (with the exception of the barge and associated dredging operations), including construction worker personnel vehicles, would be stored and staged on-site on CG land. In accordance with **BMP C1-23,** a Traffic Management Plan will be prepared, subject to review and approval by TRPA, and implemented during construction. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts. After dredging is completed, Alternative 1 would not obstruct or otherwise adversely impact public access to Lake Tahoe, and public safety services and navigation for recreational users in the area would be improved.

TRPA Thresholds

Less-than-Significant Impact. The TRPA thresholds for recreation have been implemented and are currently in attainment. Alternative 1 would have impacts on recreational users and access during dredging, but these impacts would be short term, localized, and less than significant and will not contribute to future non-attainment of the TRPA thresholds for recreation.

3.10.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on recreation?

Less-than-Significant Impact. Alternative 2 may affect water-based recreation during construction. The presence of the turbidity curtain around the construction area would temporarily obstruct boaters and other recreational users launching from and returning to the TCPUD boat ramp and pier or otherwise passing through the Project Area. In accordance with **BMP C2-1**, the Project disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational users of the Project Area. During construction, the turbidity curtain would be approximately 80 feet from the southeastern end of the TCPUD pier at its closest point, providing sufficient space for boaters to navigate through the area. Boaters would also have to navigate around the construction area for the dog-leg portion of the pier extension, which may slow down the rate of boat traffic through the area slightly. In accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid

the fish spawning season. This timing would also avoid work during the peak summer water recreation season, thus reducing impacts. Fishing would also be temporarily limited to the turbidity-curtained area, though the fish habitat in most of the Project Area is of marginal quality and fishing activity in the immediate Project Area is minimal. Project-related construction associated with Alternative 2 is expected to take approximately 7 weeks. The proposed Project would occur on CG land, which is not accessible to the public, and therefore would have no impact on parking for recreational users at the adjacent TCPUD pier. All construction materials and equipment (with the exception of the barge and associated dredging operations), including construction worker personnel vehicles, would be stored and staged on-site on CG land. In accordance with **BMP C2-20,** a Traffic Management Plan will be prepared, subject to review and approval by TRPA, and implemented during construction. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts. As discussed in *Section 3.4,* the proposed Project's impacts to fish and fish habitat would be less than significant with implementation of **MM BIO-1** and the various BMPs described in *Section 4.1.3.2*, and no long-term impacts to recreational fisheries are expected.

After construction is completed, boaters would continue to have to navigate around the dog-leg pier head when entering or exiting the TCPUD boat launch area. Kayakers and other non-motorized recreationists moving parallel to the shoreline would have to detour out into the lake approximately 310 feet to pass around the pier extension. Although this may be an annoyance to some recreational users, recreational access to or use of the lake would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing boater speed and guiding boaters away from submerged hazards and into the TCPUD boat ramp area. The pier extension would be clearly marked to avoid collisions and guide boaters around the pier extension and into the boat ramp area at night. As required by TRPA Code of Ordinances 84.4.3.D.1.b, navigational buoys would be installed to delineate a no wake zone. In addition, Alternative 2 would enhance the CG's ability to provide emergency search and rescue and recreational boating safety services to the recreational users of Lake Tahoe. The Project would not result in an increase in population in the region and would not increase the demand for recreational facilities.

In summary, impacts to recreation during construction of Alternative 2 would be temporary, localized, and less than significant. In the long term, Alternative 2's adverse impacts would be less than significant, and the pier extension would also result in beneficial effects on recreation.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

a) *Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

Less-than-Significant Impact. The Project would not result in an increase in population in the region or an increase in demand for local recreational facilities. During construction, there may be a minor increase in the use of other boat launch facilities on the northern shore of Lake Tahoe due to impacts on lake access from the TCPUD facility, but adverse impacts to these facilities and their users would be temporary and short-term (approximately 7 weeks). In accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season. Therefore, Alternative 2 would have less-than-significant impacts related to increases in demand for existing recreational facilities.

b) *Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*

No Impact. The Project does not involve the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Does the Project:

a) Create additional demand for recreation facilities?

Less-than-Significant Impact. During construction, there may be a minor increase in the use of other boat launch facilities on the northern shore of Lake Tahoe due to impacts on lake access from the TCPUD facility, but these impacts would be short term. In addition, in accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer water recreation season. The Project would not result in an increase in population in the region or a long-term increase in demand for local recreational facilities. In summary, Alternative 2 would have less-than-significant impacts related to increases in demand for existing recreational facilities.

b) Create additional recreation capacity?

No Impact. The Project does not involve the creation of additional recreation capacity.

c) Have the potential to create conflicts between recreation uses, either existing or proposed?

Less-than-Significant Impact. During construction, Alternative 2 may affect recreational users of the TCPUD boat ramp and pier, who would have to navigate around the work area to access the lake. In accordance with **BMP C2-1**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational boaters. During construction, the turbidity curtain would be approximately 80 feet from the southeastern end of the TCPUD pier at its closest point, providing sufficient space for boaters to navigate through the area. Boaters would also have to navigate around the construction area for the dog-leg portion of the pier extension, which may slow down the rate of boat traffic through the area slightly. In accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer boating season, thereby reducing impacts to recreational users of Lake Tahoe. Project-related construction of Alternative 2 is expected to take approximately 7 weeks. In summary, Alternative 2's temporary impacts to recreation during construction would be less than significant with implementation of the BMPs described above.

After construction is completed, boaters would continue to have to navigate around the dog-leg pier head when entering or exiting the TCPUD boat launch area. Kayakers and other non-motorized recreationists moving parallel to the shoreline would have to detour out into the lake approximately 310 feet (relative to the end of the existing TCPUD pier) to pass around the pier extension. Although this may be an annoyance to some recreational users, recreational access to or use of the lake would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing boater speed and guiding boaters away from submerged hazards and into the TCPUD boat ramp area. The pier extension would be clearly marked to avoid collisions and guide boaters around the pier extension and into the boat ramp area at night. In addition, Alternative 2 would enhance the CG's ability to provide emergency search and rescue and recreational boating safety services to the recreational users of Lake Tahoe.

In summary, impacts to recreation during construction of Alternative 2 would be temporary, localized, and less than significant. In the long term, Alternative 2's adverse impacts would be less than significant, and the pier extension would also result in beneficial effects on recreation.

d) Result in a decrease or loss of public access to any lake, waterway, or public lands?

Less-than-Significant Impact. Alternative 2 could temporarily affect public access to Lake Tahoe from the TCPUD facility during construction. In accordance with **BMP C2-1**, the disturbance area will be limited to

the minimum required to complete the proposed Project, thereby reducing the potential obstruction of recreational users of the Project Area. In accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer boating season, thereby reducing impacts to recreational users of Lake Tahoe.

After construction is completed, recreationists would continue to have to navigate around the dog-leg pier head. However, recreational access to Lake Tahoe would not be significantly obstructed. In addition, Alternative 2 would enhance the CG's ability to provide emergency search and rescue and recreational boating safety services to the recreational users of Lake Tahoe.

In summary, Alternative 2 would have less-than-significant impacts on public access to Lake Tahoe or other lakes, waterways, or public lands.

TRPA Thresholds

Less-than-Significant Impact. The TRPA thresholds for recreation have been implemented and are currently in attainment. Alternative 2 would have impacts on recreational users and access, but these impacts would be less than significant and will not contribute to future non-attainment of the TRPA thresholds for recreation.

3.10.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 3 would have similar impacts on recreation as Alternative 2. Construction would occur over 8 weeks rather than 7, increasing the duration of construction-related impacts slightly. As with Alternative 2, the turbidity curtain would be approximately 80 feet from the southeastern end of the TCPUD pier at its closest point, providing sufficient space for boaters to navigate through the area. The proposed Project would occur on CG land, which is not accessible to the public, and therefore would have no impact on parking for recreational users at the adjacent TCPUD pier. All construction materials and equipment (with the exception of the barge and associated dredging operations), including construction worker personnel vehicles, would be stored and staged on-site on CG land. In accordance with **BMP C2-20,** a Traffic Management Plan will be prepared, subject to review and approval by TRPA, and implemented during construction. The plan will address construction traffic, parking, emergency access, haul routes, truck turning movements, hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts. The straight configuration and longer length of the pier extension for Alternative 3 would influence the proposed Project's impacts on recreation during construction and operation of the Project, to some extent. Boaters exiting straight out of the TCPUD boat ramp facility would not have to negotiate around the dog-leg pier extension but would have to navigate out another 100 feet to go east from the area. Kayakers and other non-motorized recreationists moving parallel to the shoreline would have to detour out into the lake approximately 440 feet (relative to the end of the existing TCPUD pier) to pass around the pier extension. Although this may be an annoyance to some recreational users, recreational access to or use of Lake Tahoe would not be significantly obstructed. As required by TRPA Code of Ordinances 84.4.3.D.1.b, navigational buoys would be installed to delineate a no wake zone. In addition, Alternative 3 would enhance the CG's ability to provide emergency search and rescue and recreational boating safety services to the recreational users of Lake Tahoe.

In summary, Alternative 3 would have less-than-significant impacts on recreation.

3.10.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and no construction-related impacts to recreation would occur. Operations at the Station would continue unchanged, and therefore Alternative 4 would have no impacts when compared to baseline conditions. However, the CG's access to their response boats and response times would continue to be adversely affected, which would continue to adversely affect the CG's ability to provide search and rescue and recreational boater safety services to the recreational users of Lake Tahoe.

3.11 Transportation, Traffic, and Navigation

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to transportation, traffic, and navigation.

3.11.1 Affected Environment

3.11.1.1 Existing Road Network

The road system in the Project vicinity (*Figure 3-24*) includes the following roadways that may be used during construction of the proposed Project, including the roads used for the potential haul route for disposal of dredged material (*Figure 3-25*).

SR 28, also referred to as North Lake Boulevard, is a primarily two-lane state highway that runs along the northern shore of Lake Tahoe from the junction with SR 89 in Tahoe City to the Nevada state line near Crystal Bay. The posted speed limit on SR 28 ranges from 25 to 45 miles per hour (mph).

SR 89 is a primarily two-lane state highway that runs from the junction with U.S. Route 395 near Topaz Lake, north along the western shore of Lake Tahoe to Tahoe City, then along the Truckee River to Truckee, and eventually terminates at its junction with Interstate 5 near Mount Shasta. The posted speed limit on SR 89 ranges from 25 to 45 mph.

Lake Forest Road is a two lane collector road that runs through Lake Forest and terminates at each end with junctions with SR 28. Lake Forest Road carries traffic accessing recreational, commercial, and residential development in the area. It has a speed limit of 25 mph. A small two-lane driveway connects the Station property to Lake Forest Road and also serves as the access to the TCPUD boat ramp and pier.

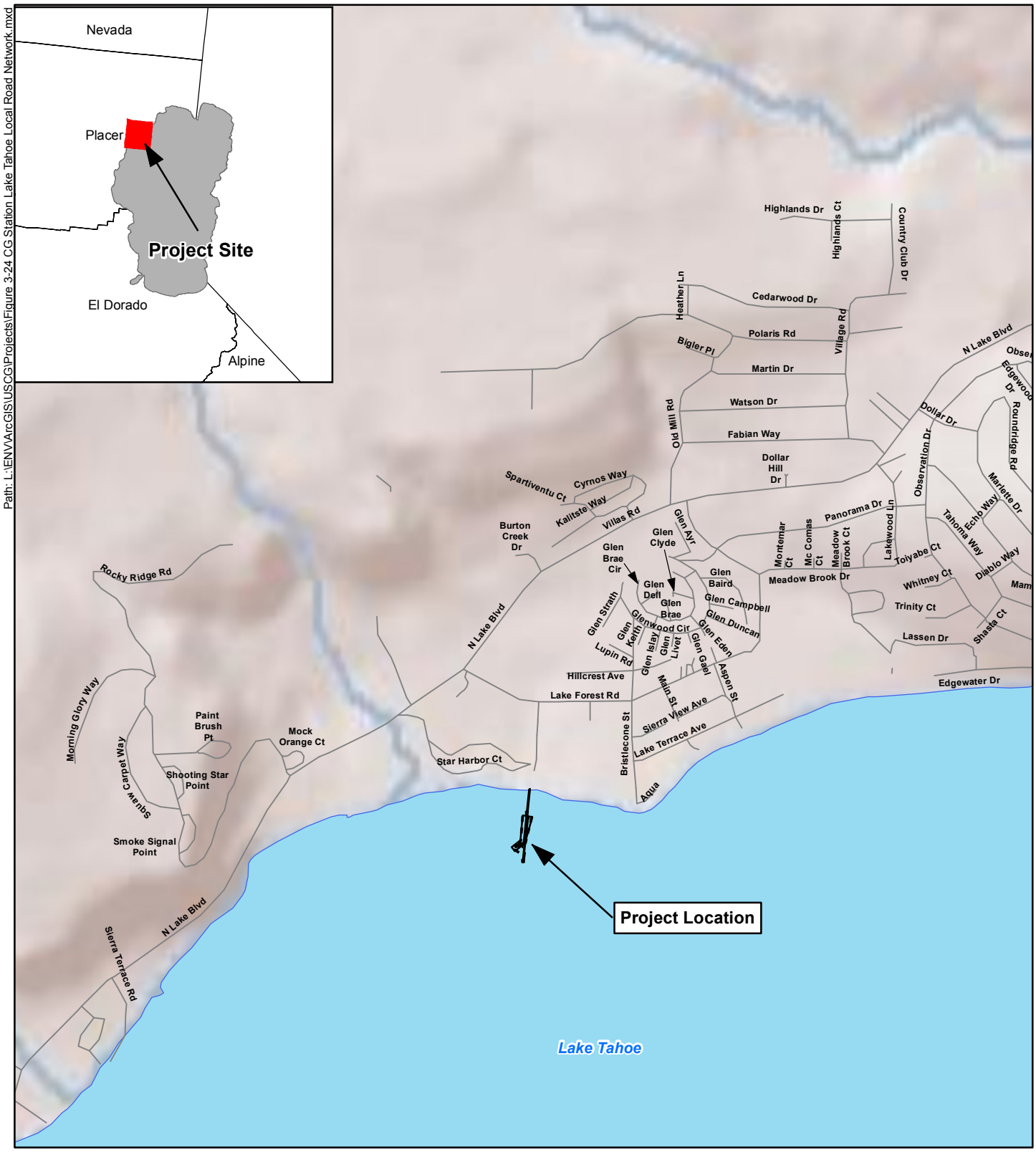
3.11.1.2 Existing Traffic Volumes

Private motor vehicles are the dominant mode of transportation in the Lake Tahoe Basin. Traffic in the region is a mixture of local and visitor vehicles traveling to residential sites, commercial establishments, tourist destinations, and recreational facilities. Traffic volumes vary considerably by season due to an influx of visitors at various times of year. The latest available Caltrans traffic volume data for highway segments that may be affected by the proposed Project are shown in *Table 3-35*. Peak month (August) and annual average daily traffic volumes in the Tahoe region have fallen 15 percent from the highest reported levels recorded in 1986, and VMT have decreased from 2.5 million miles per day in 1986 to roughly 2 million miles per day in 2011 (TRPA and Tahoe Metropolitan Planning Organization [TMPO] 2012).

Table 3-35 Baseline Traffic Volumes for Highway Segments in the Project Vicinity

Highway	Segment	Peak Hour	Peak Month Average Daily Traffic (ADT)	Vehicle Annual Average Daily Traffic (AADT)	Truck AADT
SR 28	Junction SR 89 to Grove Street	1,450	17,300	12,400	448
	Grove Street to Tahoe State Park	1,750	20,000	15,200	448
	Tahoe State Park to Lake Forest Drive	1,400	16,200	11,600	448
	Lake Forest Drive to Lardin Way	1,350	13,700	11,000	328
SR 89	Junction SR 28 to Tahoe City State Highway Maintenance Station	1,500	16,600	11,400	737
	State Highway Maintenance Station to Squaw Valley Road	1,550	14,800	10,600	737
	Squaw Valley Road to West River Street	1,600	13,600	10,000	609

Notes:
Source: Caltrans 2014a, 2014b



REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 3-27
Local Road Area Network

Path: L:\ENV\ArcGIS\USCG\Projects\Figure 3-25 CG Station Lake Tahoe Haul Routes.mxd

Haul Route

0 1.5 3

Miles

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project

Figure 3-28

Proposed Haul Route

3.11.1.3 Existing Level of Service

Level of service (LOS) ratings qualitatively characterize traffic conditions associated with varying levels of traffic congestion. Six LOSs, A through F, are used, ranging from LOS A for free-flowing traffic conditions to LOS F for congested, over-capacity conditions. LOS E corresponds to "at-capacity" operations. LOS is based on such factors as roadway speed, volume-to-capacity (V/C) ratio, travel time, delay, and freedom to maneuver. Caltrans LOS data for highway segments in the Project vicinity are shown in *Table 3-36.*

Table 3-36 LOS Data for Highway Segments in Project Vicinity

Highway	Segment	Current LOS	20-Year No Build LOS[1]	20-Year Concept LOS[2]	V/C ratio[3]	Safety Index[4]
SR 28	SR 89 to Tahoe Vista	E	E	E	0.64	+19%
SR 89	SR 28 to Placer/ Nevada County Line	D	E	E	0.57	-35%

Source: Caltrans 2012a, 2012b

Notes:

1) 20-Year No Build LOS – The LOS that would be expected at 20 years with no roadway improvements.

2) 20-Year Concept LOS – The minimum acceptable LOS over the next 20 years.

3) V/C ratio – The volume of peak hour traffic compared to capacity of the roadway.

4) Safety Index – The percentage by which the segment's reported collision rate is above or below the statewide average for comparable roadways.

Limited LOS information for several intersections along the proposed haul route is also available in several recent planning documents. In the Tahoe City Area, the SR 28/SR 89 junction is rated at LOS C during winter and D during summer, and the intersection of SR 28 and Grove Street is rated at LOS F in both summer and winter (Dyett & Bhatia 2013). The poor LOS conditions at SR 28 and Grove Street reflect the long delays for movements (particularly left turns) onto the state highway at this stop sign-controlled intersection. The intersection of SR 89 and Cabin Creek Road (i.e., the entrance road to the Eastern Regional Landfill) is rated as LOS A (Ascent Environmental 2012).

3.11.1.4 Public Transportation and Bike Routes

The Tahoe Area Regional Transit Agency (TART) is operated by the Placer County Department of Public Works and offers bus service in the Project vicinity. The TART Mainline route runs along SR 28 and SR 89 from Tahoma to Incline Village (Nevada). In the Project vicinity, there are bus stops at both ends of Lake Forest Drive, with buses passing roughly once every hour. The TART Highway 89 line runs along SR 89 from Tahoe City to Truckee. TART's Tahoe City Transit Center, in Tahoe City near the SR 89/SR 28 junction, is the hub for all transit operations on the northern shore of Lake Tahoe. The Transit Center provides an interior waiting area, restrooms, parking, bike lockers, bus arrival information, and automated ticket vending machines. Public transit ridership on the northern shore nearly doubled between 2000 and 2009 (TRPA and TMPO 2012).

There is a TRPA-designated Class I (i.e. separated path) bicycle trail along the southern side of SR 28 from Tahoe City to Dollar Drive. TRPA has also proposed designating a new Class 3 bike route along Lake Forest Drive.

3.11.1.5 Existing Navigational Setting

Lake Tahoe is used by recreational, commercial, and public service watercraft. A main access point to the lake for the boating public is the TCPUD Lake Forest Boat Ramp facility, adjacent and to the west of the existing Station pier. The TCPUD boat launch facilities consists of a boat ramp; a 325-foot-long, L-shaped multiple-use pier and floating dock to the west and south of the boat ramp; a boat trailer queuing area; restrooms; and a car parking area. The TCPUD facility operates year round and is one of the most heavily used public boat launching facilities in the area, with an estimated 120,000 users annually (Boesch 2014).

The Lake Forest Boat Ramp is one of only three public boat ramp facilities along the northern shore of Lake Tahoe (the others are the NTPUD National Avenue boat ramp in Tahoe Vista and the NTPUD Coon Street boat ramp in Kings Beach). Maintenance dredging (to a lakebed elevation of 6,219 feet, LTD) and construction to widen the boat ramp occurred at the facility in winter of 2014-2015.

The entrance channel to Star Harbor is approximately 310 feet west of the existing CG pier, just west of the TCPUD Lake Forest facilities. A 345-foot-long L-shaped private home-owners association pier, associated with the Star Harbor condominiums is on the western side of the entrance channel, approximately 400 feet from the existing CG pier. There is also a 200-foot-long private home-owner's association pier, associated with the Saint Francis Lakeside condominiums, approximately 140 feet east of the Station pier. Six private buoys (not associated with the Station) are between 450 and 700 feet south of the existing Station pier.

The CG provides essential emergency search and rescue, law enforcement, and boating safety services to the commercial and recreational boating public and agencies that use Lake Tahoe year round and 24 hours a day. The Station has a crew of 16 to 18 that respond to an average of more than 150 search and rescue calls each year. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night. Under current conditions, cyclical droughts and seasonal low-water levels at the current pier do not allow for on-site mooring of the CG's rapid response boats year round. When water levels are low (generally October through January), rapid response boats must be moored at alternate sites which increases response times and creates security issues. This is contrary to CG search and rescue standards, which require the CG rapid response boat to be underway less than 30 minutes after a distress call is received. When the CG is required to moor their response boats away from the Station, the response time increases, and it is often difficult to get underway within the CG search and rescue standards. The survival rate of a person in the water decreases as temperatures decrease, and response time can be vital to saving a person's life.

3.11.2 Regulatory Setting

3.11.2.1 Federal and State Regulatory Setting

Federal and state laws and regulations pertaining to this issue area and relevant to the proposed Project are identified in *Table 3-37*.

Table 3-37 Federal and State Laws, Regulations and Policies Potentially Applicable to the Project (Transportation, Traffic, and Navigation)

Jurisdiction	Regulation	Description
U.S.	Ports and Waterways Safety Act (33 USC 1221 et seq.)	This Act authorizes the CG to control vessel traffic in jurisdictional waters of the U.S. to protect the aquatic environment in ports, harbors, waterfront areas, and navigable waters and to minimize deaths, injuries, and property damage.
CA	California Vehicle Code	Chapter 2, Article 3 of the Vehicle Code defines the powers and duties of the California Highway Patrol, which has enforcement responsibilities for the vehicle operation and highway use in the state.
CA	Other	Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System and the portion of the Interstate Highway System in California. Caltrans also regulates the maximum load limits for trucks.

3.11.2.2 Local and Regional Regulatory Setting

TRPA is the responsible agency in the Lake Tahoe Basin for transportation issues and is the lead agency in identifying transportation strategies and projects.

TRPA Regional Plan

The Transportation Element of the Regional Plan includes goals and policies to establish a safe, efficient, and integrated transportation system that provides quality mobility options for all sectors of the population, supports the region's economic base, enhances quality of life to its residents, and maximizes opportunities for environmental benefits. The Transportation Element includes transportation goals, policies and implementation measures that address multiple aspects of transportation planning and interact to create a successful multi-modal transportation system. The following policy establishes LOS criteria for the region's roadways:

Policy T-10.7: LOS criteria for the region's highway system and signalized intersections during peak periods shall be:

- LOS C on rural recreational/scenic roads;
- LOS D on rural developed area roads;
- LOS D on urban developed area roads;
- LOS D for signalized intersections.
- LOS E may be acceptable during peak periods in urban areas, not to exceed 4 hours per day.
- The vehicle LOS standards may be exceeded when provisions for multi-modal amenities and/or services (such as transit, bicycling, and walking facilities) are adequate to provide mobility for users at a level that is proportional to project-generated traffic in relation to overall traffic conditions on affected roadways.

Currently, TRPA does not have a specific adopted standard for unsignalized intersections.

The Shorezone Subelement of the Regional Plan contains the following policy related to navigation.

Policy SZ-1.9: The TRPA shall regulate the placement of new piers, buoys, and other structures in the foreshore and nearshore to avoid degradation of fish habitats, creation of navigation hazards, interference with littoral drift, interference with the attainment of scenic thresholds and other relevant concerns.

In addition, the Recreation Element of the Regional Plan contains the following policy related to navigation:

Policy R-2.3: Nearshore/foreshore structures should be appropriately located to minimize impacts to recreational boating and top line fishing.

Lake Tahoe Region Sustainable Communities Program

In 2014, TRPA adopted the Lake Tahoe Region Sustainable Community Strategy. The Action Plan places added emphasis on alternative modes of transportation throughout the Tahoe Region, as well as implementing complete streets in existing developed areas. The Action Plan addresses GHG reduction from cars and light trucks through implementation of the Regional Transportation Plan (below).

2017 Linking Tahoe: Regional Transportation Plan

The 2017 Regional Transportation Plan (TRPA 2017) is the transportation element of the Lake Tahoe Regional Plan. The 2017 Regional Transportation Plan's vision is a first-class transportation system that prioritizes bicycling, walking, and transit, and serves residents and visitors while contributing to the environmental and socioeconomic health of the region. Every 4 years, TRPA prepares a regional transportation plan that outlines the overall vision for developing, operating, and maintaining the Lake Tahoe region's transportation system. The 2017 Regional Transportation Plan offers strategies to reduce emissions through electric vehicle infrastructure, address the routine travel demands of residents and commuters, and address the recreational travel demands of visitors that cause congestion on Lake Tahoe's transportation system during peak periods. The Regional Transportation Plan places added emphasis on alternative modes of transportation throughout the Tahoe region, and provides incentives for transfer of development rights from more remote land to areas of existing higher development, to reduce additional transportation needs. The Regional Transportation Plan also includes proposed bicycle and transit connections to fill existing gaps; ferry service between South Lake Tahoe, Tahoe City, and Kings Beach; and a complete streets program in existing highly developed areas.

TRPA Code of Ordinances and Lake Tahoe Shoreline Plan

On October 24, 2018 (effective December 24, 2018), TRPA adopted the *Lake Tahoe Shoreline Plan*, which updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. TRPA also adopted concurrent revisions to the TRPA Code of Ordinances related to boating, and adopted an implementation program for the Shoreline Plan.

This Project is an Essential Public Safety Facility, and therefore would be processed by TRPA under Code of Ordinances Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders.

TRPA Shorezone Permitting Process

TRPA review of projects in the shorezone is governed by the Lake Tahoe Shoreline Plan (TRPA 2018) and associated amendments to the TRPA Code of Ordinances described generally above. This Project is an Essential Public Safety Facility and the CG is in the process of going through TRPA's current Shorezone Permitting Process. (See Section 1.5.4.7 for additional details.)

TRPA Thresholds

TRPA does not have established thresholds specifically for traffic and transportation, but TRPA's air quality thresholds include a standard for VMT stating that VMT should be reduced 10 percent below 1981 levels. The current status of the VMT threshold is "at or somewhat better than target."

3.11.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on transportation, traffic, and navigation in the context of NEPA, CEQA, and TRPA requirements. Where potentially significant impacts are identified, a discussion of proposed measures to mitigate those impacts is also provided.

Table 3-38 provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the transportation-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-38 Significance Determinations for the Project Alternatives (Transportation, Traffic, and Navigation)

Transportation, Traffic, and Navigation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on transportation, traffic, or navigation?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
CEQA				
Would the Project: *a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Conflict with an applicable congestion management program, including, but not limited to LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	No Impact	No Impact	No Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Result in inadequate emergency access?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
TRPA				
Will the Project result in: *a) Generation of 100 or more new Daily Vehicle Trip Ends (DVTE)?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
b) Changes to existing parking facilities, or demand for new parking?	No Impact	No Impact	No Impact	No Impact

Transportation, Traffic, and Navigation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
c) *Substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
d) *Alterations to present patterns of circulation or movement of people and/or goods?*	No Impact	No Impact	No Impact	No Impact
e) *Alterations to waterborne, rail or air traffic?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) *Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?*	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

3.11.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on transportation, traffic, or navigation?

Less-than-Significant Impact. Temporary impacts to motor vehicle traffic would occur during the construction period due to worker commute trips and truck trips for disposal of dredged material. The on-site workforce during construction is expected to be minimal (no more than 10 people on any given day) and worker commute trips would only take place during the 8-week construction period. Workers would use SR 28 and Lake Forest Drive to access the Project site. Workers would park in the Station's parking lot, and public parking would not be affected.

The proposed haul route between the Station and the Eastern Regional Landfill is shown in *Figure 3-25.* Lined trucks would transport the dredged material the 13.5 miles from the Station to the landfill, using SR 28 and 89. The in situ volume of dredged material to be removed from the lakebed would be up to 5,041 CY (including full dredging of the overdepth allowance as a conservative case). Applying a bulking factor of 40 percent to account for material expansion during dredging, this would result in approximately 7,057 CY of material that would be transported by the trucks to the landfill. Assuming a truck capacity of 15 CY, this would result in up to 470 haul trips over the 8-week dredging schedule, or up to 10 trips per day on average, assuming a 6-day work week. These trips would be spread out across the course of a work day. A small number of truck trips would also be needed to bring the new boat lift, floating dock, and other materials to the site during construction. Construction traffic would cause a minor increase in traffic on local roads. Disposal trucks and other construction traffic entering and exiting Lake Forest Road at SR 28 could also present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, but the impacts would be short term and minor. In accordance with **BMP C1-16**, dredging would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer traffic and bicycling season. Project workers and truck drivers would be required to follow all applicable traffic laws, and impacts to motor vehicle and bicycle traffic due to worker commuting and material transport would be short term and localized. In addition, a Traffic Management Plan will be prepared and implemented, in accordance with **BMP C1-23**, to minimize traffic impacts during construction.

During operation of the modified pier, the long-term effects on traffic in the local area are expected to be largely beneficial, because the CG staff will no longer have to drive to an off-site mooring location to access their rapid response boats during low-water conditions. There would be minor short-term, periodic increases in local traffic associated with worker commute and dredged material disposal trips during maintenance dredging, which would occur approximately every 10 to 15 years. It is expected that the

duration of dredging and number of disposal truck trips would be less than for the initial dredging, and maintenance dredging would use traffic control BMPs similar to those used during the initial dredging. Therefore, traffic impacts during maintenance dredging would be short term, localized, and less than significant.

Temporary impacts to navigation would occur during construction. The presence of the turbidity curtain would temporarily obstruct boaters launching from and returning to the TCPUD Lake Forest boat ramp and pier, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier. In accordance with **BMP C1-3**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. When the turbidity curtain is deployed around the northern end of the dredging footprint, it would be approximately 30 feet from the southeastern end of the TCPUD pier at its closest point. This is expected to leave enough room for boats to access the boat launch, though the rate of boat traffic through the area may be reduced as a result of boats having to slow down to navigate through the 30 feet lane. In accordance with **BMP C1-16,** dredging would occur between October 1 and May 1 to avoid the fish spawning season. This schedule would also avoid work during the peak summer boating season, minimizing impacts on recreational boaters using the piers in the Project vicinity. The proposed Project would occur on CG land, which is not accessible to the public, and therefore would have no impact on parking for recreational users at the adjacent TCPUD pier. All construction materials and equipment (with the exception of the barge and associated dredging operations), including construction worker personnel vehicles, would be stored and staged on-site on CG land. Additionally, there are several alternative public boat launch sites on the northern shore of Lake Tahoe, including the NTPUD National Avenue boat ramp in Tahoe Vista (approximately 6.6 miles from the TCPUD boat ramp), that could accommodate the temporary overflow from the TCPUD facility.

After dredging is completed, navigation in the immediate Project vicinity would be improved due to the increased depth of the approach channel to the CG and TCPUD facilities. The proposed dredging for Alternative 1 would complement the maintenance dredging that was recently completed at the TCPUD facility, providing increased depth for boaters throughout the area between the CG and TCPUD piers. The addition of the 8-foot-wide boat lift and floating dock to the western side of the CG pier would not interfere with boaters using the TCPUD facility. In addition, Alternative 1 would enhance the CG's ability to provide emergency search and rescue and other public safety services to the boating public and agencies that use Lake Tahoe, thereby improving navigational safety. There would be short-term periodic disruptions to boat traffic in the immediate Project Area during maintenance dredging. It is expected that the duration of dredging would be less than for the initial dredging, and maintenance dredging would use similar BMPs to those used during the initial dredging to minimize navigational impacts. Impacts to navigation during maintenance dredging would be short term, localized, and less than significant.

In summary, Alternative 1 would have a less-than-significant adverse impacts on traffic, transportation, and navigation from the perspective of NEPA with implementation of the BMPs discussed above, and in the long term Alternative 1 would have largely beneficial impacts on traffic and navigation.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Less-than-Significant Impact. Alternative 1 would not conflict with the goals and policies of the TRPA Regional Plan or Regional Transportation Plan (RTP) or other applicable plans, ordinances, or policies

establishing measures of effectiveness for the performance of the circulation system. Alternative 1 would have minor impacts on traffic and bike path users during construction and periodic maintenance dredging, but these impacts would be short term, temporary, and less than significant. Traffic impacts would also be minimized by implementation of **BMP C1-16,** which would schedule construction outside of the peak traffic and bicycling season, and **BMP C1-23,** which would require implementation of a Traffic Management Plan during construction. Similar BMPs would be implemented during maintenance dredging.

b) Conflict with an applicable congestion management program, including, but not limited to LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Less-than-Significant Impact. Alternative 1 would increase traffic volumes during construction due to worker commuting and truck traffic (up to approximately 20 round trips per day). The peak increase in traffic would occur as a result of worker commute trips (up to 10 round trips per day) which could occur during the peak commute periods; the remaining disposal trips (up to 10 round trips per day) would be spread out across the course of the day and are not expected to substantially increase traffic volumes. When compared to the peak hour traffic numbers shown in *Table 3-35*, which range from 1,350 to 1,750 trips depending on the road segment, the peak worker commute traffic for Alternative 1 represents less than 1 percent of the total. The increase in traffic would also be limited to the 8-week construction period. Although portions of the local road network are currently operating below the TRPA's LOS standards, Project traffic is not expected to further degrade the LOS of affected roadways and intersections during construction. Traffic impacts would also be minimized by implementation of **BMP C1-16,** which schedules construction outside of the peak summer traffic season, and **BMP C1-23,** which requires implementation of a Traffic Management Plan during construction,

In the long term, Alternative 1 would have a beneficial impact on traffic levels in the Project vicinity by eliminating the need for CG staff to drive to an off-site mooring location to access their rapid response boats during low-water conditions or to transport the boats between the Station and the off-site mooring location when water levels change.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. There are no airports in the Project vicinity, the proposed Project would not involve air travel or activities that would interfere with air traffic. Therefore, Alternative 1 would have no impact on air traffic patterns.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less-than-Significant Impact. Alternative 1 would not involve construction of new roads or changes to the design features of current roads. During construction, Alternative 1 would create a temporary navigation hazard by obstructing a portion of the approach to the TCPUD Lake Forest boat ramp and pier, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier, but these impacts will be temporary and short-term. In accordance with **BMP C1-3**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. A minimum 30-foot lane of travel would be maintained between the turbidity curtain and the adjacent TCPUD pier. In accordance with **BMP C-16**, dredging would take place during the low season for boating activity, and the level of navigation hazard would be less than significant. In the long term, Alternative 1 would improve the design features of the CG pier and reduce navigation hazards in the Project Area. For these reasons, Alternative 1 would have less-than-significant impacts related to substantially increasing hazards due to a design feature or incompatible use.

e) Result in inadequate emergency access?

Less-than-Significant Impact. During construction, equipment and material would be staged in centralized locations that would not interfere with emergency access in upland areas. Because the CG is not currently able to keep their response boats at the Station pier during periods of low water levels, the occurrence of construction work around the pier will not further limit the CG's access for emergency response. Worker parking and truck loading and traffic will be managed as part of the Traffic Management Plan to be prepared in accordance with **BMP C1-23** to avoid impeding emergency access to the Station and/or the CG's ability to drive offsite to the Tahoe City Marina to access their emergency response boats during construction. In the long run, the proposed Project would improve emergency access to the pier and the CG's ability to provide emergency response services to the boating public and agencies that use Lake Tahoe. In summary, Alternative 1 would have less-than-significant adverse impacts on emergency access and would improve emergency access in the long term.

f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less-than-Significant Impact. Alternative 1 would not conflict with policies of the Regional Plan, RTP, or other planning documents related to public transit or bicycle or pedestrian facilities. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, but the impacts would be short term and minor. In accordance with **BMP C1-16**, dredging would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer bicycling season. In addition, **BMP C1-23** would require preparation of a Traffic Management Plan that would address potential conflicts with public transit, bicycle, and pedestrian traffic during construction. With implementation of this measure, Alternative 1 would have less-than-significant impacts related to conflicting with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreasing the performance or safety of such facilities.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Generation of 100 or more new DVTE?

Less-than-Significant Impact. TRPA determines a project's potential effects on DVTE by looking at long-term changes to land use and the amount of new gross floor area added for commercial and residential development. Alternative 1 would not involve commercial or residential development or any long-term changes in land use or increases in gross floor area or DVTE. During construction, there would be a temporary increase in traffic due to worker commuting and truck trips, but these would be no more than 20 total daily round trips, equivalent to 40 DVTE, during the 8-week construction period. In the long term, the proposed Project is expected to reduce traffic in the Project Area, because CG staff will no longer have to drive to an off-site mooring location to access their boats during low-water conditions, or to transport the boats between the Station and the off-site mooring location when water levels change.

b) Changes to existing parking facilities, or demand for new parking?

No Impact. Alternative 1 would not involve changes to existing parking facilities or demand for new parking. During construction, the small number of workers would park in the existing Station parking lot, and no long-term changes in parking would occur.

c) Substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities?

Less-than-Significant Impact. The Project would not have a long-term impact on existing transportation systems. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, but the impacts would be short term and minor. In accordance with **BMP C1-16**, dredging would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer traffic and bicycling season. In addition, **BMP C1-23** would require preparation of a Traffic Management Plan that would address potential bicycle and pedestrian traffic conflicts during construction. With implementation of this measure, Alternative 1 would have less-than-significant impacts on existing transportation systems, including highway, transit, bicycle or pedestrian facilities.

d) Alterations to present patterns of circulation or movement of people and/or goods?

No Impact. Alternative 1 does involve changes to present patterns of circulation or movement of people and/or goods.

e) Alterations to waterborne, rail, or air traffic?

Less-than-Significant Impact. Alternative 1 would not alter rail or air traffic. There may be some minor alterations to waterborne traffic emanating from the TCPUD Lake Forest boat ramp and pier, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier, during construction. These alterations to waterborne traffic will be temporary and short-term. In accordance with **BMP C1-3**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. A minimum 30-foot lane of travel would be maintained between the turbidity curtain and the adjacent TCPUD pier. In accordance with **BMP C-16**, dredging would take place during the low season for boating activity, and the level of alteration of waterborne traffic during construction would be less than significant. In the long term, Alternative 1 would improve navigation in the Project Area and would not result in adverse alterations to waterborne traffic.

The Project would involve removing the existing boat lift and replacing it with a slightly larger boat lift on the western side of the pier head and installing a floating dock to be used by visiting vessels on an occasional basis during the course of emergency response and law enforcement activities. The number of response boats assigned to the Station would remain unchanged, and boating capacity will not be increased. Furthermore, the Project is an Essential Public Safety Facility and therefore would be processed by TRPA under Code of Ordinances Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders.

In summary, Alternative 1 would not significantly alter waterborne, rail, or air traffic.

f) Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?

Less-than-Significant Impact. The Project would not have long-term impacts related to traffic hazards to motor vehicles, bicyclists, or pedestrians. Construction traffic entering and exiting Lake Forest Road at SR 28 could affect users of the Class I bicycle trail that runs along the southern side of SR 28, as well as motorists using local roads, but the impacts would be short term and minor. In accordance with **BMP C1-16**, dredging would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer bicycling and driving season. In addition, **BMP C1-23** would require preparation of a Traffic Management Plan that would address potential conflicts with motor vehicle, bicycle, and pedestrian traffic during construction. With implementation of this measure, Alternative 1 would have less-than-significant impacts related to increases in traffic hazards to motor vehicles, bicyclists, or pedestrians.

3.11.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on transportation, traffic, or navigation?

Less-than-Significant Impact. Temporary impacts to motor vehicle traffic would occur during the construction period due to worker commute trips and material deliveries. The required on-site work force during construction is expected to be minimal (no more than 10 people on any given day) and worker commute trips would only take place during the 7 weeks that construction would take place. Workers would use SR 28 and Lake Forest Drive to access the Project site. Workers would park in the Station parking lot and public parking would not be affected. Alternative 2 would also include truck trips for material deliveries, though the number of trips is expected to be substantially less than those needed for dredged material disposal under Alternative 1. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, but the impacts would be short term and minor. In accordance with **BMP C2-13**, construction would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer traffic and bicycling season. Project workers and truck drivers would be required to follow all applicable traffic laws, and the traffic impacts from worker commuting and material deliveries would be temporary and short-term. In addition, a Traffic Management Plan would be implemented, in accordance with **BMP C2-20**, to minimize traffic impacts during construction.

During operation of the modified pier, the long-term effects on motor vehicle traffic are expected to be beneficial, because the CG staff will no longer have to drive to an off-site mooring location to access their rapid response boats or transport their boats between the off-site location and the Station when water levels change.

Temporary impacts to navigation would occur during construction. The presence of the turbidity curtain would partially obstruct boaters launching from and returning to the TCPUD boat ramp and pier, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier. In accordance with **BMP C2-1**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. When the turbidity curtain is deployed around the northern end of the construction area, it would be approximately 80 feet from the southeastern end of the TCPUD pier at its closest point, providing sufficient space for boaters to navigate through the area. Boaters would also have to navigate around the end of the construction area for the dog-leg portion of the pier extension. The rate of boat traffic through the area would be reduced as a result of boats having to slow down to go around the extension. In accordance with **BMP C2-13,** construction would occur between October 1 and May 1 to avoid the fish spawning season. This timing would also avoid work during the peak summer boating season, thereby minimizing impacts.

After construction is completed, boaters would continue to have to navigate around the dog-leg pier head. However, navigation would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing the speed of boaters entering and exiting the TCPUD boat ramp area and guiding boaters away from submerged hazards and into the boat ramp area. The pier extension would be clearly marked and lit to avoid collisions and guide boaters into the boat ramp area at night. In addition, Alternative 2 would enhance the CG's ability to fulfill their mission to provide search and rescue and public safety services to the boating public and agencies that use Lake Tahoe, thereby improving navigational safety.

In summary, with implementation of the BMPs discussed above, Alternative 2 would have a less-than-significant adverse impacts on traffic, transportation, and navigation from the perspective of NEPA.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) *Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?*

Less-than-Significant Impact. Alternative 2 would not conflict with the goals and policies of the TRPA Regional Plan or RTP. Alternative 2 would have minor impacts to traffic and bicycling trail use during construction due to construction traffic, but these impacts would be short term, temporary, and less than significant. Traffic impacts would also be minimized by implementation of **BMPs C2-13,** which schedules construction outside of the peak traffic and bicycling season, and **BMP C2-20,** which requires implementation of a Traffic Management Plan during construction.

b) *Conflict with an applicable congestion management program, including, but not limited to LOS standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*

Less-than-Significant Impact. Alternative 2 would cause a minor increase in traffic volumes during construction due to worker commuting (up to 10 round trips per day) and minimal truck traffic for material deliveries. When compared to the peak hour traffic numbers shown in *Table 3-35*, which range from 1,350 to 1,750 trips depending on the road segment, the peak worker commute traffic for Alternative 2 represents less than 1 percent of the total. The increase in traffic would also be limited to the 7-week construction period. Although portions of the local road network are currently operating below the TRPA's LOS standards, Project traffic is not expected to further degrade the LOS of affected roadways and intersections during construction. Traffic impacts would also be minimized by implementation of **BMPs C2-13,** which schedules construction outside of the peak traffic and bicycling season, and **BMP C2-20,** which requires implementation of a Traffic Management Plan during construction,

In the long term, Alternative 2 would have a beneficial impact on traffic levels in the Project vicinity by eliminating the need for CG staff to drive to an off-site mooring location to access their rapid response boats during low-water conditions or to transport the boats between the Station and the off-site mooring location when water levels change.

c) *Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?*

No Impact. There are no airports in the Project vicinity, the proposed Project would not involve air travel or activities that would interfere with air traffic. Therefore, Alternative 2 would have no impact on air traffic patterns.

d) *Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

Less-than-Significant Impact. Alternative 2 would not involve construction of new roads or changes to the design features of current roads. Alternative 2 would partially obstruct the ingress and egress route from the TCPUD boat ramp, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier, both during and after construction. In accordance with **BMP C2-1**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. Navigation would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing boater speed and guiding boaters away from submerged hazards and into the TCPUD boat ramp area. The pier extension would be clearly marked and lit to avoid collisions and guide boaters into the boat ramp area at night. In addition, Alternative 2 would enhance the CG's ability to fulfill their mission to provide search and rescue and public safety services to the boating public and

agencies that use Lake Tahoe. For these reasons, Alternative 2 would have less-than-significant adverse impacts related to increased hazards due to design features or incompatible uses.

e) Result in inadequate emergency access?

Less-than-Significant Impact. During construction, equipment and material would be staged in centralized locations on CG property that would not interfere with emergency access in upland areas. Because the CG is not currently able to keep their response boats at the Station pier due to low water, the occurrence of construction work around the pier will not further limit the CG's access for emergency response. Worker parking and traffic will be managed as part of the Traffic Management Plan to be prepared in accordance with **BMP C2-20** to avoid impeding emergency access to the Station and/or the CG's ability to drive offsite to the Tahoe City Marina to access their emergency response boats during construction. In the long run, the proposed Project would improve emergency access to the pier and the CG's ability to provide emergency response services to the boating public and agencies that use Lake Tahoe. In summary, Alternative 2 would have less-than-significant adverse impacts on emergency access and would improve emergency access in the long term.

f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Less-than-Significant Impact. Alternative 2 would not conflict with policies of the Regional Plan, RTP, or other planning documents related to public transit or bicycle or pedestrian facilities. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, but the impacts would be short term and minor. In accordance with **BMP C2-13**, construction would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer bicycling season. In addition, **BMP C2-20** would require preparation of a Traffic Management Plan that would address potential conflicts with public transit, bicycle, and pedestrian traffic during construction. With implementation of this measure, Alternative 2 would have less-than-significant impacts related to conflicting with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreasing the performance or safety of such facilities.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Will the Project result in:

a) Generation of 100 or more new DVTEs?

Less-than-Significant Impact. TRPA determines a project's potential effects on DVTE by looking at long-term changes to land use and the amount of new gross floor area added for commercial and residential development. Alternative 2 would not involve commercial or residential development or any long-term changes in land use or increases in gross floor area or DVTE. During construction, there would be a temporary increase in traffic due to worker commuting and minimal truck trips for material deliveries, but these would result in substantially less than 100 DVTE during the 7-week construction period. In the long term, the proposed Project is expected to have a beneficial impact on traffic in the Project Area, because CG staff will no longer have to drive to an off-site mooring location to access their boats in low-water conditions or to transport the boats between the Station and the off-site mooring location when water levels change.

b) Changes to existing parking facilities, or demand for new parking?

No Impact. Alternative 2 would not involve changes to existing parking facilities or demand for new parking. During construction, the small number of workers on site would park in the existing Station parking lot, and no long-term changes in parking would occur.

c) Substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities?

Less-than-Significant Impact. The Project would not have a long-term impact on existing transportation systems. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that runs along the southern side of SR 28, and construction traffic would cause minor increases in traffic volumes on local roads, but these impacts would be short term and minor. In accordance with **BMP C2-13**, construction would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer traffic and bicycling season. In addition, **BMP C2-20** would require preparation of a Traffic Management Plan that would address potential motor vehicle, bicycle, and pedestrian traffic conflicts during construction. With implementation of this measure, Alternative 2 would have less-than-significant impacts on existing transportation systems, including highway, transit, bicycle or pedestrian facilities.

d) Alterations to present patterns of circulation or movement of people and/or goods?

No Impact. Alternative 2 does involve changes to present patterns of circulation or movement of people and/or goods.

e) Alterations to waterborne, rail, or air traffic?

Less-than-Significant Impact. Alternative 2 would not alter rail or air traffic. Alternative 2 would partially obstruct the ingress and egress route from the TCPUD Lake Forest boat ramp and pier, and to a lesser extent the Star Harbor channel/pier and Saint Francis Lakeside pier, both during and after construction. In accordance with **BMP C2-1**, the disturbance area will be limited to the minimum required to complete the proposed Project, thereby reducing the potential obstruction of boaters. Navigation would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing boater speed and guiding boaters away from submerged hazards and into the TCPUD boat ramp area. The pier extension would be clearly lit and marked to avoid collisions and guide boaters into the boat ramp area at night. In addition, Alternative 2 would enhance the CG's ability to fulfill their mission to provide search and rescue and public safety services to the boating public and agencies that use Lake Tahoe. For these reasons, Alternative 2 would have less-than-significant impacts related to alteration of waterborne traffic.

The Project would involve replacing the existing boat lift with a slightly larger one at the new pier head and adding a floating dock for use by visiting vessels on an occasional basis during the course of emergency response and law enforcement activities. The number of response boats currently kept at the Station would remain unchanged, and therefore boating capacity will not be increased. Furthermore, the Project is an Essential Public Safety Facility and therefore would be processed by TRPA under Code of Ordinances Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders.

In summary, Alternative 2 would not significantly alter waterborne, rail, or air traffic.

f) Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?

Less-than-Significant Impact. The Project would not have a long-term impacts related to traffic hazards to motor vehicles, bicyclists, or pedestrians. Construction traffic entering and exiting Lake Forest Road at SR 28 could present a potential hazard and annoyance to users of the Class I bicycle trail that crosses Lake Forest Road at that intersection, and construction traffic would have minor effects on users of local roads, but the impacts would be short term and minor. In accordance with **BMP C2-13**, construction would occur between October 1 and May 1 to avoid the fish spawning season, and this would also avoid work during the peak summer traffic and bicycling season. In addition, **BMP C2-20** would require preparation of a Traffic Management Plan that would address potential bicycle and pedestrian traffic conflicts during construction. With implementation of this measure, Alternative 2 would have less-than-significant impacts related to increases in traffic hazards to motor vehicles, bicyclists, or pedestrians.

3.11.3.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact. Alternative 3 would have similar impacts on traffic, transportation, and navigation as Alternative 2. Construction would occur over 8 weeks rather than 7, increasing the duration of construction-related impacts slightly. In addition, the fact that the pier will be 100 feet longer would likely result in a slightly higher number of material delivery trips. The size of the workforce for Alternative 3 would be the same as for Alternative 2, and the traffic effects of worker commute trips would be minimal. **BMPs C2-13** and **C2-20** would be implemented to reduce the effects of construction-related traffic. Although construction-related traffic impacts would be slightly greater for Alternative 3 than for Alternative 2, these impacts would still be temporary, short-term, and less than significant. As with Alternative 2, Alternative 3 would have a long-term beneficial effect on traffic, because the CG staff will no longer have to drive to an off-site mooring location to access their boats during low-water conditions or to transport the boats between the Station and the off-site mooring location when water levels change.

The straight configuration and longer length of the pier extension for Alternative 3 would influence to some extent the proposed Project's impacts to local navigation during construction and operation of the proposed Project. Boaters exiting straight out of the TCPUD boat ramp facility would not have to negotiate around the dog-leg pier extension but would have to navigate out another 100 feet to go east from the area. Similar to Alternative 1, during construction the turbidity curtain would be approximately 80 feet from the TCPUD pier at its closest point, providing sufficient room for boaters to navigate through the area. In general, navigation would not be significantly obstructed by Alternative 2, and the pier extension would have the benefit of improving navigational safety by reducing boater speed and guiding boaters away from submerged hazards and into the TCPUD boat ramp area. The pier extension would be clearly marked to avoid collisions and guide boaters into the boat ramp area at night. In addition, Alternative 3 would enhance the CG's ability to fulfill their mission to provide search and rescue and public safety services to the boating public and agencies that use Lake Tahoe, thereby improving navigational safety.

In summary, Alternative 3 would have less-than-significant impacts on traffic, transportation, and navigation with implementation of **BMPs C2-13** and **C2-20**.

3.11.3.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or construction would take place, and no construction-related traffic, transportation, or navigation impacts would occur. Operations would continue unchanged, and therefore Alternative 4 would be no impacts relative to baseline conditions. However, the Station staff would continue to have to drive to an off-site mooring location to access their boats during low-water conditions and to transport the boats between the Station and the off-site mooring location when water levels change. Response times would continue to be adversely affected, thereby affecting navigational safety and emergency response in Lake Tahoe.

3.12 Utilities and Service Systems

The following sections provide a general discussion of the affected environment, environmental regulations, and potential Project impacts related to utilities and service systems. Because the only resource in this topic area that would potentially be affected by the proposed Project is solid waste disposal services, solid waste disposal is the primary focus of the following discussion, although other utilities and service systems are also discussed briefly.

3.12.1 Affected Environment

3.12.1.1 Water, Wastewater, and Stormwater

The TCPUD provides potable water and sanitary sewer services in the Project vicinity. The TCPUD's service area encompasses over 31 square miles in both Placer and El Dorado Counties, extending from Emerald Bay to Dollar Hill, and along the Truckee River to the Nevada County line. The TCPUD serves approximately 4,190 water customers and 7,540 sewer customers. Water service is split into five separate water system areas; the Project Area is in the Tahoe City service area. TCPUD provides approximately

1 billion gallons of water yearly to the Tahoe City area. The TCPUD's potable water sources include both treated surface water and groundwater from wells and springs. Water in the Tahoe City service area comes from five groundwater wells. The TCPUD currently has only one active surface water intake, at Chambers Landing, approximately 7.5 miles south-southeast of the Project Area. The TCPUD has two inactive (i.e., emergency stand-by) intakes in the Project vicinity: one at Grove Street, Tahoe City, and one at Dollar Point. There are also numerous private surface water intakes around Lake Tahoe. No active private or public surface water intakes are known to occur in close proximity to the Project Area. According to engineering drawings of the Station, an inactive, abandoned private water intake line runs along the western side of the Station pier; a portion of this intake line may need to be removed if dredging is conducted in the area under Alternative 1.

The TCPUD is a member district of the Tahoe-Truckee Sanitation District (TTSA), which is responsible for sewage treatment and disposal in the local area. Strict water quality standards for discharging effluent into Lake Tahoe require that all sewage collected by the TCPUD be piped out of the Lake Tahoe Basin. Wastewater from the District is treated at the TTSA water reclamation plant in Truckee, which has a treatment capacity of 9.6 million gallons per day.

In 2003, the CG conducted a project to improve the stormwater collection system at the Station and to install additional permanent stormwater BMPs. Formerly, stormwater at the Station drained directly into Lake Tahoe. As a result of the improvements made in 2003, stormwater from paved areas at the Station is collected via curbs and drop inlets and then piped to a sand-oil separator prior to discharge to Lake Tahoe. The 2003 stormwater improvements also included removing straw bales, paving areas where equipment storage and vehicle parking occurred, adding a layer of drain rock under all raised decks, and planting vegetation or placing drain rock under all building drip lines. In December 2007, TRPA staff inspected the Station and found it to be in compliance with TRPA's stormwater BMP requirements and permit conditions. The final BMP inspection letter from TRPA is included in *Appendix M*.

3.12.1.2 Solid Waste Disposal

Solid waste from eastern Placer County is collected by Tahoe Truckee Sierra Disposal and processed at the Eastern Regional MRF. The MRF is on property owned by Placer County on Cabin Creek Road just west of SR 89, approximately halfway between Truckee and Squaw Valley. The County contracts with Eastern Regional Sanitary Landfill, Inc. (ERSL) to conduct the day-to-day operations and maintenance of the MRF. ERSL accepts solid waste from the region at the MRF and sorts it to meet California's solid waste diversion requirements. The MRF has permitted capacity to receive 800 tons of material per day and in 2014 received an average of 201 tons per day. Therefore, the remaining capacity of the facility is 599 tons per day on average. The 65-acre landfill portion of the Eastern Regional facility closed in 1995 and no longer accepts waste, though inert materials (e.g., soil and rock) are still processed on site. Inert material collected at the MRF is assessed for content by a technician and then separated out either for resale (e.g., as fill dirt or topsoil) or for use on site as working base or as fill/groundcover in a 32-acre on-site land remediation area. The MRF also receives, separates, processes, and markets recyclable materials removed from the waste stream.

Non-recyclable, non-hazardous materials received at the MRF are sent to the Lockwood Regional Landfill in Lockwood, Nevada. The Lockwood Regional Landfill is permitted to accept municipal and industrial solid waste and construction and demolition debris. The Lockwood Regional Landfill receives approximately 5,000 tons of waste per day and has a total maximum permitted capacity of 302.5 million CY, of which approximately 269.7 million CY remains available (NDEP 2014).

The results of on-site sediment testing indicated that although COCs are not present at levels that exceed any human health or environmental thresholds, and therefore are not considered hazardous wastes, the amounts of TPH in the diesel and residual range in the sediment sample as well as dissolved concentrations of arsenic and lead in the elutriate sample were slightly above the criteria for acceptance at the MRF in Truckee (AECOM Technical Services 2016). Because of the only very slight exceedance of the Truckee MRF criteria, that facility may still be able to accept the dredged materials. If not, the waste would be transported to a licensed hazardous waste facility such as the Buttonwillow Landfill, in Kern County and

owned and operated by Clean Harbors, Inc. The 320-acre Buttonwillow Landfill has a total maximum permitted capacity of 14.3 million CY, an available capacity of approximately 13.3 million CY, and an anticipated closure date of 2040 (California Department of Resources Recycling and Recovery 2013, Clean Harbors Buttonwillow, LLC, 2008).

3.12.1.3 Other Utilities

Liberty Energy provides electrical services in the Project vicinity. Southwest Gas Corporation provides natural gas services. The Project Area is in AT&T's telecommunications service area. There are no known public utility lines in the areas that would potentially be disturbed by the proposed Project Alternatives.

3.12.2 Regulatory Setting

Federal and state laws and regulations pertaining to utilities and service systems and relevant to the proposed Project are identified in *Table 3-39.*

Table 3-39 Federal and State Laws, Regulations, and Policies Potentially Applicable to the Project (Utilities and Service Systems)

Jurisdiction	Regulation	Description
U.S.	Criteria for Solid Waste Landfills (40 CFR 258)	Contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the federal landfill criteria. The federal regulations address the locations, operation, design, groundwater monitoring, and closure of landfills.
U.S.	RCRA (40 CFR 260 et. seq. and 42 USC 6901 et seq.)	RCRA provides the basic framework for federal regulation of both hazardous and non-hazardous waste. Establishes requirements and standards for the treatment, storage, and disposal of hazardous wastes.
U.S.	1984 RCRA Amendments (40 CFR 260-279)	Establishes state responsibility for regulating non-hazardous wastes and controls the generation, transportation, storage and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements.
U.S.	USDOT Regulations (49 CFR 172, 173, 179)	USDOT provides standards for labeling and packaging of hazardous waste shipments and for training of personnel completing shipping papers.
CA	California Integrated Waste Management Act (AB 939, 1989; PRC 40000 et seq.)	Contains regulations affecting solid waste disposal in California and requires that cities and counties reduce the amount of solid waste disposed in landfills through source reduction, reuse, recycling, and composting.
CA	Hazardous Waste Control Act of 1972 (22 CCR 66260.1 et seq.)	Describes hazardous waste generator requirements.
CA	California Health and Safety Code 25100 et seq.; 22 CCR 66001 et seq.	Describes management of hazardous waste; characterization, storage, transport and disposal of hazardous waste.
CA	California Government Code 4216 et seq.	Protects utility infrastructure from damage from construction activities. Contractors are required to notify and coordinate with Underground Services Alert (USA) at least 2 days before beginning ground-disturbing construction activities to determine whether underground utilities are present.
CA	Other CCR Sections	Title 23, Chapter 15, and Title 27, Chapter 3 of CCR regulate disposal of materials in landfills. The RWQCBs issue permits to each landfill that define testing requirements and acceptability criteria for material to be disposed.

3.12.2.1 Tahoe Regional Planning Agency

TRPA Regional Plan

The Water Quality Subelement and the Public Services and Facilities Element of the TRPA Regional Plan (TRPA 2012) include the following goals and policies applicable to utilities and service systems in the Lake Tahoe region:

Policy WQ-2.4: No person shall discharge solid wastes in the Lake Tahoe region by depositing them on or in the land, except as provided by TRPA ordinance.

Goal PS-2: Consider the existence of adequate and reliable public services and facilities in approving new development under the Regional Plan.

Goal PS-3: Prevent liquid and solid wastes from degrading Lake Tahoe and the surface and groundwaters of the region.

Policy PS-3.2: All solid wastes shall be exported from the region. Consolidation and transfer methods shall be developed to achieve a reduction in the volume of wastes being transported to landfills.

TRPA Code of Ordinances

The TRPA Code of Ordinances also contains regulations that are applicable to the analysis of utilities and service systems:

Chapter 32, “Basic Services,” establishes requirements for projects to be served by paved roads and water, electrical, and wastewater treatment services and establishes standards to implement those requirements.

Section 60.3, “Source Water Protection,” sets regulations pertaining to recognition of source water, prevention of contamination to source water, and protection of public health related to drinking water. It strengthens provisions of the TRPA Goals and Policies that address groundwater protection, and implements elements of the TRPA Source Water Protection Program.

3.12.3 Environmental Impacts and Mitigation Measures

The following sections describe the potential impacts of the proposed Project Alternatives on utilities and service systems in the context of NEPA, CEQA, and TRPA requirements. *Table 3-40* provides a summary of the impact significance determinations for the various Project Alternatives for NEPA and for each of the utilities and service systems-related questions from the CEQA and TRPA checklists. A detailed discussion of the impacts for each alternative is provided in the following sections.

Table 3-40 Significance Determinations for the Project Alternatives (Utilities and Service Systems)

Utilities and Service Systems	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
NEPA				
Would the Project have a significant impact on utilities and service systems?	Less-than-Significant Impact	No Impact	No Impact	No Impact
CEQA				
Would the Project: *a) Exceed wastewater treatment requirements of the applicable RWQCB?*	No Impact	No Impact	No Impact	No Impact

Utilities and Service Systems	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	No Impact	No Impact	No Impact	No Impact
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	No Impact	No Impact	No Impact	No Impact
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	No Impact	No Impact	No Impact	No Impact
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	No Impact	No Impact	No Impact	No Impact
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	Less-than-Significant Impact	No Impact	No Impact	No Impact
g) Comply with federal, state, and local statutes and regulations related to solid waste?	No Impact	No Impact	No Impact	No Impact
TRPA				
Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to the following utilities: *a) Power or natural gas?*	No Impact	No Impact	No Impact	No Impact
b) Communication systems?	No Impact	No Impact	No Impact	No Impact
c) Utilize additional water which amount will exceed the maximum permitted capacity of the service provider?	No Impact	No Impact	No Impact	No Impact
d) Utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider?	No Impact	No Impact	No Impact	No Impact
e) Stormwater drainage?	No Impact	No Impact	No Impact	No Impact
f) Solid waste and disposal?	Less-than-Significant Impact	No Impact	No Impact	No Impact

3.12.3.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

NEPA Analysis

Would the Project have a significant impact on utilities and service systems?

Less-than-Significant Impact. The impacts of Alternative 1 on utilities and service systems would be largely limited to impacts on solid waste services related to the disposal of dredged material. Alternative 1 would involve the dredging of between 2,656 and 5,041 CY of dredged material (the upper limit represents a worst case that includes dredging of the full 2-foot overdepth allowance). Applying a bulking factor of 40 percent to account for the material expansion during excavation and handling, this would result in approximately 3,720 to 7,060 CY of material to be disposed. This volume of material would weigh roughly 5,600 to 10,600 tons, assuming an average density of 1.5 tons per CY. The dredged material would be transported either to the Eastern Regional MRF or to the Buttonwillow Landfill. The MRF has permitted capacity to receive 800 tons of material per day and currently receives approximately 201 tons per day on average. During the 8-week dredging period, an average of roughly 100 to 189 tons of material a day would be taken to the MRF. This amount would comprise roughly 17 percent to 32 percent of the MRF's excess daily capacity. Therefore, even assuming the worst case that the full overdepth allowance is dredged, the MRF would have sufficient capacity to receive the solid waste generated during dredging.

Materials received at the MRF are sorted to meet California's solid waste diversion requirements. Inert material, such as soil and rock, is assessed for content by a technician and then separated out either for resale (e.g., as fill dirt) or for reuse on site as working base or as fill in a 32-acre on-site land remediation area. If the dredged material from the Project is not deemed suitable for resale, it is expected that the Eastern Regional Landfill would have capacity to re-use it on site. In the unlikely event that the Eastern Regional MRF cannot sell or re-use the dredged material, then the material would likely be transported to the Lockwood Regional Landfill, which has an available capacity of approximately 269.7 million CY (NDEP 2014).

In accordance with **BMP C1-1,** if the MRF is unable to accept the dredged material, it would be disposed of at a licensed hazardous waste facility, such as the Buttonwillow Landfill, in accordance with federal and state requirements. The Buttonwillow Landfill has an available capacity of approximately 13.3 million CY, and thus would easily be able to accommodate Alternative 1's potential hazardous waste disposal needs (California Department of Resources Recycling and Recovery 2013; Clean Harbors Buttonwillow, LLC, 2008).

The impacts of Alternative 1 on solid waste disposal would be largely limited to the construction period, and operation of the modified pier would generally not affect utilities or service systems. Periodic maintenance dredging, expected to occur every 10 to 15 years, would require disposal of dredged material. The volume and weight of material to be disposed of during maintenance dredged is likely to be less than the material disposed of during the initial dredging. Maintenance would only occur infrequently and is not expected to exceed the capacity of local solid waste disposal facilities.

Alternative 1 would have only minimal effects on other utilities and service systems. There are no known public utility lines in the proposed dredging area, and the TCPUD has been contacted to confirm that no TCPUD water or wastewater lines are in the Project disturbance area. In accordance with **BMP C1-2**, the construction contractor will take standard measures (e.g., notifying USA) to confirm that there are no other subsurface utilities in the dredging area prior to the start of work. A portion of the abandoned private water intake line to the west of the pier may need to be removed prior to dredging, but this would have no effect on public water service. As discussed in Section 3.8, *Hydrology and Water Quality*, various water quality BMPs would be implemented to avoid and minimize impacts to surface waters that are used as a public drinking water source, and no known active water intakes are close to the Project Area. In accordance with **BMP C1-9**, temporary stormwater BMPs will be implemented during construction to avoid impacts to the Station's stormwater system.

Alternative 1 would involve the use of only minimal amounts of electricity and no natural gas. Existing on-site power could be used for some applications, but portable generators would likely be used for powering the conveyor system. In accordance with **BMP C1-20,** the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, or natural gas) generators for temporary power rather than diesel power generators. Alternative 1 would have no adverse effects on communications systems. Alternative 1 would not involve new development that would require construction of additional utility infrastructure or exceed the capacity of existing utilities or service systems.

In summary, it is anticipated that there would be sufficient permitted capacity at existing landfills to accommodate solid waste disposal needs for Alternative 1, and the impacts of Alternative 1 on solid waste services would be temporary and less than significant. Alternative 1 would have no significant adverse impacts on other utilities and service systems. Therefore, Alternative 1's overall impacts on utilities and service systems would be less than significant.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Exceed wastewater treatment requirements of the applicable RWQCB?

No Impact. Alternative 1 would not include any new development that would generate new sources of wastewater requiring wastewater treatment. Project construction would only require a small work crew that would use existing on-site or temporary portable sanitary facilities. There are no known wastewater lines in the proposed dredging area, and in accordance with **BMP C1-2**, the construction contractor will take standard measures (e.g., notifying USA) to confirm that there are no subsurface utilities in the dredging area prior to the start of work.

In summary, Alternative 1 would not result in wastewater discharges that would exceed the LRWQCB's treatment requirements, and no impact to wastewater treatment systems would occur. Other applicable LRWQCB discharge and water quality requirements not related to wastewater treatment systems are discussed in *Section 3.8, Hydrology and Water Quality*.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Alternative 1 would not require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities. No impact would occur.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Alternative 1 would not result in the construction of new stormwater drainage facilities or expansion of existing facilities. In accordance with **BMP C1-9**, temporary stormwater BMPs will be implemented during construction to avoid impacts to the Station's stormwater system.

d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?

No Impact. Alternative 1 would involve the use of only negligible amounts of water, and therefore no new or expanded entitlements are needed.

e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

No Impact. Alternative 1 would not result in the need for increased wastewater treatment services, and therefore would have no impact on the capacity of local wastewater treatment providers.

f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?

Less-than-Significant Impact. Alternative 1 would involve the dredging of between 2,656 and 5,041 CY of dredged material (the upper limit represents a worst case that includes dredging of the full 2-foot overdepth allowance). Applying a bulking factor of 40 percent to account for the material expansion during excavation and handling, this would result in approximately 3,720 to 7,060 CY of material to be disposed. This volume of material would weigh roughly 5,600 to 10,600 tons, assuming an average density of 1.5 tons per CY. The dredged material may be transported to the Eastern Regional MRF. The MRF has permitted capacity to receive 800 tons of material per day and currently receives approximately 201 tons per day on average. During the 8-week dredging period, an average of roughly 100 to 189 tons of material a day would be taken to the MRF. This amount would comprise roughly 17 percent to 32 percent of the MRF's excess daily capacity. Therefore, even assuming the worst case that the full overdepth allowance is dredged, the MRF would have sufficient capacity to receive the solid waste generated during dredging.

Materials received at the MRF are sorted to meet California's solid waste diversion requirements. Inert material, such as soil and rock, is assessed for content by a technician and then separated out either for resale (e.g., as fill dirt) or for reuse on site as working base or as fill in a 32-acre on-site land remediation area. If the dredged material from the Project is not deemed suitable for resale, it is expected that the Eastern Regional Landfill would have capacity to re-use it on site. In the unlikely event that the Eastern Regional MRF cannot sell or re-use the dredged material, then the material would likely be transported to the Lockwood Regional Landfill, which has an available capacity of approximately 269.7 million CY (NDEP 2014).

In accordance with **BMP C1-1,** if the MRF is unable to accept the dredged material, it would be disposed of at a licensed hazardous waste facility, such as the Buttonwillow Landfill, in accordance with federal and state requirements. The Buttonwillow Landfill has an available capacity of approximately 13.3 million CY, and thus would easily be able to accommodate Alternative 1's potential hazardous waste disposal needs (California Department of Resources Recycling and Recovery 2013; Clean Harbors Buttonwillow, LLC, 2008).

The impacts of Alternative 1 on solid waste disposal would be largely limited to the construction period, and operation of the modified pier would generally not affect utilities or service systems. Periodic maintenance dredging, expected to occur every 10 to 15 years, would require disposal of dredged material. The volume and weight of material to be disposed of during maintenance dredged is likely to be less than the material disposed of during the initial dredging. Maintenance would only occur infrequently and is not expected to exceed the capacity of local solid waste disposal facilities.

In summary, Alternative 1 would have less-than-significant impacts related to being served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. The CG will require that the dredging contractor comply with applicable federal, state, and local requirements related to solid waste. Additionally, the landfills that would serve the proposed Project are licensed by the applicable agencies and are required to comply with pertinent regulations. Therefore, Alternative 1 would have no impact with regard to complying with federal, state, and local statutes and regulations related to solid waste.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to the following utilities:

a) Power or natural gas?

No Impact. Alternative 1 would involve the use of only minimal amounts of electricity and no natural gas. Existing on-site power could be used for some applications, but the portable generators would likely be used for powering the conveyor system. In accordance with **BMP C1-20,** the contractor will use existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, or natural gas) generators for temporary power rather than diesel power generators. Therefore, Alternative 1 would have no impacts related to the need for new or substantially altered power or natural gas systems.

b) Communication systems?

No Impact. Alternative 1 would have not involve or require the construction of new or substantially altered communication systems.

c) Utilize additional water which amount will exceed the maximum permitted capacity of the service provider?

No Impact. Alternative 1 would involve the use of only negligible amounts of water and therefore would have no impacts related to exceeding the maximum permitted capacity of water service providers. As discussed in Section 3.8, *Hydrology and Water Quality*, various water quality BMPs would be implemented to avoid and minimize impacts to surface waters that are used as a public drinking water source, and no active public water intakes are near the Project Area. Therefore, Alternative 1 would have no impact on public water service providers.

d) Utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider?

No Impact. Alternative 1 would not lead to the generation of additional sewage that would exceed the maximum permitted capacity of sewage treatment providers.

e) Stormwater drainage?

No Impact. In accordance with **BMP C1-9**, temporary stormwater BMPs will be implemented during construction to avoid impacts to the Station's stormwater system. Alternative 1 would not result in the need for new stormwater drainage facilities or the alteration of existing facilities and therefore would have no impacts related to stormwater drainage.

f) Solid waste and disposal?

Less-than-Significant Impact. Alternative 1 would involve the dredging of between 2,656 and 5,041 CY of dredged material (the upper limit represents a worst case that includes dredging of the full 2-foot overdepth allowance). Applying a bulking factor of 40 percent to account for the material expansion during excavation and handling, this would result in approximately 3,720 to 7,060 CY of material to be disposed. This volume of material would weigh roughly 5,600 to 10,600 tons, assuming an average density of 1.5 tons per CY. The dredged material may be transported to the Eastern Regional MRF. The MRF has permitted capacity to receive 800 tons of material per day and currently receives approximately 201 tons per day on average. During the 8-week dredging period, an average of roughly 100 to 189 tons of material a day would be taken to the MRF. This amount would comprise roughly 17 percent to 32 percent of the MRF's excess daily

capacity. Therefore, even assuming the worst case that the full overdepth allowance is dredged, the MRF would have sufficient capacity to receive the solid waste generated during dredging.

Materials received at the MRF are sorted to meet California's solid waste diversion requirements. Inert material, such as soil and rock, is assessed for content by a technician and then separated out either for resale (e.g., as fill dirt) or for reuse on site as working base or as fill in a 32-acre on-site land remediation area. If the dredged material from the Project is not deemed suitable for resale, it is expected that the Eastern Regional Landfill would have capacity to re-use it on site. In the unlikely event that the Eastern Regional MRF cannot sell or re-use the dredged material, then the material would likely be transported to the Lockwood Regional Landfill, which has an available capacity of approximately 269.7 million CY (NDEP 2014).

In accordance with BMP C1-1, if the MRF is unable to accept the dredged material, it would be disposed of at a licensed hazardous waste facility, such as the Buttonwillow Landfill, in accordance with federal and state requirements. The Buttonwillow Landfill has an available capacity of approximately 13.3 million CY, and thus would easily be able to accommodate Alternative 1's potential hazardous waste disposal needs (California Department of Resources Recycling and Recovery 2013; Clean Harbors Buttonwillow, LLC, 2008).

The impacts of Alternative 1 on solid waste disposal would be largely limited to the construction period, and operation of the modified pier would generally not affect utilities or service systems. Periodic maintenance dredging, expected to occur every 10 to 15 years, would require disposal of dredged material. The volume and weight of material to be disposed of during maintenance dredged is likely to be less than the material disposed of during the initial dredging. Maintenance would only occur infrequently and is not expected to exceed the capacity of local solid waste disposal facilities.

In summary, Alternative 1 would have less-than-significant impacts related to being served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs.

3.12.3.2 Alternative 2: Dog-Leg Extension with Dolphins

NEPA Analysis

Would the Project have a significant impact on utilities and service systems?

No Impact. Alternative 2 would not involve new development that would require the construction, expansion, or substantial alteration of public utility infrastructure. There are no known public utility lines in the proposed construction area, and the TCPUD has been contacted to confirm that none of their water or wastewater lines are in the Project disturbance area. In accordance with **BMP C2-2**, the construction contractor will take standard measures (e.g., notifying USA) to confirm that there are no other subsurface utilities in the construction area prior to the start of work. Project construction would only require a small work crew that would use existing on-site or temporary portable sanitary facilities, and no adverse impacts to wastewater systems would occur. Construction and operation of Alternative 2 would require only negligible amounts of water, would generate only negligible amounts of solid waste, and would not affect stormwater systems. The new pier lighting for Alternative 2 would require adding additional electrical wiring and the use of a small amount of electricity during operations, but this would not result in the need for new or substantially altered public power infrastructure. No other utilities or service systems would be affected. Alternative 2 would involve the disposal of only negligible amounts of construction waste and would have no impacts related to landfill capacity and solid waste disposal. In summary, Alternative 2 would have no impact on public utilities and service systems.

CEQA Analysis

The CEQA analysis provides responses to the questions found in the CEQA Checklist (i.e., Appendix G of the CEQA guidelines, included as Appendix A of this document) for this resource area:

Would the Project:

a) Exceed wastewater treatment requirements of the applicable RWQCB?

No Impact. Alternative 2 would not include any new development that would generate new sources of wastewater requiring wastewater treatment. Project construction would only require a small work crew that would use existing on-site or temporary portable sanitary facilities. There are no known wastewater or other public utility lines in the proposed Alternative 2 pier construction area, and the TCPUD has been contacted to confirm that no TCPUD wastewater or water lines are in the Project disturbance area. In accordance with **BMP C2-2**, the construction contractor will take standard measures (e.g., notifying USA) to confirm that there are no other subsurface utilities in the pier construction area prior to the start of work.

In summary, Alternative 2 would not result in wastewater discharges that would exceed the LRWQCB's treatment requirements, and no impact to wastewater treatment systems would occur. Other applicable LRWQCB discharge and water quality requirements not related to wastewater treatment systems are discussed in *Section 3.8, Hydrology and Water Quality*.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Alternative 2 would not require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities. No impact would occur.

c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No Impact. Alternative 2 would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities. No impact would occur.

d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?

No Impact. Alternative 2 would involve the use of only negligible amounts of water, and therefore would have no impact on water supplies.

e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

No Impact. Alternative 2 would not result in the need for increased wastewater treatment services, and therefore would have no impact on the capacity of local wastewater treatment providers.

f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?

No Impact. Alternative 2 would involve the disposal of only negligible amounts of construction waste and would have no impacts related to landfill capacity and solid waste disposal.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

No Impact. Alternative 2 would result in only negligible amounts of construction waste. The CG will require that the construction contractor comply with applicable federal, state, and local requirements for solid waste. Additionally, the landfills serving the proposed Project are licensed by the applicable agencies and are required to comply with pertinent regulations. Therefore, Alternative 2 would have no impact with regard to complying with federal, state, and local statutes and regulations related to solid waste.

TRPA Analysis

The TRPA analysis provides responses to the questions found in the TRPA IEC related to this resource area:

Except for planned improvements, will the Project result in a need for new systems, or substantial alterations to the following utilities:

a) Power or natural gas?

No Impact. The planned improvements for Alternative 2 would include new pier lighting, which would require adding additional electrical wiring and the use of a small amount of electricity during operations, but this would not result in the need for new or substantially altered public power infrastructure. Alternative 2 also would not result in the need for new or substantially altered power or natural gas systems.

b) Communication systems?

No Impact. Alternative 2 would have no effect on communications systems and therefore would have no impacts related to the need for new or substantially altered communication systems.

c) Utilize additional water which amount will exceed the maximum permitted capacity of the service provider?

No Impact. Alternative 2 would involve the use of only negligible amounts of water and therefore would have no impacts related to exceeding the maximum permitted capacity of water service providers. As discussed in Section 3.8, *Hydrology and Water Quality*, various water quality BMPs would be implemented to avoid and minimize impacts to surface waters that are used as a public drinking water source, and no active public water intakes are near the Project Area. Therefore, Alternative 2 would have no impact on public water service providers.

d) Utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider?

No Impact. Alternative 2 would not generate any additional sewage and would therefore have no impacts related to exceeding the maximum permitted capacity of sewage treatment providers.

e) Stormwater drainage?

No Impact. Alternative 2 would not result in the need for new or expanded stormwater drainage facilities and therefore would have no impacts related to stormwater drainage.

f) Solid waste and disposal?

No Impact. Alternative 2 would involve the disposal of only negligible amounts of construction waste and would have no impacts related to solid waste and disposal.

3.12.3.3 Alternative 3: Straight Extension with Dolphins

No Impact. Alternative 3 would have similar impacts related to utilities and service systems as Alternative 2. Due to the fact that the straight extension would be 100 feet longer than the dog-leg extension and the construction schedule would be 1 week longer, slightly more power and water may be required and slightly more construction waste may be generated, but the amounts would still be negligible. There are no known public utility lines in the proposed pier extension area, and the TCPUD has been contacted to confirm that none of their water or wastewater lines are in the Project disturbance area. In accordance with **BMP C2-2**, the construction contractor will take standard measures (e.g., notifying USA) to confirm that there are no other subsurface utilities in the construction area prior to the start of work. Alternative 3 would not include new

development that would require or result in the construction or expansion of public utilities and service systems. Alternative 3 would involve the disposal of only negligible amounts of construction waste and would have no impacts related to landfill capacity and solid waste disposal.

3.12.3.4 Alternative 4: No Action

No Impact. Under Alternative 4, no dredging or construction would take place at the Station, and there would be no need for additional utilities and service systems. No impact would occur. However, the CG would continue to be required to keep their response boats off site during low-water conditions, and CG response times for emergencies would likely continue to fail to meet CG search and rescue standards.

3.13 Cumulative Impacts

This section discusses the cumulative impacts associated with the proposed Project and whether its incremental contributions to regional impacts are cumulatively considerable when considered together with other projects in the region.

3.13.1 Approach to the Cumulative Impact Analysis

This section analyzes the overall cumulative impacts of the proposed Project Alternatives considered together with other past, present, and reasonably foreseeable probable future projects producing related impacts, as required by NEPA implementing regulations (40 CFR 1508.7) and the CEQA Guidelines (14 CCR 15130). The approach used to analyze cumulative impacts is described in the following subsections, including an explanation of cumulative impacts in the context of NEPA and CEQA and descriptions of the other projects considered in the cumulative impact analysis.

3.13.1.1 Definition of Cumulative Impacts

Both CEQA and NEPA require cumulative impact analysis. Both laws contain similar definitions of cumulative effects and prescribe similar approaches to the cumulative impact analysis, with some slight variation, as described in the following subsections.

NEPA

The CEQ implementing regulations for NEPA define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). The NEPA regulations themselves do not provide specific criteria for cumulative impact analyses, but the CEQ has produced a handbook of guidance for doing cumulative effects analysis (CEQ 1997). The handbook recommends temporally and spatially bounding the analysis by establishing a geographic scope and time frame that addresses past, present, and reasonably foreseeable projects that could combine with the proposed action to create cumulative impacts. Furthermore, CEQ regulations do not require agencies to exhaustively “list or analyze all individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined.” A project proponent is also not required to analyze cumulative impacts to which the project would not contribute.

CEQA

The CEQA Guidelines define a cumulative effect as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the proposed Project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (14 CCR 15355). Cumulative impact analyses should focus on

instances in which a proposed project would incrementally contribute to a significant cumulative impact. It need not discuss cumulative impacts that are not significant in detail beyond justifying this determination, nor must it consider cumulative effects to which a proposed project does not contribute (14 CCR 15130(a)).

The CEQA Guidelines at 14 CCR 15130(b) state that: "The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to a project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact." The analysis should define and justify the geographic scope of the area affected by the cumulative impact (14 CCR 15130(b)(3)). The analysis may rely on considerations of "a list of past, present, and probable future projects producing related or cumulative effects, including projects outside the agency's control" (14 CCR 15130(b)(1)(A)), which is the approach used in the cumulative impact analyses for the proposed Project (see *Section 3.13.1.2* below). Like NEPA, CEQA also does not require agencies to exhaustively list or analyze all individual past actions contributing to cumulative impacts.

In accordance with 14 CCR 15065(a)(3), a project is considered to have a significant cumulative impact on the environment if it has potential environmental effects that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past, current, and probable future projects. For the cumulative impacts of a project to be considered significant, both of the following criteria must be met: 1) the impacts from all projects considered in the cumulative impact analysis must be significant when considered together; and 2) the individual project under analysis must considerably contribute to that significant cumulative impact.

TRPA

TRPA has not established a specific definition of cumulative impacts, but TRPA's thresholds are generally designed to prevent cumulative impacts. Therefore, relevant thresholds have been referenced and addressed in the cumulative impact analyses for the proposed Project.

3.13.1.2 Projects Considered in the Cumulative Impact Analysis

This cumulative impacts analysis considers past, present, and reasonably foreseeable probable projects that may contribute to possible significant cumulative impacts when combined with those of the proposed Project. In choosing projects to consider in the cumulative impacts analysis, the focus was on projects occurring in the same general region and having similar types of impacts as the proposed Project. The geographic and temporal scope of projects considered in the analyses varied somewhat depending on the geographic and temporal extent of the expected effects for each resource area. For example, the cumulative analysis for air quality considered projects throughout the LTAB, whereas the cumulative analysis for noise considered other projects potentially affecting sensitive receptors in the local vicinity of the proposed Project. Generally though, the projects considered in detail were those occurring, or likely to occur, in the Placer County portion of the Lake Tahoe Basin between 2014 and 2020. Descriptions of the projects that were considered in detail in the cumulative impact analysis are provided in *Table 3-41*. In addition to the projects listed in *Table 3-41*, a number of other maintenance dredging and pier modification projects have occurred, or are proposed, in portions of Lake Tahoe outside of Placer County due to the recent drought-induced low lake levels. These projects were also considered generally when analyzing potential cumulative impacts to relevant lake-wide resources, such as water quality and biological resources.

Table 3-41 Projects Considered in Detail in Cumulative Impact Analysis

Project Name	Location	Description	Status	References
Lake Tahoe Shoreline Plan	Shoreline of Lake Tahoe	Updated the regulations for shoreline structures including piers, buoys, boat ramps, and marinas to support water-dependent recreation at Lake Tahoe and ensure effective natural resource management for continued environmental threshold attainment. Included concurrent revisions to the TRPA Code of Ordinances related to boating, and an implementation program for the Shoreline Plan. New public safety shorezone structures are allowed to provide lake access for public safety and emergency response (TRPA Code Section 84.8.2). One essential public safety facility is allowed in the shorezone for each of El Dorado, Placer, Washoe, and Douglas counties, and one for the U.S. Coast Guard. These facilities could be new facilities or modifications to existing facilities and could deviate from shorezone design standards to accommodate functionality.	Adopted in 2018	TRPA 2018
Tahoe City Main Emergency Supply Project	Grove Street, Tahoe City	TCPUD is proposing to construct an independent water main for raw water transport from the existing emergency stand-by surface water intake at Grove Street to the Tahoe City Golf Course.	IS/MND issued in October 2015. Start of construction to be determined (TBD).	TCPUD 2015a, Tahoe Sierra Integrated Regional Water Management 2018
Homewood Mountain Resort Master Plan	Southwest of Homewood, CA	1,200-acre Master Plan area redevelopment. Includes construction of mixed-use North Base Area, residential South Base Area, and lodge and ski area at the Mid-Mountain Base Area. Will include up to 155 tourist accommodation units, 181 residential units, and 13 workforce/employee housing units.	Final EIR/EIS (certified December 2011) was subject to two lawsuits – Earth Justice lawsuit settled in 2014, California Clean Energy Committee lawsuit under appeal. Construction expected in two phases: Phase 1 (North Base), 2018-2023; Phase 2 (South Base), 2023-2025	TRPA and Placer County Community Development Resource Agency (PCCDRA) 2011; Homewood Mountain Resort 2018
Kings Beach State Recreation Area Pier Improvements	Kings Beach State Recreation Area, Kings Beach, CA	Relocation and upgrade of existing pier. Details TBD.	A Draft Environmental Report was released in May 2018. Start of construction TBD.	CTC 2015 TRPA 2018
Lake Tahoe Passenger Ferry Project	Grove Street Pier, Tahoe City, CA, and Ski Run Marina, South Lake Tahoe, CA	Proposed cross-lake passenger ferry service between Tahoe City and South Lake Tahoe. Would require modifications to the existing piers at both terminals – increasing the length of the piers, adding ramped access, constructing floating pier platforms, and conducting both new and future maintenance dredging.	EIS/EIR/EIS in preparation. The planning process is ongoing. Start of construction TBD.	FTA, Tahoe Transportation District (TTD), and TRPA 2013; TTD 2018

Project Name	Location	Description	Status	References
North Tahoe Marina Master Plan	7360 N Lake Boulevard, Tahoe Vista, CA	Expansion of existing marina, including addition of roughly 200 slips. Additional details TBD.	TRPA application submitted 2006. Master Plan was approved and an EIR/EIS was approved. Start of construction TBD.	TRPA, personal communication
SR 89 – Fanny Bridge Community Revitalization Project	Intersection of SR 28 and SR 89, Tahoe City, CA	Construction of new elevated highway bypass and a new bridge crossing the Truckee River.	Final EIR/EIS/EA certified April 2015; construction began in May 2018 and is scheduled for completion in fall 2019.	TTD, TRPA, and FHWA 2015; TTD 2018
SR 28 Corridor Management Plan	SR 28 from Crystal Bay to U.S. Highway 50	Prepare a Corridor Management Plan that would guide future implementation of road widening; installation of bus stops, bicycle/pedestrian trails, and park-and-ride lots; constructing viewpoints and emergency pullouts; providing increased bus service; and installation interpretive signage related to the area's cultural and natural history	In the planning stages; construction TBD.	TTD 2018
America's Most Beautiful Bikeway	Circling the entirety of Lake Tahoe	Provide a complete, integrated network of bicycle/pedestrian trails allow users to circle the entirety of Lake Tahoe. The project is being implemented in various locations around the lake where site-specific trail segments do not exist. The most recent project is the Meek's Bay Bike Trail project, which is constructing 0.7 mile of pedestrian/bicycle trail that connects the existing north and south trail segments. On the Nevada side, approximately 30 miles of new trail construction are planned. Initial demonstration projects are planned from Incline Village to Sand Harbor (North/East Shore – North Demo Project) and Lake Parkway/commercial core to Round Hill Pines Beach (South/East Shore – South Demo Project).	Meek's Bay Bike Trail Project is under construction in 2018; construction of future projects TBD.	TTD 2018
West Lake Tahoe Regional Water Treatment Plant Project	Chambers Landing, Homewood, CA	TCPUD is proposing to construct a permanent surface water treatment plant, to replace the temporary seasonal treatment plant at Chambers Landing, to provide increased water service reliability and quality for the McKinney-Quail Water Service Area and other water systems in the West Lake Tahoe region.	IS/MND adopted September 2015. Construction to be implemented in two phases, construction timeframe TBD.	TCPUD 2015b; Tahoe Sierra Integrated Regional Water Management 2018
West Shore Water Storage Project	Tahoe City and Homewood, CA	TCPUD is proposing to construct two new storage tanks that could be shared by both private and public systems. The tanks would dramatically improve the fire suppression capacity necessary to better protect private property and federal lands. One tank would be in Homewood, California, and the second would be approximately halfway between Tahoe City and Homewood.	In the initial assessment and design stages; construction timeframe TBD.	Tahoe Sierra Integrated Regional Water Management 2018

Project Name	Location	Description	Status	References
California Pacific Electric Company (CalPeco), 625 and 650 Electrical Line Upgrade Project	Placer and Nevada Counties, CA	Upgrade of CalPeco's existing 625 and 650 power lines and associated substations in the North Lake Tahoe Transmission System from 60 to 120 kilovolts. Includes removal, construction, rebuild, and/or realignment of several power line segments and upgrade, modification, and/or decommissioning of six substations.	Final EIS/EIR/EIS certified in September 2014. Construction was completed in 2016.	USFS, TRPA, and California Public Utilities Commission (CPUC) 2014; CPUC 2018
Carnelian Fuels Reduction and Healthy Forest Restoration Project	USFS lands near Kings Beach, Tahoe Vista, Carnelian Bay, Cedar Flat, Lake Forest, and Tahoe City	Fuel reduction and forest restoration project on approximately 3,297 acres. Involves mechanized, hand, and prescribed burning treatments and establishment of temporary roads, cable yarding infrastructure, and landings.	Final EA/FONSI released 2012; work began in 2014 and expected to continue for 7 to 10 years.	USFS 2012
Integrated Management and Use of Roads, Trails, and Facilities	USFS lands throughout the Tahoe Basin	On USFS lands throughout the Lake Tahoe Basin, authorizes maintenance and management of trails, roads, and facilities; authorization of outfitter/guide activities; authorization of events; and reissuance of special use permits for uses of USFS lands.	Final EA/FONSI released 2017; work will be ongoing on a yearly basis as needed	USFS 2017a
West Shore Wildland Urban Interface Fuels Reduction Project	Burton Creek State Park to Emerald Bay	Implements the recommendations described in the 2007 Lake Tahoe Basin Multi-Jurisdictional Fuel Reduction and Wildfire Prevention Strategy. Includes hand and mechanical thinning of vegetation on USFS land west of Tahoe City.	Decision memo issued 2017; work will be ongoing on a yearly basis as needed	USFS 2017b
Dollar Creek Shared-Use Trail	Dollar Point, CA	Construction of 2.2 miles of new paved shared-use trail, from end of existing trail, near intersection of Dollar Drive and SR 28, to the end of Fulton Crescent Drive, and associated infrastructure.	IS/MND released in 2012; construction was completed in 2018.	Placer County Department of Public Works (PCDPW) 2012
Tahoe City Mobility Project	Tahoe City, CA	Dedicated pedestrian path corridors and trail alignments from the Wye in Tahoe City (intersection of SR 89 and SR 28) through Tahoe City, will be identified and designed to a preliminary level to pursue environmental permitting and detailed design products with future funding opportunities. Pedestrian improvements will be identified along SR 28 in downtown Tahoe City to connect the regional trail corridor to community businesses and destinations and to connect people to Lake Tahoe. The planning efforts also include addressing wayfinding, parking, and circulation improvements in downtown Tahoe City.	Final Tahoe City Mobility Plan issued 2016; construction TBD.	PCDPW 2018
Fialho Pier and Shoreline Project	1620 North Lake Boulevard, Tahoe City, CA	Repair and stabilization of a 180-foot section of shoreline and eroding slope with a rock gabion structure. An access stairway will also be modified and pier decking and underlying girders will be replaced.	LRWQCB approvals issued September 2015, exemption issued May 2018.	LRWQCB 2015h and 2018

Project Name	Location	Description	Status	References
Fleur du Lac Maintenance Dredging and Rock Riprap Installation Project	4000 West Lake Boulevard, Homewood, CA	Maintenance dredging of 24,710 square feet area to elevation of 6,219 feet, LTD. Involves removing ~2,150 CY of sediment, to be transported to Eastern Regional MRF. Also includes placing ~420 CY of rock riprap, covering ~2,225 square feet.	LRWQCB approvals issued October 2015	LRWQCB 2015j
Kings Beach Commercial Core Improvement Project	Kings Beach, CA	Modification of SR 28 in Kings Beach from four lanes to three lanes and construction of sidewalks, off-street parking areas, bus shelters, lighting, landscaping, and stormwater collection and treatment features.	Project construction was completed in 2018.	PCDPW, TRPA, and Caltrans 2008; TRPA 2009; Caltrans 2010; PCDPW 2018
Kruger Pier Repair Project	1040 West Lake Boulevard. Tahoe City, CA	Repair of existing pier including a catwalk, boat hoist, and replacement of piles.	LRWQCB approvals issued September 2015.	LRWQCB 2015i
Lake Forest Boat Ramp Project	2500 North Lake Boulevard, Tahoe City, CA; adjacent to west of Station	Boat ramp modifications and maintenance dredging. Boat ramp width increased by 11 feet; length reduced by 3 feet. Reinforced cutoff walls and 1,000 square feet of riprap added around ramp. Maintenance dredging to elevation of 6,219 feet, LTD. ~625 CY of material dredged and transported to Al Pombo's Hobart Yard, Truckee, where it will be recycled for re-use.	Project completed winter 2014-2015.	LRWQCB 2014c, Loeb 2013
Lake Tahoe Regional Transportation Plan/ Sustainable Communities Strategy	Lake Tahoe Region	The RTP identifies numerous transportation projects to be implemented in the Tahoe Basin through 2030, ranging from water quality and traffic flow improvements on major highways to installation of new bicycle paths and development of a ferry system on the Lake. The Sustainable Communities Strategy (SCS) outlines integrated transportation, land use, and housing strategies to meet environmental thresholds and GHG targets.	Sustainable Communities Plan and Regional Transportation Plan adopted in 2017	TMPO 2015; TRPA 2017
SR 89 Emergency Roadway Improvements	Emerald Bay	Construction of a 190-foot retaining wall adjacent to a section of the northbound lane of SR 89 at Emerald Bay.	Construction completed in 2018	Tahoe Daily Tribune 2018
Littrell Crib Repair Project	5428 North Lake Boulevard, Carnelian Bay, CA	Replacement of 130 linear feet of deteriorating rock crib pier wall with new timber crib.	LRWQCB approvals issued July 2015.	LRWQCB 2015g
Putnam Pier Projects	5244 and 5248 North Lake Boulevard, Carnelian Bay, CA	Removal of two existing piers and construction of replacement piers in locations that conform better to TRPA design standards.	LRWQCB approvals issued May 2015.	LRWQCB 2015e and 2015f
Lower Chipmunk and Outfall Water Quality Improvement Project	Chipmunk Street, Kings Beach	Installation of stormwater drainage and treatment improvements in the Kings Beach commercial core area.	LRWQCB approvals issued May 2015.	LRWQCB 2015d

Project Name	Location	Description	Status	References
Star Harbor Maintenance Dredging Project	2350 North Lake Boulevard, Tahoe City, CA; adjacent to west of TCPUD Lake Forest Boat Ramp	Maintenance dredging of Star Harbor entrance channel to an elevation of 6,219 feet, LTD. A total volume of 628 CY of material was removed from a ~13,050 square feet area and transported to the Eastern Regional MRF.	LRWQCB approvals issued April 2015. Dredging conducted fall 2015.	LRWQCB 2015c
Rogers Pier Catwalk Repair Project	1390 West Lake Boulevard, Tahoe City, CA	Repair of an existing catwalk, including replacement of piles.	LRWQCB approvals issued April 2015.	LRWQCB 2015b
Homewood Marina Annual Maintenance Dredging Project	5190 West Lake Boulevard, Homewood, CA	Maintenance dredging of Homewood Marina to an elevation of 6,217 feet, LTD. 535 CY of material was removed and transported to the Eastern Regional MRF for disposal.	LRWQCB approvals issued April 2015; dredging conducted spring 2015; a second dredging event may occur in spring 2016.	LRWQCB 2015a
Blackwood Creek Bank Protection Project	3750 Belleview Avenue, Homewood, CA	Bank stabilization measures including Installation of 8 linear feet of rock apron, sloping of 23 feet of bank, and installation of vegetated rock toe.	Completed 2015.	LRWQCB 2014n
Zipperian Catwalk Repair Project	5060 West Lake Boulevard, Homewood, CA	Repair of an existing catwalk associated with an existing pier, including replacement of piles.	Completed 2015.	LRWQCB 2014m
Morehead Pier Repair Project	1970 West Lake Boulevard, Tahoe City, CA	Repair of damaged crib pier, including replacement of crib timbers.	Completed 2015.	LRWQCB 2014l
Tahoe City Marina Maintenance Dredging Project	700 North Lake Boulevard, Tahoe City, CA	Maintenance dredging of 15,080 square feet area to elevation of 6,216 feet, LTD. ~1,186 CY of material was removed and transported to Eastern Regional MRF for disposal.	Completed 2015.	LRWQCB 2014k
Lake Forest Water Quality Improvement Project	Lake Forest and West Dollar Point neighborhoods, northeast of Tahoe City, CA	Erosion control, stormwater, and recreation improvements and stream restoration to decrease stormwater runoff impacts, improve water quality, and increase trail access.	Completed 2015.	LRWQCB 2014e
Colmery Pier Relocation Project	632 Olympic Drive, Tahoe City, CA	Replacement of an existing pier in new location.	Completed 2014.	LRWQCB 2014j
Meier Pier Repair and Reconstruction Project	6690 West Lake Boulevard	Removal and replacement of six pier piles.	Completed 2014.	LRWQCB 2014i
Stumpf Stout Revetment and Pier Extension Project	1830 and 1870 North Lake Boulevard, Tahoe City, CA	75-foot pier extension, boat lift replacement, and construction of shoreline retaining walls.	Completed 2014.	LRWQCB 2014h

Project Name	Location	Description	Status	References
Obexer's Marina Maintenance Dredging Project	5340 West Lake Boulevard, Homewood, CA	Maintenance dredging of ~17,000 square feet area to an elevation of 6,215 feet, LTD. Approximately 200 CY of material was removed and transported to the Eastern Regional MRF for disposal.	Completed 2014.	LRWQCB 2014g
William Kent Campground Redevelopment Project	177 Sequoia Avenue, Tahoe City, CA	Removal of a storm drain pipe and concrete headwall from below the Lake Tahoe high-water line and replacing it with an open rock-lined channel.	Completed 2014	LRWQCB 2014f
Thompson Boat Ramp Removal Project	7015 Pine Street, Tahoma, CA	Removal of a 536-square feet rock and concrete boat ramp and installation of a marine rail system.	Completed 2014	LRWQCB 2014d
Sullivan Pier Modification Project	5526 North Lake Boulevard, Carnelian Bay, CA	Removal and relocation of an existing boat lift.	Completed 2014.	LRWQCB 2014b
Tahoe City Transit Center	ST 89 at Fanny Bridge	Incorporated surface parking for 130 cars, a bus loop for six regional buses, and a transit facility building with two restrooms, administrative space, built-in bike lockers, and an enclosed meeting area for up to 40 people.	Completed in 2012	Placer County 2018

3.13.2 Evaluation of Cumulative Impacts

The following sections describe the potential cumulative impacts of the proposed Project Alternatives when considered together with the past, present, and foreseeable future projects in the Project region. *Table 3-42* provides a summary of the cumulative impact significance determinations for each of the Project Alternatives. A detailed discussion of the cumulative impacts for each alternative is provided in the following sections.

Table 3-42 Significance Determinations for the Project Alternatives (Cumulative Impacts)

Cumulative Impacts	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Would the Project considerably contribute to a significant cumulative impact on: *a) Aesthetics and Scenic Resources?*	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
b) Air Quality and GHGs?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
c) Biological Resources?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
d) Cultural Resources?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
e) Geology, Soils, and Land?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
f) Hazards, Hazardous Materials, and Risk of Upset?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
g) Hydrology and Water Quality?	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
h) Noise?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
i) Recreation?	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
j) Transportation, Traffic, and Navigation	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
k) Utilities and Service Systems	Less-than-Significant Impact	No Impact	No Impact	No Impact

3.13.2.1 Alternative 1: Dredging at Existing Pier (Proposed Action)

The effects of Alternative 1 have been evaluated in combination with the effects of other past, present, and reasonably foreseeable future actions to determine whether: 1) the combined impacts from all projects considered in the cumulative impact analysis are cumulatively significant; and 2) the Project would considerably contribute to that significant cumulative impact. Both circumstances must exist to conclude that the impacts of Alternative 1 would be cumulatively significant. Evaluations of these two criteria for each potentially affected resource area are presented below for Alternative 1.

Aesthetics, Scenic Resources, and Community Design

Less-than-Significant Impact with Mitigation. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative

impacts on aesthetics, scenic resources, or community design. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts to these resources. To obtain a permit, future projects in the region would need to comply with TRPA's scenic thresholds, standards, design guidelines, and mitigation requirements, which were established to avoid significant cumulative impacts to aesthetics, scenic resources, and community design in the Tahoe region. Therefore, cumulative impacts on aesthetics, scenic resources, and community design from all projects considered in the cumulative impact analysis would be less than significant.

At the individual project level, the environmental analysis in *Section 3.2* determined that Alternative 1 would have less-than-significant impacts on aesthetics and scenic resources with implementation of **MM AES-1** and multiple BMPs to avoid and minimize scenic impacts. The only new permanent visible structures added for Alternative 1 would be the floating dock and the new boat lift, which would replace the existing lift and would therefore result in only a small net increase in visible mass. **MM AES-1** would require the CG to mitigate for the addition of this small amount of new visible mass by screening other structures at the Station at a ratio of 1:2.0, as required by TRPA. This mitigation will avoid cumulative impacts, achieve scenic thresholds, and ensure that there is a net improvement in scenic quality in the shorezone. Other shorezone projects in the region that involve the addition of visible mass also would be required to complete similar mitigation.

The community design analysis for Alternative 1 in *Section 3.2* identified certain inconsistencies with the current TRPA design guidelines for floating docks. However, the proposed Project is an Essential Public Safety Facility and therefore would be processed under TRPA Code of Ordinances Section Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders. There are currently no other proposals that have been brought forward for public safety facilities involving piers, and therefore a cumulatively significant impact related to deviation from design standards would not occur.

In summary: 1) the combined impacts to aesthetics, scenic resources, and community design from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on aesthetics, scenic resources, and community design with implementation of **MM AES-1.** Therefore, with mitigation, Alternative 1's cumulative impacts to aesthetics, scenic resources, and community design would be less than significant.

Air Quality and Greenhouse Gases

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on air quality in the LTAB. Of the projects listed in *Table 3-41* that have completed environmental review, the only one determined to have individually significant and unavoidable or cumulatively considerable impacts on air quality was the CalPeco Electrical Line Upgrade Project (USFS, TRPA, and CPUC 2014). However, the significant and unavoidable and cumulatively considerable impacts identified for the CalPeco project were related only to NO_x emissions in the portion of the project area in Nevada County and therefore under the jurisdiction of the Northern Sierra Air Quality Management District. The CalPeco project's NO_x emissions in the portion of the project area under the jurisdiction of the PCAPCD will be mitigated to a less-than-significant level through payment of a mitigation fee to the PCAPCD's emission offset program, which was established to avoid and minimize cumulative impacts in the District. The NSMQMD does not have a similar offset program, and so the CalPeco project's NO_x emissions in Nevada County could not be mitigated to a less-than-significant level. Several of the projects listed in *Table 3-41* involve regional and local transportation planning and/or improvements (e.g., Lake Tahoe Passenger Ferry Project, SR 89-Fanny Bridge Project, Lake Tahoe RTP/SCS) that would also have the effect of reducing cumulative air emissions.

Other past, present, and reasonably foreseeable future projects under the jurisdiction of the PCAPCD would need to comply with the District's rules and standards and to pay a mitigation offset fee if their

emissions exceeded the PCAPCD's construction or operational thresholds for criteria pollutants. Similarly, future projects would be expected to comply with TRPA's air quality requirements and to pay a mitigation fee if they lead to a significant increase in daily vehicle trips. The PCAPCD and TRPA standards and mitigation requirements were established to avoid significant cumulative air quality impacts in the region. With continued enforcement of these requirements, cumulative impacts on air quality from all projects considered in the cumulative impact analysis would be less than significant.

The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis also are not expected to result in significant cumulative GHG emissions. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant GHG emissions. However, the Homewood Mountain Resort Master Plan Project EIR/EIS concluded that the project would have cumulatively considerable impacts related to GHG emissions and climate change (TRPA and PCCDRA 2011). The EIR/EIS based this conclusion on the fact that, at the time the document was prepared, it was unknown to what extent global climate would be affected by the Homewood project, and therefore the possibility existed that the project would contribute to global climate change and conflict with the state's GHG reduction goals. However, the Homewood project's estimated GHG emissions would be below the PCAPCD's current recommended significance threshold for GHGs. Additionally, according to the CARB's 2014 Scoping Plan Update, California is on track to meet its near-term 2020 GHG limit and is well positioned to continue reductions beyond 2020, as required by AB 32. At a regional level, TRPA and TMPO are implementing the 2017 Regional Transportation Plan and Sustainable Communities Strategy, which is projected to achieve a 12.1 percent passenger vehicle GHG per capita reduction by 2020, and a 7.2 percent reduction in 2035, which is more than sufficient to meet the targets established for the region under SB 375 (CARB 2013b). The Homewood project, and the other projects considered in this analysis, are not expected to substantially hinder the attainment of state or regional GHG reduction targets. Other reasonably foreseeable future projects in the region will be required to demonstrate consistency with AB 32, other state GHG reduction goals and strategies, and PCAPCD's recommended thresholds and to mitigate GHG emissions. Therefore, cumulative impacts on regional GHG emissions from all projects considered in the cumulative impact analysis are considered less than significant.

At an individual level, the environmental analysis in *Section 3.3* determined that Alternative 1 would have less-than-significant impacts on air quality and GHG emissions. Estimated emissions of criteria air pollutants and GHGs during construction of Alternative 1 would be below the relevant PCAPCD significance thresholds and would not have a substantial adverse effect on attainment of the NAAQS, CAAQS, TRPA thresholds, or state GHG reductions goals. Multiple BMPs would be implemented during construction to avoid and minimize air quality and GHG impacts. In the long term, Alternative 1 would result in a decrease in vehicle emissions due to the elimination of trips involved with accessing an off-site mooring location, and enhancement of the CG's ability to respond quickly to accidents involving releases of volatile substances. There would be emissions associated with infrequent maintenance dredging, but these are expected to be lower than for the initial dredging event. Therefore, Alternative 1 would not considerably contribute to adverse cumulative impacts on air quality or GHG emissions.

In summary: 1) the combined impacts to air quality and GHG emissions from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on air quality and GHGs. Alternative 1's cumulative impacts on air quality and GHGs would be less than significant.

Biological Resources

Less-than-Significant Impact with Mitigation. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on biological resources. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts to biological resources. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to

biological resources; to implement BMPs to avoid and minimize impacts to these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs. For projects affecting PFH, the required mitigation would include restoring PFH at a ratio of 1:1.5 to the habitat affected, which the TRPA has established to avoid cumulative impacts and ensure a net gain in PFH and to habitat.

At an individual project level, the environmental analysis in *Section 3.4* determined that Alternative 1 would have less-than-significant impacts on biological resources with implementation of **MM BIO-1** and multiple BMPs to avoid and minimize impacts to biological resources. **MM BIO-1** would require that the area of PFH disturbed by the proposed Project be mitigated by creation of replacement habitat on site and in kind at a ratio of 1:1.5. With implementation of this mitigation measure and the proposed BMPs, the impacts of Alternative 1 on biological resources would not be cumulatively considerable.

In summary: 1) the combined impacts to biological resources from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on biological resources with implementation of **MM BIO-1**. With mitigation, Alternative 1's cumulative impacts on biological resources would be less than significant.

Cultural Resources

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on cultural resources. Of the projects listed in *Table 3-41* that have completed environmental review, the only one determined to have individually significant and unavoidable impacts on cultural resources was the CalPeco Electrical Line Upgrade Project (USFS, TRPA, and CPUC 2014). However, the Final EIS/EIR/EIS for the CalPeco project indicated that although the project's potentially unavoidable impacts could make a small contribution to the cumulative loss and degradation of cultural resources in the region, the minor loss was not considered a considerable contribution to cumulative impacts on cultural resources. The types of cultural resources potentially affected by the project were not considered likely to be particularly rare, unique, or significant. In accordance with CalPeco's proposed impact avoidance and minimization measures, any cultural resources that could be adversely affected by the CalPeco project would receive appropriate treatment as required by Section 106 of the NHPA, CEQA, and TRPA policy, and resources eligible for the NRHP or CRHP would be avoided, or impacts would otherwise be minimized or mitigated. Other past, present, and reasonably foreseeable future projects would be required to take similar measures to avoid, minimize, or mitigate impacts to cultural resources.

At the individual project level, the environmental analysis in *Section 3.5* determined that Alternative 1 would have less-than-significant impacts on cultural resources. According to cultural records searches and other historical research conducted for the proposed Project, no historic properties or other cultural resources are likely to be affected by Alternative 1. In the unlikely event that buried cultural resources are discovered during Project construction, ground disturbing activities would cease in the area of the find and appropriate measures would be taken for reporting and treatment of the find, in accordance with **BMP C1-21**. Therefore, Alternative 1 would not considerably contribute to cumulative impacts on cultural resources.

In summary: 1) the combined impacts to cultural resources from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on cultural resources. Alternative 1's cumulative impacts on cultural resources would be less than significant.

Geology, Soils, and Land

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on geology, soils, or land. None of the projects listed in *Table 3-41* that have completed environmental review have

been determined to have individually significant and unavoidable or cumulatively considerable impacts to these resources. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to geology, soils, and land; to implement BMPs to avoid and minimize impacts to these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.6* determined that Alternative 1 would have less-than-significant impacts to geology, soils, and land. Multiple BMPs would be implemented during construction to avoid and minimize impacts to these resources. The main concern for Alternative 1 related to this resource area is impacts to littoral drift. The littoral drift study conducted by AECOM concluded that Alternative 1 would have less-than-significant impacts on littoral processes. Other projects in the future that may have potentially significant impacts to littoral drift must implement mitigation as required by TRPA to reduce site-specific and cumulative impacts.

In summary: 1) the combined impacts to geology, soils, and land from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on geology, soils, and land. Alternative 1's cumulative impacts on geology, soils, and land would be less than significant.

Hazards, Hazardous Materials, and Risk of Upset

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts related to hazards, hazardous materials, and risk of upset. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts related to these issues. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to hazards, hazardous materials, and risk of upset; to implement BMPs to avoid and minimize impacts related to these issues; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.7* determined that Alternative 1 would have less-than-significant impacts related to hazards, hazardous materials, and risk of upset. Impacts related to these resources would be limited to the construction period and infrequent maintenance dredging and would be short term and localized. Alternative 1 would include implementation of multiple BMPs to avoid and minimize the risk of spills and leaks of hazardous materials during construction and maintenance dredging, and the construction contractor would be required to store, handle, and dispose of hazardous materials and wastes in accordance with federal, state, regional, and local laws and CG standards. In the long term, Alternative 1 would improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials to Lake Tahoe, thereby minimizing or avoiding the cumulative impacts of such releases.

In summary: 1) the combined impacts related to hazards, hazardous materials, and risk of upset of all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts related to hazards, hazardous materials, and risk of upset. Alternative 1's cumulative impacts related to hazards, hazardous materials, and risk of upset would be less than significant.

Hydrology and Water Quality

Less-than-Significant Impact with Mitigation. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on hydrology and water quality. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on these resources. Other reasonably foreseeable future projects

would be required to comply with federal, state, and local laws, regulations, and standards relating to hydrology and water quality; to implement BMPs to avoid and minimize impacts on these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

As discussed in *Section 3.13.1.2,* a number of maintenance dredging and pier modification projects have occurred, or are proposed, around Lake Tahoe due to drought-induced low lake levels, potentially resulting in increased cumulative impacts to hydrology and water quality. However, these and other shorezone projects are strictly regulated and must comply with TRPA and LRWQCB (or NDEP) requirements for protecting hydrology and water quality. These requirements typically include implementation of BMPs such as turbidity barriers, water quality monitoring, and spill prevention and control measures during construction. The projects listed in *Table 3-41* also include several which are intended to improve water quality (e.g., those involving stormwater drainage and treatment improvements or bank stabilization), and similar projects also have occurred, or are planned for, additional sites around the lake. Partly as a result of these water quality improvement projects and enforcement of regulatory requirements related to water quality, lake transparency has shown a trend towards improvement in recent years (UC Davis TERC 2015).

At the individual project level, the environmental analysis in *Section 3.8* determined that Alternative 1 would have less-than-significant impacts related to hydrology and water quality. Alternative 1 would also include implementation of multiple BMPs related to water quality during construction and maintenance dredging. These BMPs would include use of turbidity barriers, in accordance with **BMP C1-4**; implementation of a Spill Prevention and Response Plan, in accordance with **BMP C1-7**; inspection, cleaning, and maintenance of equipment, in accordance with **BMP C1-8**; limiting the handling and dewatering of dredged materials over the lake to areas confined by turbidity barriers, in accordance with **BMP C1-9**; and implementation of a Water Quality Monitoring Plan, in accordance with **BMP C1-11**, among others. Adverse water quality impacts would be limited to the construction period and infrequent maintenance dredging and would be short term and localized. Alternative 1 would also include the implementation of **MM-BIO-1** to mitigate for impacts to the beneficial use of the Project Area as fish habitat. In the long term, Alternative 1 would have beneficial effects on water quality by improving the CG's ability to respond quickly to incidents involving releases, or potential releases, of petroleum products or other pollutants to Lake Tahoe and reducing turbidity from propeller wash from vessels moving through the Project Area during low-water conditions.

In summary: 1) the combined impacts to hydrology and water quality from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on hydrology and water quality. With mitigation, Alternative 1's cumulative impacts to hydrology and water quality would be less than significant.

Noise and Vibration

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative noise or vibration impacts. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable noise or vibration impacts. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to noise and vibration; to implement BMPs to avoid and minimize noise and vibration impacts; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At an individual project level, the environmental analysis in *Section 3.9* determined that Alternative 1 would have less than significant noise and vibration impacts. Alternative 1's noise and vibration impacts would be limited to the construction period and infrequent maintenance dredging and would be short term and localized. According to TRPA guidelines, construction work that takes place between 8:00 a.m. and 6:30 p.m. is exempt from most noise limitations, and in accordance with **BMP C1-14**, Project construction will be limited to those hours. Most other construction projects in the region also typically limit themselves

to similar hours to be exempted from TRPA noise limitations. Multiple other BMPs would also be implemented to minimize community noise exposure. The noise and vibration modeling discussed in *Section 3.9*, also concluded that noise and vibration levels at nearby sensitive receptors during construction would be below the applicable thresholds.

In summary: 1) the combined noise and vibration impacts from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative noise and vibration impacts. Alternative 1's cumulative noise and vibration impacts would be less than significant.

Recreation

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on recreation. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on recreation. Several of the projects listed in *Table 3-41* would create or improve access to recreation. These include a number of projects that would improve the public's access to water-based recreation (e.g., various pier improvement and maintenance dredging projects), which is directly relevant to the potential cumulative impacts of the proposed Project. Other reasonably foreseeable future projects would be required to address and comply with TRPA's policies and thresholds related to recreation, to implement BMPs to avoid and minimize impacts on recreation; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.10* determined that Alternative 1 would have less-than-significant impacts related to recreation. The impacts of Alternative 1 to recreation would be limited to the construction period and infrequent maintenance dredging and would be short term and localized. In accordance with **BMP C1-3**, the disturbance area would be limited to the minimum practicable during construction, and in accordance with **BMP C1-16,** dredging would occur between October 1 and May 1, which would avoid work during the peak summer water-recreation season. In addition, Alternative 1 would enhance the CG's ability to fulfill their mission to provide search and rescue and public safety services to the recreational users of Lake Tahoe year round.

In summary: 1) the combined impacts on recreation from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on recreation. Alternative 1's cumulative impacts on recreation would be less than significant.

Transportation, Traffic, and Navigation

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on transportation, traffic, or navigation. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on these resources. Several of the projects listed in *Table 3-41* involve improvements related to traffic and transportation (e.g., Lake Tahoe Passenger Ferry Project, SR 89-Fanny Bridge Project, Lake Tahoe RTP/SCS) or navigation (e.g., various maintenance dredging projects). Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to transportation, traffic, and navigation; to implement BMPs to avoid and minimize impacts on these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.11* determined that Alternative 1 would have less-than-significant impacts related to transportation, traffic, and navigation. Adverse impacts related to these issues would be limited to the construction period and infrequent maintenance dredging

and would be short term and localized. BMPs would be implemented during construction to minimize impacts related to these issues, including **BMP C1-23**, which would require preparation and implementation of a Traffic Management Plan that would address construction traffic, parking, emergency access, and related issues. In the long term, Alternative 1 would have a beneficial impact on traffic, because CG staff will no longer have to drive to access their boats at an off-site mooring location during low-water conditions or to transport the boats between the Station and the off-site location. Additionally, after dredging is completed, navigation in the immediate Project vicinity would be improved due to the increased depth of the approach channel to the CG and TCPUD facilities, and the CG's ability to assist the boating public and agencies that use Lake Tahoe would be enhanced, thereby improving navigational safety.

In summary: 1) the combined impacts on transportation, traffic, and navigation from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on transportation, traffic, and navigation. Alternative 1's cumulative impacts on transportation, traffic, and navigation would be less than significant.

Utilities and Service Systems

Less-than-Significant Impact. Under NEPA and CEQA, a project proponent is not required to analyze cumulative impacts to which the project would not contribute. Because the only utility or service system that would be affected by Alternative 1 is solid waste disposal, the cumulative impact analysis for this resource area only considers cumulative impacts to solid waste disposal services and facilities.

The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on solid waste disposal services or facilities. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on solid waste services or facilities. The projects listed in *Table 3-41* include a number of projects that would generate solid waste, including several maintenance dredging projects that would require dredged material disposal. However, few, if any, of these projects would involve waste disposal that would take place concurrently with implementation of Alternative 1. After accounting for the waste disposal needs of Alternative 1, the Eastern Regional MRF would still have remaining available capacity to receive between 410 and 499 CY of waste per day on average, which is expected to be sufficient to meet the requirements of other projects potentially occurring concurrently with Alternative 1. The Eastern Regional MRF would be able to re-sale or re-use dredged material that meets their criteria for these uses, thereby reducing demand for landfill disposal, and regional landfills are expected to have sufficient capacity for materials that cannot be re-sold or re-used by the Eastern Regional MRF. Future projects also would be required to analyze their impacts on solid waste services and facilities; to comply with federal, state, and local laws, regulations, and standards relating to solid waste disposal; to implement BMPs to avoid and minimize impacts on solid waste disposal services or facilities; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.12* determined that local waste management facilities would have sufficient capacity to serve the waste disposal needs of the Project, and therefore Alternative 1 would have less-than-significant impacts on solid waste disposal services and facilities.

In summary: 1) the combined impacts to utilities and service systems from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 1 would not considerably contribute to cumulative impacts on utilities and service systems. Alternative 1's cumulative impacts to utilities and service systems would be less than significant.

3.13.2.2 Alternative 2: Dog-Leg Extension with Dolphins

The effects of Alternative 2 have been evaluated in combination with the effects of other past, present, and reasonably foreseeable future actions to determine whether: 1) the combined impacts from all projects considered in the cumulative impact analysis are cumulatively significant; and 2) the Project would considerably contribute to that significant cumulative impact. Both circumstances must exist to conclude that the impacts of Alternative 2 would be cumulatively significant. Evaluations of these two criteria for each potentially affected resource area are presented below for Alternative 2.

Aesthetics, Scenic Resources, and Community Design

Less-than-Significant Impact with Mitigation. The past and present projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on aesthetics, scenic resources, and community design. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts to these resources. However, the environmental analysis in *Section 3.2* determined that Alternative 2 individually would have potentially significant impacts on aesthetics and scenic quality, even with implementation of **MM AES-1**. The potentially significant impacts from Alternative 2 are due to nonconformity with the SQIP and effects on the views from public recreation areas. Similar to Alternative 1, the proposed Project is an Essential Public Safety Facility and therefore would be processed under TRPA Code of Ordinances Section Section 84.8.2, which allows deviations to TRPA location, design, and construction standards so facilities can meet the long-term operational and safety needs of emergency responders. There are currently no other proposals that have been brought forward for public safety facilities involving piers, and therefore a cumulative significant impact related to deviation from design standards would not occur.

In summary: 1) the combined impacts to aesthetics, scenic resources, and community design from all projects considered in the cumulative impact analysis would not be cumulatively significant; and 2) Alternative 2 would not considerably contribute to significant cumulative impacts on aesthetics, scenic resources, and community design. Therefore, Alternative 2's cumulative impacts on aesthetics, scenic resources, and community design are considered less than significant.

Air Quality and Greenhouse Gases

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on air quality in the LTAB. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on air quality within the geographic scope considered in this analysis. Additionally, several of the projects listed in *Table 3-41* involve regional and local transportation planning and/or improvements that would also have the effect of reducing cumulative air emissions. Other past, present, and reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to air quality; to implement BMPs to avoid and minimize air quality impacts; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis also are not expected to result in significant cumulative GHG emissions. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant GHG emissions. The Homewood Mountain Resort Master Plan Project EIR/EIS concluded that the project would have cumulatively considerable impacts related to GHG emissions and climate change because the extent to which the project would contribute to global climate or conflict with the state's GHG reduction goals was unknown at the time the document was prepared (TRPA and PCCDRA 2011). However, the Homewood project's GHG emissions would be below the PCAPCD's currently recommended significance threshold for GHG emissions. In addition, the state and the Tahoe region are on track to meet or exceed their current GHG reduction targets, and the Homewood project, and the other

projects considered in this analysis, are not expected to substantially hinder the attainment of those targets. Other reasonably foreseeable future projects in the region will be required to demonstrate consistency with AB 32, other state GHG reduction goals and strategies, and PCAPCD's recommended thresholds and to mitigate GHG emissions. Therefore, cumulative impacts on regional GHG emissions from all projects considered in the cumulative impact analysis are considered less than significant.

At an individual level, the environmental analysis in *Section 3.3* determined that Alternative 2 would have less-than-significant impacts on air quality and GHG emissions. Estimated emissions of criteria air pollutants and GHGs during construction of Alternative 2 would be below the relevant PCAPCD significance thresholds and would not have a substantial adverse effect on attainment of the NAAQS, CAAQS, TRPA thresholds, or state GHG reductions goals. Multiple BMPs would be implemented during construction to avoid and minimize air quality and GHG impacts. In the long term, Alternative 2 would result in a decrease in emissions due to the elimination of vehicle trips involved with accessing an off-site mooring location, and enhancement of the CG's ability to respond quickly to accidents involving releases of volatile substances Therefore, Alternative 2 would not have cumulatively considerable adverse impacts on air quality or GHG emissions.

In summary: 1) the combined impacts to air quality and GHG emissions from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on air quality or GHG emissions. Alternative 2's cumulative impacts on air quality and GHGs would be less than significant.

Biological Resources

Less-than-Significant Impact with Mitigation. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on biological resources. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts to biological resources. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws and regulations relating to biological resources; to implement BMPs to avoid and minimize impacts to these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs. For projects affecting PFH, the required mitigation would include restoring habitat at a ratio of 1:1.5 to the area of PFH affected, which the TRPA has established to ensure a net gain in PFH and avoid cumulative impacts to habitat.

At an individual project level, the environmental analysis in *Section 3.4* determined that Alternative 2 would have less-than-significant impacts on biological resources with implementation of **MM BIO-1** and multiple BMPs to avoid and minimize impacts to biological resources. **MM BIO-1** would require that the area of PFH disturbed by the proposed Project be mitigated by creation of replacement habitat on site and in kind at a ratio of 1:1.5. With implementation of this mitigation measure and the proposed BMPs, the impacts of Alternative 2 on biological resources would not be cumulatively considerable.

In summary: 1) the combined impacts to biological resources from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on biological resources with implementation of **MM BIO-1**. With mitigation, Alternative 2's cumulative impacts on biological resources would be less than significant.

Cultural Resources

Less-than-Significant Impact. The past, present, and foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on cultural resources. Of the projects listed in *Table 3-41* that have completed environmental review, the only one determined to have individually significant and unavoidable impacts on cultural resources was the CalPeco Electrical Line Upgrade Project (USFS, TRPA, and CPUC 2014). However, the Final EIS/EIR/EIS for the CalPeco project indicated that although the project's potentially unavoidable impacts

could make a small contribution to the cumulative loss and degradation of cultural resources in the region, the minor loss was not considered a considerable contribution to a significant cumulative impact on cultural resources. Other past, present, and foreseeable future projects would be required to take standard measures to avoid, minimize, or mitigate cumulative impacts to cultural resources.

At the individual project level, the environmental analysis in *Section 3.5* determined that Alternative 2 would have less-than-significant impacts on cultural resources. According to cultural records searches and other historical research conducted for the proposed Project, no historic properties or other cultural resources are likely to be affected by Alternative 2. In the unlikely event that buried cultural resources are discovered during Project construction, ground disturbing activities would cease in the area of the find and appropriate measures would be taken for reporting and treatment of the find, in accordance with **BMP C2-18**. Therefore, Alternative 2 would not considerably contribute to cumulative impacts on cultural resources.

In summary: 1) the combined impacts to cultural resources from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on cultural resources. Alternative 2's cumulative impacts on cultural resources would be less than significant.

Geology, Soils, and Land

Less-than-Significant Impact. The past, present, and foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on geology, soils, or land. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts to these resources. Foreseeable future projects would be required to comply with federal, state, and local laws and regulations relating to geology, soils, and land; to implement BMPs to avoid and minimize impacts to these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.6* determined that Alternative 2 would have less-than-significant impacts to geology, soils, and land. Multiple BMPs would be implemented during construction to avoid and minimize impacts to these resources. The main concern for Alternative 2 related to this resource area is impacts to littoral drift. The littoral drift study conducted by AECOM concluded that Alternative 2 would have less-than-significant impacts on littoral processes. Other projects in the future with potentially significant impacts to littoral drift must implement mitigation as required by TRPA to reduce site-specific and cumulative impacts.

In summary: 1) the combined impacts to geology, soils, and land from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on geology, soils, and land. Alternative 2's cumulative impacts on geology, soils, and land would be less than significant.

Hazards, Hazardous Materials, and Risk of Upset

Less-than-Significant Impact. The past, present, and foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts related to hazards, hazardous materials, and risk of upset. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts related to these issues. Foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to hazards, hazardous materials, and risk of upset; to implement BMPs to avoid and minimize impacts related to these issues; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.7* determined that Alternative 2 would have less-than-significant impacts related to hazards, hazardous materials, and risk of upset. Impacts related to these resources would be limited largely to the construction period and would be short term and localized. Alternative 2 would include implementation of multiple BMPs to avoid and minimize the risk of spills and leaks of hazardous materials during construction, and the construction contractor would be required to store, handle, and dispose of hazardous materials and wastes in accordance with federal, state, regional, and local laws and CG standards. In the long term, Alternative 2 would improve the CG's ability to respond quickly to incidents involving releases or potential releases of hazardous materials to Lake Tahoe, thereby minimizing or avoiding the cumulative impacts of such releases.

In summary: 1) the combined impacts related to hazards, hazardous materials, and risk of upset from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts related to hazards, hazardous materials, and risk of upset. Alternative 2's cumulative impacts related to hazards, hazardous materials, and risk of upset would be less than significant.

Hydrology and Water Quality

Less-than-Significant Impact with Mitigation. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on hydrology and water quality. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on these resources. Other past, present, and reasonably foreseeable future projects, including recent and current shorezone projects implemented in response to low lake levels, would be required to comply with federal, state, and local laws, regulations, and standards relating to hydrology and water quality; to implement BMPs to avoid and minimize impacts on these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs. The projects listed in *Table 3-41* also include several which are intended to improve water quality, and similar projects also have occurred, or are planned for, additional sites around the lake. Partly as a result of these water quality improvement projects and enforcement of regulatory requirements related to water quality, lake transparency has shown a trend towards improvement in recent years (UC Davis TERC 2015).

At the individual project level, the environmental analysis in *Section 3.8* determined that Alternative 2 would have less-than-significant impacts related to hydrology and water quality. Alternative 2 would also include implementation of multiple BMPs related to water quality, including use of a turbidity curtain, in accordance with **BMP C2-3**; implementation of a Spill Prevention and Response Plan, in accordance with **BMP C2-5**; inspection, cleaning, and maintenance of equipment, in accordance with **BMP C2-6**; and implementation of a Water Quality Monitoring Plan during construction, in accordance with **BMP C2-8,** among others. Adverse water quality impacts would be limited to the construction period and would be short term and localized. Alternative 2 would also include the implementation of **MM-BIO-1** to mitigate for impacts to the beneficial use of the Project Area as fish habitat. In the long term, Alternative 2 would have beneficial effects on water quality by improving the CG's ability to respond quickly to incidents involving releases, or potential releases, of petroleum products or other pollutants to Lake Tahoe and reducing turbidity from propeller wash from vessels using the Station pier during low-water conditions.

In summary: 1) the combined impacts to hydrology and water quality from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on hydrology and water quality. With mitigation, Alternative 2's cumulative impacts to hydrology and water quality would be less than significant.

Noise

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative noise or vibration

impacts. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable noise or vibration impacts. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to noise and vibration; to implement BMPs to avoid and minimize noise and vibration impacts; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At an individual project level, the environmental analysis in *Section 3.9* determined that Alternative 2 would have less-than-significant impacts related to noise and vibration. Alternative 2's noise and impacts would be limited to the construction period and would be short term and localized. According to TRPA guidelines, construction work that takes place between 8:00 a.m. and 6:30 p.m. is exempt from most noise limitations, and in accordance with **BMP C2-11**, Project construction will be limited to those hours. Most other construction projects in the region also typically limit themselves to similar hours to be exempted from TRPA noise limitations. Multiple other BMPs would be implemented to minimize community noise exposure. The noise and vibration modeling discussed in *Section 3.9*, also concluded that noise and vibration levels at nearby sensitive receptors during construction would be below the applicable thresholds.

In summary: 1) the combined noise and vibration impacts from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative noise and vibration impacts. Alternative 2's cumulative noise and vibration impacts would be less than significant.

Recreation

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on recreation. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on recreation. Several of the projects listed in *Table 3-41* would create opportunities for or improve access to recreation. These include a number of projects that would improve the public's access to water-based recreation, which is directly relevant to the potential cumulative impacts of the proposed Project. Other reasonably foreseeable future projects would be required to address and comply with TRPA's policies and thresholds related to recreation, to implement BMPs to avoid and minimize impacts on recreation; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.10* determined that Alternative 2 would have less-than-significant impacts related to recreation. In accordance with **BMP C2-1**, the disturbance area would be limited to the minimum practicable during construction, and in accordance with **BMP C2-13,** construction would occur between October 1 and May 1, which would avoid work during the peak summer boating season. After construction is completed, boaters would continue to have to navigate around the dog-leg pier head. However, recreational access to the Lake would not be significantly obstructed, and the pier extension would have the benefit of improving navigational safety by reducing boater speed, guiding boaters away from submerged hazards and into the TCPUD boat ramp area, and enhancing the CG's capacity to provide search and rescue and public safety services to the recreational users of Lake Tahoe year round.

In summary: 1) the combined impacts on recreation from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on recreation. Alternative 2's cumulative impacts on recreation would be less than significant.

Transportation, Traffic, and Navigation

Less-than-Significant Impact. The past, present, and reasonably foreseeable future projects considered in this cumulative impact analysis are not expected to result in significant cumulative impacts on transportation, traffic, or navigation. None of the projects listed in *Table 3-41* that have completed environmental review have been determined to have individually significant and unavoidable or cumulatively considerable impacts on these resources. Several of the projects listed in *Table 3-41* involve improvements related to traffic, transportation, and/or navigation. Other reasonably foreseeable future projects would be required to comply with federal, state, and local laws, regulations, and standards relating to transportation, traffic, and navigation; to implement BMPs to avoid and minimize impacts on these resources; and to implement mitigation if significant impacts would still occur after implementation of BMPs.

At the individual project level, the environmental analysis in *Section 3.11* determined that Alternative 2 would have less-than-significant impacts related to transportation, traffic, and navigation. Impacts on traffic and transportation would be limited largely to the construction phase and would be short term and localized. BMPs would be implemented during construction to minimize impacts related to these issues, including **BMP C2-20**, which would require preparation and implementation of a Traffic Management Plan that would address construction traffic, parking, emergency access, and related issues. In the long term, Alternative 2 would have a beneficial impact on traffic, because CG staff will no longer have to drive to access their boats at an off-site mooring location during low-water conditions or to transport the boats between the Station and the off-site location. After construction is completed, boaters would continue to have to navigate around the dog-leg pier head. However, navigation would not be significantly affected, and the pier extension would have the benefit of improving navigational safety by reducing boater speed, guiding boaters away from submerged hazards and into the TCPUD boat ramp area, and enhancing the CG's capacity to provide search and rescue and public safety services to the boating public, thereby improving navigational safety.

In summary: 1) the combined impacts on transportation, traffic, and navigation from all projects considered in the cumulative impact analysis are cumulatively less than significant, and 2) Alternative 2 would not considerably contribute to cumulative impacts on transportation, traffic, and navigation. Alternative 2's cumulative impacts on transportation, traffic, and navigation would be less than significant.

Utilities and Service Systems

No Impact. Under NEPA and CEQA, a project proponent is not required to analyze cumulative impacts to which the project would not contribute. The environmental analysis in *Section 3.12* determined that Alternative 2 would have no impact on utilities and service systems. Because the Alternative 2 would have no impact on utilities and service systems on its own, it also would not considerably contribute to cumulative impacts on utilities and service systems.

3.13.2.3 Alternative 3: Straight Extension with Dolphins

Less-than-Significant Impact with Mitigation. Alternative 3 would have similar cumulative impacts as Alternative 2. For all resources, cumulative impacts would be less than significant with mitigation (aesthetics, scenic resources, and community design; biological resources; and hydrology and water quality), less than significant (air quality and GHGs; cultural resources; geology, soils, and land; hazards, hazardous materials, and risk of upset; noise; recreation; and traffic, transportation, and navigation), or nonexistent (utilities and service systems). Alternative 3 would differ from Alternative 2 primarily in the duration of construction (8 weeks versus 7 weeks), the number of piles installed (22 versus 26), the length of the pier extension (450 feet versus 350 feet), and orientation of the pier head (dog-leg versus straight). Although these differences may influence the proposed Project's individual impacts on certain resources, the differences would not change the significance determinations made for cumulative impacts.

3.13.2.4 Alternative 4: No Action

No Impact. Under the No Action Alternative, no dredging or pier construction would take place, and the proposed Project would not contribute to any cumulative impacts when compared with baseline conditions. However, Alternative 4 would not fulfill the purpose and need of the proposed Project, and existing adverse effects on public safety, spill response, air quality, water quality, recreation, and traffic would continue due to the need for the CG to moor their response boats at an off-site location.

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4.0 Conclusions

This section provides a comparative analysis summary for the Project Alternatives, identifies the CG's Proposed Action (i.e., preferred Alternative, based on the results of the comparative analysis), assesses the overall environmental significance of that Proposed Action, and provides a determination of whether a FONSI can be supported by the environmental analysis of the Proposed Action or whether an EIS must be prepared to further analyze potentially significant impacts. The section also addresses the CEQA and TRPA requirements for findings of significance for the Proposed Action, as identified in the CEQA and TRPA environmental checklists.

4.1 Comparative Analysis and Selection of the Proposed Action

Table 4-1 provides a summary of the impact significance determinations of the proposed Project Alternatives for each resource area analyzed in detail. For CEQA and TRPA the determination is based on the highest degree of impact assessed for the various checklist questions for each resource.

Table 4-1 Comparison Summary of Impact Significance for Each Project Alternative

Resource Area	Legislation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Aesthetics, Scenic Resources, and Community Design	NEPA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Potentially Significant and Unmitigable Impact	Potentially Significant and Unmitigable Impact	No Impact
Air Quality and GHGs	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Biological Resources	NEPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact

Resource Area	Legislation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Cultural Resources	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Geology, Soils, and Land	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Hazards, Hazardous Materials, and Risk of Upset	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Hydrology and Water Quality	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
	TRPA	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact
Noise and Vibration	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Recreation	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact

Resource Area	Legislation	Alternative 1: Dredging at Existing Pier	Alternative 2: Dog-Leg Extension	Alternative 3: Straight Extension	Alternative 4: No Action
Transportation, Traffic, and Navigation	NEPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	CEQA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
	TRPA	Less-than-Significant Impact	Less-than-Significant Impact	Less-than-Significant Impact	No Impact
Utilities and Service Systems	NEPA	Less-than-Significant Impact	No Impact	No Impact	No Impact
	CEQA	Less-than-Significant Impact	No Impact	No Impact	No Impact
	TRPA	Less-than-Significant Impact	No Impact	No Impact	No Impact
Cumulative Impacts	All	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	Less-than-Significant Impact with Mitigation	No Impact

Based on the impact significance determinations in *Table 4-1*, the CG has selected Alternative 1, Dredging at Existing Pier, as its Proposed Action because it meets the purpose and need of the Project while avoiding potentially significant impacts to the environment. As shown in *Table 4-1*, Alternative 1 is not expected to have the potential to cause significant environmental impacts with implementation of the proposed mitigation measures and BMPs, whereas Alternatives 2 and 3 would both have potentially significant and unmitigable impacts on aesthetics, scenic resources, and community design, including cumulatively considerable impacts on these resources. Although Alternative 4 would have no impacts relative to the existing baseline, the No Action Alternative does not fulfill the purpose and need of the Project and would result in the continuation of unacceptable adverse conditions related to public safety and security, as well as air quality, hazardous materials, water quality, and traffic, caused by the current need for the CG to moor their boats off site during low water conditions.

In addition to not having potentially significant adverse impacts on aesthetics, scenic resources, and community design, Alternative 1 would also have less impact on many other key environmental resources than the other Action Alternatives, while still fulfilling the purpose and need of the Project. For those resources where the impacts of Alternative 1 are greater than the other Action Alternatives, these impacts can still be minimized or mitigated to a less-than-significant level. A summary of the impacts of Alternative 1 on key resources in comparison to those of the other two Action Alternatives is provided below:

- *Aesthetics, Scenic Resources, and Community Design* – Alternative 1 would involve the addition of substantially less area of new structure visible from Lake Tahoe and local public recreation areas than Alternatives 2 and 3 (174 square feet for Alternative 1, versus 734 square feet and 704 square feet for Alternatives 2 and 3, respectively). As discussed, Alternative 1 also would avoid potentially significant and unmitigable impacts to aesthetics, scenic resources, and community design. In contrast, Alternatives 2 and 3 would both have significant and unmitigable impacts related to inconsistency with TRPA's SQIP and design standards and effects on views from public recreation areas. Additionally, multiple comments received during the public scoping period for this document indicated a preference for Alternative 1 because it would avoid significant impacts on public and private views to and from Lake Tahoe.

- *Air Quality and GHGs* – Daily emissions of criteria pollutants during construction of Alternative 1 would be less than for Alternatives 2 or 3. Total emissions of most criteria pollutants would also be less for Alternative 1. The LTAB is in attainment of the NAAQS and CAAQS for CO, and Alternative 1's emissions of CO would not affect this attainment status or have other significant impacts. Daily and total GHG emissions are somewhat higher for Alternative 1 than the two pier extension Alternatives, but would still be well below the PCAPCD's recommended threshold and therefore are less than significant. Alternative 1 would also involve infrequent maintenance dredging that would generate air emissions, but these emissions are expected to be lower than for the original dredging episode and therefore would be less than significant. In the long term, all three Action Alternatives would have beneficial effects on air quality and GHG emissions by eliminating vehicle emissions involved with driving between the Station and an off-site mooring location, and by improving the CG's ability to respond to incidents involving release of volatile fuels that contribute to ROG emissions.

- *Biological Resources* – Although Alternative 1 would affect a larger area of lake-bottom habitat than Alternatives 2 or 3, most of the area affected does not provide high-quality habitat. Alternative 1 would affect more potential PFH than Alternatives 2 or 3 (up to 1,895 square feet versus 5 and 3 square feet, respectively), but implementation of **MM BIO-1** would mitigate impacts on PFH by replacing the affected PFH at a 1:1.5 ratio, ensuring that there is no net loss of habitat. Alternative 1 would also involve significantly less pile driving than Alternatives 2 and 3, and therefore has less potential to cause hydroacoustic-related impacts to aquatic biota.

- *Cultural Resources* – Alternative 1 would involve greater disturbance of the lake bed than the other Action Alternatives, but no historic properties are likely to occur in the Project Area based on cultural records searches and other historical research. In the unlikely event that buried cultural resources are discovered during dredging, **BMP C1-21** would be implemented, requiring that ground-disturbing activities cease in the area of the find and that appropriate reporting and treatment protocols are implemented.

- *Geology, Soils, and Land* – The main concern related to geology, soils, and land for all Action Alternatives was impacts on littoral processes – i.e., erosion, transport, and deposition of sediment in the shorezone. The littoral drift study conducted for the Project concluded that none of the three Action Alternatives would have significant impacts on littoral processes. Alternative 1 would affect wave heights and velocities over a larger area than Alternatives 2 and 3, but under normal conditions these changes would not extend to the shoreline and would not affect shoreline or backshore erosion or deposition. Alternative 1 would have less effect on long-shore currents, and therefore long-shore transport of sediments, than Alternatives 2 and 3, and overall the impacts of Alternative 1 on littoral processes would be less than significant.

- *Hazards, Hazardous Materials, and Risk of Upset* – The three Action Alternatives would involve similar impacts related to hazards, hazardous materials, and risk of upset. The results of sediment and water samples collected at the Project site indicate there are no human health or water quality COCs present at levels that would exceed the respective thresholds (AECOM Technical Services 2016). In accordance with **BMP C1-1**, all dredged materials would be transported to an appropriately licensed off-site disposal facility. In the long term, all three Action Alternatives would improve the CG's ability to respond to incidents involving releases, or potential releases, of hazardous materials to Lake Tahoe.

- *Hydrology and Water Quality* – Alternative 1 would involve greater lakebed disturbance, and therefore greater potential for turbidity-related impacts on water quality, than Alternatives 2 and 3. Alternative 1 would also involve potential water quality impacts associated with maintenance dredging, which would be required every 10 to 15 years and is expected to involve a lower level of water quality impacts than the original dredging episode. Multiple BMPs related to water quality would be implemented during construction and maintenance dredging, as described in *Section 2.1.1*, and construction-related impacts to water quality would be temporary, localized, and less than significant. Alternative 1 would involve long-term modification of a larger area of bed

lakebed. In the long term, all Action Alternatives would improve the CG's ability to respond to incidents on Lake Tahoe that could involve the discharge, or potential discharge, of deleterious substances that could affect water quality. However, only Alternative 1 would minimize future turbidity caused by boats passing through the dredged area, because the water would be deeper.

- *Noise and Vibration* – Construction of Alternative 1 would generate substantially less noise and vibration than Alternatives 2 and 3, because it would involve substantially less pile driving.

- *Recreation* – Construction of Alternative 1 would involve impacts to recreational users of Lake Tahoe similar to those of Alternatives 2 and 3, and recreational impacts during construction of all three Alternatives would be short term, localized, and less than significant. In the long term, Alternative 1 would have beneficial effects on recreation, by increasing water depth in the approach channel to the TCPUD Lake Forest boat launch facilities and enhancing the CG's ability to provide recreational boating safety services, while avoiding the need for recreationists to have to navigate around a 350- or 450-foot pier extension, as they would in the case of Alternatives 2 or 3.

- *Traffic, Transportation, and Navigation* – During construction, Alternative 1 would have more impact on traffic in the Project vicinity, due to truck trips involved with the disposal of dredged material, but these impacts would be short term, localized, and less than significant. Maintenance dredging would also involve impacts on traffic, though these are likely to be less than for the original dredging episode and would be infrequent, short term, and less than significant. Impacts to navigation during construction would be similar for all three Action Alternatives. In the long term, Alternative 1 would have beneficial effects on navigation, by increasing water depth in the Project Area, and would avoid the need for recreationists to have to navigate around a 350- or 450-foot pier extension, as they would in the case of Alternatives 2 or 3.

- *Utilities and Service Systems* – Alternative 1 would involve the disposal of dredged material, and therefore would affect local solid waste disposal facilities, whereas Alternatives 2 and 3 would only involve disposal of negligible amounts of construction waste. However, local solid waste disposal facilities would have more than sufficient capacity to receive the dredged material generated by implementation of Alternative 1, and impacts on solid waste services would be short term, localized, and less than significant. Alternative 1 would also involve dredged material disposal associated with periodic maintenance dredging, but the volume of material is likely to be less than for the original dredging episode, and impacts of maintenance dredging on solid waste disposal services would be infrequent, short term, and less than significant. Other utilities and service systems would not be significantly affected by any of the three Action Alternatives.

In summary, Alternative 1 would not have significant impacts on environmental resources (whereas Alternatives 2 and 3 would have significant impacts), and Alternative 1 would also have less impact on key environmental resources than Alternatives 2 or 3. Alternative 1 also fulfills the purpose and need of the proposed Project, whereas Alternative 4 does not. Alternative 1 would also result in long-term beneficial effects on air quality, hazardous materials, water quality, recreation, traffic, and navigation as well as to public health and safety. For these reasons, Alternative 1 is the CG's selected alternative based on the results of the environmental analysis.

4.2 Environmental Significance of the Proposed Action

The environmental analysis concluded that the Proposed Action (Alternative 1) would not significantly affect the quality of the human environment. Therefore the CG proposes to prepare a FONSI pursuant to NEPA and to implement the Proposed Action. Public comments on the Draft EA will be reviewed and considered during preparation of the Final EA and FONSI.

The Proposed Action would include implementation of the BMPs and mitigation measures described for Alternative 1 in this EA, to avoid, minimize, and mitigate impacts to a less-than-significant level. To monitor compliance with the proposed BMPs, the CG has prepared a Mitigation and Monitoring Program Checklist (Appendix N), which will be tracked as the measures are completed prior to and during construction.

Although NEPA only requires that an EA assess whether or not a Proposed Action would "significantly affect the quality of the human environment" to determine whether a FONSI can be supported by the environmental analysis or whether an EIS must be prepared to further analyze potentially significant impacts, CEQA and the TRPA impact analysis processes require that a number of specific findings of significance be addressed for a Proposed Action. Therefore, to assist the LRWQCB and TRPA in making the required findings, the questions from the CEQA and TRPA environmental checklists related to general findings of significance are addressed in the following sections.

4.3 CEQA Mandatory Findings of Significance

The CEQA checklist includes several mandatory findings of significance for a proposed project as a whole. Answers to each of the CEQA checklist questions related to mandatory findings of significance are provided below for the CG's Proposed Action (i.e., Alternative 1):

a) *Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*

Less-than-Significant Impact with Mitigation. As indicated in the environmental impact analysis in *Section 3*, the CG's Proposed Action would not have significant impacts on, and therefore would not degrade, the quality of the environment. The impacts of Alternative 1 on the environmental resources covered by the CEQA checklist would be either less than significant with mitigation (aesthetics, biological resources, and hydrology and water quality), less than significant (air quality, cultural resources, geology and soils, GHG emissions, hazards and hazardous materials, noise, recreation, transportation and traffic, and utilities and service systems), or nonexistent (agriculture and forestry, land use and planning, mineral resources, population and housing, and public services). Alternative 1 would also result in long-term beneficial effects on air quality and GHG emissions, hazardous materials, water quality, recreation, shorezone conditions, traffic, and navigation as well as to public health and safety. Because Alternative 1 would have no significant adverse impacts after implementation of mitigation measures and BMPs, and would also have multiple beneficial effects, it would not substantially degrade the quality of the environment.

Most of the dredging footprint consists of substrate types that do not provide good-quality habitat for fish or other aquatic fauna. The construction of Alternative 1 would involve the removal of up to 1,895 square feet of lakebed with substrate that could provide fish feed and cover habitat. However, implementation of **MM BIO-1** (Fish Habitat Mitigation and Monitoring) would mitigate this impact to a less-than-significant level by replacing the affected habitat at a 1:1.5 ratio, resulting in a net increase of 948 square feet of feed and cover habitat. The replacement habitat would be monitored for 3 years to confirm that it provides equal or greater habitat function and value as the feed and cover habitat removed by the dredging, and corrective actions would be taken if this is not the case. With implementation of this mitigation, Alternative 1 would not substantially reduce the habitat of a fish or wildlife species.

Although the Proposed Action could affect individual organisms, it is not expected to cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of rare or endangered plants or animals. Multiple BMPs would be implemented during construction to avoid and minimize impacts to plants, fish, and wildlife and their habitat, as discussed in *Section 3.4.3.1*. The only federally listed threatened or endangered species with potential to occur in the Project Area is the Lahontan cutthroat trout. There is only a very small possibility of Lahontan cutthroat trout occurring in the Project Area during construction, because there is currently no self-sustaining population of the species in Lake Tahoe and no recent records of the species in the Project vicinity. The only recent stocking of Lahontan cutthroat trout in Lake Tahoe was conducted by NDOW in 2011 – this stocking event occurred on the other side of the lake from the Project Area, and it was conducted only to provide anglers the opportunity to catch the species during the 2011 fishing season, not to create a self-sustaining population in the lake. **MM BIO-1** would be implemented to mitigate impacts

to potential habitat for Lahontan cutthroat trout and other fish species. For state-listed flora and fauna, the primary concern for shorezone project in Lake Tahoe is the Tahoe yellow cress. This species is not expected to occur in the Project Area, based on the results of past focused surveys for the species and lack of high quality habitat in the Project Area. In accordance with **BMP C1-18**, an additional pre-construction survey will be conducted to confirm that Tahoe yellow cress is not present in the Project Area, and measures to avoid impacts to the species would be implemented if it is found during the pre-construction survey.

As discussed in the analysis for cultural resources (*Section 3.5*), no historical or prehistorical cultural resources are likely to be affected by the Proposed Action. No cultural resources have been previously documented in or in close proximity to the Project Area, and none are likely to be found since because dredging footprint is in a submerged area where cultural resources are less likely to be found, and much of it has been previously disturbed. In the unlikely event that buried cultural resources are discovered during dredging, **BMP C1-21** would be implemented. In accordance with **BMP C1-21**, ground-disturbing activities would cease in the area of the find and appropriate reporting, consultation, investigation and treatment measures would be implemented. Therefore, Alternative 1 is not expected to eliminate important examples of the major periods of California history or prehistory.

In summary, with the incorporation of the proposed mitigation measures and BMPs, the Proposed Action would have less-than-significant impacts related to the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less-than-Significant Impact with Mitigation. A thorough discussion of Alternative 1's potential for cumulative impacts is provided in *Section 3.13.2.1*. As indicated in the cumulative impacts analysis, Alternative 1's cumulative impacts on the environmental resources covered by the CEQA checklist would be either less than significant with mitigation (aesthetics, biological resources, and hydrology and water quality), less than significant (air quality, cultural resources, geology and soils, GHG emissions, hazards and hazardous materials, noise, recreation, transportation and traffic, and utilities and service systems), or nonexistent (agriculture and forestry, land use and planning, mineral resources, population and housing, and public services). Alternative 1 has no impacts that are individually limited but cumulatively considerable.

c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less-than-Significant Impact with Mitigation. The environmental analysis indicates that all of the Proposed Action's impacts on humans and the human environment would be either less than significant with mitigation, less than significant, or nonexistent, including impacts on human beings either directly or indirectly. The Project would not have significant adverse effects on human health, safety, socioeconomics, or enjoyment of the environment. The Project also would have beneficial effects on human health, safety, and enjoyment of Lake Tahoe by improving the CG's ability to provide vital search and rescue, law enforcement, recreational boating safety, and spill response services to the boating public and agencies that use the lake.

4.4 TRPA Findings of Significance

Similar to the CEQA checklist, the TRPA IEC also includes a requirement for findings of significance for a proposed project. Answers to each of the IEC questions related to TRPA's required findings of significance are provided below for Alternative 1:

a) *Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California or Nevada history or prehistory?*

Less-than-Significant Impact with Mitigation. As indicated in the environmental impact analysis in *Section 3*, the CG's Proposed Action would not have significant impacts on, and therefore would not degrade the quality of the environment. Alternative 1's adverse impacts on the environmental resources covered by the TRPA IEC would be either less than significant with mitigation (scenic resources and community design, wildlife, and water quality), less than significant (air quality, archaeological/historic resources, land, light and glare, noise, recreation, risk of upset/human health hazards, transportation and circulation, utilities, and vegetation), or nonexistent or negligible (energy, land use, natural resources, population and housing, and public services). Alternative 1 would also result in long-term beneficial effects on air quality and GHG emissions, hazardous materials, water quality, recreation, shorezone conditions, traffic, and navigation as well as to public health and safety. Because Alternative 1 would have no significant adverse impacts, and would also have multiple beneficial effects, it would not substantially degrade the quality of the environment.

Most of the dredging footprint consists of substrate types that do not provide good-quality habitat for fish or other aquatic fauna. The construction of Alternative 1 would involve the removal of up to 1,895 square feet of fish feed and cover habitat, which falls under the TRPA's definition of PFH. However, implementation of **MM BIO-1** (Fish Habitat Mitigation and Monitoring) would mitigate this impact to a less-than-significant level by replacing the affected habitat at a 1:1.5 ratio, resulting in a net increase of 948 square feet of PFH. The replacement habitat would be monitored for 3 years to confirm that it provides equal or greater habitat function and value as the PFH removed by the dredging, and corrective actions would be taken if this is not the case. With implementation of this mitigation, Alternative 1 would not substantially reduce the habitat of a fish population to drop below self-sustaining levels.

Although the Proposed Action could affect individual organisms, it is not expected to threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of rare or endangered plants or animals. Multiple BMPs would be implemented during construction to avoid and minimize impacts to plants, fish, and wildlife and their habitat, as discussed in *Section 3.4.3.1*. The only federally listed threatened or endangered species with potential to occur in the Project Area is the Lahontan cutthroat trout. There is only a very small possibility of Lahontan cutthroat trout occurring in the Project Area during construction, because there is currently no self-sustaining population of the species in Lake Tahoe and no recent records of the species in the Project vicinity. The only recent stocking of Lahontan cutthroat trout in Lake Tahoe was conducted by NDOW in 2011 – this stocking event occurred on the other side of the lake from the Project Area, and it was conducted only to provide anglers the opportunity to catch the species during the 2011 fishing season, not to create a self-sustaining population in the lake. **MM BIO-1** would be implemented to mitigate impacts to potential habitat for Lahontan cutthroat trout and other fish species. For state-listed flora and fauna, the primary concern for shorezone project in Lake Tahoe is the Tahoe yellow cress. This species is not expected to occur in the Project Area, based on the results of past focused surveys for the species and lack of high quality habitat in the Project Area. In accordance with **BMP C1-18**, an additional pre-construction survey will be conducted to confirm that Tahoe yellow cress is not present in the Project Area, and measures to avoid impacts to the species would be implemented if it is found during the pre-construction survey.

As discussed in the analysis for cultural resources (*Section 3.5*), no historical or prehistorical cultural resources are likely to be affected by the Proposed Action. No cultural resources have been previously documented in or in close proximity to the Project Area, and none are likely to be found because the

dredging footprint is in a submerged area where cultural resources are less likely to be found, and much of it has been previously disturbed. In the unlikely event that buried cultural resources are discovered during dredging, **BMP C1-21** would be implemented. In accordance with **BMP C1-21**, ground-disturbing activities would cease in the area of the find and appropriate reporting, consultation, investigation and treatment measures would be implemented. Therefore, Alternative 1 is not expected to eliminate important examples of the major periods of California history or prehistory.

In summary, with the incorporation of the proposed mitigation measures and BMPs, the Proposed Action would have less-than-significant impacts related to the potential to degrade the quality of the environment, substantially reduce the habitat of a fish population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

b) Does the Project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)

Less-than-Significant Impact with Mitigation. Most of Alternative 1's potential impacts would occur during the construction phase, or during infrequent maintenance dredging, and would be short term and localized. Potential long-term impacts on aesthetics and scenic quality due to the introduction of new visible mass for the boat lift and floating dock would be mitigated by implementation of **MM AES-1**. Potential long-term impacts on aquatic habitat due to the removal of PFH would be mitigated by implementation of **MM BIO-1**. Long-term impacts to littoral processes would be less than significant. Alternative 1 would also result in long-term beneficial effects on air quality and GHG emissions, hazardous materials, water quality, recreation, shorezone conditions, traffic, and navigation, as well as to public health and safety, due to the fact that the CG will be able to keep their response boats at the Station year round, will not have to drive off site to access the boats, and will be able to better provide search and rescue, law enforcement, and boating safety services to the boating public and agencies that use Lake Tahoe. In summary, with implementation of the proposed mitigation measures, Alternative 1 would have less-than-significant impacts related to its potential to achieve short-term, to the disadvantage of long-term, environmental goals.

c) Does the Project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environmental is significant?)

Less-than-Significant Impact with Mitigation. A thorough discussion of Alternative 1's potential for cumulative impacts is provided in *Section 3.13.2.1*. As indicated in the cumulative impacts analysis, Alternative 1's cumulative impacts covered by the TRPA IEC would be either less than significant with mitigation (scenic resources and community design, wildlife, and water quality), less than significant (air quality, archaeological/historic resources, land, light and glare, noise, recreation, risk of upset/human health hazards, transportation and circulation, utilities, and vegetation), or nonexistent or negligible (energy, land use, natural resources, population and housing, and public services). Alternative 1 has no impacts that are individually limited but cumulatively considerable.

d) Does the Project have environmental impacts which will cause substantial adverse effects on human beings, either directly or indirectly?

Less-than-Significant Impacts with Mitigation. The environmental analysis indicates that all of the Proposed Action's impacts on humans and the human environment would be either less than significant with mitigation, less than significant, or nonexistent, including impacts on human beings either directly or indirectly. The Project would not have significant adverse effects on human health, safety, socioeconomics, or enjoyment of the environment. The Project also would have beneficial effects on human health, safety, and enjoyment of Lake Tahoe by improving the CG's ability to provide vital search and rescue, law enforcement, recreational boating safety, and spill response services to the boating public and agencies that use the lake.

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Appendix A

CEQA Checklist for the Preferred Alternative

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CEQA Environmental Checklist
Project Proponent's Draft

PROJECT DESCRIPTION AND BACKGROUND

Project Title:	Coast Guard Station Lake Tahoe Year-Round Mooring Project
Lead agency name and address:	Lahontan RWQCB South Lake Tahoe Office 2501 Lake Tahoe Blvd So. Lake Tahoe, CA 96150
Contact person and phone number:	Dale Payne, (530) 542-5464
Project Location:	2500 Lake Forest Rd Tahoe City, CA
Project sponsor's name and address:	US Coast Guard Civil Engineering Unit – Oakland 1301 Clay Street, Suite 700N Oakland, CA 94612
General plan description:	N/A
Zoning:	N/A
Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation.)	The proposed Project involves dredging a channel to provide consistent year-round mooring capabilities at the Coast Guard Station Lake Tahoe pier. The channel would be dredged to an elevation of 6,215 ft, Lake Tahoe Datum, with 2 ft of overdepth allowance. The dredging footprint would cover an area of 27,816 to 29,749 sq ft, and 2,656 to 5,041 cubic yards of material would be dredged (upper limits include full overdepth allowance).
Surrounding land uses and setting; briefly describe the project's surroundings:	The Tahoe City Public Utilities District Lake Forest pier and boat ramp are located to the west, the Lake Forest Campground is to the northwest, the Saint Francis Lakeside Condominiums are to the northeast and east, and Lake Tahoe is to the south.
Other public agencies whose approval is required (e.g. permits, financial approval, or participation agreements):	Permits - Tahoe Regional Planning Agency, US Army Corps of Engineers; Consultation - US Fish & Wildlife Service, California Department of Fish & Wildlife, State Historic Preservation Officer

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project. Please see the checklist beginning on page 3 for additional information.

☒	Aesthetics	☐	Agriculture and Forestry	☒	Air Quality
☒	Biological Resources	☒	Cultural Resources	☒	Geology/Soils
☒	Greenhouse Gas Emissions	☒	Hazards and Hazardous Materials	☒	Hydrology/Water Quality
☐	Land Use/Planning	☐	Mineral Resources	☒	Noise
☐	Population/Housing	☐	Public Services	☒	Recreation
☒	Transportation/Traffic	☒	Utilities/Service Systems	☒	Mandatory Findings of Significance

DETERMINATION:

On the basis of this initial evaluation:

☐	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☐	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required

Signature:	**Date:**
Printed Name:	**For:**

CEQA Environmental Checklist

Dist.-Co.-Rte.	P.M/P.M.	E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☒	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐
d) Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code §21074?	☐	☐	☒	☐
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

IX. HYDROLOGY AND WATER QUALITY: Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☒	☐

X. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

XI. MINERAL RESOURCES: Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

XII. NOISE: Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XIII. POPULATION AND HOUSING: Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIV. PUBLIC SERVICES:

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

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Appendix B

TRPA Initial Environmental Checklist for the Preferred Alternative

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TAHOE REGIONAL PLANNING AGENCY

SOUTH SHORE
128 Market St.
Stateline,NV
Monday-Friday
9:00 am-5:00 pm

NORTH SHORE
3080 North Lake Blvd.
Tahoe City,CA
Wednesday-Friday
9:00 am-4:00pm

MAIL
PO Box 5310
Stateline, NV 89449-5310
Accepting Applications
Until 4:00 pm at both offices

Phone:(775) 588-4547
Fax:(775)588-4527
www.trpa.org
trpa@trpa.org

Print Form

INITIAL ENVIRONMENTAL CHECKLIST FOR DETERMINATION OF ENVIRONMENTAL IMPACT

I. Assessor's Parcel Number (APN)/Project Location 094-140-015-510

Project Name Coast Guard Station Lake Tahoe Year-Round Mooring Project

County/City Placer/Tahoe City

Brief Description of Project:

Alternative 1 consists of dredging a channel to allow access to the existing pier during low-water conditions. The channel would be dredged to an elevation of 6,215 feet, LTD, or until bedrock is encountered, whichever is higher, and would cover an area of 27,816 to 29,749 square feet (sq. ft.). A volume of up to 5,041 cubic yards of material would be removed from the lake bottom.

The dredging would be conducted with a barge-mounted excavator. Dredging would be conducted in accordance with U.S. Army Corps of Engineers (USACE), Lahontan RWQCB, and TRPA requirements. The dredged material would be dewatered and loaded into lined trucks. The trucks would transport the material to a licensed upland disposal facility. The anticipated construction duration would be approximately 8 weeks. Maintenance dredging would be required approximately once every 10 to 15 years to remove accumulated sediments to maintain an elevation of 6,215 feet, LTD, at the pier head. The CG would obtain the appropriate regulatory approvals for the future maintenance dredging.

In addition to dredging, Alternative 1 would also include the replacement of the pier's existing 8,000-pound (lb) capacity boat lift with a 10,000-lb capacity lift to accommodate one of the Station's rapid response boats and the addition of an 18,000-lb boat lift and a 70-foot by 8-foot floating dock to the west side of the existing pier head to accommodate the Station's second response boat and visiting vessels. In order to mount the second boat lift on the western side of the existing pier head, two steel h-piles would be installed on the western side of the existing pier head. Piles would be installed using a pile driver mounted on the work barge. Piles would be driven to the minimum tip elevation shown on the construction plans and to a minimum driving resistance to obtain the specified minimum bearing capacity. Generally, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. Typically, the construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used. Due to the variety of substrate types present at the Project site, techniques such as pre-drilling or jetting may also be required. Once the new piles have been driven, the tops of the piles would be cut to the required elevation using a welding torch. After the piles are cut, the mounting hardware and boatlift would be installed.

The following questionnaire will be completed by the applicant based on evidence submitted with the application. All "Yes" and "No, With Mitigation" answers will require further written comments.

II. ENVIRONMENTAL IMPACTS:

1. Land

Will the proposal result in:

a. Compaction or covering of the soil beyond the limits allowed in the land capability or Individual Parcel Evaluation System (IPES)?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

b. A change in the topography or ground surface relief features of site inconsistent with the natural surrounding conditions?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

c. Unstable soil conditions during or after completion of the proposal?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

d. Changes in the undisturbed soil or native geologic substructures or grading in excess of 5 feet?

The Project would include the installation of two h-piles for the new boat lift that would be driven to a depth of approximately 30 feet below the mudline. The area of lake bottom that would be disturbed would be

☒ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

e. The continuation of or increase in wind or water erosion of soils, either on or off the site?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

f. Changes in deposition or erosion of beach sand, or changes in siltation, deposition or erosion, including natural littoral processes, which may modify the channel of a river or stream or the bed of a lake?

AECOM conducted a study to model the Project's effects on the hydrodynamic parameters that drive littoral drift, including wave height, orbital velocity, and long-shore current velocity. The modeling showed

- [x] Yes
- [ ] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

g. Exposure of people or property to geologic hazards such as earthquakes, landslides, backshore erosion, avalanches, mud slides, ground failure, or similar hazards?

- [ ] Yes
- [x] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

2. Air Quality

Will the proposal result in:

a. Substantial air pollutant emissions?

- [ ] Yes
- [x] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

b. Deterioration of ambient (existing) air quality?

- [ ] Yes
- [x] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

c. The creation of objectionable odors?

- [ ] Yes
- [x] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

d. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?

- [ ] Yes
- [x] No
- [ ] No, With Mitigation
- [ ] Data Insufficient

e. Increased use of diesel fuel?

Construction activities will require a minor temporary increase of diesel fuel use, but the Project will not result in a significant or long term increase of diesel use. During construction, measures will be taken to reduce	☒ Yes	☐ No
	☐ No, With Mitigation	☐ Data Insufficient

3. Water Quality

Will the proposal result in:

a. Changes in currents, or the course or direction of water movements?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff so that a 20 yr. 1 hr. storm runoff (approximately 1 inch per hour) cannot be contained on the site?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

c. Alterations to the course or flow of 100-yearflood waters?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

d. Change in the amount of surface water in any water body?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?

Project impacts to water quality would be limited to the dredging/construction phase. The primary impact to water quality during dredging would be increased turbidity and subsequent sedimentation resulting from	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

f. Alteration of the direction or rate of flow of ground water?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

g. Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

h. Substantial reduction in the amount of water otherwise available for public water supplies?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

i. Exposure of people or property to water related hazards such as flooding and/or wave action from 100-year storm occurrence or seiches?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

j. The potential discharge of contaminants to the groundwater or any alteration of groundwater quality?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

k. Is the project located within 600 feet of a drining water source?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

4. Vegetation

Will the proposal result in:

a. Removal of native vegetation in excess of the area utilized for the actual development permitted by the land capability/IPES system?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Removal of riparian vegetation or other vegetation associated with critical wildlife habitat, either through direct removal or indirect lowering of the groundwater table?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

c. Introduction of new vegetation that will require excessive fertilizer or water, or will provide a barrier to the normal replenishment of existing species?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

d. Change in the diversity or distribution of species, or number of any species of plants (including trees, shrubs, grass, crops, micro flora and aquatic plants)?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

e. Reduction of the numbers of any unique, rare or endangered species of plants?

Focused surveys indicate that no Tahoe yellow cress occurs in the Project Area, the potential habitat for Tahoe yellow cress within the Project Area is of marginal quality, and no other special-status plants	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

f. Removal of stream bank and/or backshore vegetation, including woody vegetation such as willows?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

g. Removal of any native live, dead or dying trees30 inches or greater in diameter at breast height (dbh) within TRPA's Conservation or Recreation land use classifications?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

h. A change in the natural functioning of an old growth ecosystem?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

5. Wildlife

Will the proposal result in:

a. Change in the diversity or distribution of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects, mammals, amphibians or microfauna)?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

b. Reduction of the number of any unique, rare or endangered species of animals?

One federally-listed species, the Lahontan cutthroat trout, has a low potential to occur in the Project Area. There is only a small possibility of Lahontan cutthroat trout occurring in the Project Area during

☐ Yes ☐ No
☒ No, With Mitigation ☐ Data Insufficient

c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?

The Coast Guard anticipates that the vessels and equipment to be used for the project will not be brought in from outside the Lake Tahoe Basin, thus minimizing the chance of introduction of non-native	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

d. Deterioration of existing fish or wildlife habitat quantity or quality?

The Project site is in an area mapped by TRPA as Prime Fish Habitat (PFH) for spawning and feed and cover. Fish habitat surveys conducted by AECOM indicate that the dredging footprint is composed mostl	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

6. Noise

Will the proposal result in:

a. Increases in existing Community Noise Equivalency Levels (CNEL) beyond those permitted in the applicable Plan Area Statement, Community Plan or Master Plan?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Exposure of people to severe noise levels?

Most construction activities would occur 300 feet or more from the shoreline, well away from where most people at risk of exposure to severe noise levels would be, and the only construction activity that would	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

c. Single event noise levels greater than those set forth in the TRPA Noise Environmental Threshold?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

7. Light and Glare

Will the proposal:

a. Include new or modified sources of exterior lighting?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Create new illumination which is more substantial than other lighting, if any, within the surrounding area?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

c. Cause light from exterior sources to be cast off -site or onto public lands?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

d. Create new sources of glare through the siting of the improvements or through the use of reflective materials?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

8. Land Use

Will the proposal:

a. Include uses which are not listed as permissible uses in the applicable Plan Area Statement, adopted Community Plan, or Master Plan?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Expand or intensify an existing non-conforming use?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

9. Natural Resources

Will the proposal result in:

a. A substantial increase in the rate of use of any natural resources?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Substantial depletion of any non-renewable natural resource?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

10. Risk of Upset

Will the proposal:

a. Involve a risk of an explosion or the release of hazardous substances including, but not limited to, oil, pesticides, chemicals, or radiation in the event of an accident or upset conditions?

Standard safety, materials storage, and spill prevention and response measures would be required during construction and operation to ensure the proper handling of hazardous materials, mainly fuel and oil.	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Involve possible interference with an emergency evacuation plan?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

11. Population

Will the proposal:

a. Alter the location, distribution, density, or growth rate of the human population planned for the Region?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Include or result in the temporary or permanent displacement of residents?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

12. Housing

Will the proposal:

a. Affect existing housing, or create a demand for additional housing?

To determine if the proposal will affect existing housing or create a demand for additional housing, please answer the following questions:

(1) Will the proposal decrease the amount of housing in the Tahoe Region?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

(2) Will the proposal decrease the amount of housing in the Tahoe Region historically or currently being rented at rates affordable by lower and very-low-income households?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

Number of Existing Dwelling Units: _____

Number of Proposed Dwelling Units: _____

b. Will the proposal result in the loss of housing for lower-income and very-low-income households?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

13. Transportation/Circulation

Will the proposal result in:

a. Generation of 100 or more new Daily Vehicle Trip Ends (DVTE)?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

b. Changes to existing parking facilities, or demand for new parking?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

c. Substantial impact upon existing transportation systems, including highway, transit, bicycle or pedestrian facilities?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

d. Alterations to present patterns of circulation or movement of people and/or goods?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

e. Alterations to waterborne, rail or air traffic?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

f. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

14. Public Services

Will the proposal have an unplanned effect upon, or result in a need for new or altered governmental services in any of the following areas?

a. Fire protection?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

b. Police protection?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

c. Schools?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

d. Parks or other recreational facilities?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

e. Maintenance of public facilities, including roads?

☐ Yes ☒ No
☐ No, With Mitigation ☐ Data Insufficient

f. Other governmental services?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

15. Energy

Will the proposal result in:

a. Use of substantial amounts of fuel or energy?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

16. Utilities

Except for planned improvements, will the proposal result in a need for new systems, or substantial alterations to the following utilities:

a. Power or natural gas?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Communication systems?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

c. Utilize additional water which amount will exceed the maximum permitted capacity of the service provider?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

d. Utilize additional sewage treatment capacity which amount will exceed the maximum permitted capacity of the sewage treatment provider?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

e. Storm water drainage?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

f. Solid waste and disposal?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

17. Human Health

Will the proposal result in:

a. Creation of any health hazard or potential health hazard (excluding mental health)?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

b. Exposure of people to potential health hazards?

☐ Yes ☒ No

☐ No, With Mitigation ☐ Data Insufficient

18. Scenic Resources/Community Design

Will the proposal:

a. Be visible from any state or federal highway, Pioneer Trail or from Lake Tahoe?

The Project is not visible from any state or federal highway or Pioneer Trail, but is visible from Lake Tahoe. Dredging and construction activities would have impacts on the view from Lake Tahoe due to the	☐ Yes ☒ No, With Mitigation	☐ No ☐ Data Insufficient

b. Be visible from any public recreation area or TRPA designated bicycle trail?

Project construction activities would be visible from the adjacent TCPUD boat ramp and pier and the Lake Forest Beach. Visual impacts during construction would be temporary, short-term, and less than	☐ Yes ☒ No, With Mitigation	☐ No ☐ Data Insufficient

c. Block or modify an existing view of Lake Tahoe or other scenic vista seen from a public road or other public area?

The Project Area is not visible from any public road and would not block or modify views of Lake Tahoe or other scenic vistas from public roads. As discussed under question b, the Project is visible from Lake	☐ Yes ☒ No, With Mitigation	☐ No ☐ Data Insufficient

d. Be inconsistent with the height and design standards required by the applicable ordinance or Community Plan?

The Project will not have impacts related to height standards, as the proposed new dock will be floating on the surface of Lake Tahoe and the new boat lift will be at the same height as the existing pier and will conform	☐ Yes ☐ No, With Mitigation	☒ No ☐ Data Insufficient

e. Be inconsistent with the TRPA Scenic Quality Improvement Program (SQIP) or Design Review Guidelines?

The Project Area is located in Shoreline Unit 16 - Lake Forest. The SQIP guidelines for improving scenic quality in Unit 16 include several recommendations that are relevant to the Project. SQIP Recommendatio	☐ Yes ☒ No, With Mitigation	☐ No ☐ Data Insufficient

19. Recreation

Does the proposal:

a. Create additional demand for recreation facilities?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Create additional recreation capacity?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

c. Have the potential to create conflicts between recreation uses, either existing or proposed?

The Project would temporarily impact recreational users of the TCPUD boat ramp and pier during dredging. Various BMPs would be implemented to reduce recreational impacts, including the following.	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

d. Result in a decrease or loss of public access to any lake, waterway, or public lands?

The Project would temporarily impact recreational users of the TCPUD boat ramp and pier during dredging. BMPs would be implemented to reduce impacts as follows. The disturbance area will be limited	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

20. Archaeological/Historical

a. Will the proposal result in an alteration of or adverse physical or aesthetic effect to a significant archaeological or historical site, structure, object or building?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

b. Is the proposed project located on a property with any known cultural, historical, and/or archaeological resources, including resources on TRPA or other regulatory official maps or records?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

c. Is the property associated with any historically significant events and/or sites or persons?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

d. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

e. Will the proposal restrict historic or pre-historic religious or sacred uses within the potential impact area?

	☐ Yes	☒ No
	☐ No, With Mitigation	☐ Data Insufficient

21. Findings of Significance.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California or Nevada history or prehistory?

As indicated in the Environmental Assessment, the Project's impacts to environmental resources would be either less than significant with mitigation (aesthetics and scenic quality; biological resources; and hydrology	☐ Yes	☐ No
	☒ No, With Mitigation	☐ Data Insufficient

b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)

Operations at the Station would continue largely unchanged after dredging and construction are completed, and the Project would have few long-term impacts. The large majority of potential impacts would

- ☐ Yes
- ☐ No
- ☒ No, With Mitigation
- ☐ Data Insufficient

c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environmental is significant?)

A thorough discussion of Alternative 1's potential for cumulative impacts is provided in Section 3.13.2.1 of the Environmental Assessment. As indicated in the Environmental Assessment, the Project's cumulative

- ☐ Yes
- ☐ No
- ☒ No, With Mitigation
- ☐ Data Insufficient

d. Does the project have environmental impacts which will cause substantial adverse effects on human being, either directly or indirectly?

The Environmental Assessment indicates that all impacts from the Project would be either less than significant with mitigation, less than significant, or nonexistent, including impacts on human beings either

- ☐ Yes
- ☐ No
- ☒ No, With Mitigation
- ☐ Data Insufficient

DECLARATION:

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best ofmy ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signature: **(Original signature required.)**

_____ At _____ Date: _____

Person Preparing Application County

Applicant Written Comments: (Attach additional sheets if necessary)

Print Form

FOR OFFICE USE ONLY

Date Received: _____ By: _____

Determination:

On the basis of this evaluation:

a. The proposed project could not have a significant effect on the environment and a finding of no significant effect shall be prepared in accordance with TRPA's Rules of Procedure.

☐ Yes ☐ No

b. The proposed project could have a significant effect on the environment, but due to the listed mitigation measures which have been added to the project, could have no significant effect on the environment and a mitigated finding of no significant effect shall be prepared in accordance with TRPA's Rules and Procedures.

☐ Yes ☐ No

c. The proposed project may have a significant effect on the environment and an environmental impact statement shall be prepared in accordance with this chapter and TRPA's Rules of Procedure

☐ Yes ☐ No

_____ Date: _____

Signature of Evaluator

_____

Title of Evaluator

ADDENDUM FOR TRANSFERS/CONVERSIONS OF USE

The following is to be used as a supplemental checklist for the Tahoe Regional Planning Agency Initial Environmental Checklist (IEC). It is to be used when reviewing any transfer pursuant to Chapter 34 of the Code of Ordinances or Conversion of Use pursuant to Chapter 33 of the Code of Ordinances. Any question answered in the affirmative will require written documentation showing that the impacts will be mitigated to a less than significant level. Otherwise, an environmental impact statement will be required.

The asterisk (*) notes threshold subjects.

a) Land *
Does the proposal result in any additional land coverage?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

b) Air Quality *
Does the proposal result in any additional emission?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

c) Water *
Does the proposal result in any additional discharge that is in violation of TRPA discharge standards?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

d) Does the proposal result in an increase in the volume of discharge?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

e) Noise *
Does the proposal result in an increase in Community Noise Equivalency Level (CNEL)?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

f) Aesthetics *
Does the proposal result in blockage of significant views to Lake Tahoe or an identified visual resource?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

g) Recreation *
Does the proposal result in a reduction of public access to public recreation areas or public recreation opportunities?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

h) Land Use
Does the converted or transferred use result in a use that is not consistent with the goals and policies of the Community Plan or Plan Area Statement?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

i) Population
Does the proposal result in an increase in the existing or planned population of the Region?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

j) Housing
Does the proposal result in the loss of affordable housing?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

k) Transportation
Does the proposal result in the increase of100 Daily Vehicle Trip Ends (DVTE)?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

l) Does the proposal result in a project that does not meet the parking standards?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

m) Utilities
Does the proposal result in additional water use?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

n) Does the proposal result in the need for additional sewer treatment?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

o) Historical
Does the proposal result in the modification or elimination of a historic structure or site?

☐ Yes ☐ No
☐ No, With Mitigation ☐ Data Insufficient

DECLARATION:

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Signature: **(Original signature required.)**

_____ At_____ Date: _____

Person Preparing Application County

Applicant Written Comments: (Attach additional sheets if necessary)

Print Form

Appendix C

Biological Assessment

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Prepared for:
US Coast Guard
CEU Oakland
Oakland, CA

Prepared by:
AECOM
Oakland, CA
60218657-202
May 2014

Biological Assessment
Station Lake Tahoe Pier Extension

Prepared for:
US Coast Guard
CEU Oakland
Oakland, CA

Prepared by:
AECOM
Oakland, CA
60218657-202
May 2014

Biological Assessment
Station Lake Tahoe Pier Extension

Prepared By Tiffany Yap

Reviewed By Justin Westrum

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List of Acronyms and Abbreviations

BA	Biological Assessment
BMPs	Best Management Practices
CDFW	California Department of Fish and Wildlife's
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
ESA	Endangered Species Act
LTBMU	Lake Tahoe Basin Management Unit
MBTA	Migratory Bird Treaty Act
NDOW	Nevada Department of Wildlife
PFH	Prime Fish Habitat
SAR	Search and Rescue
Station	United States Coast Guard Station Lake Tahoe
TCPUD	Tahoe City Public Utility District's
TRPA	Tahoe Regional Planning Agency
USCG	United States Coast Guard
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

Executive Summary

This Biological Assessment (BA) has been prepared by the United States Coast Guard (USCG) in accordance with Section 7 of the Endangered Species Act (ESA) to evaluate the potential direct and indirect effects of the USCG Station Lake Tahoe (Station) Pier Extension Project (Proposed Action) in Tahoe City, California, on species listed as Threatened or Endangered under the ESA, candidate species, species proposed for listing, and designated critical habitat for these species and to support consultation with the US Fish and Wildlife Service (USFWS). This BA also addresses potential effects of the Proposed Action on species given special status by the State of California, including those listed or proposed for listing as Endangered or Threatened under the California Endangered Species Act (CESA), considered Species of Special Concern by the California Department of Fish and Wildlife (CDFW), identified as rare by the California Native Plant Society (CNPS), or otherwise included in the CDFW's California Natural Diversity Database. This BA also discusses regionally sensitive species and habitat identified by the Lake Tahoe Basin Management Unit (LTBMU) of the United States Forest Service and the Tahoe Regional Planning Agency (TRPA) and nesting birds protected under California Fish and Game Code 3503 and the Migratory Bird Treaty Act (MBTA).

The USCG intends to extend the existing Station pier to allow for year-round, 24-hour rapid access to response boats. This is necessary to provide essential emergency search and rescue, law enforcement, and marine safety services to the boating public of Lake Tahoe. Because the region experiences cyclical droughts, seasonal low water levels at the current pier do not allow for year-round on-site mooring of rapid response boats. When water levels are low (generally October through January), response boats must be moored at alternate sites, which increases response times and creates security issues. This is unacceptable according to USCG Search and Rescue (SAR) standards, which require the USCG response boat to be underway under 30 minutes from when a distress call is received. When the USCG is required to moor their response boats away from the Station, their response time increases, and it is often difficult to get underway within the USCG SAR standards. The survival rate of a person in the water decreases as temperatures decrease, and the response time can be vital to saving that person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the USCG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls. However, they do not have a full crew able to respond to distress calls at night. The USCG is on duty 24 hours a day and is the only agency capable to respond within a reasonable timeframe at night.

Thus, the purpose of the proposed pier extension is to provide mooring sites at a suitable depth during drought cycles so that rapid response boats can moor at the USCG facility at all times. The Proposed Action would improve the USCG's ability to protect and serve the boating public of Lake Tahoe. The extended pier would also be a potential asset for other regional first response agencies, providing capacity for their vessels on a periodic basis.

The Proposed Action is to extend the Station's pier 350 feet in a dog-leg formation. The proposed pier extension would consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. The span connecting the existing pier to the new pier head would be 5 feet wide and would extend 250 feet straight southward from the existing pier head. The decking of this connecting span would consist of pre-fabricated grated metal gangway superstructures supported by steel dolphins consisting of two opposing batter piles (installed at a 45-degree angle from horizontal) with a steel cap. The dolphins would be spaced 50 feet apart, and the connecting span would require ten piles 10 inches in diameter.

The pier head would be 100 feet long and 8 feet wide and would dog-leg west at an approximately 45-degree angle from the connecting span. The pier head would have a grated metal deck supported by fourteen steel piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, Lake Tahoe Datum, which is expected to be sufficient for year-round mooring during drought years. The dog-leg orientation of the pier head is designed to reach a sufficient depth while minimizing the overall length of the extension. The pier head structure is designed to accommodate the facilities required for the USCG to provide essential emergency search and rescue, law enforcement, and marine safety services to the boating public of Lake Tahoe. Facilities on the pier head would include two 30-foot by 8-foot boat lifts, a 70-foot by 8-foot floating dock, a fuel station, and utility lines that would run underneath the pier.

The total overall footprint for the Proposed Action would be approximately 2,870 square feet. The grated decking would create approximately 70 percent less shading than a solid deck, and the shaded footprint of the Proposed Action would be approximately 1,435 square feet. The total lake bottom footprint for the 24 piles would be approximately 14 square feet. The anticipated construction duration for the Proposed Action would be approximately seven weeks.

For the purpose of this BA, the USCG has defined the Action Area as extending southward from the point where the existing pier connects to the shore and encompassing the proposed pier extension plus a 200-foot buffer around the entire structure. The 200-foot buffer would encompass upland areas of the USCG property that may be used for temporary staging of equipment and materials during construction of the pier extension. The Action Area would cover approximately 11.1 acres, including 9.26 acres within the littoral zone of Lake Tahoe and approximately 1.84 acres of upland areas. There is a public pier, owned by the Tahoe City Public Utilities District, located to the west of the USCG pier and a private pier to the east.

In addition to the Proposed Action (i.e., constructing a dog-leg extension with catwalk/dolphins), the USCG considered five alternatives, listed below. For all alternatives involving pier construction, the pier head would have the same design and materials as that of the Proposed Action, and the primary differences in those alternatives are in the design of the supporting structures of the connecting span and/or the orientation of the pier head.

Alternative 1: Dog-leg Extension with Monopiles. Alternative 1 would have the same dog-leg layout and dimensions as the Proposed Action. However, the span connecting the existing and new pier heads would be supported by 12-inch diameter steel monopiles spaced at 10-foot intervals. The total and shaded footprints of Alternative 1 would be the same as the Proposed Action. Alternative 1 would require a total of 39 piles, which would result in a lake bottom footprint of approximately 27 square feet. Construction duration would be approximately 9 weeks.

Alternative 2: Straight Extension with Catwalks/Dolphins. Alternative 2 would have of the same type of support structures as the Proposed Action. However, the new pier head would extend straight south from the connecting span, and the connecting span would be increased from 250 feet to 350 feet so that the pier head would attain a sufficient depth to meet USCG requirements. The total footprint of Alternative 2 would be 3,370 square feet, and the shaded footprint would be 1,585 square feet. Alternative 2 would require a total of 28 piles, which would result in a lake bottom footprint of approximately 16 square feet. Construction duration would be approximately 8 weeks.

Alternative 3: Straight Extension with Monopiles. Alternative 3 has the same layout as Alternative 2; however, the span connecting the existing and new pier heads would be supported by 12-inch diameter steel monopiles spaced at 10-foot intervals. The total and shaded footprints of Alternative 3 would be the same as Alternative 2. Alternative 3 would require a total of 49 piles, which would result in a lake bottom footprint of approximately 35 square feet. Construction duration would be approximately 12 weeks.

Alternative 4: Dredge at the Existing Pier. Alternative 4 consists of dredging a channel 350 feet long, 50 feet wide, and 7 feet deep (5 feet plus an overdepth of 2 feet) to allow access to the existing pier and boatlift. The channel would be dredged to an elevation of approximately 6,213 feet and would cover a footprint of approximately 17,500 square feet. A volume of approximately 4,540 cubic yards would be removed from the lake bottom. Dredgeate would be removed by an excavator, placed into a front end loader, de-watered, transported to dump trucks located on shore and disposed of at an appropriate disposal site.

Alternative 5: No Action. Under Alternative 5 no construction would occur at the existing pier, and USCG operations would continue with existing conditions. This alternative is not a viable solution, as it puts public health and safety in jeopardy and prevents the USCG from performing its duties to acceptable standards.

The USCG chose the Proposed Action over the alternatives because it provides the optimal conditions for 1) meeting the USCG's need to provide year-round emergency, law enforcement, and safety services to the boating public, and 2) minimizing impacts to biological resources in the Action Area. See Table ES-1 below for a comparison summary of the Proposed Action and Alternatives.

Table ES-1 Comparison of the Proposed Action and Alternatives

Alternative	Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Proposed Action	Dog-leg Extension with Catwalks/Dolphins	2,870	6,215.5	24	1,435	14	7
Alternative 1	Dog-leg Extension with Monopiles	2,870	6,215.5	39	1,435	27	9
Alternative 2	Straight Extension with Catwalks/Dolphins	3,370	6,214.5	28	1,585	16	8
Alternative 3	Straight Extension with Monopiles	3,370	6,214.5	49	1,585	35	12
Alternative 4	Dredge at Existing Pier	17,500	6,213	0	0	17,500	5
Alternative 5	No Action	0	6,220	0	0	0	0

Only one federally-listed species, the Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi;* Federal Threatened), has potential to occur in the Action Area. Naturally occurring populations of Lahontan cutthroat trout were extirpated from Lake Tahoe in the 1930s, and there are currently no self-sustaining populations of the species within Lake Tahoe. However, there are ongoing attempts to reintroduce Lahontan cutthroat trout into portions of the Lake Tahoe Basin, and in 2011, the Nevada Department of Wildlife (NDOW) stocked approximately 22,000 Lahontan cutthroat trout into Lake Tahoe itself to provide anglers the opportunity to catch this native species.

The Proposed Action may affect but is unlikely to adversely affect Lahontan cutthroat trout. The potential for the species to occur in the Action Area during construction is low, but if reintroduction efforts continue Lahontan cutthroat trout may have potential to occur in the Action Area in the future. If Lahontan cutthroat trout are present in the Action Area during construction, temporary construction-related impacts may include increased turbidity and subsequent sedimentation of foraging habitat, displacement of prey species, potential physical injury from vessel movements, and increased potential for accidental spills. Fish would likely avoid the Action Area during construction activities due to vessel movements and

increased noise levels and turbidity. In addition, the USCG would implement best management practices (BMPs), including disturbance minimization, use of a silt curtain, and spill prevention and control measures, to avoid and minimize construction impacts. Once sediment-disturbing activity is complete the sediment will resettle and benthic organisms may re-colonize, which would facilitate fish species to return to forage. Long-term impacts from the Proposed Action would include the direct removal or modification of potential habitat in the area occupied by the proposed pier extension, though fish habitat surveys conducted by the USCG indicate that the area to be impacted does not provide high quality fish habitat. The disturbance area of the Proposed Action would be minimized to the extent practical in order to decrease long-term impacts, and if high quality foraging habitat is affected, the impacts will be mitigated at the 1:1.5 ratio established by the USFWS and TRPA.

No designated critical habitat occurs in the Action Area, and the Proposed Action will have no effect on designated critical habitat. Additionally, the Proposed Action would have no effect on species protected under the CESA, since no state-listed, candidate, or proposed species are expected to occur in the Action Area.

The Proposed Action may affect individuals of other state and regional special status species, including ribbon-leaved pondweed (*Potamogeton epihydrus*; CDFW Rare Plant Rank 2B.2), Lahontan Lake tui chub (*Gila bicolor pectinifer*; LTBMU Sensitive Species), and Great Basin rams-horn (*Helisoma newberryi*; LTBMU Sensitive Species), but is not likely to result in a trend toward federal or state listing or loss of viability of these species. The Proposed Action would also affect TRPA-designated prime fish habitat (PFH), although the area to be occupied by the pier does not provide high quality habitat for spawning or forage and cover. Short-term effects from construction of the pier extension could include increased turbidity, sedimentation, displacement of prey species, potential physical injury from vessel movements, disturbance of foraging habitats, and accidental spills of fuel, lubricants, or other materials. Long-term impacts from construction and pier operations could include the direct removal of individuals, spawning and foraging habitat, and/or prey species. However, to avoid or minimize impacts, the USCG will implement measures such as avoiding in-water work during the spawning season or other sensitive life stages of special status species, installing a floating boom and silt curtain around the disturbance area during construction, and implementing measures to prevent and control spills. If TRPA-designated PFH is affected, the impacts will be mitigated at a 1:1.5 ratio.

1.0 Introduction

This Biological Assessment (BA) has been prepared by the United States Coast Guard (USCG) in accordance with Section 7 of the Endangered Species Act (ESA) to evaluate the potential direct or indirect effects of the USCG Station Lake Tahoe (Station) Pier Extension Project (Proposed Action) on species listed as Threatened or Endangered under the ESA, candidate species, species proposed for listing, and designated critical habitat for these species. This BA also addresses potential effects of the Proposed Action on species given special status by the State of California, including those listed or proposed for listing as Endangered or Threatened under the California Endangered Species Act (CESA), considered Species of Special Concern by the California Department of Fish and Wildlife (CDFW), identified as rare by the California Native Plant Society (CNPS), or otherwise included in the CDFW's California Natural Diversity Database (CNDDB). This BA also discusses regionally sensitive species and habitat identified by the Lake Tahoe Basin Management Unit (LTBMU) of the United States Forest Service (USFS) and the Tahoe Regional Planning Agency (TRPA) and nesting birds protected under California Fish and Game Code 3503 and the Migratory Bird Treaty Act (MBTA).

The BA describes the Proposed Action and the alternatives considered by the USCG and reviews relevant biological information on the special status species potentially occurring within the Action Area. Potential direct and indirect effects on special status species or critical habitat due to the Proposed Action are discussed. In addition, the BA describes measures that would be implemented to avoid or minimize potential effects on special status species.

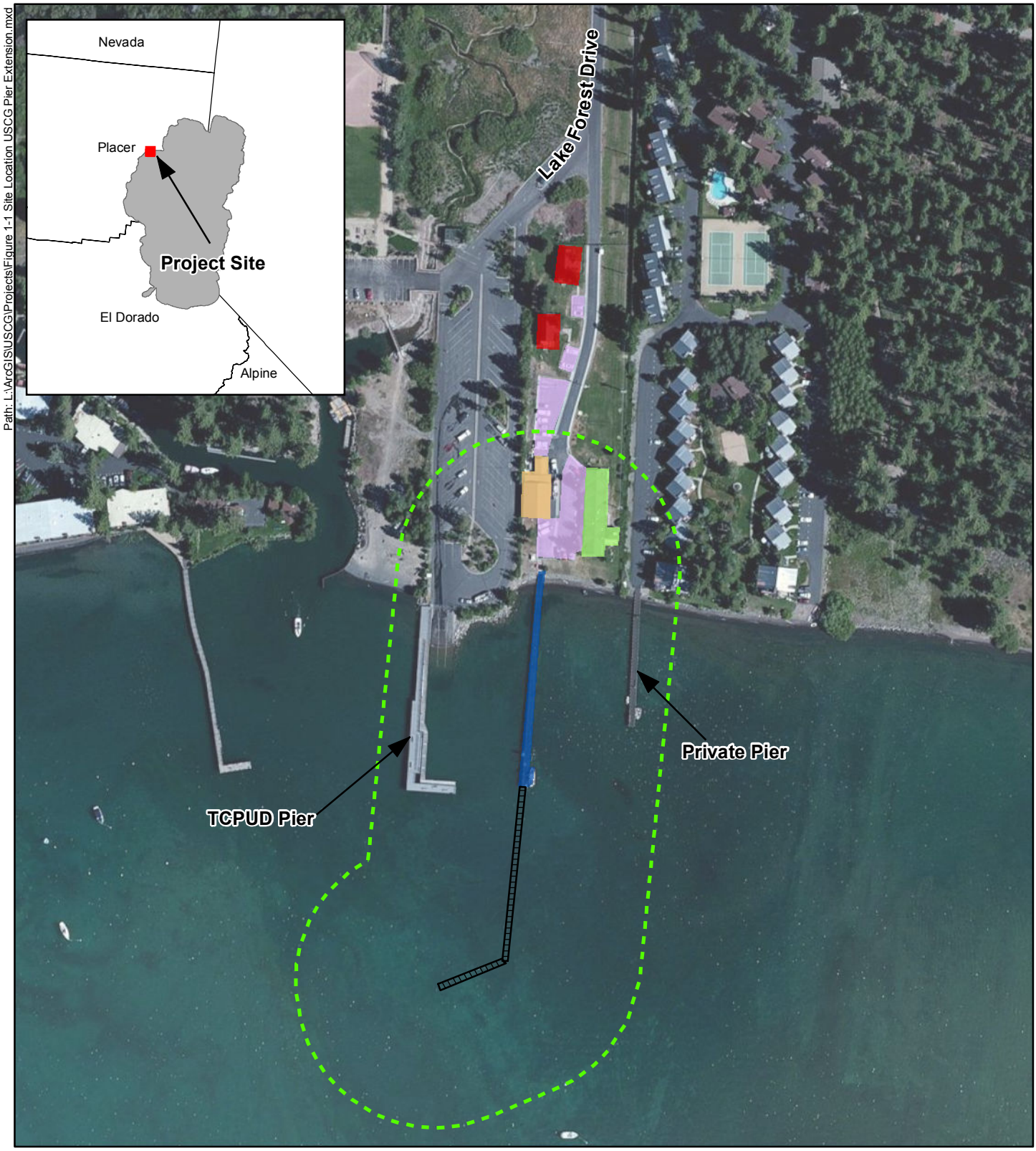
This BA provides the information necessary to support consultation with the United States Fish and Wildlife Service (USFWS) as required by Section 7 of the ESA. It provides the best available scientific and commercial data on federally-listed, candidate, and proposed species and their designated critical habitat in and around the Action Area. It is the intent of this BA to establish the basis upon which the USCG will request concurrence from USFWS that the Proposed Action will not adversely affect federally listed, candidate or proposed species and will not be adversely modify designated critical habitat.

The BA also provides the information necessary to support consultation with the CDFW and permitting through the TRPA and therefore also considers state and regional special status species and habitat. As discussed below, it is the conclusion of the USCG that the Proposed Action will have no effect on state-listed species and may have minor effects on state and regionally sensitive species and TRPA-designated Prime Fish Habitat (PFH), but that these effects would be mitigated by implementation of the avoidance and minimization measures discussed in Section 2.4 below.

1.1 Project Location and Site Description

The Station is located at 2500 Lake Forest Road, Tahoe City, California, on the northwest shore of Lake Tahoe in Placer County (Figure 1-1). The existing pier is currently 312 feet long and 8 feet wide, extending south into the lake to a lake-bottom elevation of 6,220 feet (Lake Tahoe Datum). The pier includes one boat lift and a fueling station. The facility maintains two 25-foot rapid response boats.

For the purpose of this BA, the USCG has defined the Action Area as extending southward from the point where the existing pier connects to the shore and encompassing the proposed pier extension plus a 200-foot buffer around the entire structure (Figure 1-1). The 200-foot buffer would encompass upland areas of the USCG property that may be used for temporary staging of equipment and materials during construction of the pier extension. The Action Area would cover approximately 11.1 acres, including 9.26 acres within the littoral zone of Lake Tahoe and approximately 1.84 acres of upland areas. There is a public pier, owned by the Tahoe City Public Utilities District (TCPUD), located to the west of the USCG pier and a private pier to the east.



Path: L:\ArcGIS\USCG\Projects\Figure 1-1 Site Location USCG Pier Extension.mxd

0 200 400
Feet

Proposed Pier Extension

200 ft Project Buffer / Action Area

TCPUD = Tahoe City Public Utility District

USCG Facilities

- Existing Pier
- Garage
- Housing
- Offices
- Parking

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

USCG Lake Tahoe Pier Extension
Figure 1-1
Project Site Location

1.2 Purpose and Need for the Proposed Action

The USCG requires year-round, 24-hour rapid access to response boats in order to provide essential emergency search and rescue, law enforcement, and marine safety services to the boating public of Lake Tahoe. Because the region experiences cyclical droughts, seasonal low water levels at the current pier do not allow for on-site mooring of their rapid response boats year-round. When water levels are low (generally October through January), response boats must be moored at alternate sites, which increases response times and creates security issues. This is unacceptable according to USCG Search and Rescue (SAR) standards, which require the USCG response boat to be underway under 30 minutes from when a distress call is received. When the USCG is required to moor their response boats away from the Station, their response time increases, and it is often difficult to get underway within the USCG SAR standards. The survival rate of a person in the water decreases as temperatures decrease, and the response time can be vital to saving that person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the USCG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls. However, they do not have a full crew able to respond to distress calls at night. The USCG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

Thus, the purpose of the proposed pier extension is to provide mooring sites at a suitable depth during drought cycles so that rapid response boats can moor at the USCG facility at all times. The Proposed Action would improve the USCG's ability to protect and serve the boating public of Lake Tahoe. The extended pier would also be a potential asset for other regional first response agencies, providing capacity for their vessels on a periodic basis.

1.3 Special Status Species and Critical Habitat Potentially Occurring within the Action Area

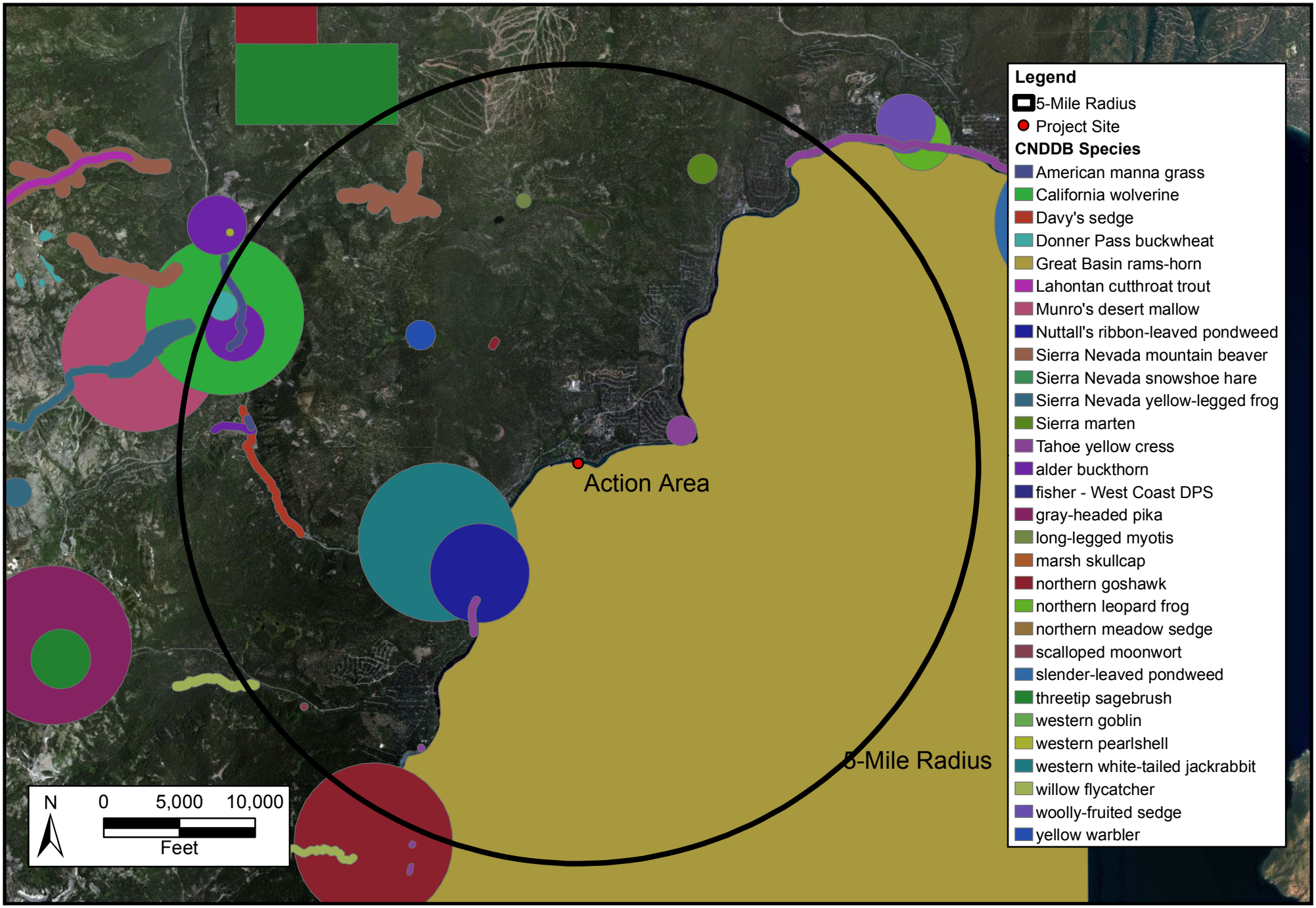
For the purposes of this BA, special status species include those federally or state listed, candidate, or proposed as Endangered or Threatened under the ESA and CESA; Species of Special Concern as designated by the CDFW; species identified as rare by the CNPS and CDFW; species otherwise identified in the CNDDB; regionally sensitive species identified by the LTBMU and the TRPA; and species otherwise protected by other state or federal regulations. The following is a description of special status species and critical habitat that may occur in or near the Action Area.

1.3.1 Plants and Wildlife

The CDFW's CNDDB provides recorded occurrences of special status species throughout California. A CNDDB search was conducted for the vicinity of the Proposed Action. See Appendix A for the CNDDB search results. Figure 1-2 shows CNDDB species records within 5 miles of the Action Area. Additional information on regionally sensitive species that may occur in the Project area was obtained from the LTBMU and TRPA. Table 1-1 provides a list of special status species with potential to occur within a 5-mile radius of the Action Area and identifies their potential to occur within the Action Area.

1.3.2 Critical Habitat

There is no designated critical habitat, as defined by USFWS, in the Action Area. PFH, as designated by the TRPA, is discussed below in Section 3.1.1.



Source:
AECOM/California Natural Diversity Database (CNDDB)

USCG Lake Tahoe Station Pier Extension
Figure 1-2
CNDDB Species Records within 5 Miles of the Action Area

Table 1-1 Special Status Species within 5 Miles of the Action Area

Species	Status[1]					Habitat Characteristics	Potential to Occur within Action Area
	Federal	State	CNPS	LTBMU	TRPA		
Plants							
alder buckthorn (*Rhamnus alnifolia*)	~	~	2B.2	~	~	Meadows and seeps, lower montane coniferous forest, upper montane coniferous forest, riparian scrub.	**Not expected** – no suitable habitat present.
Davy's sedge (*Carex davyi*)	~	~	1B.3	~	~	Subalpine coniferous forest, upper montane coniferous forest, elevation 1500 to 3200 meters.	**Not expected** – no suitable habitat present.
Donner Pass buckwheat (*Eriogonum umbellatum var. torreyanum*)	~	~	1B.2	~	~	Upper montane coniferous forest, chaparral, meadows.	**Not expected** – no suitable habitat present.
Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus*)	~	~	2B.2	~	~	Shallow water, ponds, lakes, streams, irrigation ditches.	**Low** – suitable habitat is present in the Action Area though this species was not noted during site surveys conducted by AECOM.
Tahoe yellow cress (*Rorippa subumbellata*)	C	E	1B.1	S	SI	Sandy beach on lakeside margins.	**Not expected** – this species was not identified during species-specific site surveys conducted by TRPA and AECOM (See Appendix B).
threetip sagebrush (*Artemisia tripartita tripartita*)	~	~	2B.3	~	~	Openings in upper montane coniferous forest, rocky, volcanic soils.	**Not expected** – no suitable habitat present.
Invertebrates							
Great Basin rams-horn (*Helisoma newberryi*)	~	~	N/A	S	~	Soft mud of larger lakes and slow rivers where macrophytes are present. Associated with well-oxygenated, soft substrate and clear, cold, slowly flowing water.	**Low** – this species is known to occur in Lake Tahoe (Taylor 1981). Suitable habitat is present in the Action Area; however, the existing boating traffic likely limits the availability of the high quality habitat preferred by this species.

Table 1-1 Special Status Species within 5 Miles of the Action Area

Species	Status[1]					Habitat Characteristics	Potential to Occur within Action Area
	Federal	State	CNPS	LTBMU	TRPA		
Fish							
Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*)	T	~	N/A	MIS	SI	Lakes and streams of Lahontan Basin.	**Low** – wild populations of this species were extirpated from Lake Tahoe in the 1930s; however, attempts have been made in recent years to reintroduce the species into Lake Tahoe for recreational purposes and there is a possibility of the species occurring in the Action Area in the future
Lahontan Lake tui chub (*Gila bicolor pectinifer*)	~	~	N/A	S	~	Both deep and shallow freshwater lakes and rivers, generally with abundant aquatic vegetation.	**Moderate** – this species is known to occur in Lake Tahoe.
Amphibians							
northern leopard frog (*Lithobates pipiens*)	~	SSC	N/A	S	~	Near permanent or semi-permanent water, shoreline cover, submerged and emergent aquatic vegetation.	**Not expected** – no suitable habitat present. Presumed extirpated from the Tahoe Basin (Schlesinger and Romsos 2000)
Birds							
northern goshawk (*Accipiter gentilis*)	~	SSC	N/A	S	SI	Mature coniferous forests with large trees, snags, downed logs, dense canopy cover, and an open understory for nesting.	**Not expected** – no suitable habitat present.
willow flycatcher (*Empidonax traillii*)	~	E	N/A	S	~	Dense willows on water's edge.	**Not expected** – no suitable habitat present.
Mammals							
California wolverine (*Gulo gulo luteus*)	C	T	N/A	S	~	Variety of high elevation habitats, primarily coniferous forests with a near water source.	**Not expected** – no suitable habitat present.
Sierra Nevada mountain beaver (*Aplodontia rufa californica*)	~	SSC	N/A	~	~	Dense growth of small deciduous trees and shrubs, wet soil, abundance of water.	**Not expected** – no suitable habitat present.

Table 1-1 Special Status Species within 5 Miles of the Action Area

Species	Status[1]					Habitat Characteristics	Potential to Occur within Action Area
	Federal	State	CNPS	LTBMU	TRPA		
Mammals (continued)							
western white-tailed jackrabbit (*Lepus townsendii townsendii*)	~	SSC	N/A	~	~	Sagebrush, subalpine conifer, juniper, alpine dwarf shrub and perennial grassland.	**Not expected** – no suitable habitat present.

Notes:

1. Code Designations

Federal: C = Candidate for listing under the Endangered Species Act (ESA)
T = Threatened (ESA)

State: State status includes species regulated under the California Endangered Species Act (CESA) and the California Department of Fish and Wildlife (CDFW)
E = Endangered (CESA)
T = Threatened (CESA)
SSC = Species of Special Concern (CDFW)

CNPS: California Native Plant Society Rare Plant Ranks
1B.1 = Rare or endangered in California and elsewhere, seriously threatened in California
1B.2 = Rare or endangered in California and elsewhere, moderately threatened in California
1B.3 = Rare or endangered in California and elsewhere, not very threatened in California
2B.1 = Rare, threatened, or endangered in California but more common elsewhere, not very threatened in California
2B.2 = Rare, threatened, or endangered in California but more common elsewhere, moderately threatened in California
2B.3 = Rare, threatened, or endangered in California but more common elsewhere, not very threatened in California

LTBMU: Lake Tahoe Basin Management Unit
S= Sensitive Species
MIS=Management Indicator Species

TRPA: Tahoe Regional Planning Agency
SI = Special Interest Species

2.0 Proposed Action and Alternatives

The following provides detailed descriptions of the USCG's Proposed Action and the alternatives considered for the Proposed Action. In addition, avoidance and minimization measures are proposed and discussed. Some information presented below was obtained from the USCG Station Lake Tahoe Pier Extension Design Concept Study prepared by Appledore Marine Engineering Inc. (2009). The Proposed Action would extend the Station's pier to a lake bottom elevation of approximately 6,215 feet, which would provide a water depth of approximately 5 feet at the lowest recent recorded lake level from November 1992 (USGS 2013).

2.1 Description of the Proposed Action – Dog-leg with Catwalks/Dolphins

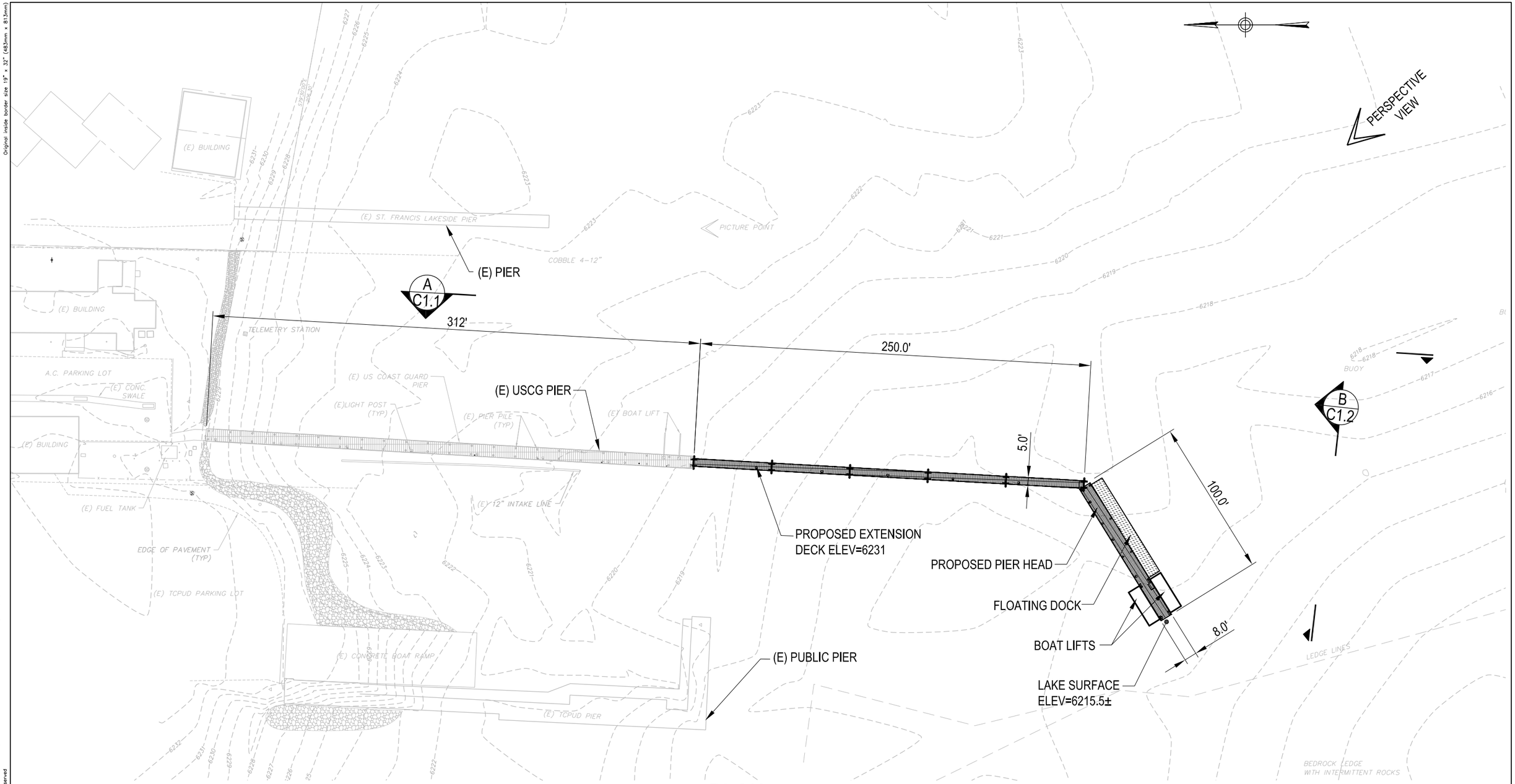
The Proposed Action is to extend the Station's pier 350 feet in a dog-leg formation (see Figure 2-1). The proposed pier extension would consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. The span connecting the existing pier to the pier head would be 5 feet wide and would extend 250 feet straight southward from the existing pier head. The decking of this connecting span would consist of pre-fabricated grated metal gangway superstructures supported by steel dolphins consisting of two opposing batter piles (installed at a 45-degree angle from horizontal) with a steel cap. The dolphins would be spaced 50 feet apart, and the connecting span would require ten (10) piles 10 inches in diameter.

The pier head would be 100 feet long and 8 feet wide and would dog-leg west at an approximately 45-degree angle from the connecting span. The pier head would have a steel grated deck supported by fourteen steel piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, Lake Tahoe Datum, which is expected to be sufficient for year-round mooring during drought years. The dog-leg orientation of the pier head is designed to reach a sufficient depth while minimizing the length of the connecting span. The pier head structure is designed to accommodate the facilities required for the USCG to provide essential emergency search and rescue, law enforcement, and marine safety services to the boating public of Lake Tahoe. Facilities on the pier head would include two 30-foot by 8-foot boat lifts, a 70-foot by 8-foot floating dock, a fuel station, and utility lines that would run underneath the pier.

The total overall footprint for the Proposed Action would be approximately 2,870 square feet. The grated decking would create approximately 70 percent less shading than a solid deck, and the shaded footprint of the Proposed Action would be approximately 1,435 square feet. The total lake bottom footprint for the 24 piles would be approximately 14 square feet. The anticipated construction duration for the Proposed Action would be approximately 7 weeks. The relatively small number of piles required and the pre-fabrication of gangway elements would reduce the amount of time needed for on-site construction compared to the other pier extension alternatives discussed below. Table 2-1 provides a summary of the specifications for the Proposed Action.

Table 2-1 Summary of Proposed Action

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Dog-leg Extension with Catwalks/Dolphins	2,870	6,215.5	24	1,435	14	7



PLAN

0' 30' 60' 90'
SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

TRANSPORTATION

AECOM
2101 Webster St., Suite 1900
Oakland, CA 94612
T 510.622.6600 F 510.835.3464

AECOM
www.aecom.com

Drawn By: EM
Approved By:
Date: 7/26/12
Meeting: Meeting 1

U.S. Department of Homeland Security
United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

Figure 2-1
Plan View of the Proposed Action

Sheet Title: PIER EXTENSION DOGLEG W/CATWALK DOLPHIN OPTION 1
Project Number: 60218657
Sheet Number: C1.0 of

Original inside border size 19" x 32" (483mm x 813mm)
\60218657-TahoePier\000_CAD\006_Civil\Sheets\C1-EXISTING LAKEFRONT FACADE.dwg 1/3/2012 1:26 PM meekse
Copyright © 2011 by AECOM. All rights reserved
N:\0285\W93598\ACAD\Filename

2.2 Description of the Alternatives

The USCG considered five alternatives to the Proposed Action, which are described below. Note that the pier head design for Alternatives 1, 2 and 3 would be the same as that of the Proposed Action, though the alignment may differ (straight versus dog-leg). See Appendix C for plan and perspective drawings of the various pier extension alternatives.

2.2.1 Alternative 1: Dog-leg with Monopile Walkway

Alternative 1 would have the same dog-leg layout and dimensions as the Proposed Action. However, the span connecting the existing and new pier heads would be supported by 12-inch diameter steel monopiles spaced approximately 10 feet apart in order to provide the required structural support. The total and shaded footprints of Alternative 1 would be the same as the Proposed Action. Alternative 1 would require a total of 39 piles, which would result in a lake bottom footprint of approximately 27 square feet. Construction duration would be approximately 9 weeks. Table 2-2 provides a summary of the specifications for the Proposed Action. Table 2-2 provides a summary of the specifications for Alternative 1.

Table 2-2 Summary of Alternative 1

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Dog-leg Extension with Monopiles	2,870	6,215.5	39	1,435	27	9

2.2.2 Alternative 2: Straight Extension with Catwalks/Dolphins

Alternative 2 would consist of the same type of support structures as the Proposed Action. However, the new pier head would extend straight south from the connecting span, and the connecting span would be increased from 250 feet to 350 feet so that the pier head would attain a sufficient depth to meet USCG requirements. The total footprint of Alternative 2 would be 3,370 square feet, and the shaded footprint would be 1,585 square feet. Alternative 2 would require a total of 28 piles, which would result in a lake bottom footprint of approximately 16 square feet. Construction duration would be approximately 8 weeks. Table 2-3 provides a summary of the specifications for Alternative 2.

Table 2-3 Summary of Alternative 2

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Straight Extension with Catwalks/Dolphins	3,370	6,214.5	28	1,585	16	8

2.2.3 Alternative 3: Straight Extension with Monopile Walkway

Alternative 3 has the same layout as Alternative 2; however, the span connecting the existing and new pier heads would be supported by 12-inch diameter steel monopiles spaced approximately 10 feet apart. The total and shaded footprints of Alternative 3 would be the same as Alternative 2. Alternative 3 would require a total of 49 piles, which would result in a lake bottom footprint of approximately 35 square feet. Construction duration would be approximately 12 weeks. Table 2-4 provides a summary of the specifications for Alternative 3.

Table 2-4 Comparison Summary

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Straight Extension with Monopiles	3,370	6,214.5	49	1,585	35	12

2.2.4 Alternative 4: Dredge at Existing Pier

Alternative 4 consists of dredging a channel 350 feet long by 50 feet wide by 7 feet deep (5 feet plus an overdepth of 2 feet) to allow access to the existing pier and boatlift. The channel would be dredged to an elevation of approximately 6,213 feet and would cover approximately 17,500 square feet. A volume of approximately 4,540 cubic yards would be removed from the lake bottom. A silt curtain would be installed around the dredge area up to the shore to minimize turbidity. Wetland mats would be placed on the lake bottom to create a temporary bridge to the dredge area. Dredgeate would be removed by an excavator, placed into a front end loader, de-watered, transported to sealed dump trucks located on shore, and disposed of at an appropriate upland disposal site. Potential disposal sites include the Eastern Regional Landfill, operated by Tahoe Truckee Sierra Disposal and located at Highway 89 and Cabin Creek Road, Truckee, and a closed sewage disposal site operated by the North Tahoe Public Utility District in Tahoe Vista. The silt curtain would be removed only when turbidity levels reach background levels. The anticipated construction duration would be approximately 5 weeks. Maintenance dredging would be required approximately once every 10 years. Table 2-5 provides a summary of the specifications for Alternative 4.

Table 2-5 Comparison Summary

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Dredge at Existing Pier	0	6,213	0	0	17,500	5

2.2.5 Alternative 5: No Action

Under Alternative 5 no construction would occur at the existing pier, and USCG operations would continue with existing conditions. This alternative is unacceptable because water levels often get too low for USCG vessels to moor from October through January. Continued use of existing pier conditions would prevent the USCG from performing its public service and safety duties because response times would not meet USCG standards. Table 2-6 provides a summary of the specifications for Alternative 5.

Table 2-6 Comparison Summary

Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
No Action	0	6,220	0	0	0	0

2.3 Comparison Summary of the Proposed Action and Alternatives

The USCG chose the Proposed Action as the preferred action because it would require a shorter pier with a smaller footprint (shaded and/or lake bottom), shorter construction duration, less cost, and/or less environmental impact than the other pier extension configuration alternatives. Compared to the dredging alternative, the Proposed Action would have a much smaller lake bottom footprint and would thereby minimize impacts to PFH. As discussed above, the No Action Alternative is unacceptable because it would prevent the USCG from satisfactorily performing its public service and safety functions. Table 2-7 provides a comparison of the specifications for the Proposed Action and Alternatives.

Table 2-7 Comparison Summary

Alternative	Description	Total Area (feet^2)	Lowest Elevation Reached (feet)	Total Number of Piles	Shaded Footprint (feet^2)	Lake Bottom Footprint (feet^2)	Construction Duration (weeks)
Proposed Action	Dog-leg Extension with Catwalks/Dolphins	2,870	6,215.5	24	1,435	14	7
Alternative 1	Dog-leg Extension with Monopiles	2,870	6,215.5	39	1,435	27	9
Alternative 2	Straight Extension with Catwalks/Dolphins	3,370	6,214.5	28	1,585	16	8
Alternative 3	Straight Extension with Monopiles	3,370	6,214.5	49	1,585	35	12
Alternative 4	Dredge at Existing Pier	0	6,213	0	0	17,500	5
Alternative 5	No Action	0	6,220	0	0	0	0

2.4 Proposed Avoidance and Minimization Measures

The USCG will incorporate best management practices (BMPs) to avoid and minimize potential adverse impacts to biological resources and water quality in and adjacent to the Action Area. There is potential for the release of pollutants from construction equipment and re-suspension of sediments in Lake Tahoe resulting from the construction and operation of the pier extension, which may potentially affect designated PFH as well as the species that rely on it. BMPs will be used to avoid spills or minimize impacts from spills or re-suspended sediments. The following BMPs will be implemented:

- The disturbance area will be limited to the minimum required to complete the Proposed Action.
- In accordance with the TRPA BMP handbook (TRPA 2012a), a silt curtain will be installed around the area of disturbance to avoid the spread of suspended sediments and the sedimentation of surrounding sensitive habitats. A double silt curtain may be used if required. Prior to daily construction activities, the perimeter will be checked to ensure proper installment and functionality. Needed repairs or replacements will be performed before construction can begin.
- The USCG will conduct turbidity sampling during in water work and will stop work if Basin Plan criteria (typically 20 NTUs) are exceeded outside of the area contained by the silt curtain.
- Construction schedules will avoid spawning seasons or other sensitive life stages of special status fish species to the extent feasible.

- Petroleum, oil, and lubricant spill prevention and control measures will be implemented during construction and operations, and if a spill occurs, it will be contained and cleaned up immediately to the extent work can be accomplished safely.
- A Spill Prevention and Control Plan will be prepared for construction and operation of the fueling station prior to the start of construction. The plan will be regularly updated, maintained and implemented.
- A floating boom and skirt will be deployed around the Action Area to prevent the escape of sheen-producing liquids or floating debris. Boom inspections will be conducted daily and waste will be removed.
- A supply of suitable cleanup materials, such as absorbent booms and pads, will be available on site for prompt cleanup of spills containing hazardous materials. Supplies will be kept on vessels on site during construction activities and at the fuel station during operations.
- Petroleum absorbent socks or collars will be stored at the fueling station and used when fueling boats at the pier.
- Signs will be posted at the fueling station to educate personnel on fueling techniques that avoid and minimize spills.
- Waste material from the site will be transported off site and disposed of in accordance with federal, state, and local regulations.
- Vessel fueling will be conducted at the staging area or at an approved docking facility. No cross-vessel fueling will be allowed.
- Acoustic monitoring will occur during pile driving to ensure underwater peak sound pressure levels do not exceed the thresholds of 206 decibels (dB) peak and 187 dB cumulative sound exposure levels. If sound pressure thresholds exceed the acceptable thresholds, an air bubble curtain system will be used to provide sound attenuation.
- Construction activities will be limited to daytime hours to avoid the use of bright lights at night that could affect the normal behavior of fish and potentially increase predation.
- A Worker Environmental Awareness Program will be mandated for personnel involved in construction activities. Training will include the importance of the aquatic environment to special-status species and the environmental protection measures that are being implemented to avoid and/or minimize negative impacts to PFH and the species that depend on it.
- Construction crew members will keep the work area well-maintained and free from trash or litter.
- Should construction activities occur during nesting bird season (generally February 1st through August 31st) a nesting bird survey will be performed along the shoreline and within 100 feet from upland staging areas by a qualified biologist within 14 days prior to the commencement of construction activities. If nests are discovered, an appropriate non-disturbance buffer zone will be established around the nesting site. A qualified biologist will monitor active nests to determine when the young have fledged and are feeding on their own. The Project biologist and CDFW will be consulted for clearance before construction activities may resume in the vicinity.

3.0 Existing Conditions

This chapter describes the existing environmental conditions within the Action Area, focusing on features relevant to the determination of special status species occurrences.

3.1 Aquatic Habitats

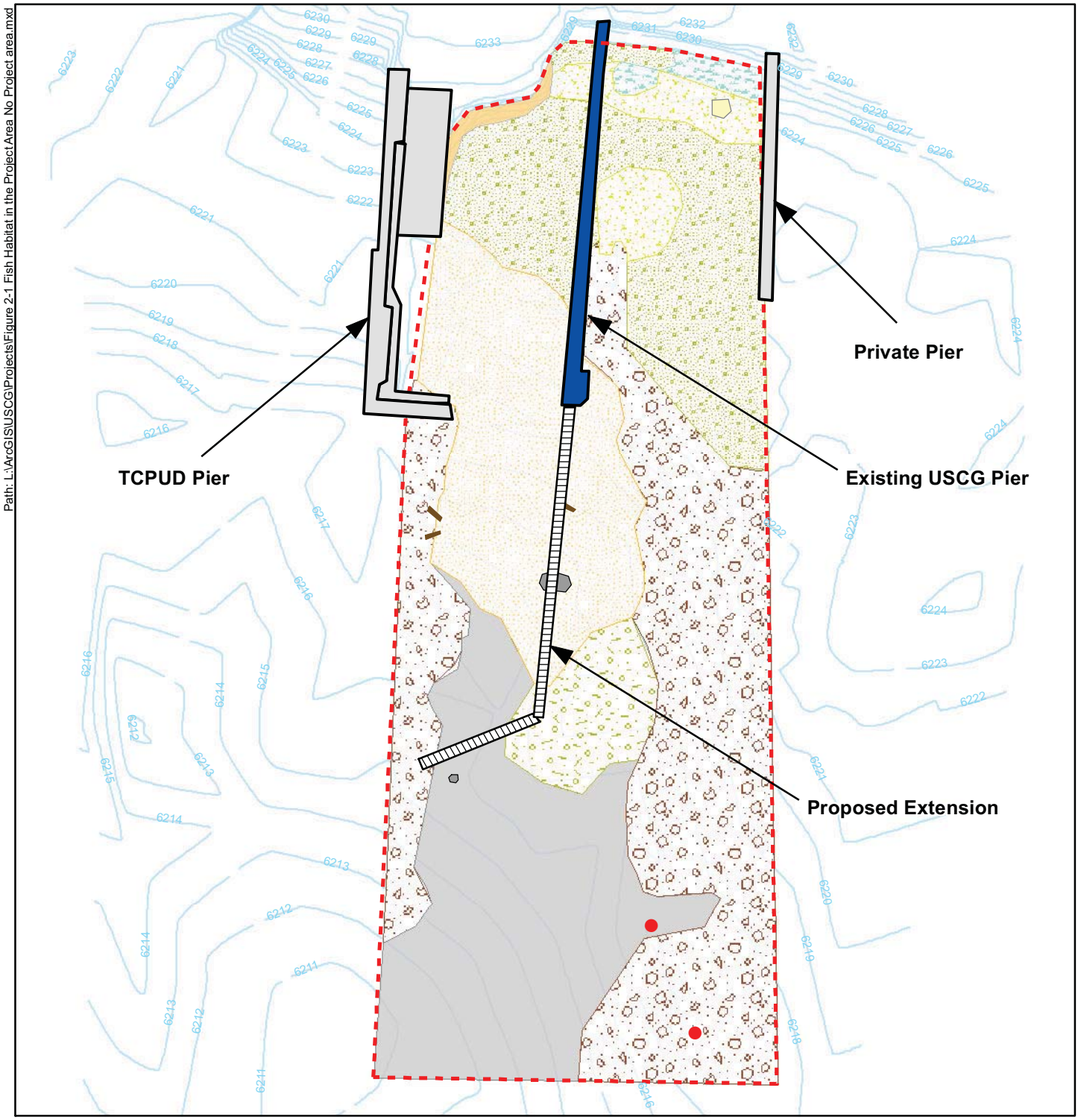
The majority of the Action Area occurs in the littoral zone, which is the portion of the lake where enough light reaches the bottom for aquatic macrophytes to grow. In Lake Tahoe this zone is composed of a variety of habitats from gently sloping open sand to very steep boulder drop offs. The biological community associated with the littoral zone of Lake Tahoe includes benthic invertebrates, zooplankton, and fish.

Current ecological conditions within Lake Tahoe reflect decades of anthropogenic impacts that have altered ecological processes and biological communities. Increases in nutrient and fine sediment levels have resulted in algal growth and a decline in lake clarity since the 1960s. Additionally, introduction of non-native species have drastically altered aquatic communities due to increased competition and predation of native species by non-native species.

3.1.1 Prime Fish Habitat

The aquatic portion of the Action Area is designated by the TRPA as PFH for fish spawning as well as for feed and cover (TRPA 2012b). Spawning habitat consists of substrates including rocks 2 to 64 millimeters in diameter, while larger diameter rocks are used for foraging and cover (TRPA 2012b). The TRPA Code of Ordinances defines “significant spawning habitat” in Lake Tahoe as “areas designated on TRPA’s Prime Fish Habitat Map as ‘Spawning Habitat’ and, through field examination, confirmed to consist of substrate predominantly comprised of small rock, cobble, gravel, or any combination thereof.” (TRPA 2013)

AECOM performed field verification in July 2011 and documented current conditions within the Action Area, including physical habitat conditions, habitat complexity, and incidental fish observations (see Appendix D). The field verification found that the survey area included substrates of gravel, cobble, and boulders, confirming that potential fish spawning, foraging, and cover habitat is present within the Action Area (Figure 3-1). The majority of the area that would be occupied by the proposed pier extension has a substrate of fine sediments or bedrock that does not provide high-quality spawning, foraging, or cover habitat, though some areas of cobble substrate could also be affected. Most of the potential spawning habitat (i.e., gravel substrate) occurs closer to shore. Although potential spawning habitat is present in the Action Area, substantial spawning activity is unlikely due to disturbance from existing boat traffic in the area. No spawning activity was observed during the field verification.



Existing Pier
Proposed Pier Extension
Fish Habitat Study Area
Buoy
Large Boulders
Large Wood Debris (>30cm)

TCPUD = Tahoe City Public Utility District

Contours
Sand with Aquatic Macrophyte Cover
Cobble
Cobble with Small Boulders
Fines
Gravel Course
Gravel, Course with Aquatic Macrophyte Cover

Bedrock
Rip Rap (Boulder, Small)
Sand

0 100 200
Feet

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

USCG Lake Tahoe Pier Extension
Figure 3 -1
Fish Habitat in the Project Area

3.2 Shoreline and Upland Habitats

The shoreline at the Station is highly developed. The USCG buildings are directly north of the existing pier with a paved parking lot extending to about 20 feet from where the existing pier attaches to the shoreline. The TCPUD paved parking lot is approximately 40 feet to the west of the USCG pier and a residential area with paved parking areas and a private pier is approximately 135 feet to the east. See Figure 1-1.

The shoreline portion of the USCG property consists of a narrow band of coarse gravel and sand, rip rap, and a lawn area. There are several small trees on the property. Between the existing USCG pier and the TCPUD parking lot is a rip rap shoreline with several trees lining the shoreline.

3.2.1 Sensitive Shoreline Vegetation

Tahoe yellow cress (*Rorippa subumbellata*) was listed as Endangered under the CESA in 1982, and was identified by the USFWS as a Candidate species for listing under the ESA in 1999. This species is also designated by the LTBMU as a Sensitive Species and by the TRPA as a Special Interest Species. Threats to Tahoe yellow cress include recreational activities on public beaches and adjacent habitats and shorezone development.

Tahoe yellow cress is known to occur around the margins of Lake Tahoe on sandy substrates and in silty soils. The presence and availability of suitable habitat for this species correlates with lake level, with decreased potentially suitable habitat as lake levels rise (Pavlik et al. 2002).

AECOM biologists performed a focused survey for Tahoe yellow cress within the Action Area in July 2011 following the protocols provided in Appendix N of the Conservation Strategy for Tahoe Yellow Cress (Pavlik et al. 2002), as applicable. There were no observations of Tahoe yellow cress or other special status plants during the survey, which encompassed all exposed beach and backshore areas within the USCG property. See Appendix B for the full report. A previous survey conducted by TRPA in September 2010 also found no Tahoe yellow cress at the USCG property. Results of the TRPA survey are also included in Appendix B. An additional survey will be completed in the summer of 2014 to confirm the absence of Tahoe yellow cress within the Action Area.

3.3 Fish and Wildlife

The following sections provide a general discussion of the fish and wildlife potentially found in the Action Area. Detailed descriptions of special status species with potential to occur in the Action Area are provided in Section 4.

3.3.1 Fish

Native fish species commonly found within the littoral zone of Lake Tahoe include Lahontan redside shiner (*Richardsonius egregius*), Lahontan speckled dace (*Rhinichthys osculus robustus*), Lahontan Lake tui chub (*Gila bicolor pectinifer*), Paiute sculpin (*Cottus beldingii*), Tahoe sucker (*Catostomus* tahoensis), and mountain whitefish (*Proposium williamsoni*). Of these, the Lahontan Lake tui chub is an LTBMU Sensitive Species.

Shore zone spawning of native fish species in Lake Tahoe occurs from April to August and October to December (Table 3-1). Larval and juvenile life stages typically move into shallow nursery areas that contain cover, with the exception of Tahoe sucker fry, which take up a benthic existence along the lake bottom (Moyle 2002).

Table 3-1 Spawning Timing of Native Fish Species

Native Fish Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lahontan Lake tui chub*												
Lahontan redside shiner												
Lahontan speckled dace												
mountain whitefish												
Paiute sculpin												
Tahoe sucker												

* LTBMU Sensitive Species
Source: Adapted from Moyle 2002

Lake Tahoe's fishery has experienced a variety of stressors including introduction of non-native species, eutrophication, algal blooms, and nearshore habitat modification. Habitats and environmental conditions that support non-native fish populations have increased with elevated water temperatures and reduced ultraviolet transparency (Chandra 2010). This expansion of non-native fish populations has led to the continued decline of native fish due to competition and predation.

The non-native fish species in the littoral zone of Lake Tahoe include rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), Kokanee salmon (*Oncorhynchus nerka*), goldfish (*Carassius auratus*), bluegill (*Lepomis macrochirus*), black crappie (*Pomixis nigromaculatus*), brown bullhead (*Ictalarus nebulosus*), carp (*Cyprinus carpio*), and largemouth bass (*Micropterus salmoides*).

3.3.2 Benthic Invertebrates

Invertebrates native to Lake Tahoe that may occur in the shallow waters of the Action Area include various worms (Phyla Annelida and Platyhelminthes), midges (Suborder Nematocera), pea clams (*Pisidium* spp.), and various snails, such as the Great Basin rams-horn (*Helisoma newberryi*), dextral pond snails (*Lymnaea* spp. or *Fossaria* spp.), sinistral pond snails (*Phsella* spp.) and the freshwater limpet (*Ferrisia fragilis*). The Great Basin rams-horn is an LTBMU Sensitive Species.

There has been a significant decline in native benthic invertebrate density since the 1960s, likely due to eutrophication and the introduction of non-native species to the lake that prey on and outcompete the native benthos (Caires et al. 2013). Non-native species include the Asian clam (*Corbicula fluminea*), signal crayfish (*Pacifastacus leniusculus*) and Mysid shrimp (Order Mysida).

3.3.3 Birds

A variety of aquatic bird species utilize the waters of Lake Tahoe and the surrounding habitats for foraging and nesting. The nests and eggs of most bird species are protected under the MBTA and California Fish and Game Code 3503 (under the CDFW). In addition, the TRPA has established threshold standards for Special Interest Species, which include the northern goshawk (*Accipiter gentilis*), which appeared in the CNDDB search results within 5 miles of the project area (see Figure 1-2). According to the TRPA, a 0.5 mile radius disturbance zone is required around northern goshawk nest sites, and the TRPA can limit the types of activities that occur in the disturbance zone. Should the Proposed Action occur within the disturbance zone of this species (or other special interest, threatened, endangered, or rare species), an application must be submitted to the TRPA that includes appropriate environmental documentation prepared by a biologist that provides specific recommendations for avoiding significant adverse impacts to the species.

As described in Section 3.2 Shoreline and Upland Habitats, the shoreline and upland portions of the Action Area are highly developed. Although there is minimal nesting habitat in or near the Action Area there are several small trees on the shoreline and within the USCG upland property that small or medium-sized birds may utilize. However, it is unlikely that birds would nest in the minimal vegetation or open space of these areas; noise and other human disturbance from nearby buildings, parking lots, and both the TCPUD pier to the west and the private pier to the east likely cause birds to avoid nesting there. In addition, birds are more likely to choose the nearby high quality habitat of the various nearby state parks and nature preserves as nesting sites. However, birds nesting in the general vicinity may use the shallow waters of the Action Area for foraging.

4.0 Description of Special Status Species and Habitat that May Be Affected by the Proposed Action

The following describes other special status species with potential to occur in the vicinity of the Proposed Action that may be affected by the Proposed Action. Species or habitat not expected to occur in the Action Area will not be discussed.

4.1 Nuttall's Ribbon-Leaved Pondweed

Nuttall's ribbon-leaved pondweed (*Potamogeton epihydrus*) is an aquatic plant species native to much of North America, where it grows in shallow freshwater bodies such as ponds, lakes, ditches, and slow-moving streams. It is a perennial rhizomatous herb that blooms from June to September. The CNPS and CDFW have assigned the species a Rare Plant Rank of 2B.2, indicating that it is moderately threatened in California but more common elsewhere. Threats to the species in California include recreational activities and water contamination. The CNDDB includes a record for this species from 1932 approximately 1.5 miles southwest from the Action Area and the species is considered to have a low potential to occur in the Action Area. The species was not noted in the Action Area during AECOM's site surveys, though no species-specific surveys were conducted. According to AECOM's Fish Habitat Survey, areas occupied by aquatic macrophytes within the Action Area are mostly limited to nearshore habitats with coarse gravel and sand substrates.

4.2 Lahontan Cutthroat Trout

Lahontan cutthroat trout (*Oncorhyncus clarkii henshawi*) was listed as Endangered under the federal ESA in 1970 and reclassified as Threatened in 1975 to facilitate management and to allow for regulated angling. The species is currently not listed under the CESA. It is considered to be a Management Indicator Species by the LTBMU and a Special Interest Species by the TRPA.

Lahontan cutthroat trout historically occupied large freshwater and alkaline lakes, small mountain streams and lakes, small tributary streams, and major rivers of the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. The species currently occupies only a small fraction of its historic range. Lahontan cutthroat trout was extirpated from the Tahoe Basin in the 1930s due to overharvesting, habitat degradation, and the introduction of non-native fishes which predate on, compete with, and/or hybridize with Lahontan cutthroat trout.

Lahontan cutthroat trout spawn in stream environments, typically between April and July. Lahontan cutthroat trout typically spawn in riffles or the tail end of pools in relatively silt-free gravel substrate. In lake habitats, small Lahontan cutthroat trout feed largely on insects and zooplankton while large Lahontan cutthroat trout feed on smaller fishes. Unlike most freshwater fish species, LCT tolerate relatively high alkalinity and total dissolved solid levels found in some lake environments. LCT evolved in the absence of other trout and they are highly susceptible to hybridization and competition from introduced trout species (USFWS 2009).

Multiple attempts have been made to reintroduce the Lahontan cutthroat trout to the Tahoe Basin since the 1950s. Most recent reintroduction efforts have focused on water bodies located in the southern portion of the Tahoe Basin. In 1989 and 1990, CDFW, in collaboration with LBTMU, reintroduced Lahontan cutthroat trout into the headwaters of the Upper Truckee River near Meiss Meadows (US Forest Service 2014). CDFW and LBTMU removed non-native brook trout (*Salvelinus fontinalis*) from the Upper Truckee River prior to reintroduction of the Lahontan cutthroat trout. Since the initial reclamation activities, annual maintenance removal efforts occurred in Meiss Meadows until 2009, after three consecutive years of no non-natives observed. Since 2009, the

Meiss Meadow population has been allowed to recover from sampling and electro-shocking effects. CDFW currently monitors the success of brook trout removal efforts through voluntary angler reporting. In 2008 the LTBMU began implementation of the Upper Truckee River Lahontan Cutthroat Trout Restoration Project downstream of the Meiss Meadow area. The objective of the effort is to facilitate natural range expansion of the Meiss Meadows population downstream by removing non-native trout.

Beginning in 2002 the USFWS began stocking the Pilot Peak strain of Lahontan cutthroat trout into Fallen Leaf Lake, located approximately 1 mile south of Lake Tahoe (USFWS 2013). This effort was undertaken in order to reintroduce a lake form of the species within the Tahoe basin, to develop adaptive management strategies for reintroduction, and to provide opportunities for anglers. Challenges for the reintroduction effort include predation by lake trout and hybridization with rainbow trout. The reintroduction effort has resulted in multiyear survival of Lahontan cutthroat trout in Fallen Leaf Lake, increased angler catch rates of Lahontan cutthroat trout, and successful spawning in Glen Alpine Creek.

In 2011, the Nevada Department of Wildlife (NDOW) stocked approximately 22,000 Lahontan cutthroat trout in the southeast portion of Lake Tahoe (near Cave Rock) to provide anglers the opportunity to catch this native species. NDOW plans to continue stocking Lahontan cutthroat trout into Lake Tahoe annually, though no stocking was conducted in 2012 or 2013. NDOW's stocking efforts are unlikely to result in a self-sustaining population in Lake Tahoe due to predation by, hybridization with, and competition from non-native fish.

4.3 Lahontan Lake Tui Chub

Lahontan Lake tui chub is an LTBMU Sensitive Species that has moderate potential to occur in the Action Area. Smaller individuals typically inhabit shallow water around the lake margins, while larger individuals move from deeper waters into the shallows at night (Miller 1951). There are also seasonal migrations, with fish spending the winter in deeper waters and spending the summer in shallower waters (Miller 1951). In Lake Tahoe, most spawning occurs at night in May and June, typically in nearshore shallow areas over beds of aquatic vegetation. Young remain in the nearshore areas until winter, when they move into deeper waters offshore. Lahontan Lake tui chubs are opportunistic omnivores. They feed mostly on zooplankton, especially cladocerans and copepods, but they also consume benthic invertebrates, such as chironomid larvae and annelid worms.

Threats to this species include loss of spawning areas; introduced Kokanee salmon and Mysid shrimp, both of which out-compete the Lahontan Lake tui chub for zooplankton; and the establishment of largemouth bass, which prey on juvenile chubs in their near-shore rearing areas (Moyle et al. 1995).

4.4 Great Basin Rams-Horn

The Great Basin rams-horn is an LTBMU Sensitive Species. It is a 5 to 15 millimeter snail that feeds on detritus and associated bacteria on the lake bottom. Populations can be found in both deep and shallow water, where there is a well-oxygenated muddy substrate, and clear, very cold, slow flowing water. The snails burrow in soft mud, just below the sediment surface, and they prefer habitats where macrophytes are present. There is a CNDDB record for the Great Basin rams-horn within 5 miles of the Action Area, though the record does not provide a specific location, stating that it is presumed extant in Lake Tahoe and referencing Taylor (1981). The nearby piers and high boating traffic in the area make the Great Basin rams-horn's potential to occur in the Action Area low, as it needs high water quality to survive. Population declines are likely a result of habitat loss and decreased water quality due to pollution, eutrophication, and habitat modification (Frest and Johannes 1998).

4.5 Nesting Birds

Nesting birds have a low potential to occur in the Action Area, due to the high disturbance levels and the presence of higher quality habitat nearby. Larger birds are not likely to use the minimal vegetation or open areas along the shoreline of the existing pier as nesting sites, though they may utilize these areas and the shallow waters of the Action Area as foraging habitat. The closest known northern goshawk nest site, recorded in 2005 in the CNDDB, is located approximately 2.3 miles northwest of the Action Area. Small to medium size birds could potentially use the small trees along the shoreline and within the USCG upland property as nesting sites, though they are more likely to choose higher quality habitat away from high disturbance levels.

4.6 Prime Fish Habitat

As described in Section 3.0 Existing Conditions, potential spawning, foraging, and cover habitats occur within the Action Area. However, the areas in which the main construction activities would occur consist mostly of fine sediments and exposed bedrock, which do not provide high quality spawning, foraging, or cover habitat Areas of potential spawning habitat are nearer to the foreshore, away from the main construction activities.

5.0 Potential Effects of the Proposed Action on Special Status Species and Habitat

This section presents an analysis of potential direct and indirect effects on special status species that could result from the Proposed Action. Effects are evaluated based on an understanding of the pier configuration and components, construction methods and materials, equipment that would be used, and how the site would be used after construction is completed.

No designated critical habitat occurs in the Action Area, and the Proposed Action will have no effect on critical habitat. Similarly, no species covered under the CESA are expected to occur in the Action Area, and the project will have no state-listed species. As discussed below, the Proposed Action may have direct and/or indirect effects on other special status species and habitat, but these effects are not likely to be significant. In addition, the USCG will implement the avoidance and minimization measures described above in Section 2.4 to further reduce adverse effects.

This section also identifies the potential effects of the considered alternatives on the special status biological resources with potential to occur in the Action Area.

5.1 Nuttall's Ribbon-Leaved Pondweed

The Proposed Action may affect individuals, but is not likely to result in a trend toward federal or state listing or loss of viability of Nuttall's ribbon-leaved pondweed. Temporary impacts from project construction could include disturbance of habitat due to increased turbidity and subsequent sedimentation and increased potential for accidental spills. Direct removal of individuals is unlikely, since this species is most likely to occur in nearshore areas that will not be directly affected by construction of the pier extension. In addition, impacts would be minimized and/or avoided by the implementation of the measures described in Section 2.4, including implementation of a silt curtain and floating boom around the disturbance area during construction and spill prevention and control measures during construction and operations.

5.2 Lahontan Cutthroat Trout

The Proposed Action may affect but is unlikely to adversely affect Lahontan cutthroat trout. There is only a small possibility of Lahontan cutthroat trout occurring in the Action Area during construction, since there is currently no self-sustaining population of Lahontan cutthroat trout in Lake Tahoe, NDOW has not conducted stocking within Lake Tahoe since 2011, and the NDOW stocking site is not in the vicinity of the Action Area. Lahontan cutthroat trout that have been reintroduced into the Upper Truckee River watershed and Fallen Leaf Lake are not expected to occur in the Action Area. However, future reintroduction efforts in Lake Tahoe may result in Lahontan cutthroat trout utilizing the Action Area for foraging habitat in the future. Lahontan cutthroat trout spawning is not expected in the lake environment of the Action Area, since the species is an obligate stream spawner.

If Lahontan cutthroat trout are present in the Action Area during construction, temporary construction-related impacts may include increased turbidity and subsequent sedimentation of feeding and spawning grounds, displacement of prey species, potential physical injury from vessel movements, and increased potential for accidental spills. Fish would likely avoid the Action Area during construction activities due to vessel movements and increased noise levels and turbidity. The BMPs listed in Section 2.4, including use of a silt curtain and spill prevention and control measures, would be implemented to avoid and minimize impacts. Once sediment-disturbing activity is complete the sediment will resettle and benthic

organisms may re-colonize, which would facilitate fish species to return to forage. Long-term impacts from the Proposed Action would include the direct removal or modification of potential habitat in the area occupied by the proposed pier extension, though as discussed above, the area to be impacted does not provide high quality fish habitat. The disturbance area of the Proposed Action would be minimized to the extent practical in order to decrease long-term impacts, and if high quality foraging habitat is affected, the impacts will be mitigated at the 1:1.5 ratio established by the USFWS and TRPA. Therefore the Proposed Action is unlikely to adversely affect Lahontan cutthroat trout.

5.3 Lahontan Lake Tui Chub

The Proposed Action may affect individuals, but is not likely to result in a trend toward federal or state listing or loss of viability of Lahontan Lake tui chub, Impacts would be avoided or minimized by the implementation of the BMPs described in Section 2.4, specifically by scheduling work to avoid spawning seasons or other sensitive life stages. Temporary impacts from project construction could include increased turbidity and subsequent sedimentation of feeding and spawning grounds, displacement of prey species, potential physical injury from vessel movements, and increased potential for accidental spills. Fish would likely avoid the Action Area during construction activities due to vessel movements and increased noise levels and turbidity. However, high disturbance levels from existing boating traffic in the area likely deter significant foraging or spawning activities in the Action Area. Once sediment-disturbing activity is complete the sediment will resettle and benthic organisms may re-colonize, which would facilitate fish species to return to forage. Long-term impacts from the Proposed Action would include the direct removal or modification of potential habitat in the area occupied by the proposed pier extension.

Fish would likely avoid the Action Area during construction activities due to vessel movements and increased noise levels and turbidity. However, due to the nearby public TCPUD pier to the west and the private pier to the east, the high disturbance levels from boating traffic in the area likely already deter fish from foraging or spawning in the area.

5.4 Great Basin Rams-Horn

The Proposed Action may affect individuals, but is not likely to result in a trend toward federal or state listing or loss of viability of the Great Basin rams-horn. Impacts would be minimized and/or avoided by the implementation of the BMPs described in Section 2.4. Temporary impacts from project construction could include increased turbidity and subsequent sedimentation of habitat, increased potential for accidental spills, and direct removal of or physical injury to individuals. Long-term impacts from the Proposed Action would include direct removal or modification of potential habitat in the area occupied by the proposed pier extension. However, as mentioned previously, the likelihood of this species to occur in the Action Area is low, as the habitat quality is likely low due to existing boat traffic and the minimal macrophyte coverage where the pier would be installed.

5.5 Nesting Birds

No federal- or state-listed or proposed bird species are expected to occur in or adjacent to the Action Area; therefore, no effects on bird species protected under the ESA or CESA are expected. The Proposed Action may affect nests and eggs of other nesting birds protected under the MBTA. However, potential effects on nesting birds, such as noise disturbance, prey displacement, and air pollution, would be short-term and insignificant. Construction activities could disturb bird species that may be utilizing the area for nesting and/or foraging habitat, as birds would likely avoid the area during construction activities. However, the shoreline and upland area near the Action Area is highly developed and there is minimal nesting habitat in or near the Action Area. Existing disturbance levels and lack of habitat likely limit the amount of nesting in the vicinity of the Proposed Action. Should construction occur during the nesting bird season (generally February 15th to August 31st), a pre-construction nesting bird survey of the Action Area would be conducted at least 14 days prior to the start of construction activities, and, if nests are identified, avoidance measures would be taken in consultation with CDFW to avoid or minimize impacts.

5.6 Prime Fish Habitat

The Proposed Action may affect PFH. Temporary impacts during construction could include decreased water quality due to increased turbidity, subsequent sedimentation of habitat, increased potential for accidental spills, and increased noise and disturbance due to the presence of construction equipment. Implementation of the BMPs described in Section 2.4 would minimize these impacts. Long-term impacts would include direct removal of 14 square feet of lake-bottom habitat and modification of 1,315 square feet through shading. As noted above, the majority of the substrate in the area to be occupied by the proposed pier extension is made up of fines and exposed bedrock, which do not provide high quality spawning or forage and cover habitat. Some areas of cobble, which could provide forage and cover habitat, would also be affected. If it is determined that PFH is affected by the Proposed Action, the impacts will be mitigated at the 1:1.5 ratio established by TRPA. Of the action alternatives considered, the Proposed Action would result in the least disturbance of lake-bottom habitat.

5.7 Potential Effects of the Considered Alternatives

The considered alternatives involving the construction of a pier extension would have similar impacts to special status species and critical habitat; however, impacts to biological resources from the alternatives, aside from the No Action Alternative, would be greater. As shown in Table 2-1 Comparison Summary, the Proposed Action would have the smallest lake bottom footprint of all the alternatives and the shortest construction duration compared to the alternatives involving pier construction. The No Action Alternative is not a viable alternative because it would not improve existing conditions and would prevent the USCG from meeting acceptable standards for public service and safety responsibilities.

6.0 References

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Appendix A

California Natural Diversity Database Search Results

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad is (Truckee (3912032) or Martis Peak (3912031) or Mt. Rose (3911938) or Tahoe City (3912022) or Kings Beach (3912021) or Marlette Lake (3911928) or Homewood (3912012) or Meeks Bay (3912011) or Glenbrook (3911918))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter gentilis northern goshawk	ABNKC12060	None	None	G5	S3	SSC
Aplodontia rufa californica Sierra Nevada mountain beaver	AMAFA01013	None	None	G5T3T4	S2S3	SSC
Arabis rigidissima var. demota Galena Creek rockcress	PDBRA061R1	None	None	G3T3Q	S1	1B.2
Artemisia tripartita ssp. tripartita threetip sagebrush	PDAST0S1S2	None	None	G5T3T5	S2	2B.3
Botrychium crenulatum scalloped moonwort	PPOPH010L0	None	None	G3	S2	2B.2
Botrychium lunaria common moonwort	PPOPH01080	None	None	G5	S2?	2B.3
Botrychium minganense mingan moonwort	PPOPH010R0	None	None	G4G5	S2	2B.2
Botrychium montanum western goblin	PPOPH010K0	None	None	G3	S2	2B.1
Capnia lacustra Lake Tahoe benthic stonefly	IIPLE03200	None	None	G1	S1	
Carex davyi Davy's sedge	PMCYP033H0	None	None	G2	S2	1B.3
Carex lasiocarpa woolly-fruited sedge	PMCYP03720	None	None	G5	S2	2B.3
Carex praticola northern meadow sedge	PMCYP03B20	None	None	G5	S2S3	2B.2
Dendroica petechia brewsteri yellow warbler	ABPBX03018	None	None	G5T3?	S2	SSC
Empidonax traillii willow flycatcher	ABPAE33040	None	Endangered	G5	S1S2	
Eriogonum umbellatum var. torreyanum Donner Pass buckwheat	PDPGN086U9	None	None	G5T2	S2.2	1B.2
Fen Fen	CTT51200CA	None	None	G2	S1.2	
Glyceria grandis American manna grass	PMPOA2Y080	None	None	G5	S2	2B.3
Gulo gulo California wolverine	AMAJF03010	Proposed Threatened	Threatened	G4	S1	FP
Helisoma newberryi Great Basin rams-horn	IMGASM6020	None	None	G1Q	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ivesia sericoleuca Plumas ivesia	PDROS0X0K0	None	None	G2	S2	1B.2
Juncus luciensis Santa Lucia dwarf rush	PMJUN013J0	None	None	G2G3	S2S3	1B.2
Lepus americanus tahoensis Sierra Nevada snowshoe hare	AMAEB03012	None	None	G5T3T4Q	S2?	SSC
Lepus townsendii townsendii western white-tailed jackrabbit	AMAEB03041	None	None	G5T5	S3?	SSC
Lithobates pipiens northern leopard frog	AAABH01170	None	None	G5	S2	SSC
Margaritifera falcata western pearlshell	IMBIV27020	None	None	G4G5	S2S3	
Martes americana sierrae Sierra marten	AMAJF01014	None	None	G5T3T4	S3S4	
Martes pennanti fisher - West Coast DPS	AMAJF01021	Candidate	Candidate Threatened	G5T2T3Q	S2S3	SSC
Myotis volans long-legged myotis	AMACC01110	None	None	G5	S4?	
Ochotona princeps schisticeps gray-headed pika	AMAEA0102H	None	None	G5T2T4	S2S4	
Oncorhynchus clarkii henshawi Lahontan cutthroat trout	AFCHA02081	Threatened	None	G4T3	S2	
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S3	WL
Potamogeton epihydrus Nuttall's ribbon-leaved pondweed	PMPOT03080	None	None	G5	S2S3	2B.2
Potamogeton robbinsii Robbins' pondweed	PMPOT030Z0	None	None	G5	S3	2B.3
Rana sierrae Sierra Nevada yellow-legged frog	AAABH01340	Proposed Endangered	Threatened	G1	S1	SSC
Rhamnus alnifolia alder buckthorn	PDRHA0C010	None	None	G5	S3	2B.2
Rorippa subumbellata Tahoe yellow cress	PDBRA270M0	Candidate	Endangered	G1	S1	1B.1
Scutellaria galericulata marsh skullcap	PDLAM1U0J0	None	None	G5	S2	2B.2
Sphaeralcea munroana Munro's desert mallow	PDMAL140F0	None	None	G4	S1	2B.2
Stuckenia filiformis ssp. alpina slender-leaved pondweed	PMPOT03091	None	None	G5T5	S3	2B.2
Stygobromus lacicolus Lake Tahoe amphipod	ICMAL05970	None	None	G1	S1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Stygobromus tahoensis	ICMAL05A70	None	None	G1	S1	
Lake Tahoe stygobromid						
Vulpes vulpes necator	AMAJA03012	None	Threatened	G5T1T2	S1	
Sierra Nevada red fox						

Record Count: 42

Appendix B

Tahoe Yellow Cress Survey

AECOM Environment

Prepared for:
U.S. Coast Guard
Oakland, California

Prepared by:
AECOM
Oakland, California
October 2011

Tahoe Yellow Cress Survey

U.S. Coast Guard, Station Lake Tahoe
Pier Extension Project
Lake Tahoe, Placer County, California

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1. Methods

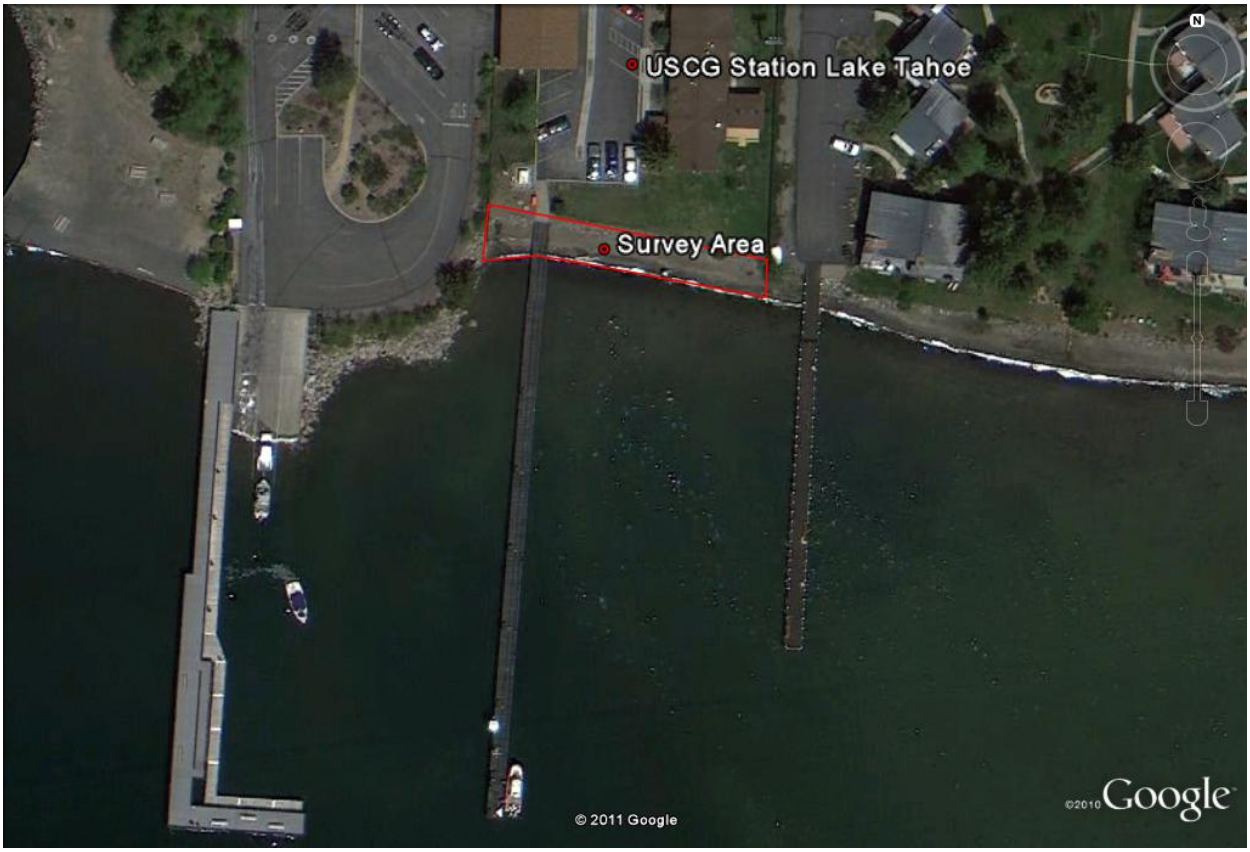
This report provides results of a focused survey for Tahoe yellow cress (*Rorippa subumbellata*) at US Coast Guard (USCG) Station Lake Tahoe, California. The survey was conducted on July 18, 2011, by AECOM biologist, Justin Westrum. The survey followed the protocols provided in Appendix N of the Conservation Strategy for Tahoe Yellow Cress[1], as applicable. The survey encompassed all exposed beach and backshore areas within the USCG property. Due to the relatively high water level at the time of the survey, much of the forebeach was inundated and the surveyed strip was approximately 8 to 10 feet wide. This included the backshore area, which consisted of up rip rap. The surveyor walked two full lengths of the shoreline and identified all plants observed.

2. Results

No Tahoe yellow cress was observed during the survey. In addition, no other special-status plants were observed. The survey data form from the survey is included as Attachment 1. A previous Tahoe yellow cress survey had been conducted of the property in September 2010 by Jason Ramos of the Tahoe Regional Planning Agency, and the data form for that survey is also included in Attachment 1. Representative photos of the survey area from AECOM's July 2011 survey are included as Attachment 2.

[1] Pavlik, B. *et al.* 2002. Conservation Strategy for Tahoe Yellow Cress (*Rorippa subumbellata*). Tahoe Regional Planning Agency. Lake Tahoe, NV

Figure 1. Survey Area



Appendix 1. Survey Data Forms

TAHOE YELLOW CRESS *(Rorippa subumbellata)* FIELD SURVEY FORM

Survey date: 7/18/2011
Surveyor: Justin Westrum Affiliation: AECOM (on contract to US Coast Guard)
Email: justin.westrum@aecom.com Telephone: 510.745.4537

LOCATION (attach copy of quad map showing boundaries and pictures taken)

Site name: US Coast Guard Station Lake Tahoe **Site Code:** 094-140-015

USGS quad: S. Lake Tahoe Emerald Bay Meeks Bay Homewood Tahoe City Kings Beach **X** Marlette Lake Glenbrook

County: El Dorado Placer Washoe Carson Douglas **Site ownership:** Private State Federal **X** City/Local

Legal access: _____

TYC Present? **Yes** **No X** **Actual Number of Plants: 0 or Estimated Plants: _____**

Amount of person minutes spent in search? 30

Previous plant occurrence? Yes No **X** Date Plant last observed[8]: _____

Cluster 1(individual clusters are equal to TYC that is within 13 m radius): (record additional clusters on back or on additional data sheets)

GPS Coordinates taken: (UTM NAD 27, Zone 11) – be specific about where the coordinates are from (centroid, endpoints, etc.)

Easting: _____ Northing: _____ Location: _____
Easting: _____ Northing: _____ Location: _____
Easting: _____ Northing: _____ Location: _____
Easting: _____ Northing: _____ Location: _____

Number of plants within cluster_____ Actual Number or Estimated Percentage in each phenological stage (circle one)

Juvenile: _____ Senescent: _____ Flowering: _____ Fruiting (may also be flowering): _____

Min. Rosette Diameter (cm): _____ Max. Rosette Diameter (cm): _____

PHYSICAL ATTRIBUTES

Approximate Elevation of Population: _____
Lake level on day of survey (USGS Station 10337000):_____
Distance to lake water line (meters): Shortest _____ Longest _____
Other waterbodies closer than lake?_____ How far_____
Sketch beach profile (use back paper additional space):

substrate / soils (relative cover w/in 0.3 meter):

_____ % sand (<2 mm)
_____ % fine gravel (>2-5 mm)
_____ % medium gravel (>5-20 mm)
_____ % coarse gravel (>20-75 mm)
_____ % cobbles (>75-250 mm)
_____ % stones (>250-600 mm)
_____ % boulders (>600 mm)
_____ % other (silt, wrack, litter)

BIOLOGICAL ATTRIBUTES

Total Vegetation % cover: _____

Associated vegetation:

% Cover	*Name*	*% Cover*	*Name*
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____

Common associates:

% Cover		*% Cover*	
__	Spike-rush (*Eleocharis* spp.)	___	Willow (*Salix* spp.)
__	Sweet clover (*Melilotus alba*)*	___	Alder (*Alnus incana*)
__	Clover (*Lotus purshianus*)	___	*Epilobium* spp.
__	Mullein (*Verbascum thapsus*)*	___	Sedge (*Carex* spp.)
__	Monkey flower (*Mimulus primuloides*)	___	Rush (*Juncus* spp.)
__	W. yellow cress (*Rorippa curvisiliqua*)	___	Dock (*Rumex* spp.)

Non-native species in vicinity of TYC population? Yes No (If YES, add to above species list and % cover and identify w/ an *)

LAND USES and IMPACTS

Cover of footprints within patch: <5% 5-25% 26-50% 51-75% >75%

Note vegetation removal, trash, recreational impacts, vandalism and/or other impacts: _____

Enclosure effectiveness: good fair poor Comment: _____

Possible management actions and other notes: _____

TAHOE YELLOW CRESS *(Rorippa subumbellata)* FIELD SURVEY FORM

Survey date: 9-30-10
Surveyor: Jason Ramos
Email: _____
Affiliation: _____
Telephone: _____

LOCATION (attach copy of quad map showing boundaries and pictures taken)

Site name: U.S. Coast Guard
Site code # (NNHP) 094-140-015
USGS quad: S. Lake Tahoe Emerald Bay Meeks Bay Homewood Tahoe City Kings Beach Marlette Lake Glenbrook
County: El Dorado Placer Washoe Carson Douglas
Site ownership: Private State Federal City/Local
Best access: _____

Coordinates of corners of TYC population (UTM NAD 27, Zone 11) If not these coordinates, specify: _____
north: _____ east: _____
south: _____ west: _____

TYC Present? Yes (No)

Amount of person minutes spent in search? _____ Specimens collected? Yes No
Previous plant occurrence? Yes No Date plant last observed: _____

Juvenile: _____ typical size (cm): _____
Flowering: _____ typical size (cm): _____
Flowering/Fruiting: _____ typical size (cm): _____
Fruiting: _____ typical size (cm): _____
Senescent: _____ typical size (cm): _____
Min. rossette diameter (cm): _____ Max. rossette diameter (cm): _____

PHYSICAL ATTRIBUTES

Approx. elevation of the population (ft, LTD): _____
Lake level on day of survey (USGS Station 10337000): _____
Distance to lake water line (meters): Shortest _____ Longest _____
Slope: 0 1-2% 3-5% 5-10% >10%
Sketch beach profile:

substrate / soils (relative cover w/in 0.3 meter):
_____ % sand (<2 mm)
_____ % gravel (0.2-6.4 cm)
_____ % cobble (6.4-25.6 cm)
_____ % small boulder (25.6-51.2 cm)
_____ % med-large boulder (>51.2 cm)
_____ % other (silt, wrack)

BIOLOGICAL ATTRIBUTES

Associated vegetation:

% Cover	*Name*	*% Cover*	*Name*
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____
___	_____	___	_____

Common associates:

% Cover		*% Cover*	
___	Spike-rush (*Eleocharis* spp.)	___	Willow (*Salix* spp.)
___	Sweet clover (*Melilotus alba*)*	___	Alder (*Alnus incana*)
___	Clover (*Lotus purshianus*)	___	*Epilobium* spp.
___	Mullein (*Verbascum thapsus*)*	___	Sedge (*Carex* spp.)
___	Monkey flower (*Mimulus primuloides*)	___	Rush (*Juncus* spp.)
___	W. yellow cress (*Rorippa curvisiliqua*)	___	Dock (*Rumex* spp.)

Non-native species in vicinity of TYC population? Yes No (If YES, add to above species list and % cover and identify w/ an *)

LAND USES and IMPACTS

Cover of footprints within patch: <5% 5-25% 26-50% 51-75% >75%
Note vegetation removal, trash, recreational impacts, vandalism and/or other impacts: Low gradient shoreline. Mostly gravel shoreline; mid-shoreline (6,227) heavily vegetated; some open sand areas at HWL.
Enclosure effectiveness: good fair poor Comment: _____
Possible management actions and other notes: _____

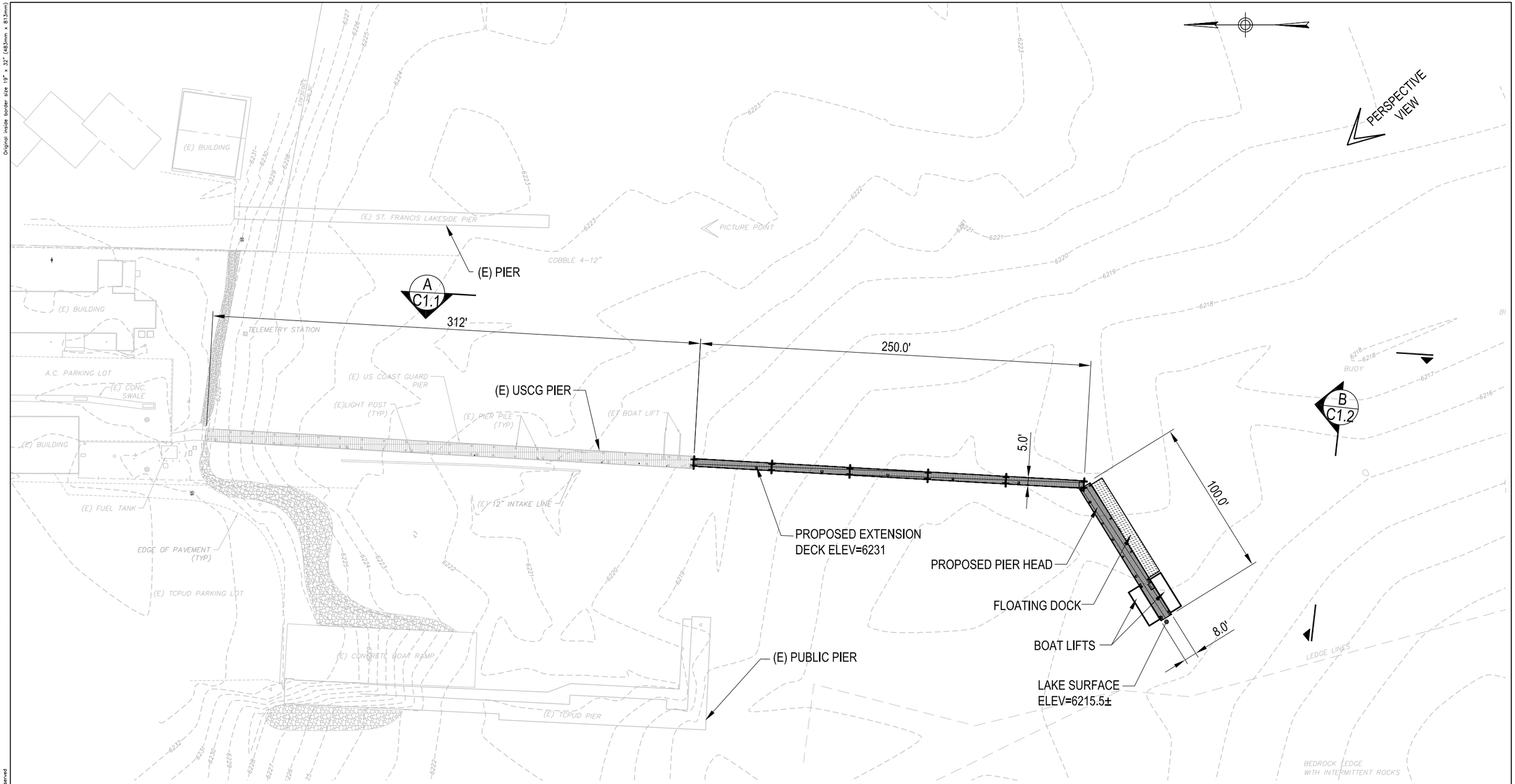
Appendix 2. Representavie Site Photos

Photograph 1. Surveyed beach and backshore area (looking East).

Photograph 2. View of survey area from USCG Pier (looking North).

Appendix C

Proposed Action and Alternatives – Plan and Perspective Drawings



PLAN

0' 30' 60' 90'
SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

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Drawn By: EM
Approved By:
Date: 7/26/12
Meeting: Meeting 1

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United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
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Oakland, CA 94606-5337
Staff Symbol: EVD

PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION DOGLEG W/CATWALK DOLPHIN OPTION 1

Project Number: 60218657

Sheet Number: C1.0 of

Original inside border size 19" x 32" (483mm x 813mm)
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Copyright © 2011 by AECOM. All rights reserved
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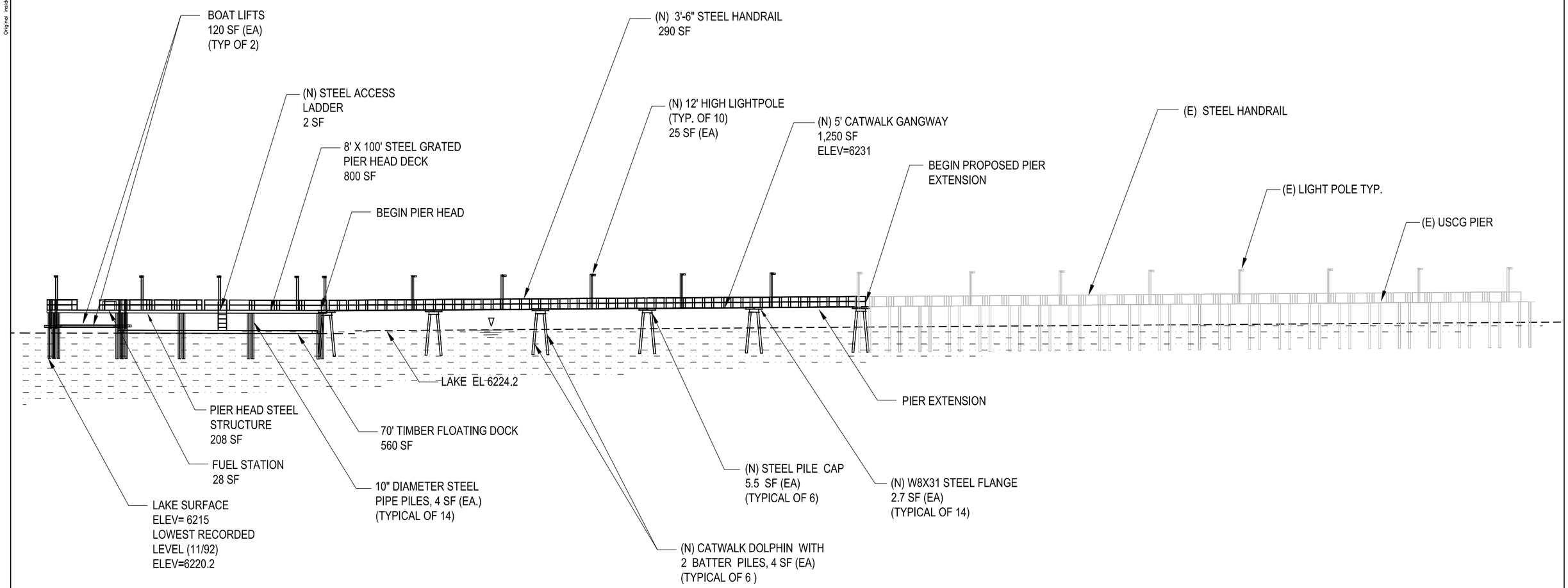

PERSPECTIVE A / C1.1

PRELIMINARY

Original inside border size 19" x 32" (483mm x 813mm)
Copyright © 2011 by AECOM All rights reserved
N:\CBS\W93098\ACAD\Filename

Revision	By	Approved	Date

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Date: 7/26/12
Meeting: Meeting 1

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Commanding Officer
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Civil Engineering Unit Oakland
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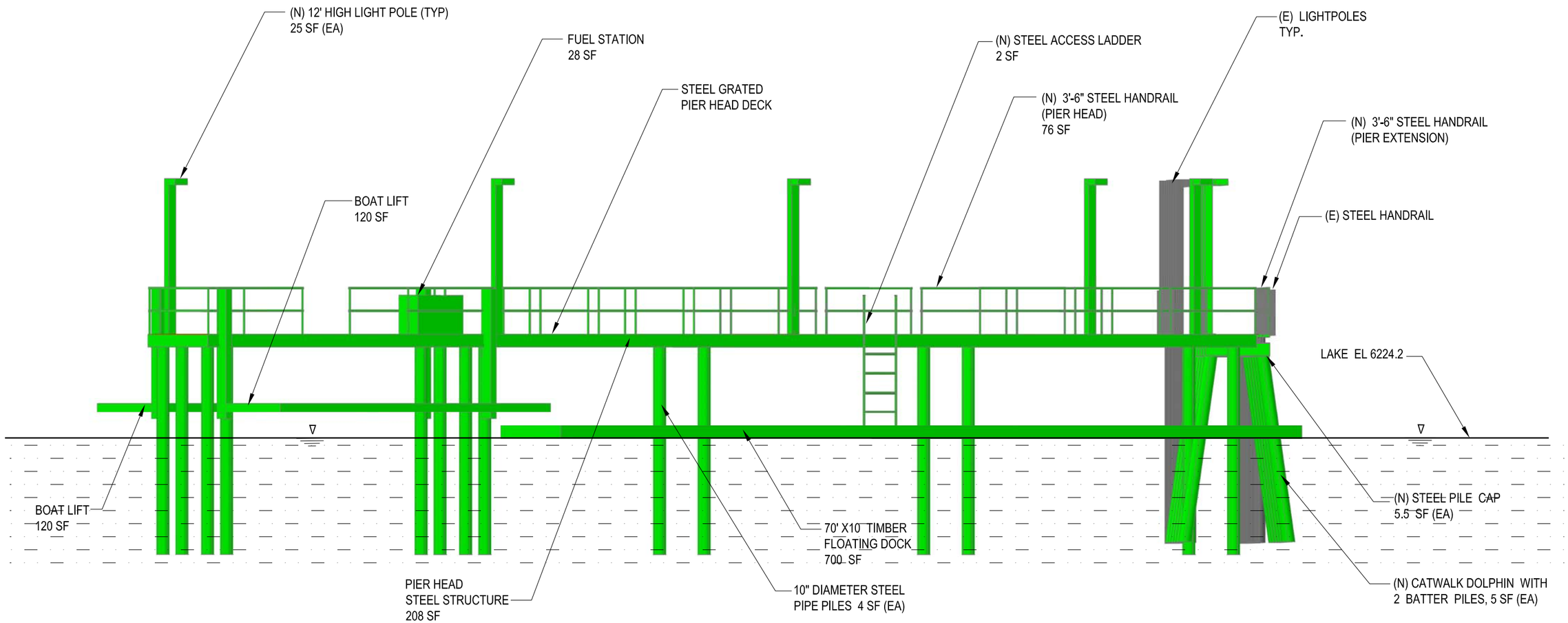
Staff Symbol: EVD

PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION DOGLEG W/CATWALK DOLPHIN OPTION 1
Project Number: 60218657
Sheet Number: C1.1 of



FRONT VIEW B / C1.2

PRELIMINARY

Revision	By	Approved	Date

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Approved By:
Date: 7/26/12
Meeting: Meeting 1

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United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION DOGLEG W/CATWALK DOLPHIN OPTION 1

Project Number: 60218657

Sheet Number: C1.2 of

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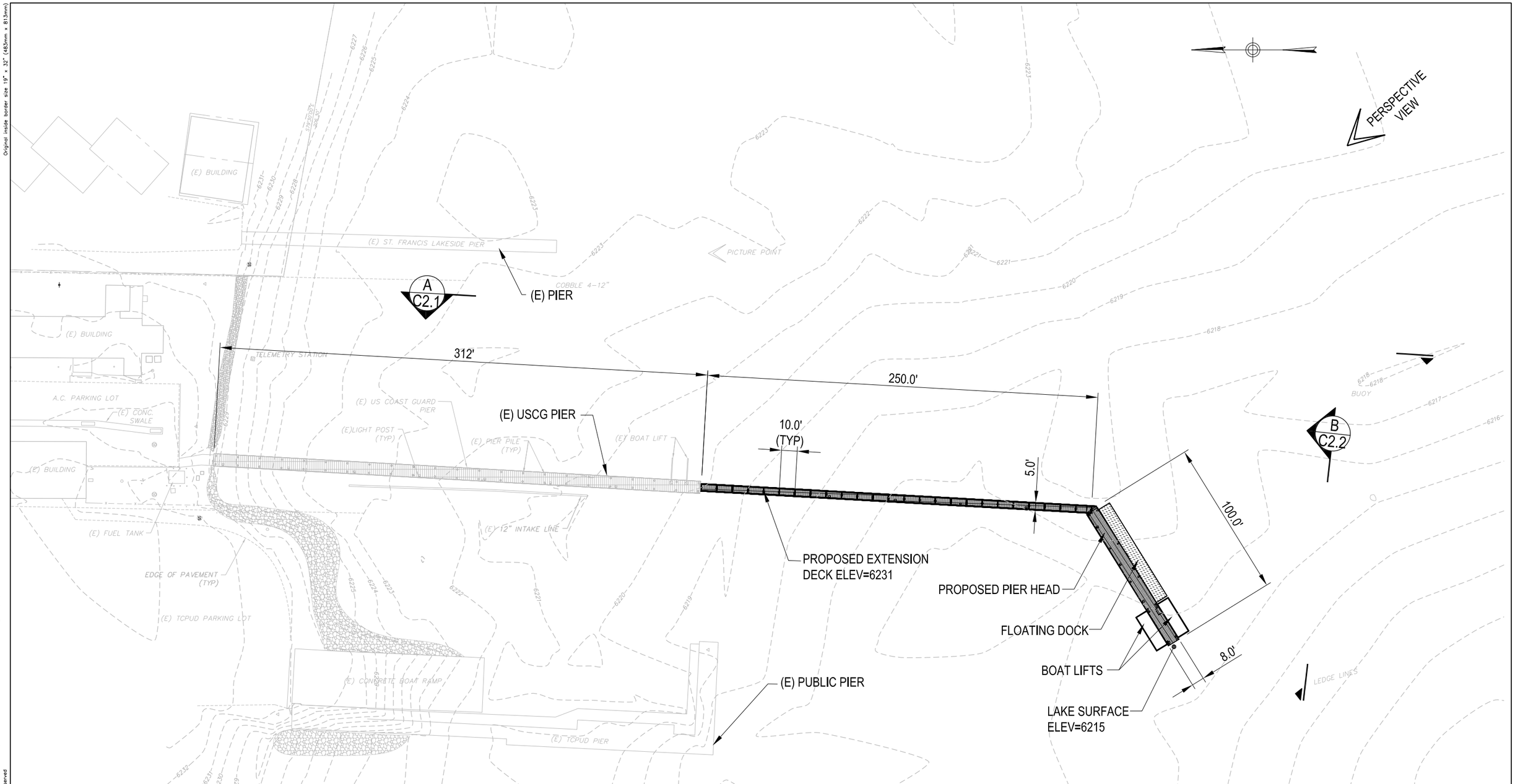

PLAN

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SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

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PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION DOGLEG W/MONOPILE OPTION 2

Project Number: 60218657

Sheet Number: C2.0 of

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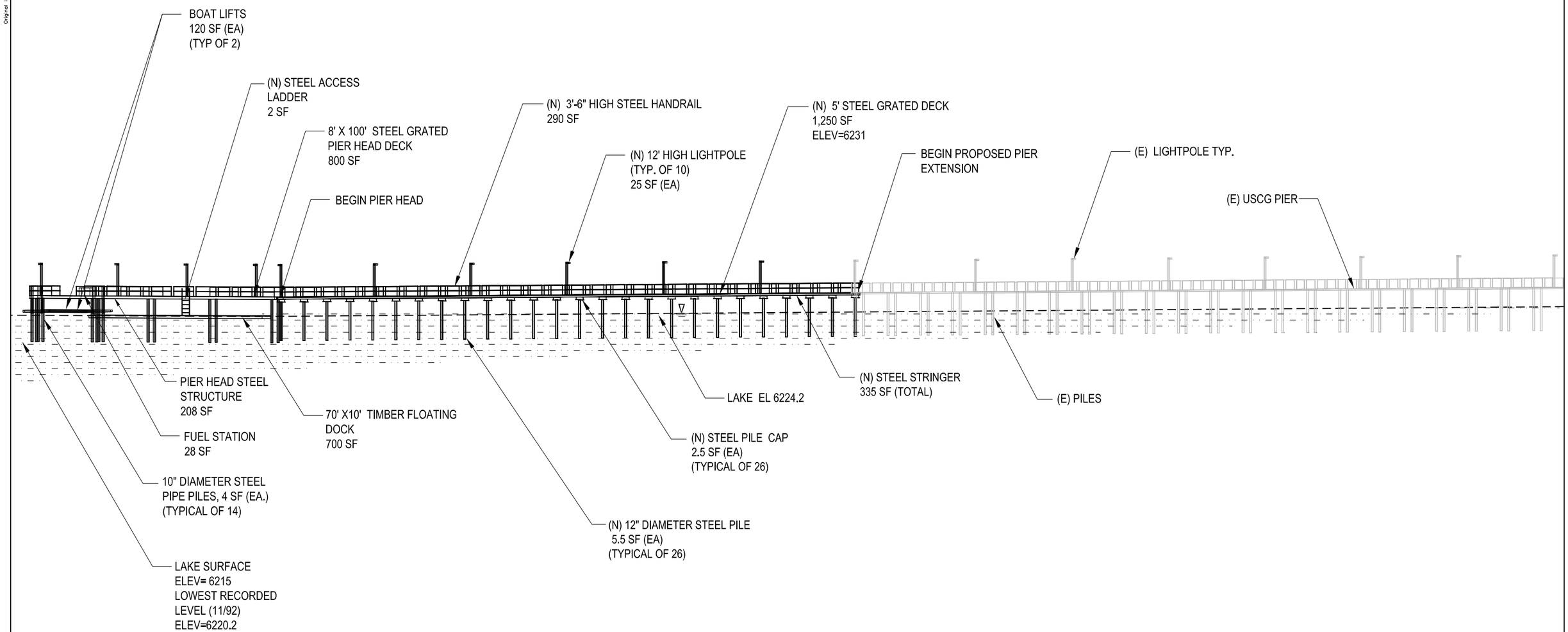

PERSPECTIVE A / C2.1

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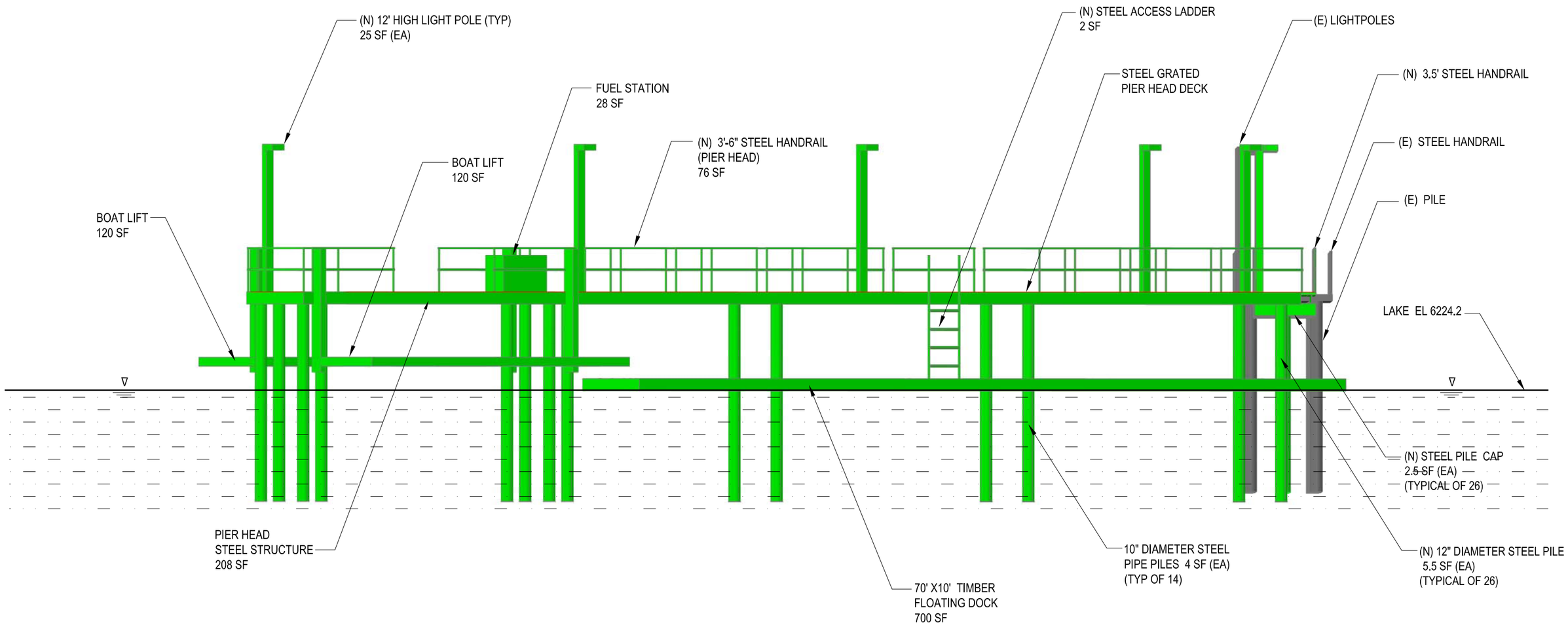

FRONT VIEW B / C2.2

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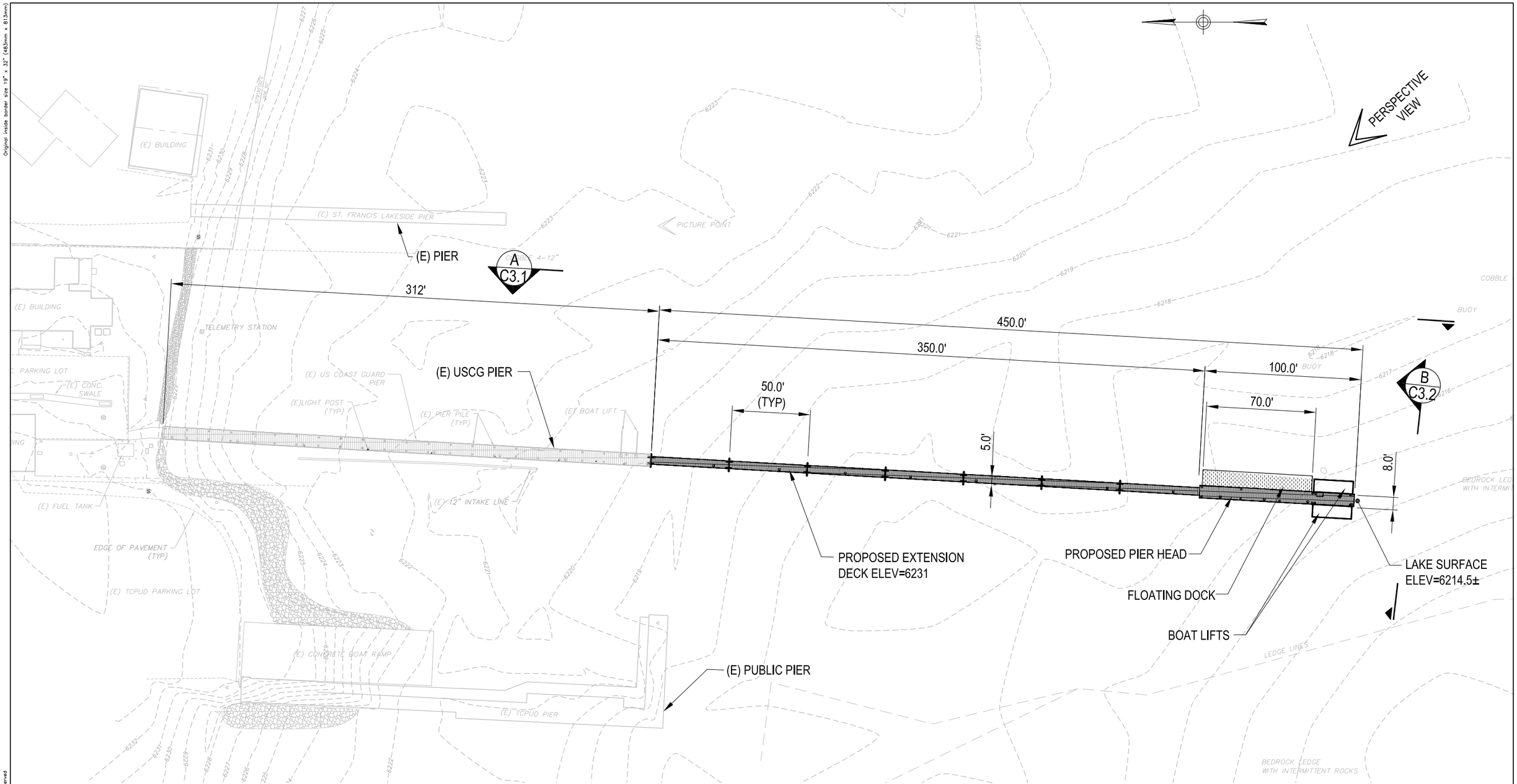
Sheet Title: PIER EXTENSION DOGLEG W/MONOPILE OPTION 2

Project Number: 60218657

Sheet Number: C2.2 of



PLAN

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SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

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PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION STRAIGHT W/CATWALK DOLPHIN OPTION 3

Project Number: 60218657

Sheet Number: C3.0 of

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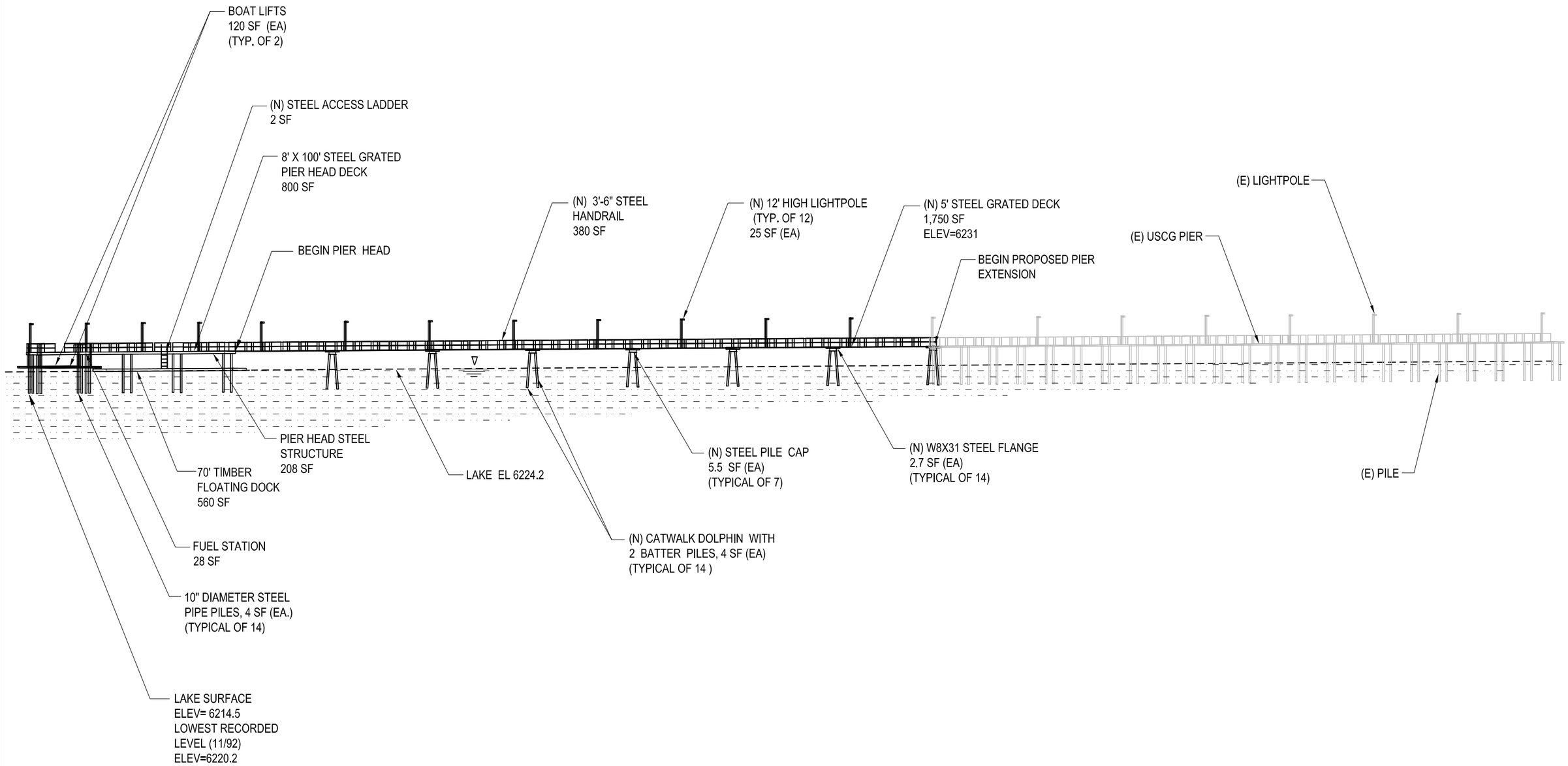

PERSPECTIVE A / C3.1

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Sheet Title: PIER EXTENSION STRAIGHT W/CATWALK DOLPHIN OPTION 3

Project Number: 60218657

Sheet Number: C3.1 of

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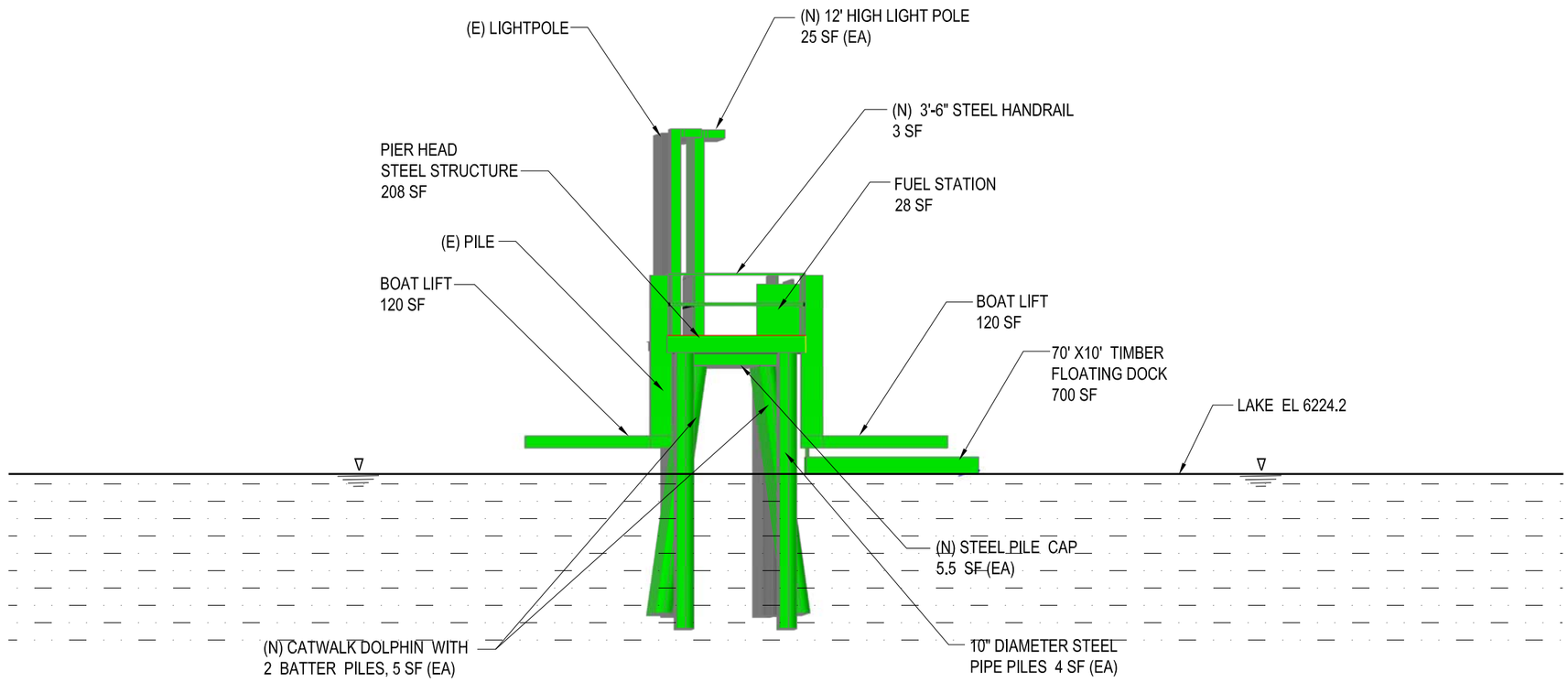

FRONT VIEW B / C3.2

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PIER EXTENSION ALTERNATIVES

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Project Number: 60218657

Sheet Number: C3.2 of

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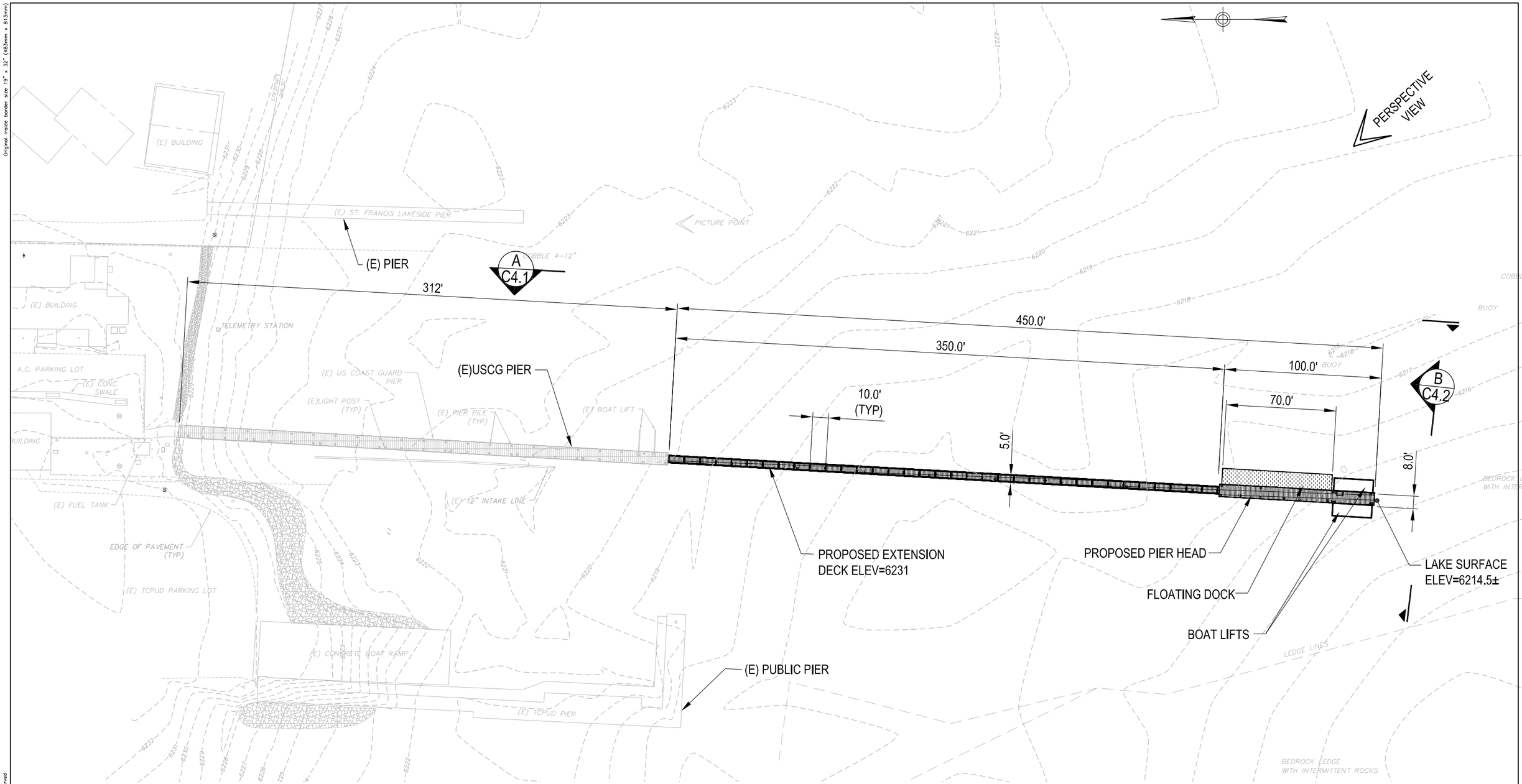

PLAN

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SCALE: 1" = 30' FULL SIZE
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PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION STRAIGHT W/MONOPILE OPTION 4

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Sheet Number: C4.0 of

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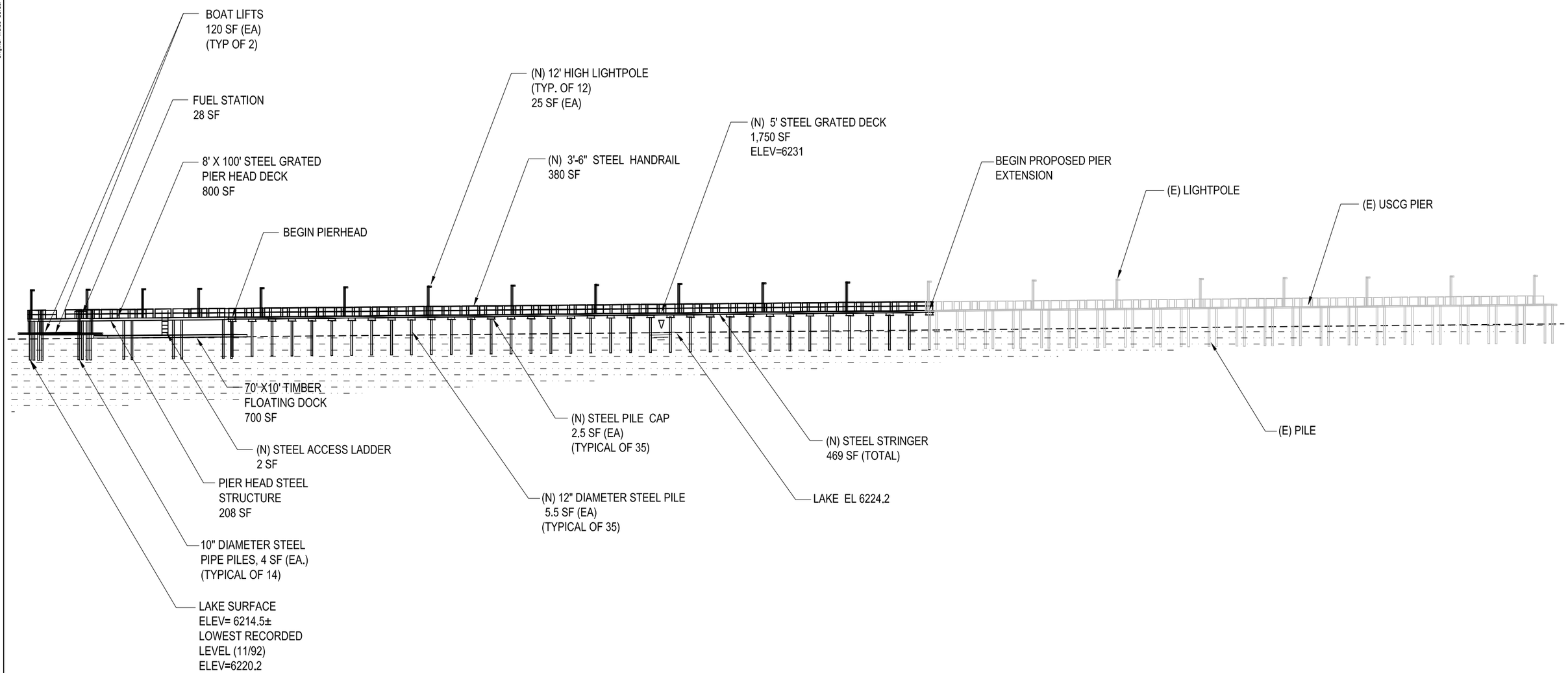

PERSPECTIVE A / C4.1

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Sheet Number: C4.1 of

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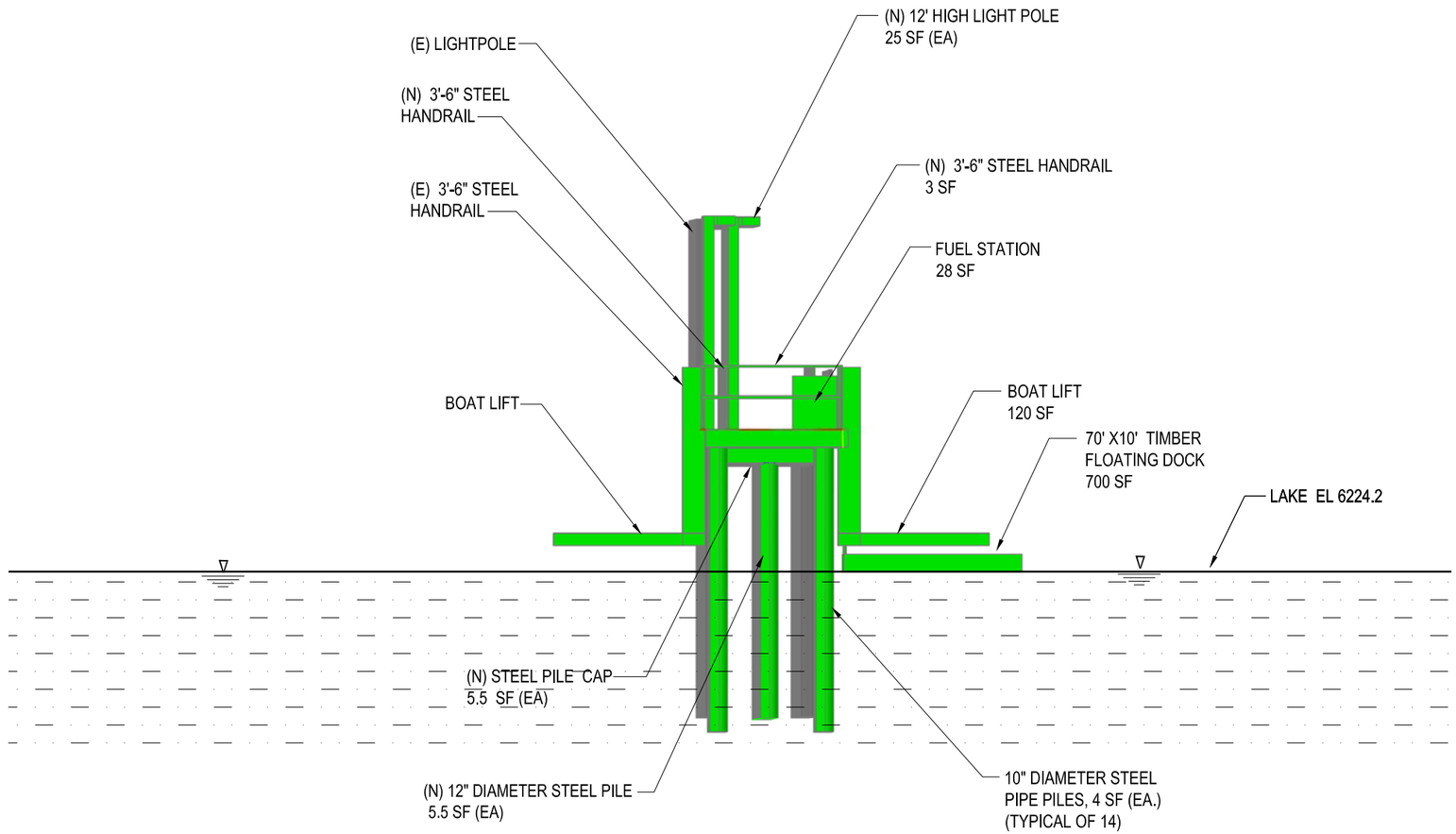

10" DIAMETER STEEL
PIPE PILES 4 SF (EA)

FRONT VIEW B / C4.2

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PIER EXTENSION ALTERNATIVES

Sheet Title: PIER EXTENSION STRAIGHT W/MONOPILE OPTION 4
Project Number: 60218657
Sheet Number: C4.2 of

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Appendix D

Fish Habitat Survey Memorandum

AECOM Environment

Prepared for:
U.S. Coast Guard
Oakland, California

Prepared by:
AECOM
Oakland, California
October 2011

Fish Habitat Survey

U.S. Coast Guard, Station Lake Tahoe
Pier Extension Project
Lake Tahoe, Placer County, California

CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1. Introduction

The current US Coast Guard (USCG) pier and any potential pier extension at this location are situated in Tahoe Regional Planning Agency (TRPA) designated Prime Fish Habitat for fish spawning. Prime fish habitat is defined in the TRPA Code of Ordinances as locations within Lake Tahoe waters with "substrate less than 30 feet deep where suitable habitat exists for purposes of spawning, feeding, or escape cover, or as designated on TRPA Prime Fish Habitat Maps." As required by the Shorezone Project Application, a Field Verification is required to determine the current conditions and potential impacts from shorezone activities on fish habitat. This document describes the methods used for fish habitat verification, and the current conditions present in Lake Tahoe near the USCG facility.

2. Methods

Field habitat verification took place on July 19-20, 2011. Snorkel surveys were conducted on both mornings between 7:00 - 11:00am when both boat traffic from the public launch and winds were light. Two fisheries biologists swam pre-designated transects spaced 5 meters apart throughout the survey area. Both biologists were accompanied by a kayaker who recorded data using a GPS, and who also ensured that the survey transects were followed. Physical habitat conditions, habitat complexity, and incidental fish observations were recorded. Particle size classes were estimated visually and through subsurface dives.

The particle size classes that were measured and recorded are listed below:

- bedrock, smooth larger than a car (> 4 m)
- bedrock, rough larger than a car (> 4 m)
- boulder, large meter stick to car (1 - 4 m)
- boulder, small basketball to meter stick (25 cm - 1.0 m)
- cobble tennis ball to basketball (64 - 250 mm)
- gravel, coarse marble to tennis ball (16 - 64 mm)
- gravel, fine ladybug to marble (2 – 16 mm)
- sand, gritty to ladybug (0.06 – 2 mm)
- fines, not gritty (< 0.06 mm)

In general, young (under-yearling) littoral fishes use calm areas or areas with sandy substrates as nursery habitat, while older fishes use more complex rocky habitat for foraging and cover. Gravel substrates are the most important substrates for spawning habitat. These spawning areas are dynamic, with wave action and littoral drift altering the locations and quality of suitable spawning habitat. Rock outcrops, boulders, cobble bars, and large woody debris provide feed and cover habitat. For the littoral community to be self sustaining, a mixture of habitat types should be present in close proximity to support all life stages and activities.

Habitat complexity was categorized as:

- - filamentous algae (long-stranded algal forms that are large enough to see with the naked eye)
- - aquatic macrophytes (vascular plants)
- - boulders (> 25cm)
- - large woody debris (> 30 cm diameter)
- - artificial structures (includes any anthropogenic object)

3. Results

The entire area surveyed is less than 30 feet deep, and contains a variety of physical habitat conditions (Figure 1). Detailed bathymetry data were gathered by Webb Land Surveying, and elevations are shown. Between the existing public pier and the current USCG pier, a large area has been filled in with fine sediment. This area extends approximately 200 feet past the existing piers into Lake Tahoe. Beyond the fine sediment area, a relatively shallow bedrock bench extends out beyond 500 feet from the existing piers. Cover on this bedrock bench includes scattered small boulders, a few large boulders, and a few pieces of large woody debris. On the west side of the bench, the lake gradually becomes deeper and is dominated by silt-covered cobble with small boulders. On the east side of the bench the lake remains shallow, and is dominated by silt-covered embedded cobble with interspersed small boulders. Between the USCG pier and the private pier to the east, the physical habitat is dominated by embedded coarse gravel. The nearshore habitats are dominated by rip-rap along the public boat launch, with coarse gravel and sand to the east. Both the coarse gravel and sand habitat in this area had variable cover of aquatic macrophytes with some dense patches but less than 20% cover overall in either substrate category (Figure 1).

Fish species observed included 2 Piute Sculpin (*Cottus beldingi*), a school of approximately 40 Lahontan Redside (*Rhinichthys egregious*), and 4 Lahontan Speckled Dace (*Rhinichthys osculus robustus*). All of the fish observed were using the nearshore rip-rap area next to the existing public boat launch for cover. No fish were observed anywhere else within the survey boundary.

4. Discussion

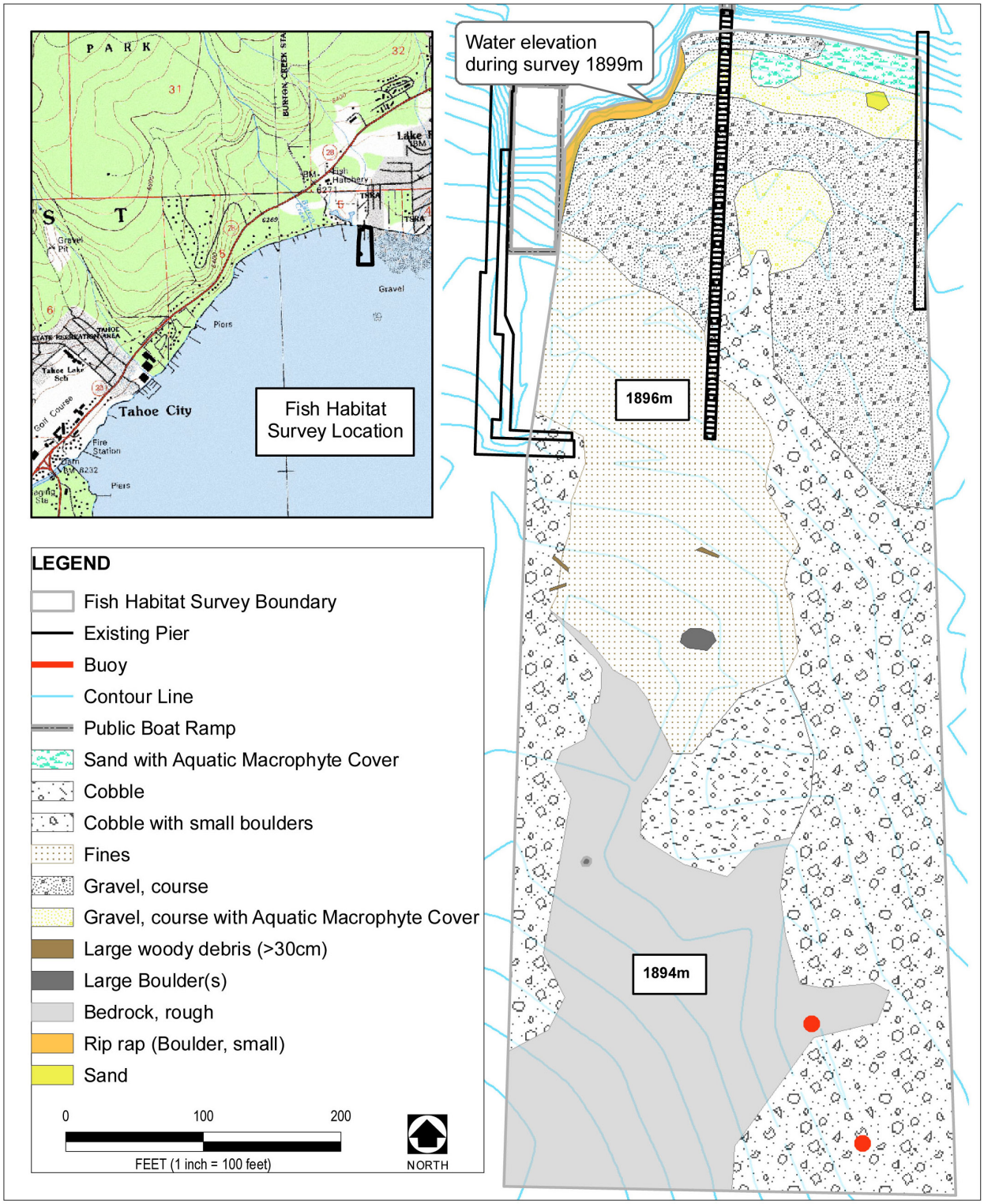
The littoral zone in Lake Tahoe is a dynamic environment with seasonal variability in fish species assemblage, and varied habitat use by the same fish species depending on life stage or activity. For this reason it is difficult to conclude that one habitat type (gravel vs. fine sediment for example) is preferred by fish species, since during different times of year or during different life stages the fish species could use varied habitats.

Within the area surveyed, nearshore habitats were observed to provide summertime habitat for native minnow species. These areas, particularly habitat with cover, could also provide habitat for juvenile game and non-game fish. In winter, fish species such as the Lahontan Redside would be expected to use deeper offshore portions of the survey area. Nearshore habitats with gravel substrate could also provide spawning habitat for Lahontan Redside, Mountain Whitefish, or Tui Chub. While potential spawning

habitat is present within the survey area, no observed spawning locations are known to occur in areas of high boat traffic such as the survey area. Boat traffic is known to temporarily displace fish, but specific effects on spawning and other behaviors have not been well studied. The USCG pier is adjacent to a popular public boat launch so boat traffic is a factor in the habitat quality of the survey area.

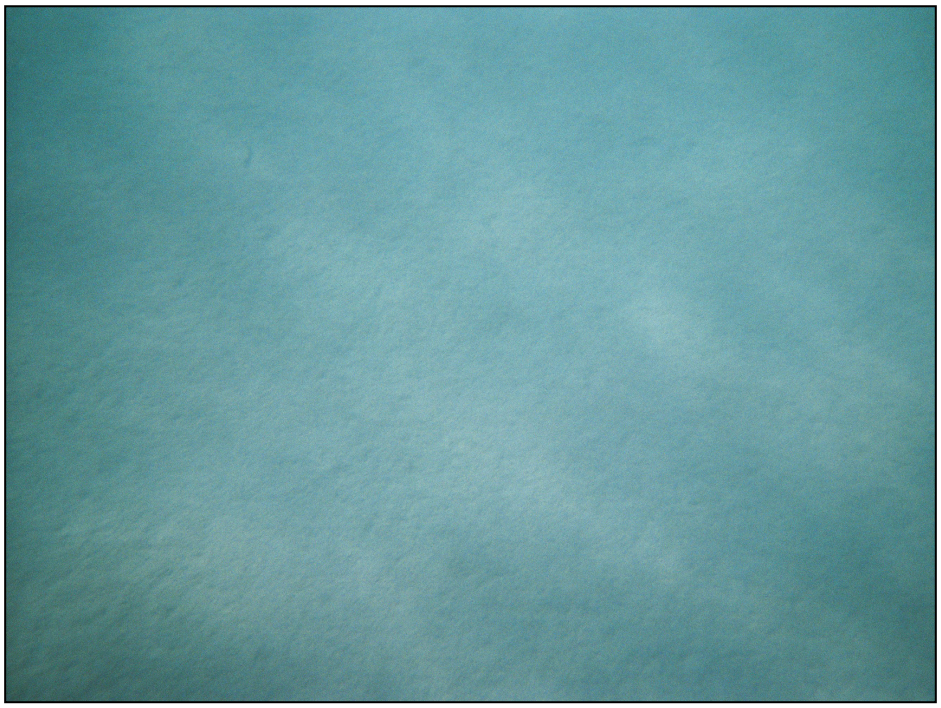
Effects to fish habitat from pier extension could include loss of habitat, disturbance of spawning, substrate siltation or removal, obstruction to migration, native vegetation removal, introduction of aquatic invasive species, or disruptions to the littoral drift process. Because of the special and temporal variable in habitat use within the survey area, potential effects from pier extension could be limited through pier design and construction windows to avoid potential spawning seasons or other sensitive life stages. A site-specific mitigation program based on the habitat present and seasonal and life stage variability in habitat use would be prepared if specific pier extension designs are evaluated. Representative photos of physical habitat in the vicinity of the USGS pier are included in Appendix 1.

Figure 1 Fish Habitat Survey Results



Appendix 1. Representative Photographs

Photograph 1. Typical cobble substrate within the study area.



Photograph 2. Fine sediment within the study area.

Appendix D

Scoping Report

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Prepared for:
US Coast Guard
CEU Oakland
Oakland, CA

Prepared by:
AECOM
Oakland, CA
60218657-101
September 2014

Station Lake Tahoe Pier Modifications Environmental Assessment Scoping Report

Contents

List of Appendices

1.0 Scoping Process

The U.S. Coast Guard (CG) is proposing a project that will allow CG Station Lake Tahoe (Station) to moor their response boats at their facility year-round (Project). The Station is located at 2500 Lake Forest Road, Tahoe City, California, on the northwest shore of Lake Tahoe in Placer County.

The CG is preparing a draft Environmental Assessment (EA) to assess the proposed Project and its environmental impacts in compliance with the National Environmental Policy Act (NEPA), its implementing regulations (40 Code of Federal Regulations Parts 1500-1508), and CG guidance (CG Commandant Instruction Manual 16475.1D). The EA will also meet the requirements of the California Environmental Quality Act (CEQA) for an Initial Study and Tahoe Regional Planning Agency Code of Ordinances and Rules of Procedure for an EA. In compliance with these applicable laws and regulations, the CG requested assistance in identifying environmental issues that should be addressed in the EA from relevant local, state, and federal agencies; Native American Tribes; and the public.

The environmental review process for the Project began with issuance of a Scoping Letter on August 8, 2014, to inform agencies and the public that a Draft EA will be prepared for the Project and to solicit views of agencies and the public on the scope and content of the document. A copy of the Scoping Letter is provided in Appendix A. The Scoping Letter was sent to public agencies with regulatory oversight over or potential interest in the Project, local newspapers and libraries, and landowners within 500 feet of the proposed Project. The Scoping Letter included an explanation of the purpose and need for the Project as well as a description of the alternatives that the CG proposes to analyze in the EA, which include the following:

- Alternative 1: 350-Foot Dog-Leg Pier Extension with Dolphin (Angled) Piles
- Alternative 2: 350-Foot Dog-leg Pier Extension with Monopiles
- Alternative 3: 450-Foot Straight Extension with Dolphin Piles
- Alternative 4: 450-Foot Straight Extension with Monopiles
- Alternative 5: Dredging at the Existing Pier
- Alternative 6: No Action

2.0 Scoping Comments

The scoping period started on August 12, 2014, and ended on September 12, 2014. Written comments were accepted via mail, fax, and email. In addition, an Open House was held on August 26, 2014, from 6:30pm to 8:30pm at the North Tahoe Event Center in Kings Beach, California. The public was invited to submit verbal and written comments at the Open House. A complete set of the written comments received during scoping is included in Attachment B. Brief summaries of the comments received are provided below:

- One letter and four emails were received from adjacent landowners in support of Alternative 5 (Dredging at Existing Pier). Three of these commenters expressed opposition to Alternatives 1 through 4 (i.e., the alternatives involving pier extensions) because they felt that the visual impacts of a pier extension would be unacceptable, and one of these commenters also expressed concerns over navigation impacts and increased risk of fuel spills due the increased length of the fuel line running to the end of the pier extension. One commenter noted that Regional Water Quality Control Board has recently approved several other dredging projects in Lake Tahoe.
- The Tahoe City Public Utility District (TCPUD), which operates a public pier and boat ramp adjacent to the west of the CG Station, commented that the EA should consider recreation-

and/or transportation-related impacts on users of the public pier and boat ramp potentially resulting from construction and operation of the Project. TCPUD also commented that the EA should also consider other impacts to the public boat ramp, pier, and harbor area resulting from Project construction, including use of the public facilities for access or other purposes by the Project's construction contractor. TCPUD also noted that any such access or use of the public facilities during construction would be subject to review and approval by the TCPUD and the California Department of Fish and Wildlife's Wildlife Conservation Board (owner of the public boat ramp and pier).

- One member of the public suggested that the CG consider using an inclined rail and winch/cable system, similar to those used by the Royal National Lifeboat Institution, as a cost effective solution to address launch response time issues at the Station.

The CG will consider the above comments, as applicable, when preparing the Draft EA. The public and interested agencies will also be given an opportunity to comment on the Draft EA, which will be available for public review prior to preparation of the Final EA.

Appendix A

Scoping Letter

U.S. Department of Homeland Security
United States Coast Guard

Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland

1301 Clay Street, 7th FL, Suite 700N
Oakland, CA 94612-5203
Staff Symbol: EM
Phone: (510) 410-8300

16475
August 8, 2014

Dear Interested Party:

The U.S. Coast Guard (CG) is proposing a project that will allow CG Station Lake Tahoe (Station) to moor their response boats at their facility year-round. The Station is located at 2500 Lake Forest Road, Tahoe City, California, on the northwest shore of Lake Tahoe in Placer County, enclosure (1).

The CG is preparing a draft Environmental Assessment (EA) to assess the proposed project and its environmental impacts in compliance with the National Environmental Policy Act (NEPA), its implementing regulations (40 CRF Parts 1500-1508) and CG guidance (CG Commandant Instruction Manual 16475.1D). The EA will also meet the requirements of the California Environmental Quality Act (CEQA) for an Initial Study and Tahoe Regional Planning Agency Code of Ordinances Rules of Procedure for an EA. In compliance with these applicable laws and regulations, the CG is requesting assistance in identifying environmental issues that should be addressed in the EA from local, state and federal agencies, Native American Tribes and the public.

Purpose and Need for Action

The CG requires year-round, 24-hour, immediate access to rapid response boats in order to provide essential emergency search and rescue (SAR), law enforcement and marine safety services to the boating public of Lake Tahoe. Cyclical droughts and seasonal low water levels at the current pier do not allow for on-site mooring of the CG's rapid response boats year-round. When water levels are low (generally October through January) rapid response boats must be moored at alternate sites which increases response times and creates security issues. This is contrary to CG SAR standards which require the CG rapid response boat to be underway less than 30 minutes after a distress call is received. When the CG is required to moor their response boats away from the Station this response time increases and it is often difficult to get underway within the CG SAR standards. The survival rate of a person in the water decreases as temperatures decrease and response time can be vital to saving a person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

The purpose of the proposed project is to provide mooring capabilities at a suitable depth so that rapid response boats can moor at the Station year-round. The Proposed Action would improve the CG's ability to protect and serve the boating public of Lake Tahoe and is in furtherance of the CG's mission of protecting maritime safety and security at Lake Tahoe.

Development of a Reasonable Range of Alternatives

The CG is required to consider a reasonable range of alternatives for the proposed action during an environmental review. An EA must consider a reasonable range of options that could accomplish the

purpose and need and reduce environmental effects. Reasonable alternatives are those that may be feasibly carried out based on environmental, technical and economic factors.

The alternatives being considered are four pier construction alternatives, a dredging alternative and a No Action alternative:

Alternative 1: 350-Foot Dog-leg Pier Extension with Dolphin (angled) Piles:

Span Connecting to Existing Pier: The connecting span would extend the existing pier 250 feet south into Lake Tahoe and would be 5 feet wide. The pier decking material for the span would consist of pre-fabricated grated metal. The connecting span would be supported by a dolphin pile configuration. The dolphin configuration consists of 10 inch diameter steel pipe battered piles (two opposing piles installed at an angle toward each other). The dolphins would be spaced 50 feet apart, for a total of 5 dolphins (total of 10 piles).

New Pier Head: The new pier head would be 100 feet long and 8 feet wide and would dog-leg west at an approximate 45-degree angle from the connecting span. The pier head would have a grated metal deck supported by 14 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, Lake Tahoe Datum, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include two 30-foot by 8-foot boat lifts, a 70-foot by 8-foot floating dock, a fuel station and utility lines that would run underneath the pier.

Alternative 2: 350-Foot Dog-leg Pier Extension with Monopiles:

Alternative 2 is identical to Alternative 1 except that the Connecting Span would be supported by monopiles, single 1-foot diameter steel pipe piles. The monopiles would be spaced approximately 10 feet apart, for a total of total of 25 piles.

Alternative 3: 450-Foot Straight Extension with Dolphins:

Span Connecting to Existing Pier: This alternative would extend 350 feet south. The span would be 5 feet wide and be comprised of grated sections supported by 10 inch diameter steel pipe pile dolphins. The dolphins would be spaced 50 feet apart, for a total of 7 dolphins (total of 14 piles).

New Pier Head: The new pier head would be 100 feet long and 8 feet wide and would extend straight south from the connecting span. The pier head would have a grated metal deck supported by 14 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 feet, Lake Tahoe Datum, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include two 30-foot by 8-foot boat lifts, a 70-foot by 8-foot floating dock, a fuel station and utility lines that would run underneath the pier.

Alternative 4: 450-Foot Straight Extension with Monopiles:

Alternative 4 is identical to Alternative 3 except that the Connecting Span would be supported by monopiles. The monopiles would be spaced approximately 10 feet apart, for a total of 35 piles.

Alternative 5: Dredging:

Alternative 5 consists of dredging a channel 350 feet long, 50 feet wide and 9 feet deep to allow access to the existing pier and boatlift. The channel would cover a footprint of approximately 17,500 square feet. A volume of approximately 5,840 cubic yards would be removed from the lake bottom. Dredged material would be removed by an excavator, placed into a front end loader, de-watered, transported to dump trucks located on shore and disposed of at an appropriate disposal site.

Alternative 6: No Action:

Under Alternative 6 no construction would occur at the existing pier and CG operations would continue with existing conditions.

Environmental Effects/Issues scoped for the Environmental Assessment

The EA will describe and analyze potential impacts on the environment that would be caused by the proposed project and will identify possible mitigation measures to reduce or eliminate impacts on:

Visual Resources and Scenic Quality	Hazards, Hazardous Materials and Risk of Upset
Air Quality	Hydrology and Water Quality
Biological Resources	Land Use and Planning
Cultural Resources	Noise
Geology, Soils and Land	Recreation
Greenhouse Gas Emissions	Socioeconomics and Environmental Justice
Transportation (Navigation) and Traffic	Utilities and Service Systems

Public Involvement

The purpose of this letter is to solicit views of interested parties as they relate to the scope and content of the information to be included and analyzed in the EA. The CG welcomes comments on the project, alternatives and potential environmental impacts. All interested local, state and federal agencies and Native American Tribes are invited to provide input on issues to be discussed in the EA. Agencies should identify the issues, within their statutory responsibilities, that should be considered in the EA.

The general public is also invited to submit written comments on the scope and content of the EA. Comments and related personally identifying information will be subject to disclosure under the Freedom of Information Act (FOIA), and comments may be published as part of the EA and other related documents. Individual respondents may request confidentiality. If you wish to withhold your name, street address or email address from public review and disclosure under the FOIA, you must state this prominently at the beginning of the written comment. Such requests will be honored to the extent allowable by law. All submissions from organizations or businesses will be made available for public inspection in their entirety. The CG will not accept anonymous comments.

16475
August 8, 2014

Subj: STATION LAKE TAHOE YEAR-ROUND MOORING

Comment Period

The designated scoping period will commence on August 12, 2014 and conclude on September 12, 2014. During the scoping period, interested parties can provide comments in two ways:

- Submit comments via mail, fax or email to Mr. Justin Westrum.

  Mail:
  Justin Westrum
  AECOM
  2101 Webster Street, Suite 1900
  Oakland, CA 94612

  Fax:
  Justin Westrum
  Subj: Station Lake Tahoe
  (510) 834-4304

  Email:
  justin.westrum@aecom.com
  Subj: Station Lake Tahoe

- Provide written comments at an Open House that will be held on August 26, 2014, from 6:30 p.m. to 8:30 p.m.at the following location:

  North Tahoe Event Center
  8318 N Lake Blvd
  Kings Beach, CA 96143

Comments must be received within the designated scoping period. If you do not wish to comment but would like to remain on the draft EA mailing list, please mail, fax or email Mr. Justin Westrum stating this.

Thank you for participating in the scoping process. We look forward to receiving your comments.

Sincerely,

Dave Stalters
Chief, Environmental Management Branch
U.S. Coast Guard
By direction of the Commanding Officer

Encl: (1) Vicinity Map

Vicinity Map: Coast Guard Station Lake Tahoe Year-Round Mooring Project

Appendix B

Scoping Comments

Westrum, Justin

From: Rod [tahoemacs@hotmail.com]
Sent: Tuesday, August 19, 2014 2:51 PM
To: Westrum, Justin
Subject: Station Lake Tahoe

Read the article regarding the launch facilities on Lake Tahoe in the Tahoe Daily Tribune.

Can't help but draw similarities to areas of the world with significant tidal differences such as the United Kingdom and the RNLI lifeboats there. Using an inclined rail from the storage position to deeper water would seem the most cost effective solution to me.

RNLI ramps appear to be steeper than is probably possible on the shores of Lake Tahoe, but if the vessel could be rapidly winched from storage to launch positions via cable and a pulley wheel at the deep end, I think this could be an elegant solution to your launch response time dilemma. The pulley and cable would also facilitate recovery of the vessel. The whole system would allow "out of the water" maintenance and inspection at virtually any time.

There are many videos on Youtube of RNLI launches and recoveries as reference, I won't bore you with links.

Sincerely, Rod MacLean. South Lake Tahoe

August 30, 2014

Mr. Justin Westrum
AECOM
2101 Webster Street, Suite 1900
Oakland, CA 94612

Subject: Lake Tahoe Emergency Search and Rescue (SAR)

Dear Mr. Westrum:
Since 1985, we have continuously owned a condominium at St. Francis Lakeside Condominiums, 2560 Lake Forest Road in Tahoe City, a development that is adjacent to US Coast Guard Station Lake Tahoe (CG). Our present condo fronts on Lake Tahoe and has an unobstructed view of the present and proposed CG pier. We regularly hear instructions given to CG dock personnel over the CG public address system.

Your proposed Alternatives 1 – 4 seem to be variants of the same solution – a pier extension to deeper water.

- The proposed pier extensions will make the CG pier among the five longest on Lake Tahoe. With the public boat launching facility next to the present CG pier, a longer pier poses a potential hazard to night-time navigation unless it is well marked and lighted. The additional lighting required will create more visual pollution, and increased CG energy consumption resulting in additional CG operating cost.
- At night, the longer lighted pier may lure inexperienced boaters coming from the east, looking for the existing public launching ramp, into the shallow water in front of SFL.
- A longer pier will result in increased pier maintenance expense.
- The longer pier will have longer fuel lines, which creates more opportunity for a fuel spill into Lake Tahoe.
- The longer pier will require emergency personnel to travel at least double the present distance before gaining access to the SAR boat. Whether the time differential is critical will depend on the particular situation. A foot or two of fresh snow on the pier will slow response significantly unless the pier is heated, or the deck grating is open enough to allow snow and ice to fall through during times of heavy weather and freezing temperatures.
- If the Lake Tahoe CG mission or CG equipment capability changes, pier access to deeper water may no longer be needed, resulting in a cost of removal or maintenance of an unneeded facility.

Proposed Alternative 5 – Dredging offers another way to solve the problem, although perhaps at greater first and long term cost, but provides more ongoing public benefit.

- Dredging eliminates the need for Alternatives 1 – 4 and their safety, aesthetic, operating cost, and possible environmental disadvantages.
- If the dredging to the 6,215 feet Lake Tahoe Datum scope is expanded to include the adjacent public launching basin and connection to the CG channel, the dredging option would serve both safety and recreational purposes, especially during low water years. This will also benefit the TCPUD with launching fees that would otherwise be foregone during periods of low lake level.
- The State of California collects fees from boaters for boater safety and boater facility improvement. If some of these funds are available to dredge the common channel, it may reduce the amount of CG funds required for the project.
- Depending upon siltation rates in this part of Lake Tahoe, a channel and basin may be significantly less expensive to maintain than a long pier exposed to the elements.
- Disturbing the lake bottom in this area may have some adverse environmental impact. My observation is that bird life tends to feed in the shallow water in front of SFL. Dredging would not disturb this area.
- Dredging to the 6,215 foot level may compromise some existing piles of the present CG and boat launching piers.
- The dredging option will also require buoys to mark the deeper channel.
- Disposal of dredge spoil may be expensive and environmentally difficult.
- Dredging will require over six hundred 10 cubic yard truck-loads moving between the CG station on Lake Forest Road and the disposal site, which may have some one-time safety and environmental impact.

We favor the dredging option:

- Dredging will create both a CG benefit and a recreation benefit.
- No fuel lines will need to be extended over the lake
- No additional lighting will be required
- No additional piles in the lake, but some existing piles may need to be replaced.
- No additional structures will extend over the lake surface

Thank you for the opportunity to comment.

Richard and Loree Draeger
#28 St. Francis Lakeside Condominiums
c/o 511 McClay Road
Novato, CA 94947-3859

Westrum, Justin

From: Helena Mclain [wmmclain@pacbell.net]
Sent: Thursday, September 04, 2014 3:23 PM
To: Westrum, Justin
Subject: Station Lake Tahoe

Mr Westrum;
As an owner at St Francis Lakeside, next to the coast guard station, we would support alternative #5, dredging.
thank you,
Helena McLain
949*413*6683

Westrum, Justin

From: email address witheld at request of commenter
Sent: Monday, September 08, 2014 4:48 PM
To: Westrum, Justin
Subject: Station Lake Tahoe

Please withhold my email address from public view.

Dear Mr. Westrum,

I am writing regarding the proposed Coast Guard pier project. Per Mr. Dave Stalter's letter, dated 8/8/14, I understand the need for pier or lake bottom alterations in order to maintain rapid response capabilities.

I -- as well as all other parties I have spoken with concerning this matter -- strongly oppose alternatives 1 - 4 which involve constructing 350' or 450' pier extensions out into the lake. Any of these alternatives would create a visual "eye sore" and degrade views both from the shore and the lake. It is impossible to think these monstrous structures would not detract from the natural beauty of Lake Tahoe which is, of course, of paramount importance and something we all wish to preserve.

The shoreline is under constant attack from those who wish to develop it for whatever purpose they might have.

Of the alternatives presented, clearly the only one that makes sense is alt 5: dredging. It solves the rapid response issue at hand, would have no long-term impact on the lake, remediates the visual blight issue and, I imagine, would also be helpful to boaters using the nearby boat launch facility.

Thank you for your time and please keep me on the draft EA mailing list.

Sincerely,

Ray Moshy

Westrum, Justin

From: email address witheld at request of commenter
Sent: Tuesday, September 09, 2014 12:35 PM
To: Westrum, Justin
Cc: email addresses witheld at request of commenter
Subject: Fwd: North Tahoe - Drought forcing Tahoe marinas to dredge

Justin,

I wrote you yesterday advocating for alt 5: dredging as solution for coast guard pier issue.

Below is an email I received today which illustrates that when a need exists apparently it is not that difficult to get permission to dredge.

Please add this info to the public comment record.

Thank you,

Ray Moshy

Sent from mobile

----- Forwarded message -----
From: "Ellie tahoellie@yahoo.com [north_tahoe]" <north_tahoe@yahoogroups.com>
To: "North Tahoe Yahoo Grp Tahoe Community" <north_tahoe@yahoogroups.com>
Subject: North Tahoe - Drought forcing Tahoe marinas to dredge
Date: Tue, Sep 9, 2014 11:20 AM

Drought forcing Tahoe marinas to dredge

Published: September 8, 2014 By: admin, In: Outdoor & Sports, 11 Comments

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The following is an update from Lahontan Regional Water Quality Control Board in regards to dredging on the California side of Lake Tahoe:

- Obexer's Marina – issued dredging authorization April 23.
- Meeks Bay — authorized dredging May 23; completed, included a beach replenishment.
- Tahoe City — authorized dredging Aug. 8. Had an incomplete application in May so once all the information was gathered they didn't get approved until August. They have not dredged yet.

- Tahoe Keys Property Owners Association – issued authorization with beach replenishment Sept. 8.
- Tahoe Keys Marina — no applications.

Posted by: Ellie <tahoellie@yahoo.com>

Reply via web post • Reply to sender • Reply to group • Start a New Topic • Messages in this topic (1)

Never doubt that a small group of thoughtful,
committed citizens can change the world.
Indeed, it is the only thing that ever has... Margaret Mead

"Whenever the people are well-informed, they can be trusted with their own government;... whenever things get so far wrong as to attract their notice, they may be relied on to set them to rights." ... Thomas Jefferson to Richard Price, 1789. ME 7:253

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Westrum, Justin

From: email address witheld at request of commenter
Sent: Tuesday, September 09, 2014 9:42 AM
To: Westrum, Justin
Subject: Station Lake Tahoe

Please withhold name and address from public view.

Dear Mr. Westrum,

I am writing regarding the proposed Coast Guard pier improvement project for year-round mooring at Lake Tahoe.

I strongly oppose alternatives 1-4, the construction of very large piers into the lake. These alternatives would create a visual blight and negatively affect views from both the shore and the lake.

We all share the responsibility to protect and preserve the natural beauty of Lake Tahoe, and the first four options do not align with that responsibility.

I strongly support alternative 5 - dredging - and I urge the Coast Guard to choose this option.

This is the best choice of the options presented. It achieves the goal of the Coast Guard to provide year round rapid response, a valuable service to the community. There is no long term or permanent damage to the lake, and it does not negatively affect the natural beauty of the lake.

Thank you for your time, and please add my name to the email list.

Sincerely,
name witheld at request of commenter

Westrum, Justin

From: Matt Homolka [mhomolka@tcpud.org]
Sent: Friday, September 12, 2014 11:18 AM
To: Westrum, Justin
Cc: Cindy Gustafson; Bob Bolton; Peter.Perrine@wildlife.ca.gov
Subject: Station Lake Tahoe

Mr. Westrum,

The Tahoe City Public Utility District (TCPUD) is pleased to provide the following comments related to scoping the Environmental Assessment (EA) of the proposed Coast Guard (CG) Station Lake Tahoe pier modification project. These comments are provided in response to the CG's August 8, 2014 correspondence.

The Lake Forest Boat Ramp Facility is located immediately adjacent to CG Station Lake Tahoe. It consists of a public boat launch ramp, lake access pier, parking lot, restroom facility, and shared driveway with CG Station Lake Tahoe. The Lake Forest Boat Ramp Facility is owned by the California Department of Fish and Wildlife (Wildlife Conservation Board - WCB) and is operated by the TCPUD. The facility is one of the most heavily-used public access facilities to Lake Tahoe.

The EA should consider and analyze the following potential impacts as it relates to the Lake Forest Boat Ramp Facility:

- Recreation and/or transportation impacts to public boat traffic and access to the Lake Forest Boat Ramp Facility, both during construction and after build out.
- Recreation and/or transportation impacts to public users of the lake access pier and vehicles accessing the parking lot, both during construction and after build out.
- Any impacts caused to the Lake Forest boat ramp, pier, or harbor area by construction of the CG pier modification; to include any use of the facility by the construction contractor for access or other construction purposes.

Use of the Lake Forest Boat Ramp Facility for construction access or other construction related activities associated with the CG pier modifications should be considered only as a last resort. Any use of the facility for construction purposes will be subject to WCB and TCPUD review and approval. If this is proposed, early consultation with both entities should begin immediately.

Thank you for the opportunity to provide these comments. Please contact me directly should you have any questions or need additional information.

Sincerely,

Matt Homolka, P.E.
District Engineer/Assistant General Manager
Tahoe City Public Utility District
530.580.6042 Direct
www.tahoecitypud.com

Tahoe City Public Utility District

The Mission of the TCPUD is to serve the people, our community, and its environment.
It is our responsibility to provide safe and reliable water service, sewer service for the protection of public health, and parks and recreation services to enhance quality of life.

Appendix E

Scenic Baseline Assessment

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TAHOE REGIONAL PLANNING AGENCY

Mail
PO Box 5310
Stateline, NV 89449-5310

Location
128 Market Street
Stateline, NV 89449

Contact
Phone: 775-588-4547
Fax: 775-588-4527
www.trpa.org

July 05, 2012

Kaufman Planning
P.O. Box 253
Carnelian Bay, CA 96140

SUBJECT: SCENIC SHORELAND ASSESSMENT TO ESTABLISH BASELINE CONDITION, 2550 LAKE FOREST ROAD, ASSESSOR'S PARCEL NUMBER 094-140-015, PLACER COUNTY, CALIFORNIA, TRPA FILE #LCAP2012-0004

Dear Ms. Kaufman:

This letter is to inform you that the Tahoe Regional Planning Agency (TRPA) has made a determination regarding the Baseline Scenic Shoreland Assessment on Assessor's Parcel Number (APN) 094-140-015. Based on the contrast rating score information submitted with the application, TRPA has reviewed your submittals and calculated a **revised Composite Scenic Baseline Contrast Rating Score of 18. This score was revised downward from the submitted score of 20**. During staff review, adjustments were made to the following:

1. Color Contrast:

<u>Main Office Building and Garage</u>

- Siding and concrete foundation (garage) – Reported as 4/2 7.5YR and scored as 15. During staff review the color of the siding material was determined to be 4/1 7.5YR (grey) and was scored at 12 in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.
- Belly band trim (main office building) – Reported as 5/1 2.5YR and scored as 12. During staff review the color of the trim material was verified as reported but scored at 9 (grey) in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.
- Aluminum windows (main office building) – Reported as 8/2 10YR and scored as 1. During staff review the color of the trim material was verified as White, N9.5 based on Munsell Soil-Color Charts 2009 revised and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines. The score was not changed.
- "Aluminum windows" were clarified to mean window frames for both buildings.

The Total Color Contrast weighted average score for the Main Office Building was revised downward from 11.9 to 10.3, and for the Garage from 14.1 to 11.3. The overall contrast rating for the main office building was revised downward from 23 to 22, and for the garage from 20 to 17.

Chain Link Fence

- Fence – Reported as 3/5g 1 gley and scored as 16. During staff review the color of the fence material was determined to be 10Y-5GY 4/4 (green) and was scored at 13 in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.

The Total Color Contrast weighted average score for the fence was revised downward from 16 to 13, and the overall contrast rating for the fence was revised downward from 24 to 19. The total lakefront façade score was also revised; see Section III for details.

Flagpole

- Flagpole – Reported as 8/5PB 2 gley and scored as 1. During staff review the color of the flagpole material was verified as White, N9.5 based on Munsell Soil-Color Charts 2009 revised and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines. The score was not changed.

White box

- White box – Reported as 8/5PB 2 gley and scored as 9. During staff review the color of the white box material was determined to be White, N/8 and was scored at 1 based on Munsell Soil-Color Charts 2009, revised, and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.

The Total Color Contrast weighted average score for the white box was revised downward from 11 to 1, and the overall contrast rating for the white box was revised downward from 11 to 3.

Solar Panels

- Concrete Stand – Reported as 3/1 10r with no score. During staff review the color of the concrete stand material was determined to be 3/1 10YR and was scored at 17 based on Munsell Soil-Color Charts 2009, revised, and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.
- Grey Electric Box – Reported as 8/n 1gley with no score. During staff review the color of the concrete stand material was determined to be 8/n 1gley and was scored at 1 based on Munsell Soil-Color Charts 2009, revised, and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.

The Total Color Contrast weighted average score for the solar panels was revised upward from 4.8 to 1.7, and the overall contrast rating for the solar panels was revised upward from 7 to 14.

Pier

- Decking – Reported as 4/n 1 Gley, with a score of 12. During staff review the color of the decking material was determined to be 5/n 1 Gley (grey) and was scored at 9 based on Munsell Soil-Color Charts 2009, revised, and in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.

The Total Color Contrast weighted average score for the pier was revised downward from 14.3 to 13.0, and the overall contrast rating for the pier was revised downward from 24 to 22.

2. Surface Plane/Texture:

The texture of each of the materials that comprise the lakefront façade is scored in consideration of the number of plane surfaces that comprise the entire façade of the structure.

Pier

- Surface Plane/Texture Score – Reported as 3 planes. During staff review the number of planes was determined to be 4 in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines.

The Total Surface Plane/Texture weighted average score for the pier was unchanged at 4.3.

Chain Link Fence

- Surface Plane/Texture Score – Reported as heavy texture. During staff review the texture was determined to be minimal in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines. The number of planes (2) was verified as reported.

The Total Surface Plane/Texture weighted average score for the chain link fence was revised downward from 5 to 3, and the overall contrast rating for the chain link fence was revised downward from 24 to 19. The total lakefront façade score was also revised; see Section III for details.

Above-ground tank and accessories

- Surface Plane/Texture Score – Reported as 4 planes. During staff review the number of planes was determined to be 2 in accordance with the Surface Plane/Texture Matrix found in Appendix H of the Design Review Guidelines. The texture score of none was verified as reported.

The Total Surface Plane/Texture weighted average score for the above-ground tank was revised downward from 3 to 2, and the overall contrast rating for the above-ground tank and accessories was revised downward from 6 to 5.

The baseline assessment fulfills the initial scenic requirement for a shoreland project by documenting the existing scenic baseline condition on the site and by identifying scenic impact mitigation measures that may be required for future projects. The information regarding scenic impact mitigation is intended to serve as a planning and design tool to assist you with designing future projects so that project proposals in the shoreland and shorezone meet the scenic quality ordinances. Section I of Attachment A contains suggested ways to improve your baseline score.

Please be aware that changes in vegetation, colors, measurements and visibility due to lack of maintenance, natural occurrences, fire, lot line adjustments, etc. may affect future site conditions.

The visible area of your existing structure has also been verified and is detailed in Attachment A. This information will assist you in determining which level of review your future project may require and plan to accordingly. The TRPA Code of Ordinances Chapter 30.15.C describes the levels of scenic review and mitigation that are required based on the level of activity or project (see Attachment B for overview). *Please note that this letter does not include verification of existing land coverage or existing shorezone structures.*

This letter is not a conceptual approval of any future project. If you have any questions, please call.

Sincerely,

David L. Landry
Senior Planner
Planning Department

Attachments:
A: Contrast Rating Verification Worksheet
B: Levels of Scenic Review and Mitigation Matrix
C: Visible Magnitude Table

TRPA Executive Director/Designee

7/5/12
Date

c: US Coast Guard, c/o David Stalters, 2000 Embarcadero, Site 200, Oakland, CA 94606-5337

Attachment A

I. Scenic Best Management Practices (BMPs) are mitigation measures that reduce the visual impact of structures. They can be implemented to increase the contrast rating of the structure in order to meet possible future requirements. The Visual Assessment Tool (Appendix H of TRPA Design Review Guidelines) can be used to test the design elements of scenic BMPs and how they may affect the Contrast Rating of the structure. Below is a list of recommended scenic BMPs:

- Increased texture in building materials
- Use of darker roofing, siding and/or paint (for unique site conditions where the dominant color in the background is gray or green, those colors may be used to reduce contrast with the natural environment.)
- Additional screening of perimeter/facade of structure
- Use of low reflectivity glass treatment
- Use of trellis and overhangs to create breaks and depth

In the case of your application reviewed herein, increased screening of the perimeter of existing structures may increase the contrast rating score. **Better photos or actual color samples of the siding materials of the garage, main office building, and the pier to justify the higher color contrast score submitted with the application would increase the contrast rating score.**

II. Verified Contrast Rating Score Sheets. The TRPA-verified calculations for the subject property are included in the tables shown below. Please refer to these tables for the specific scoring as verified by TRPA. For additional information regarding the process for scoring each element, see the detailed instructions in the Baseline Scenic Assessment Application.

CONTRAST RATING SHEET											
USCG Baseline Scenic											
Main office building											
	Roof	*glass*	*siding*	*Alum window frames*	*awning*	*roof flashing, chimney cap*	*deck, railings, stairs*	*lattice*	*belly band trim*	*antennae, satt dish, outlet*	*Total Lakefront Façade*
Area SF	123.0	104.0	400.0	26.0	25.0	16.0	28.0	12.0	14.0	14.0	762
Percentage	16.1%	13.6%	52.5%	3.4%	3.3%	2.1%	3.7%	1.6%	1.8%	1.8%	
	x	x	x	x	x	x	x				
Color Rating[1]	15	1	12	1	12	7	10	10	9	9	
Munsell Color	4/4 5YR	glass	4/1 7.5YR Grey	white, N9.5	5/4 2.5YR	6N 1 gley	6/4 7.5YR	6/4 7.5YR	5/1 2.5 yr Grey	5/N I gley	
	=	=	=	=	=	=					
	2.4 +	0.1 +	6.3 +	0.0 +	0.4 +	0.1 +	0.4	0.2	0.2	0.2	10.3
											+
Percentage	16.1%	13.6%	52.5%	3.4%	3.3%	2.1%	3.7%	1.6%	1.8%	1.8%	
	x	x	x	x	x	x	x				
Surface Plane/ Texture Score[2]	8 +	5 +	6 +	5 +	6 +	5 +	6	8	6	5	
Texture:	heavy	none	minimal	none	minimal	none	mnimal	heavy	minimal	none	
# of Planes: 9	=	=	=	=	=	=					
	1.3 +	0.7 +	3.2 +	0.2 +	0.2 +	0.1 +	0.2	0.1	0.1	0.1	6.2
											+
			Percent of Perimeter Visible:		54%	*Perimeter Score*[3]	=				5
				70 of 130							=
						CONTRAST RATING					22

CONTRAST RATING SHEET

Garage Building

	siding		glass		aluminum windows		sign red		sign white		sign black		concrete foundation		Total Lakefront Façade
Area SF	600.0	+	14.0	+	5.0	+	2.0	+	32.0	+	2.0	+	12.0	=	667
Percentage	90%		2%		1%		0%		5%		0%		2%		
	x		x		x		x		x		x		x		
Color Rating[1]	12		1		15		10		1		17		12		
Munsell Color	4/1 7.5Y		glass		4/2 7.5yr		3/6 10r		8n 1 gley		2.5/N 1 gley		4/1 7.5Y		
	=		=		=		=		=		=				
	10.8	+	0.0	+	0.2	+	0.0	+	0.1	+	0.0	+	0.2	=	11.3
Percentage	90%		2%		1%		0%		5%		0%		2%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	2	+	1	+	1	+	1	+	1	+	1	+	2		+
Texture	minimal		none		none		none		none		none		minimal		
# of Planes: 1	=		=		=		=		=		=				
	1.8	+	0.0	+	0.0	+	0.0	+	0.1	+	0.0	+	0.0	=	1.9
															+
					Percent of Perimeter Visible:				69%		**Perimeter Score**[3]			=	4
							72 of 104								=
											CONTRAST RATING				17

CONTRAST RATING SHEET

chain link fence

	fence														Total Lakefront Façade
Area SF	321.0	+		+		+		+		+		+		=	321
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	13														
Munsell Color	10y-5gy 4/4 green														
	=		=		=		=		=		=				
	13.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	13.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	3	+		+		+		+		+		+			=
Texture	minimal														
# of Planes: 2															
	=		=		=		=		=		=				
	3	+	0	+	0	+	0	+	0	+	0	+	0	=	3.0
															+
					Percent of Perimeter Visible:				72%		**Perimeter Score**[3]			=	3
									260 of 360						=
											CONTRAST RATING				19

CONTRAST RATING SHEET

flagpole

	flagpole														Total Lakefront Façade
Area SF	13.0	+		+		+		+		+		+		=	13
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	1														
Munsell Color	white n/9.5														
	=		=		=		=		=		=		=		
	1.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	1.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+
					Percent of Perimeter Visible:				48%		***Perimeter Score***[3]			=	6
									12 of 25						=
											CONTRAST RATING				8

CONTRAST RATING SHEET

white box

	white box														Total Lakefront Façade
Area SF	16.0	+		+		+		+		+		+		=	16
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	1														
Munsell Color	white n/8														
	=		=		=		=		=		=		=		
	1.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	1.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+
					Percent of Perimeter Visible:				100%		***Perimeter Score***[3]			=	1
									14 of 14						=
											CONTRAST RATING				3

CONTRAST RATING SHEET

solar panels

	solar panels		concrete stand		grey elec box										Total Lakefront Façade
Area SF	8.0	+	6.0	+	1.0	+		+		+		+		=	15
Percentage	53%		40%		7%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	9		17		1										
Munsell Color	6/n 1 gley		3/1 10yr		8/n 1 gley										
	=		=		=		=		=		=				
	4.8	+	6.8	+	0.1	+	0.0	+	0.0	+	0.0	+	0.0	=	11.7
Percentage	53%		40%		7%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+	1	+	1	+		+		+		+			=
Texture	none		none		none										
# of Planes: 1															
	=		=		=		=		=		=				
	0.53	+	0.4	+	0.07	+	0	+	0	+	0	+	0	=	1.0
															+
					Percent of Perimeter Visible:				100%		**Perimeter Score**[3]			=	1
									36 of 36						=
											CONTRAST RATING				14

CONTRAST RATING SHEET

pier

	lighting		railing, ladder		decking		cable railing		joists, pilings						Total Lakefront Façade
Area SF	28.0	+	60.0	+	108.0	+	15.0	+	33.0	+		+		=	244
Percentage	11%		25%		44%		6%		14%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	17		17		9		7		17						
Munsell Color	2.5/n 1 gley		2.5/n 1 gley		5/n 1 gley (grey)		6n 1 gley		2.5/n 1 gley						
	=		=		=		=		=		=				
	1.9	+	4.3	+	4.0	+	0.4	+	2.4	+	0.0	+	0.0	=	13.0
Percentage	11%		25%		44%		6%		14%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	3	+	3	+	6	+	3	+	3	+		+			=
Texture	no texture		no texture		heavy		no texture		no texture						
# of Planes: 4															
	=		=		=		=		=		=				
	0.33	+	0.75	+	2.64	+	0.18	+	0.42	+	0	+	0	=	4.3
															+
					Percent of Perimeter Visible:				50%		**Perimeter Score**[3]			=	5
							200 of 400								=
											CONTRAST RATING				22

CONTRAST RATING SHEET

above ground tank and acessories

	tank		bollards											Total Lakefront Façade
Area SF	32.0	+	28.0	+		+		+		+		+		=	60
Percentage	53%		47%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	1		2												
Munsell Color	7/1 2.5Y		8/6 5Y												
	=		=		=		=		=		=		=		
	0.5	+	0.9	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	1.4
Percentage	53%		47%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	2	+	2	+		+		+		+		+			=
Texture	none		none												
# of Planes:2															
	=		=		=		=		=		=		=		
	1.06	+	0.94	+	0	+	0	+	0	+	0	+	0	=	2.0
															+
					Percent of Perimeter Visible:				83%		**Perimeter Score**[3]			=	2
									20 of 24						=
											CONTRAST RATING				5

CONTRAST RATING SHEET

Revetment

	stone													Total Lakefront Façade
Area SF	600.0	+		+		+		+		+		+		=	600
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	9														
Munsell Color	5/1 2.5Y														
	=		=		=		=		=		=		=		
	9.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	5	+		+		+		+		+		+			=
Texture	heavy														
# of Planes: 2															
	=		=		=		=		=		=		=		
	5	+	0	+	0	+	0	+	0	+	0	+	0	=	5.0
															+
					Percent of Perimeter Visible:				94%		**Perimeter Score**[3]			=	1
									290 of 306						=
											CONTRAST RATING				15

CONTRAST RATING SHEET

antennae

	antennae														Total Lakefront Façade
Area SF	10.0	+		+		+		+		+		+		=	10
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	9														
Munsell Color	5/n 1 gley														
	=		=		=		=		=		=		=		
	9.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+
							Percent of Perimeter Visible:		100%		***Perimeter Score[3]***			=	1
									20 of 20						=
											CONTRAST RATING				11

CONTRAST RATING SHEET

orange box

	box														Total Lakefront Façade
Area SF	12.0	+		+		+		+		+		+		=	12
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	8														
Munsell Color	4/8 2.5yr														
	=		=		=		=		=		=		=		
	8.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	8.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+
							Percent of Perimeter Visible:		80%		***Perimeter Score[3]***			=	2
									8 of 10						=
											CONTRAST RATING				11

CONTRAST RATING SHEET

picnic bench

	wood frame		trex bench, table												Total Lakefront Façade
Area SF	4.0	+	24.0	+		+		+		+		+		=	28
Percentage	14%		86%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	17		8												
Munsell Color	2/1 10yr		7/2 10yr												
	‖		‖		‖		‖		‖		‖				
	2.4	+	6.9	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.3
Percentage	14%		86%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	2	+	2	+		+		+		+		+			=
Texture	minimal		minimal												
# of Planes: 2															
	‖		‖		‖		‖		‖		‖				
	0.28	+	1.72	+	0	+	0	+	0	+	0	+	0	=	2.0
															+
					Percent of Perimeter Visible:				100%		**Perimeter Score[3]**			=	1
									18 of 18						‖
											CONTRAST RATING				12

COMPOSITE CONTRAST RATING

	Main office building	garage	pier	fence	revetment	antennae	gas tank	flagpole	orange box	picnic bench	white box	solar panels	Total Lakefront Façade
Area SF	762 +	667 +	244 +	321 +	600 +	10 +	60	13 +	12 +	28 +	16 +	15 =	2748
Percentage	28%	24%	9%	12%	22%	0%	2%	0%	0%	1%	1%	1%	
	x	x	x	x	x	x	x	x	x	x	x	x	
CONTRAST RATING	22	17	24	19	15	11	5	8	11	12	3	14	
	‖	‖	‖	‖	‖	‖		‖	‖	‖	‖	‖	
	6.2 +	4.1 +	2.2 +	2.3 +	3.3 +	0.0 +	0.1	0.0 +	0.0 +	0.1 +	0.0 +	0.1 =	18.2
													‖
				COMPOSITE CONTRAST RATING									18

	EXISTING
LAKEFRONT FAÇADE:	2748
SCREENED AREA:	900
VISIBLE AREA:	1,848

III. Visible Area: 1,848 SF

Lakefront Façade (2,748 sf) – Façade screened from 300' offshore (900 sf) = 1,848 SF.

- Chain Link Fence Area Square Feet – This amount was reported as 697 square feet. During staff review the area was determined to be 321 square feet. Because the chain link mesh design is not a solid surface, the overall lakefront façade of the fence was calculated based on the size of the support poles, resulting in a reduction of 367 square feet of façade for the chain link fence. Eighteen standing posts were counted with a pole size of three inches in width by a height of six feet, plus a top pole of one inch by forty feet in length, for a total lakefront façade of 321 square feet.

The Total Lakefront Façade area was reduced from 3,115 square feet to 2,748 square feet; the overall visible area was reduced from 2,215 square feet to 1,848 square feet.

Leah Kaufman
PLANNING & CONSULTING SERVICES

November 21, 2011

Job # 2011004

TRPA
Project Review Committee
P.O. Box 5310
Stateline, NV 89449-5310

Re: USCG Baseline Scenic Assessment, 2500 Lake Forest Road, Tahoe City, Placer County APN 094-140-015

To Whom It May Concern,

Enclosed please find the following information for the above-referenced project:

1. Complete Baseline Scenic Assessment Application Form with original signatures,
2. A check in the amount of $488.00 for application fee and information technologies fee;
3. Existing color and material samples (photos with munsell chart);
4. Existing to scale elevations with lakefront façade and visible area calculations;
5. Existing contrast rating score;
6. Site plan of the property with existing vegetation and photo locations;
7. Photos of the existing conditions from high-water line, 300' and ¼ mile of the high-water line.

As per our enclosed analysis, we believe that the baseline score for this property should be a 20. If you have any questions or need additional information, please do not hesitate to contact this office.

Sincerely,

Abigail Edwards
Associate Planner

Enc.

Cc: Elizabeth Copely, AECOM
Gail Bouffard, USCG

Post Office Box 253 ❑ Carnelian Bay, CA 96140 ❑ Phone/Fax (530) 546-4402
kaufmanplanning@sbcglobal.net

TAHOE REGIONAL PLANNING AGENCY

OFFICE
128 Market St.
Stateline, NV

Phone: (775) 588-4547
Fax: (775) 588-4527

MAIL
PO Box 5310
Stateline, NV 89449-5310

www.trpa.org

HOURS
Monday-Friday
9:00 am-5:00 pm
New Applications Until 4:00 pm

trpa@trpa.org

BASELINE SCENIC CONDITIONS ASSESSMENT APPLICATION FOR SHORELAND AND SHOREZONE PROJECTS

Agent Kaufman Planning
Mailing Address P.O. Box 253 City Carnelian Bay State CA
Zip Code 96140 Email kaufmanplanning@sbcglobal.net Phone (530)546-4402 FAX (530)546-4402

Owner US Coast Guard c/o David Stalters, Chief, Environmental Management Division
Mailing Address 2000 Embarcadero, Suite 200 City Oakland State CA
Zip Code 94606-5337 Email Gail.M.Bouffard@uscg.mil Phone (510) 535-7262 FAX

Project Location/Assessor's Parcel Number (APN) 094-140-015
Street Address 2500 Lake Forest Road Subdivision n/a Lot # n/a
County Placer Previous APN
(if changed by county assessor since 1987)

Scenic Resource Inventory Information:
For the following information, refer to the Scenic Resources Inventory and Scenic Threshold Maps available at the TRPA Front Counter, or on the Scenic Documents page of the TRPA website. List all unit numbers the parcel(s) is located in. Then list any scenic points from which the parcel(s) can be seen.

Shoreline Unit No. 16 (Lake Forest) **Status:** Attainment (Non-attainment X)

Shoreline Scenic Resource No. _____ **Status:** Attainment Non-attainment

Is this a Shorezone Project? (Yes) No

Current and/or Prior Shorezone Project(s) on site? X (Yes) No TRPA File # ESRP2010-0813 19980062STD 20000896STD

If yes, and scenic mitigation measures were required, please clearly identify location(s) of any approved mitigation measures on lakefront façade/landscape elevation drawings.

If property boundaries are not clearly defined, all property corners must be located and staked before the site visit. Use one inch by two inch boards about 3 feet long, driven solidly into the ground at the property corners. In cases where there is heavy brush or tree cover, surveyors tape (brightly colored plastic ribbon) shall be tied to the stakes. The address must be posted on the property.

Planner Notes: _____

DECLARATION:

I hereby authorize TRPA to access the property for the purpose of site visits. I hereby declare under penalty of perjury that this application and all information submitted as part of this application are true and accurate to the best of my knowledge. I am the owner of the subject property or I have been authorized in writing by the owner(s) of the subject property to represent this application and understand that should any information or representation be submitted in connection with this application be incorrect or untrue, TRPA may rescind any approval or take other appropriate action. I further understand that additional information may be required by TRPA to review this project.

I understand that I am responsible for all fees set forth in the TRPA Filing Fee Schedule (including cost recovery, filing fees and deposit accounts) associated with this application.

Signature: **(Original signature required.)**

Abigail Edwards At Placer County Date: 11/15/11

Person Preparing Application

AUTHORIZATION FOR REPRESENTATION (Original signatures required):

The following person(s) own the subject property (Assessor's Parcel Number(s) 094-140-015) or have sufficient interest therein to make application to TRPA:

Print Owner(s) Name(s):

Dave Stalters, Chief, Environmental Management Division

I/We authorize Kaufman Planning to act as my/our representative in connection with this application to TRPA for the subject property and agree to be bound by said representative. I understand that additional information may be required by TRPA beyond that submitted by my representative to review this project. Any cancellation of this authorization shall not be effective until receipt of written notification of same by TRPA. I also understand that should any information or representation submitted in connection with this application be incorrect or untrue, TRPA may rescind any approval or take other appropriate action. I further accept that if this project is approved, I, as the permittee, will be held responsible for any and all permit conditions.

Owner(s) Signature(s): **(Original signature required.)**

X _____ Date: _____

_____ Date: _____

FOR OFFICE USE ONLY

Date Received: _____ By: _____

Initial Filing Fee: $_____ Receipt No: _____

Per the TRPA Filing Fee Schedule, additional costs/fees may apply

Comments: _____

SCENIC ASSESSMENT FOR BASELINE CONDITIONS APPLICATION CHECKLIST

APPLICATIONS LACKING ANY OF THE FOLLOWING ITEMS WILL NOT BE ACCEPTED. TRPA OR YOUR LOCAL JURISDICTION MAY REQUIRE ADDITIONAL INFORMATION ABOVE AND BEYOND THE CHECKLIST ITEMS TO REVIEW THIS APPLICATION.

Each item and number corresponds to TRPA's Master Checklist available at our offices or online at www.trpa.org. Refer to the *Master Checklist* for more information on any item.

PROJECT NAME: USCG Baseline Scenic Assessment

CURRENT ASSESSOR'S PARCEL NUMBER (APN): 094-140-015

PREVIOUS ASSESSOR'S PARCEL NUMBER (APN): _____

A SCENIC ASSESSMENT IS NOT REQUIRED FOR PROJECTS IN THE SHORELAND WHICH:

- ARE NOT VISIBLE
- DO NOT ALTER OR INCREASE THE AREA OF THE LAKEFRONT FAÇADE
- ARE COMPLETE TEARDOWN / REBUILD PROJECTS WITH NO PREVIOUS SHOREZONE PROJECT APPROVALS

Applicant	TRPA		
___	___	2.	Complete Application with original signed authorization and checklist.
___	___	3.	Application Fee: Please refer to the filing fee schedule available at TRPA offices or CLICK HERE to download the schedule (275k pdf). Filing Fee: $ 400 + Information Technology (IT) surcharge: $ 88 = $ 488
✓	___	5.	Baseline Scenic Impact assessment information including:
	✓	___	b. Color and material samples of existing structures. Samples can be no larger than 8.5" x 11". Or, to assist TRPA in the review of your project, you may also submit close-up photographs of outer walls with the applicable page from a Munsell® Color Chart held against the wall. A chart of TRPA-approved Munsell® colors is available at TRPA offices.
	✓	___	d. Dimensions of structure(s). Scale drawings showing the exact dimensions of all walls, roofs, planes and structural façades visible from scenic areas or points.
	N/A	___	f. TRPA-verified contrast rating score resulting from the Baseline Scenic Assessment (Appendix H).
✓	___	7.	One site plan: Minimum 18" x 24" on blackline or blueline print paper, showing the following:
	✓	___	a. All property lines and lot dimensions.
	✓	___	c. Assessor's Parcel Number (APN) and property address.
	✓	___	d. Property owner's name.
	✓	___	k. High waterline-elevation 6,229 feet.
	✓	___	n. Location and dimensions of all existing buildings and structures (including walls and fences) with location and dimensions of each.

✓ ____ kk..i. Existing landscaping (trees, shrubs, berms, etc.) that screens buildings and structures from Lake Tahoe including species, diameter at breast height (dbh) and aerial extent, spacing and height.

✓ ____ kk.ii. Dimensions of yards and open space between buildings and structures.

✓ ____ kk.iii.. Location and bearing (if available) of the vantage point of each photograph submitted for checklist item 52.c, including photographs taken 300' or ¼ mile off shore.

✓ ____ 52. Physical renditions of structures and parcel.

✓ ____ a. Elevation drawings of all existing structure (buildings, walls, fences, etc.) done to a standard architect's scale for any façade facing Lake Tahoe. To speed review of your application, submit an electronic copy or electronic CAD file of the dimensions on a compact disc so that project review staff can verify the scale of drawings. Renditions must include the following:

✓ ____ i. Dimensions and height.

✓ ____ ii. Existing materials and existing Munsell® Color for all walls, fences and buildings. Square footage for each material must be clearly labeled on the elevation drawing (See steps 1, 2 and 3 of the Contrast Rating Worksheet).

✓ ____ iii. Existing surface planes for each building/structure. Clearly label each plane of the lakefront façade on elevation drawings (See step 4 of the Contrast Rating Worksheet).

✓ ____ b. Elevation outline or equivalent (See Figure 4 of the Contrast Rating Worksheet).

✓ ____ i. Perimeter screening (buildings, walls and fences). Show areas of building/structure perimeter(s) screened by vegetation or other material (See step 6 of the Contrast Rating Worksheet).

✓ ____ ii. Visible Area (buildings, walls and fences - See the attached Terms for Scenic Assessment Applications for definition of visible area). Indicate areas screened from view by vegetation or other means and clearly identify any screening required as mitigation for previous projects (See step 8 of the Contrast Rating Worksheet).

✓ ____ c. Minimum of 10 photographs depicting existing project area conditions. Photographs should be taken on site from the High Water Line at different angles. Additional photographs should be taken from 300 feet off shore. At a minimum, one photograph should be taken perpendicular to the shoreline and one perpendicular to the proposed project. One photograph should be taken from ¼-mile off shore and perpendicular to the shoreline. All photographs should be taken using a 35mm camera lens or equivalent. Please provide the following information for each photograph:

✓ ____ i. Time of day photo was taken.

✓ ____ ii. Date photo was taken.

✓ ____ iii. Camera type and setting(s).

✓ ____ iv. Photographs taken 300' or ¼ mile off shore from the high water line must be pre-approved by TRPA staff. An accurate estimate of the distance from high water shall be indicated on each photograph.

✓ ____ v. GPS location, if available.

✓ ____ vi. The height (elevation) from which the photograph way taken on either land or lake. For example, was the photo taken from a kayak or other type of boat, from an automobile or standing?

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General Search General Search

Permit Number:

Street No: **Direction:** --select-- (e.g. N) **Street Name:** (e.g. Main) **Street Type:** --select--

Unit Type: --select-- (e.g. Apt) **Unit No:** (e.g. 5) **Parcel Number:** 094-140-015

City: **State:** --select-- **Zip:**

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17 Permit results matching your search results

Click any of the results below to view more details.

Showing 11-17 of 17

Date	File Number	Permit Type	Description	Project Name	Status
02/16/1994	19940108STD	Building/ERS/Permits/X-PTS-Migration	STACKS 10/5/11	940108	Withdrawn
11/13/1991	20060017COR	Building/ERS/Admin/Correspondence	STACKS 10/5/11		Concluded
02/08/1991	EIPC2011-0026	Building/EI/Permits/EIP Construction	Problem with this cap - linked to multiple apn's incorrectly?	910128	Project Completed
09/01/1989	19891085STD	Building/ERS/Permits/X-PTS-Migration	STACKS 10/7/11 jf	891085	Project Completed
04/03/1987	309141STD	Building/ERS/Permits/X-PTS-Migration	STACKS 10/06/11 jf		Project Completed
12/02/1983	19830956STD	Building/ERS/Permits/Rec-Public Service		83956	Issued
03/03/1977	310888STD	Building/ERS/Permits/X-PTS-Migration	STACKS 10/06/11 jf	7725	Project Completed

< Prev Additional Results: 1 2 Next >

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Enter information below to search the TRPA's permitting database. Permits can be searched for by entering any of the following information:

- Site Address
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General Search General Search

Permit Number:

Street No: **Direction:** --select-- (e.g. N) **Street Name:** (e.g. Main) **Street Type:** --select--

Unit Type: --select-- (e.g. Apt) **Unit No:** (e.g. 5) **Parcel Number:** 094-140-015

City: **State:** --select-- **Zip:**

Search »

17 Permit results matching your search results

Click any of the results below to view more details.

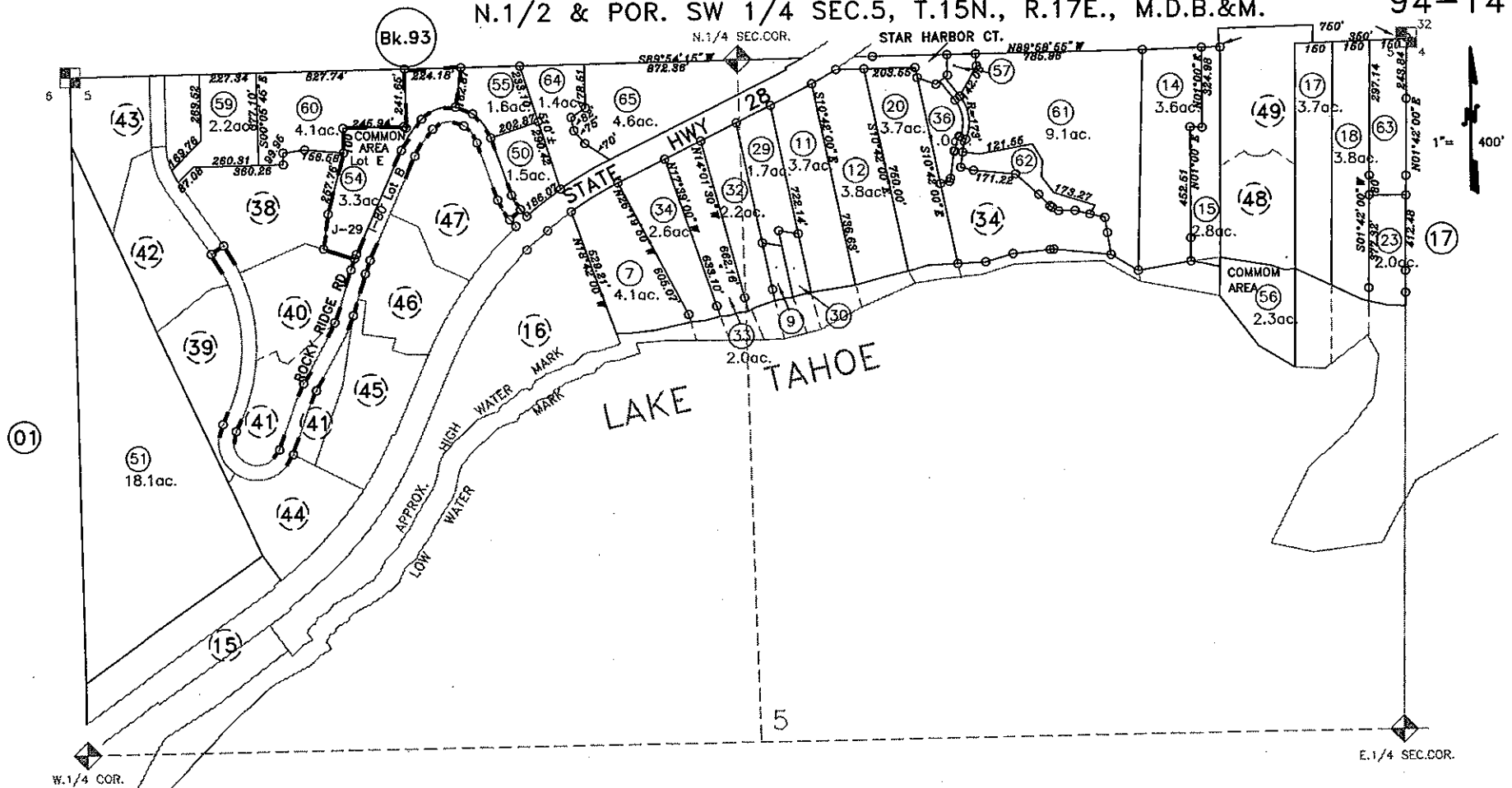
Showing 1-10 of 17

Date	File Number	Permit Type	Description	Project Name	Status
05/10/2010	ERSP2010-0813	Building/ERS/Permits/Shore-Lakezone	wjepson 10/5/11.lh		Incomplete
12/15/2009	ENVR2009-0002	Building/ERS/Environmental/EA Process	mcavanaugh 10/5/11.lh		Under Review
10/16/2006	20060824QE	Building/ERS/Admin/Qualified Exempt	STACKS 10/5/11		Project Completed
05/09/2005	20051347STD	Building/ERS/Permits/Rec-Public Service	STACKS 10/7/11 jf		Project Completed
11/07/2002	20021777STD	Building/ERS/Permits/Temporary Uses	unable to locate after 8/10/12 request.		Withdrawn
10/17/2002	20021687STD	Building/ERS/Permits/Rec-Public Service	STACKS 10/7/11 jf		Finaled
08/23/2001	20010585STD	Building/ERS/Permits/Rec-Public Service	STACKS 10/5/11		Withdrawn
12/28/2000	20000896STD	Building/ERS/Permits/Shore-Lakezone	STACKS 10/5/11	200896	Project Completed
02/02/1998	19980062STD	Building/ERS/Permits/Shore-Lakezone	STACKS 10/7/11 jf	980062	Project Completed
08/31/1994	19940844STD	Building/ERS/Permits/X-PTS-Migration	STACKS 10/5/11	940844	Project Completed

<Prev Additional Results: 1 2 Next >

N.1/2 & POR. SW 1/4 SEC.5, T.15N., R.17E., M.D.B.&M.

94-14



Survey M.O.R. Bk.15, Pg.129
Survey M.O.R. Bk.4, Pg.14
Rocky Ridge Unit No.3 M.O.R. Bk.J, Pg.29
Rocky Ridge Unit No.1 M.O.R. Bk.I, Pg80
Survey M.O.R. Bk.2, Pg.71
Survey M.O.R. Bk.3 Pg.49

06-30-2006 BMJ
Page Redrawn Per Basemap Information

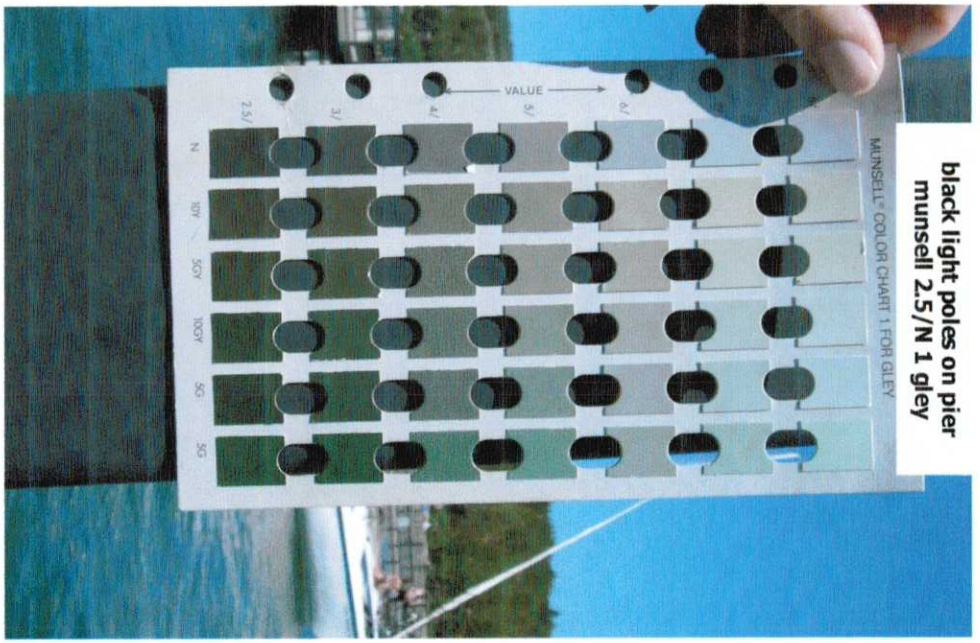
NOTE
All distances on curved lines are chord measurements.

NOTE
This map was prepared for assessment purposes only, and is not intended to illustrate legal building sites or establish precedence over local ordinances. Official information concerning size or use of any parcel should be obtained from recorded documents and local governing agencies.

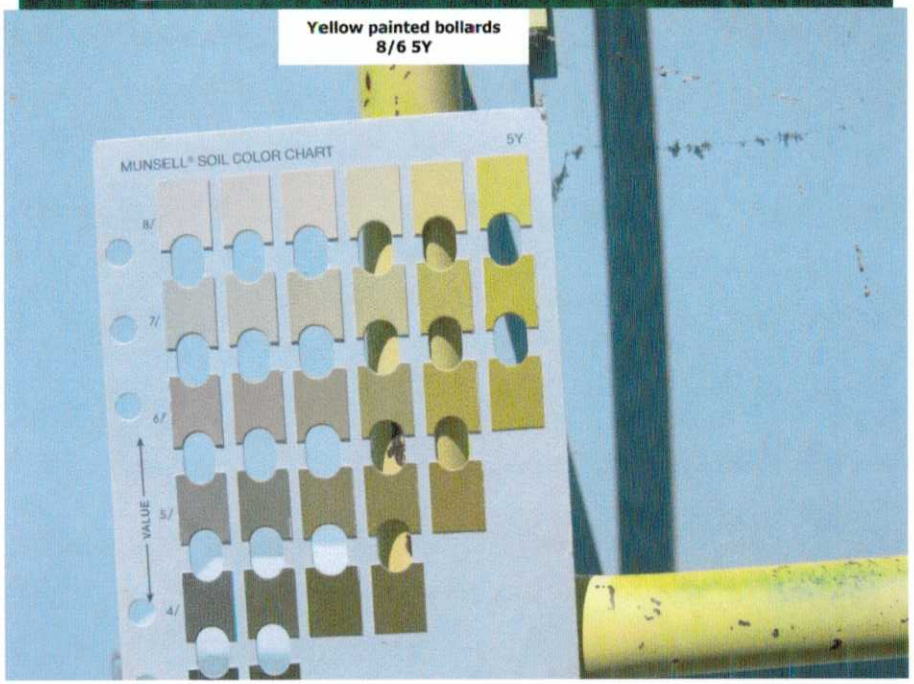
Assessor's Map Bk. 94 Pg.14
County of Placer, Calif.

NOTE
Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.

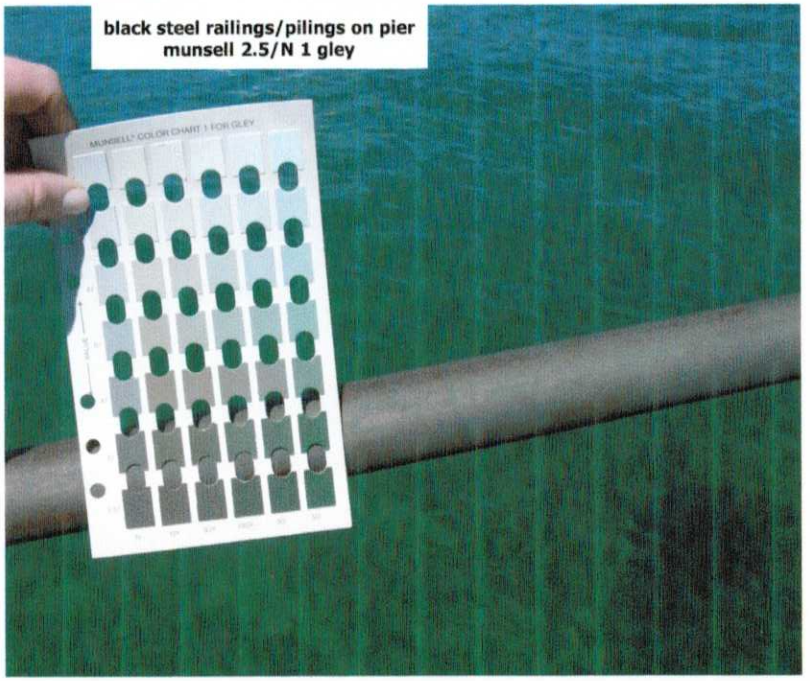
cable railings on pier
munsell 6/N 1 gley



black light poles on pier
munsell 2.5/N 1 gley

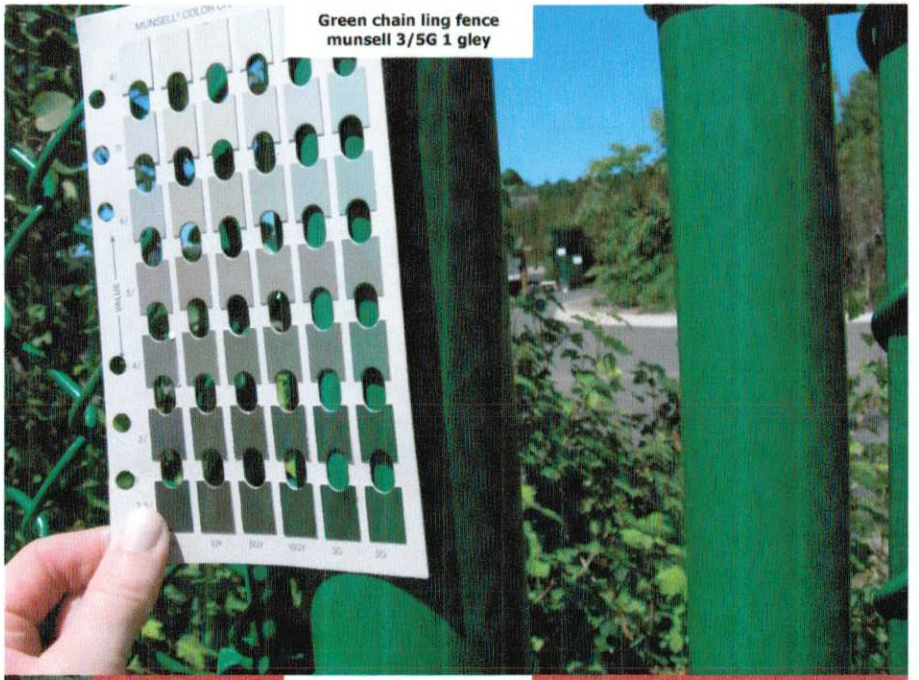


Yellow painted bollards
8/6 5Y

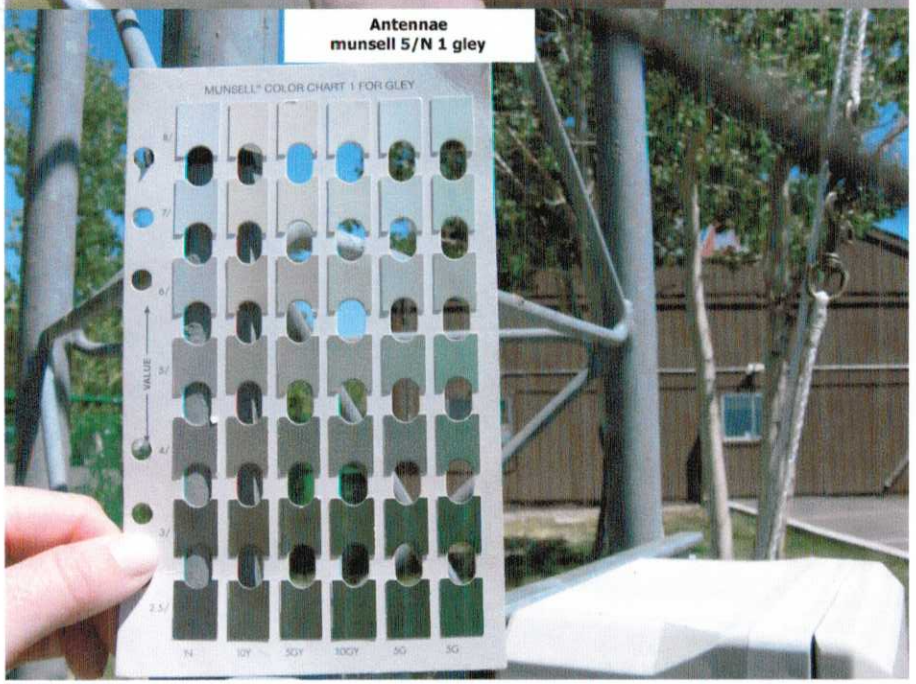


black steel railings/pilings on pier
munsell 2.5/N 1 gley

Above ground gas tank
munsell 7/1 2.5Y

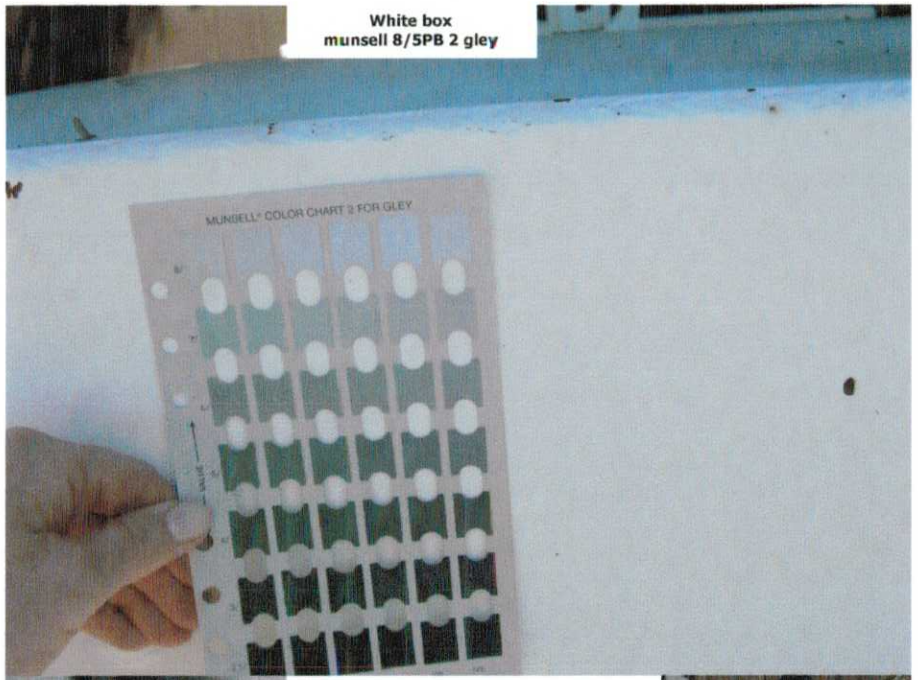


Green chain ling fence
munsell 3/5G 1 gley



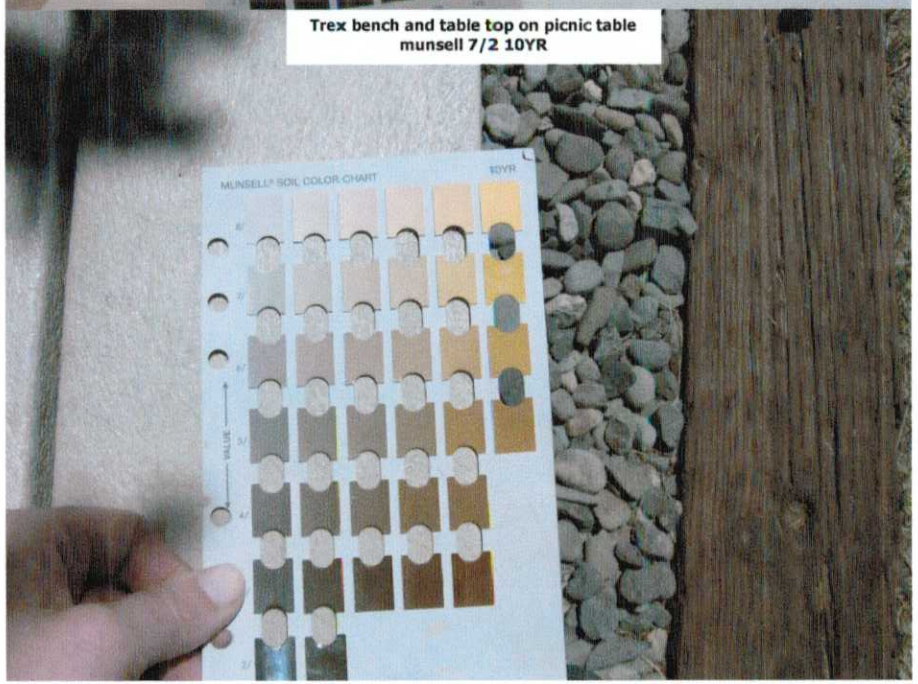
Antennae
munsell 5/N 1 gley

Orange box
munsell 4/8 2.5 YR

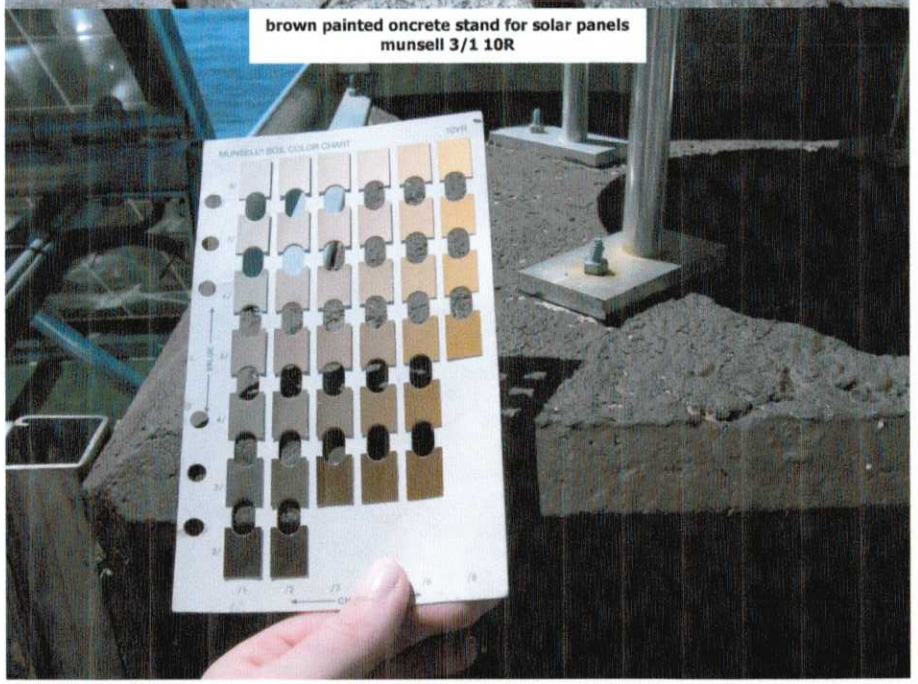


White box
munsell 8/5PB 2 gley

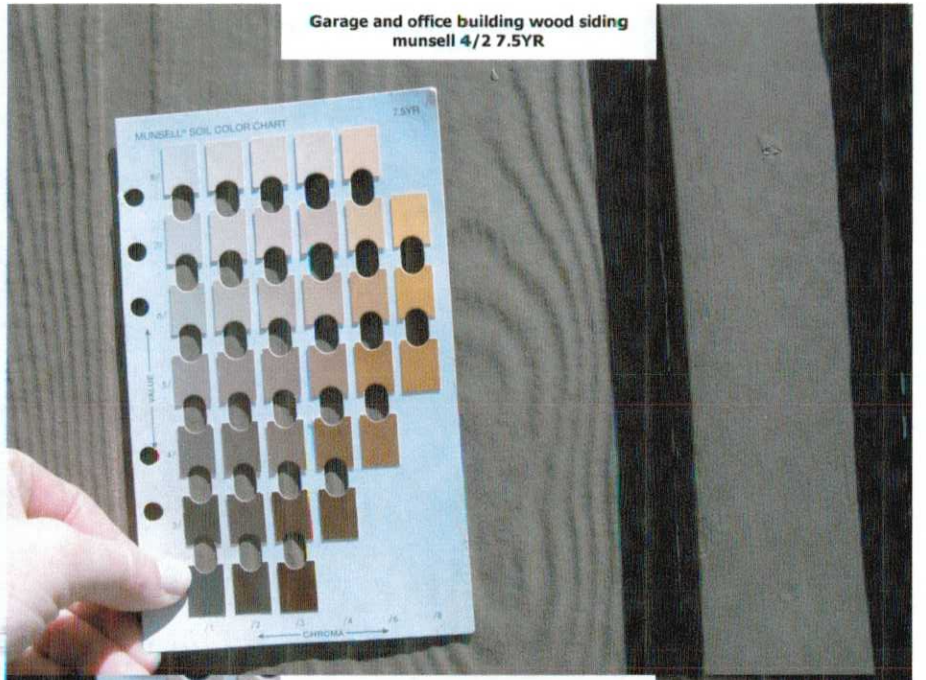
Revetment
munsell 5/1 2.5Y



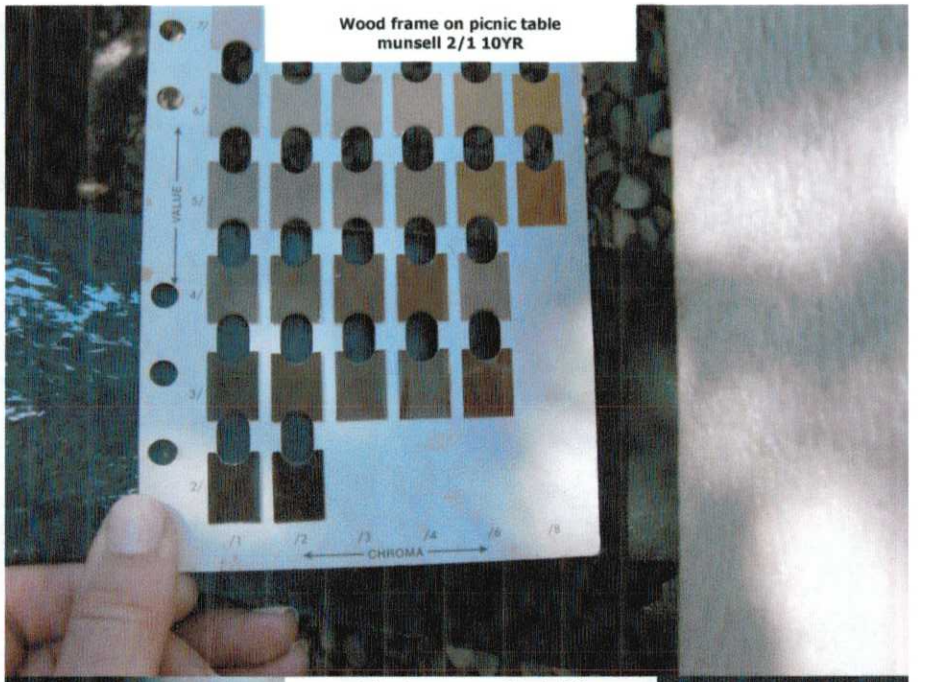
Trex bench and table top on picnic table
munsell 7/2 10YR



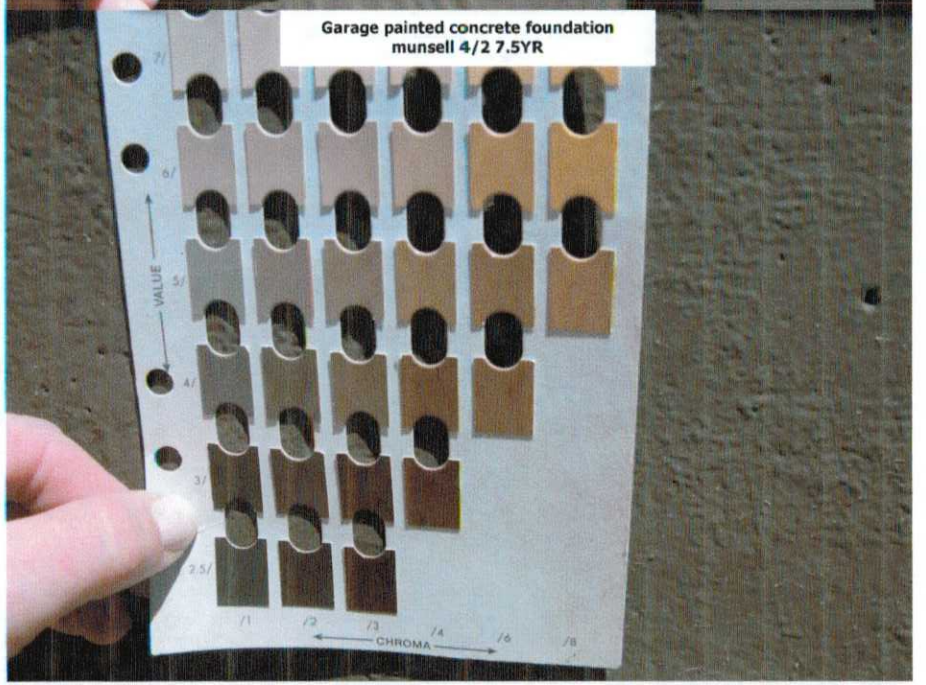
brown painted oncrete stand for solar panels
munsell 3/1 10R



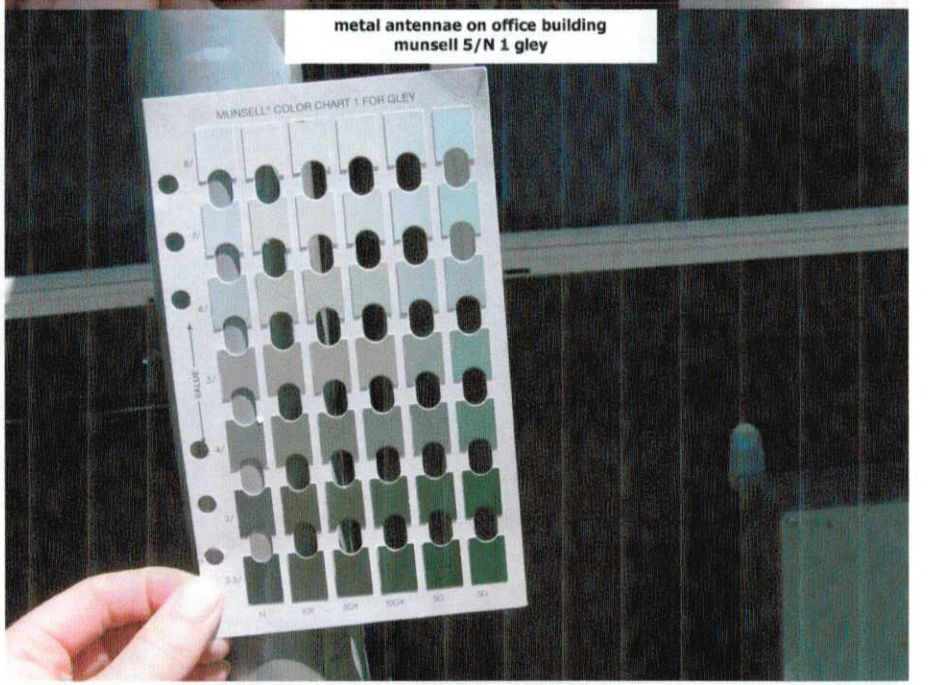
Garage and office building wood siding
munsell 4/2 7.5YR



Wood frame on picnic table
munsell 2/1 10YR



Garage painted concrete foundation
munsell 4/2 7.5YR



metal antennae on office building
munsell 5/N 1 gley

Kaufman

From: "Lief Larson" <llarson@trpa.org>
To: "Kaufman" <kaufmanplanning@sbcglobal.net>; "David Landry" <dlandry@trpa.org>; "leah Kaufman" <leah.lkplanning@sbcglobal.net>
Sent: Friday, October 07, 2011 2:13 PM
Subject: RE: scenic photo and map of photo points

Let go with 'photo 12'

Thanks,

Life Larson
llarson@trpa.org
775.589.5206

From: Kaufman [mailto:kaufmanplanning@sbcglobal.net]
Sent: Tuesday, October 04, 2011 5:00 PM
To: David Landry; Lief Larson; leah Kaufman
Subject: scenic photo and map of photo points

David, Life,

Attached are photos from 300' (photos 10-13) and 600' (photos 3-8) for the USCG Baseline Scenic Assessment. Can you please choose a photo point for us to use for the contrast rating score? I took photos from both 300' and 600' because the USCG existing pier is longer than 300' (312') and I thought you may want a view from further out as the pier will be included in the scenic.

I will send this in two e-mails due to the size of the photos.

Please feel free to call if you have any questions.

Sincerely,

Abigail Edwards
Associate Planner
Kaufman Planning and Consulting
phone/fax: (530)546-4402
P.O. Box 253
Carnelian Bay, CA 96140
kaufmanplanning@sbcglobal.net

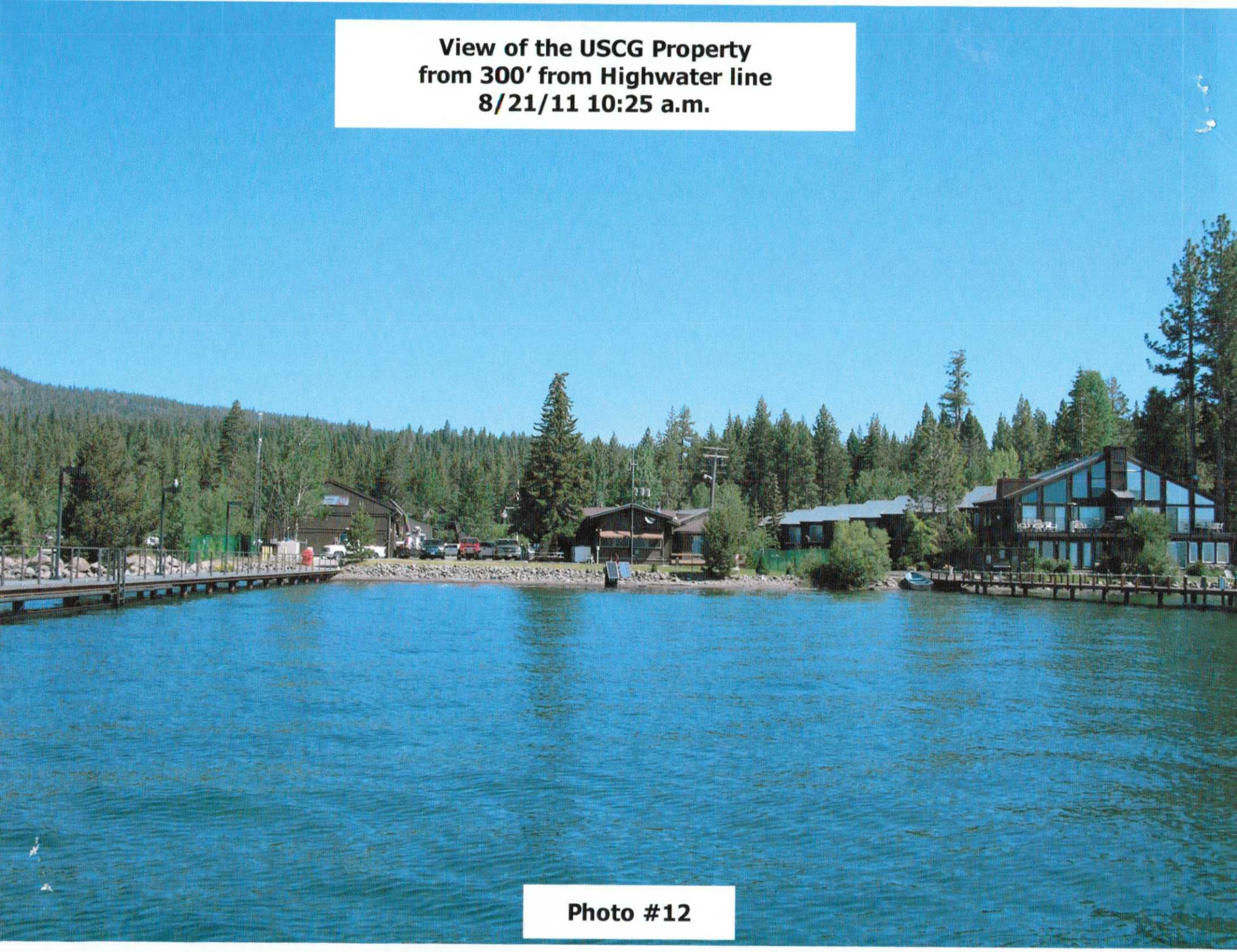

View of the USCG Property
from 300' from Highwater line
8/21/11 10:25 a.m.
Photo #12

PHOTO INDEX
for the
USCG Property
2500 Lake Forest Road
Placer County
APN 098-022-005

Photos were taken with an Olympus Camedia Digital Camera set at high quality on landscape mode at approximately 55 mm on 8/21/11. All photos from the lake were taken from a ski boat standing. Please refer to individual photos for bearing location of each.

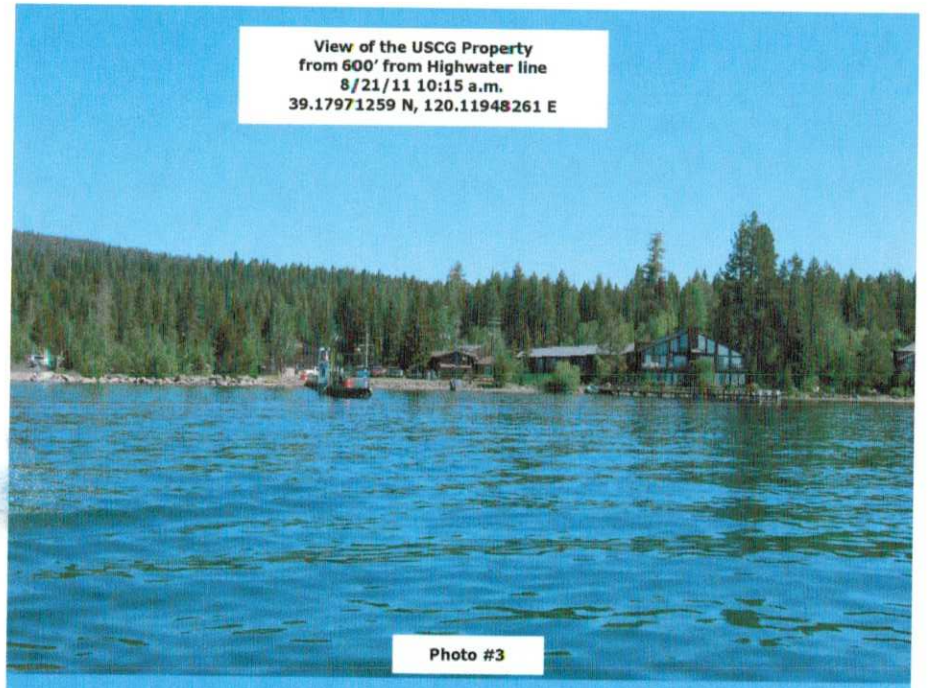


Photo #3

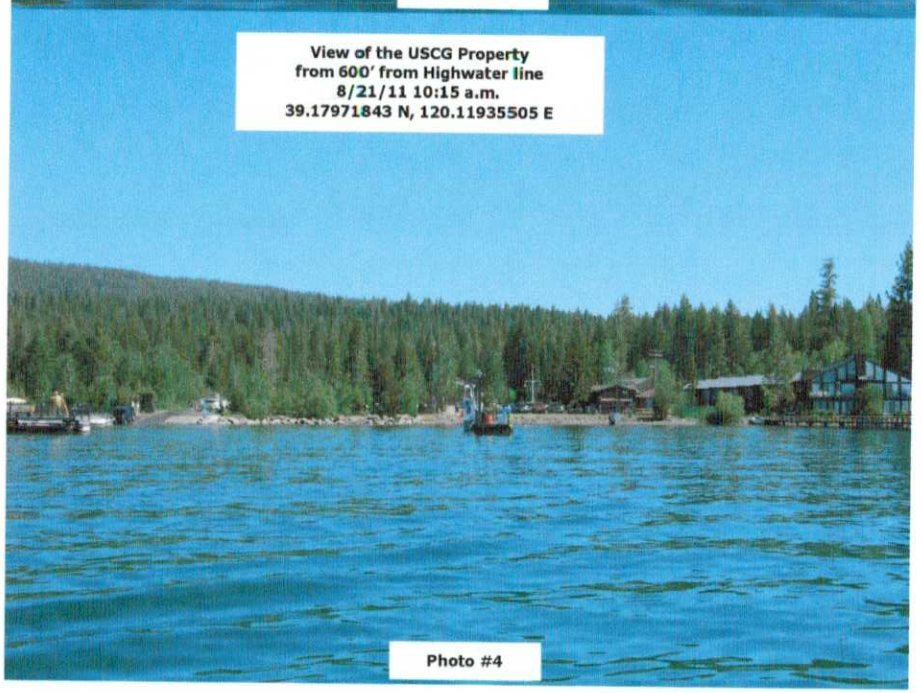


Photo #4

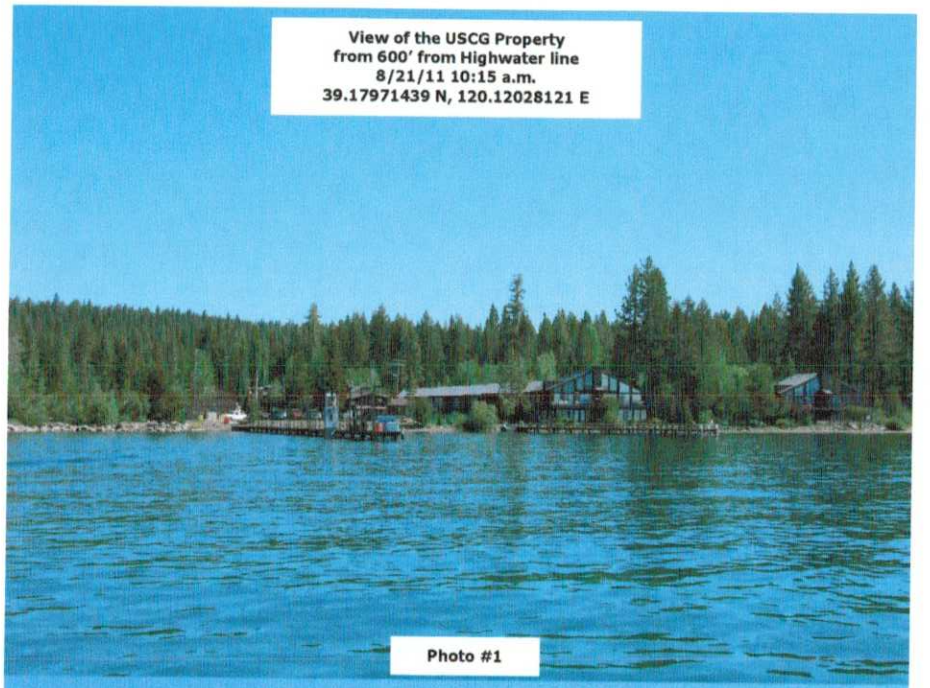


Photo #1

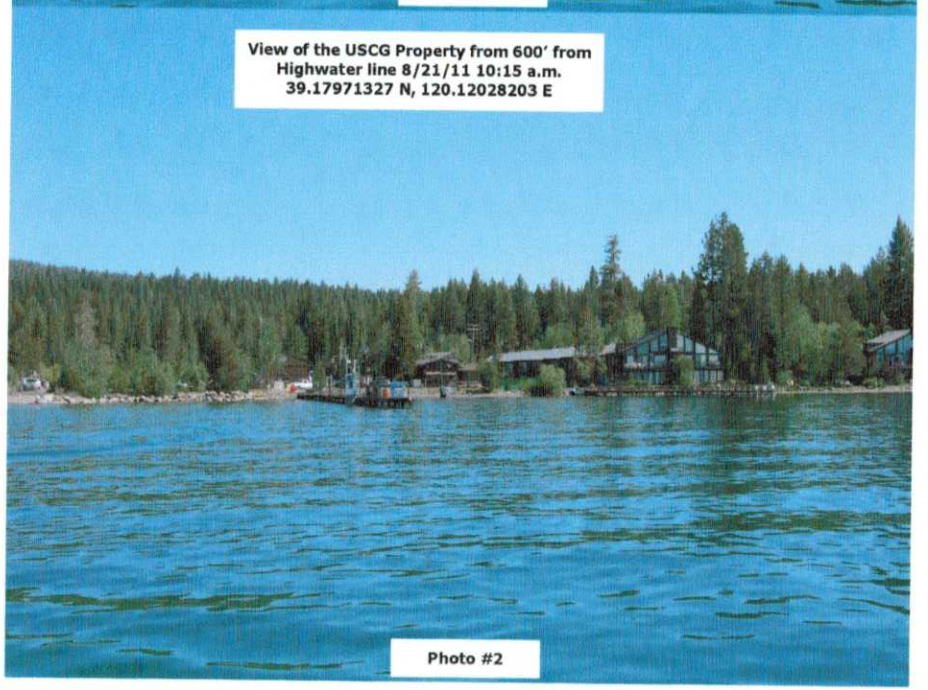
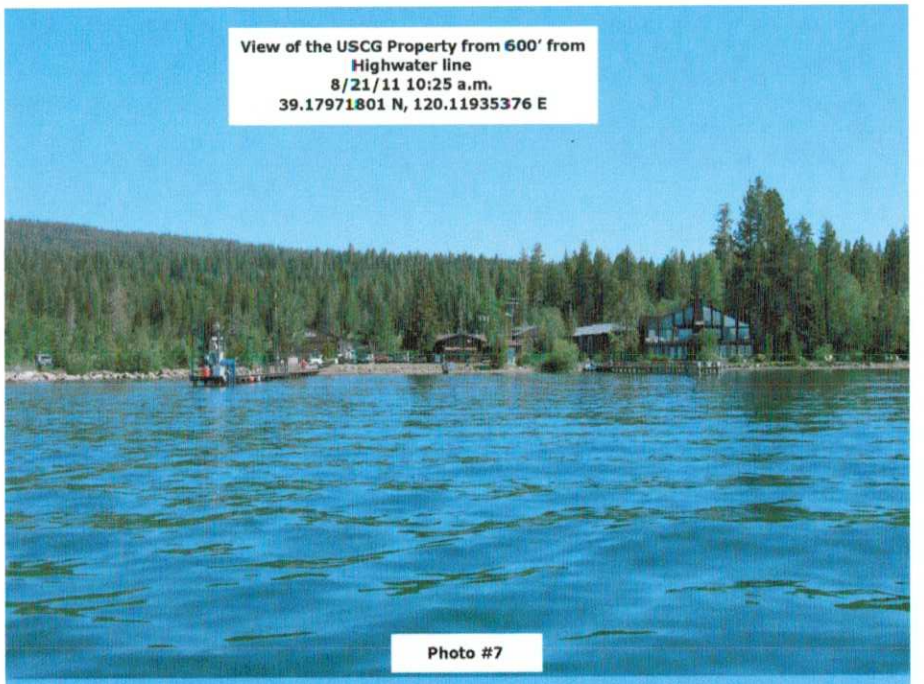


Photo #2



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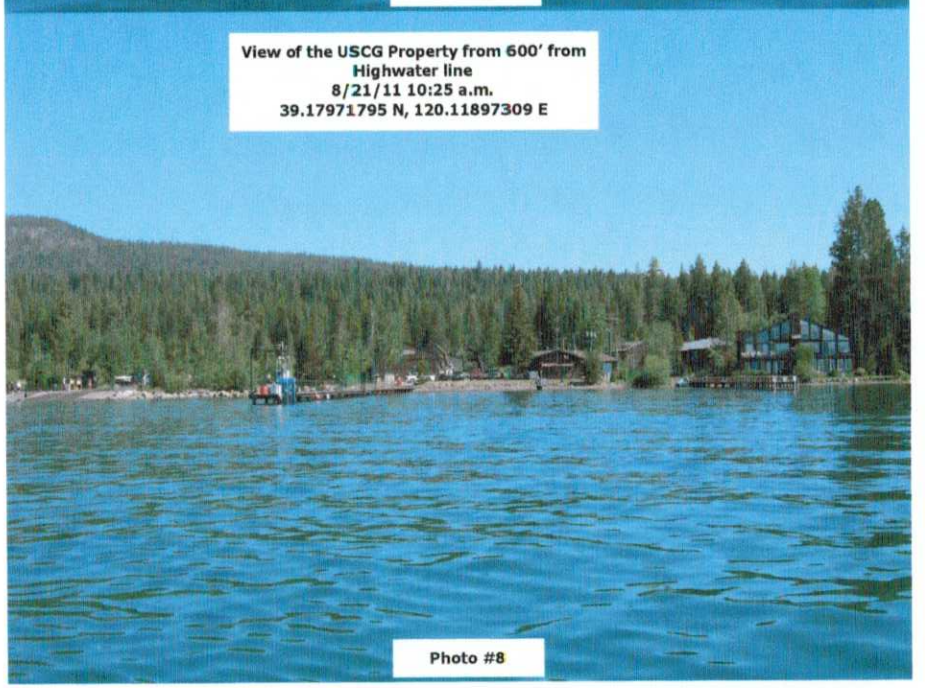
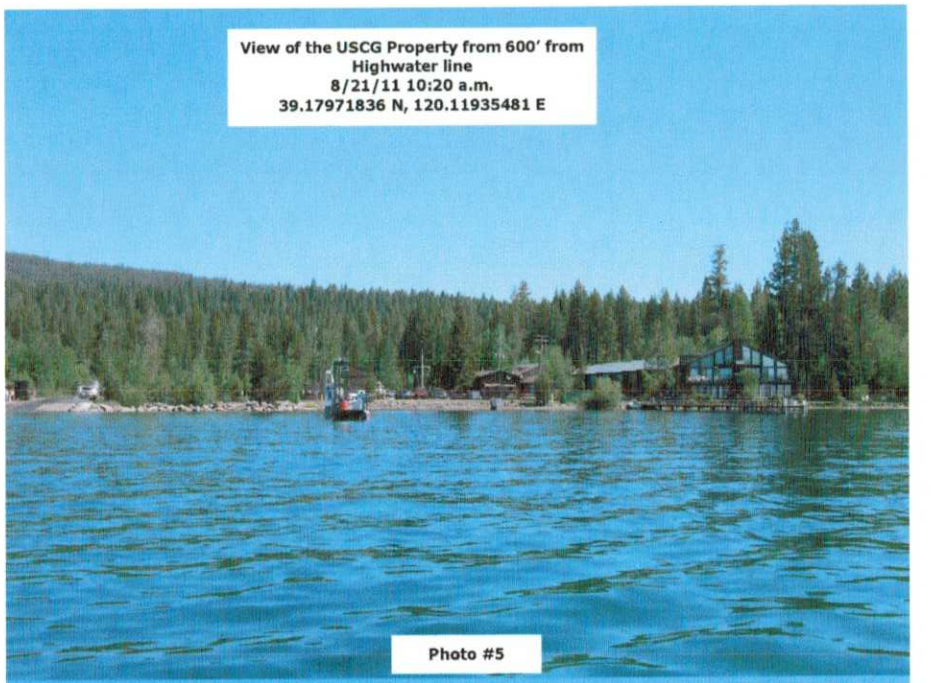


Photo #8



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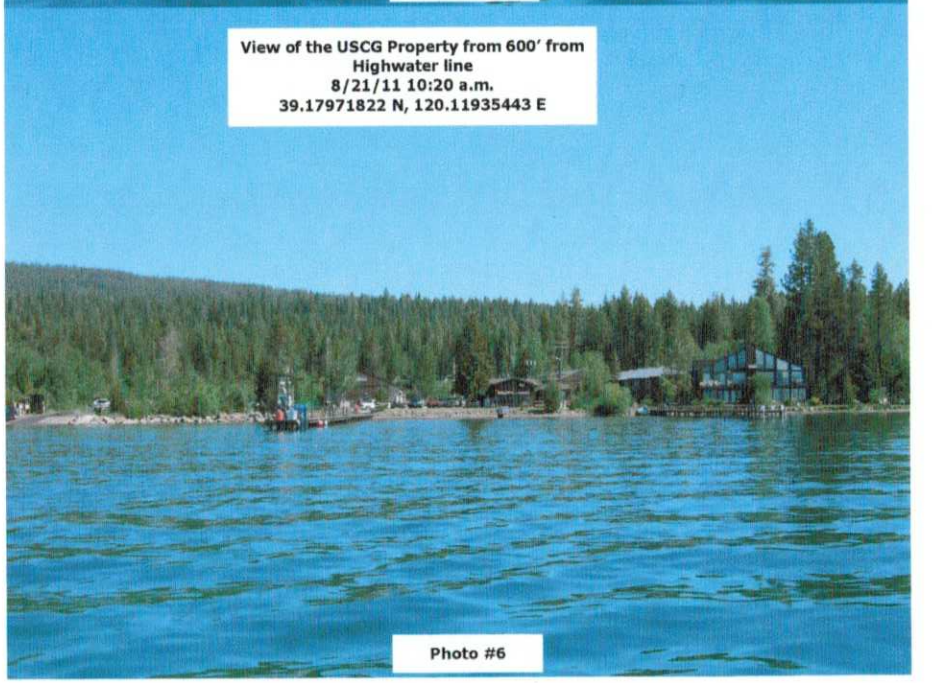

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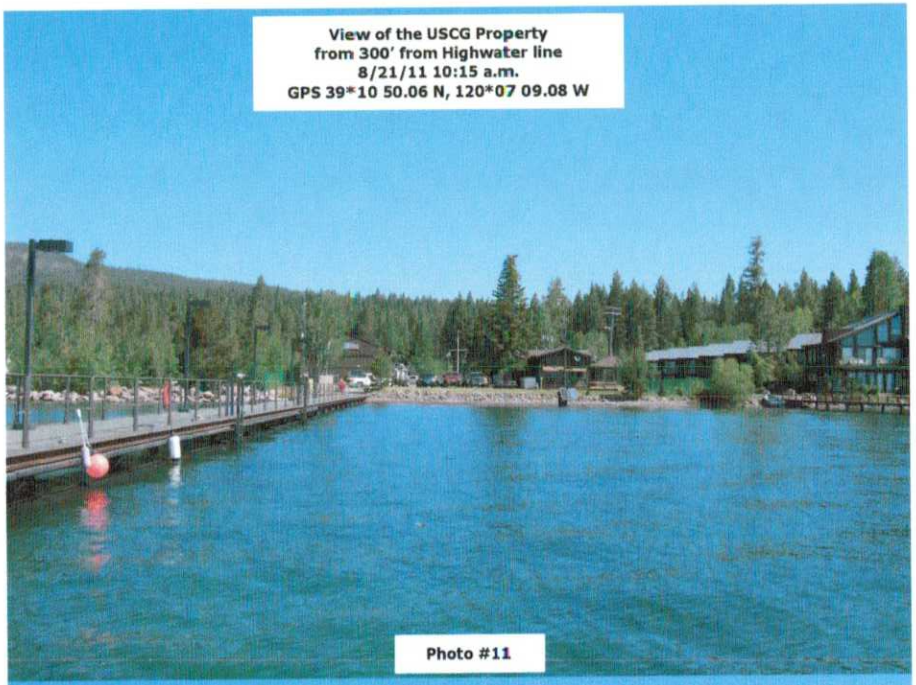

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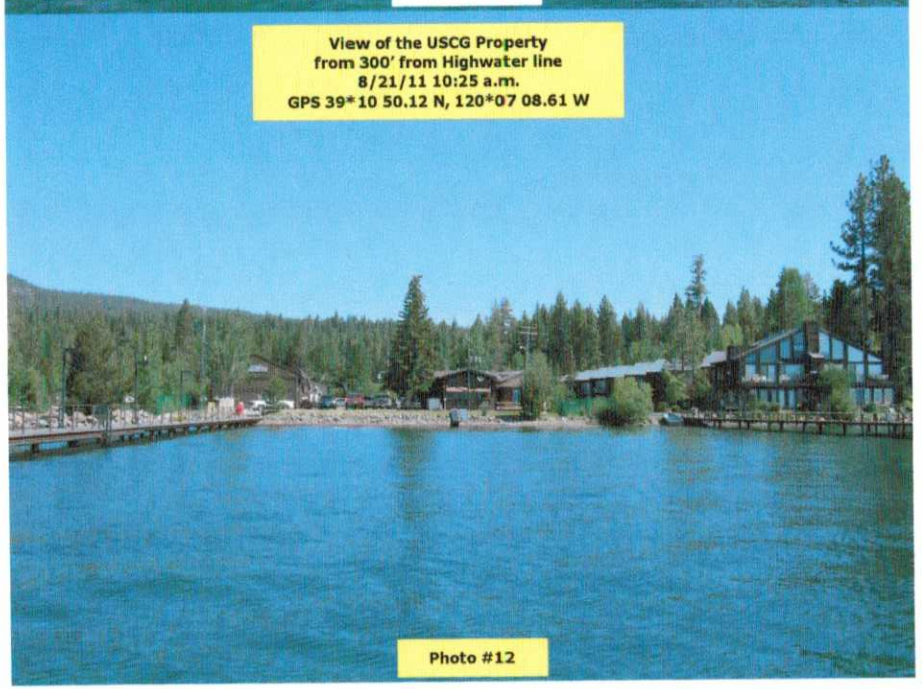

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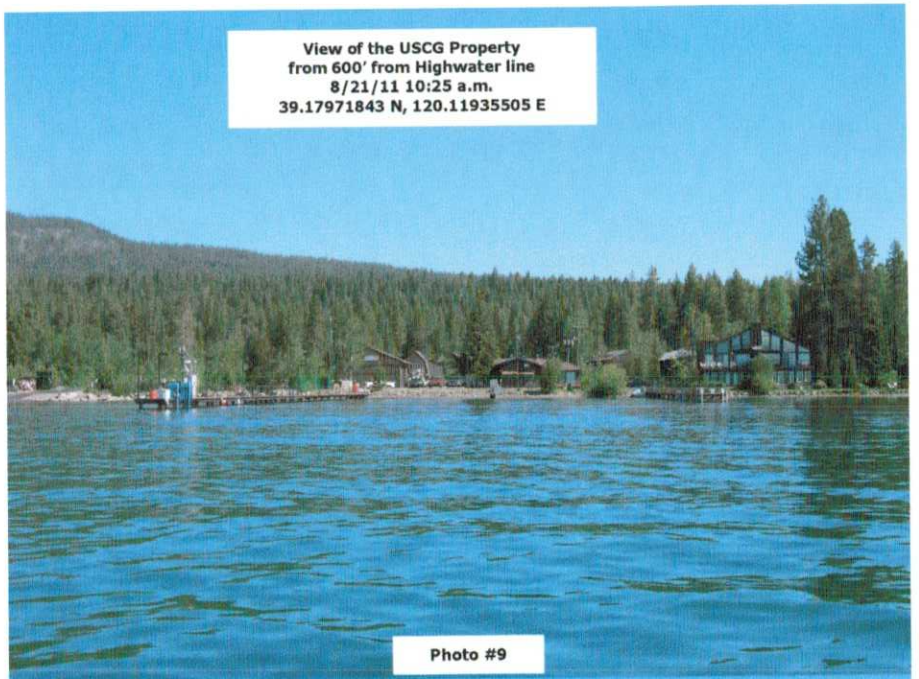

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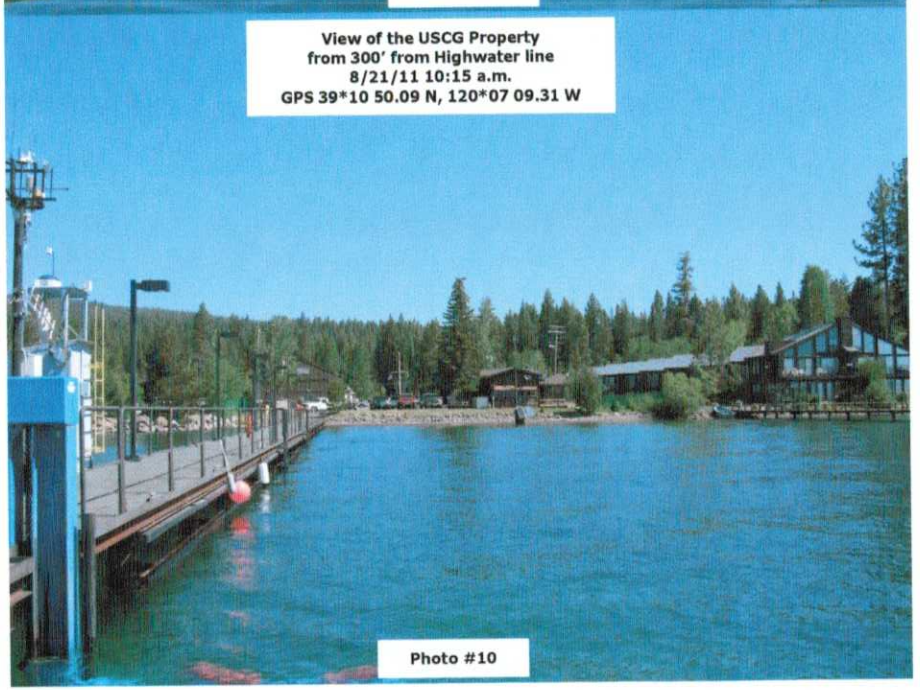

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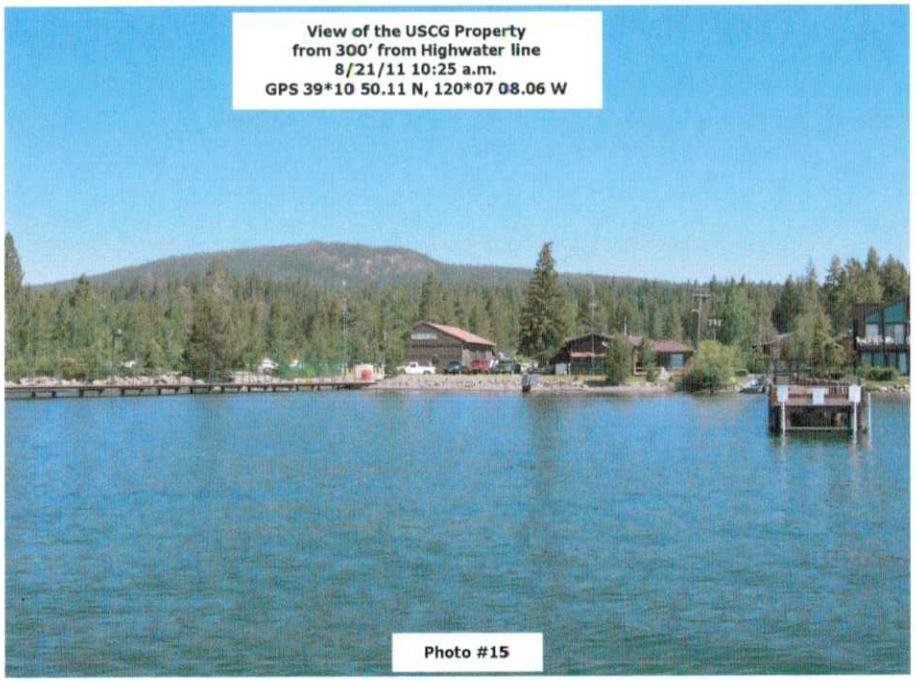
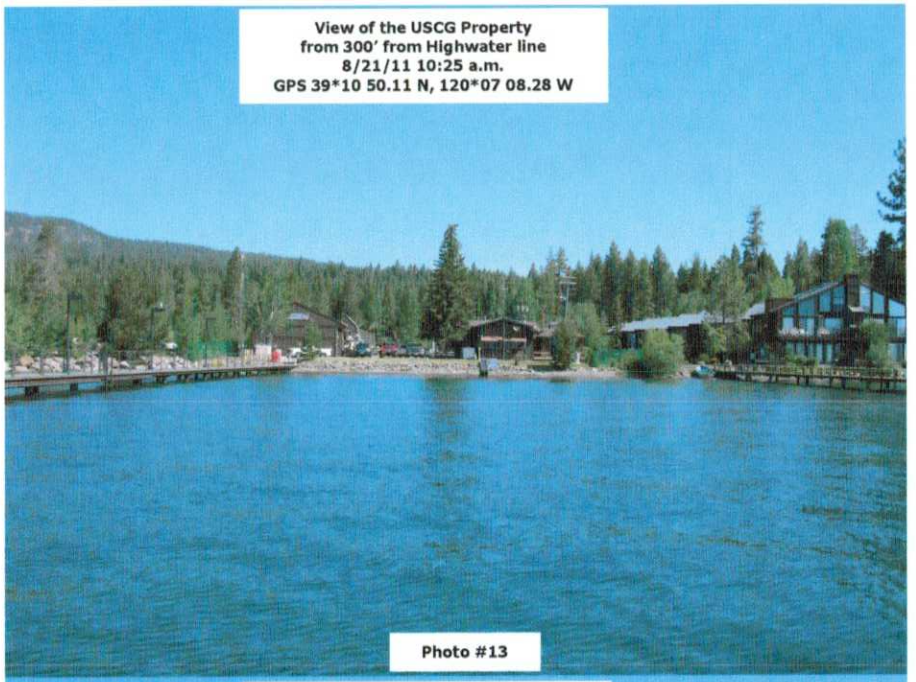
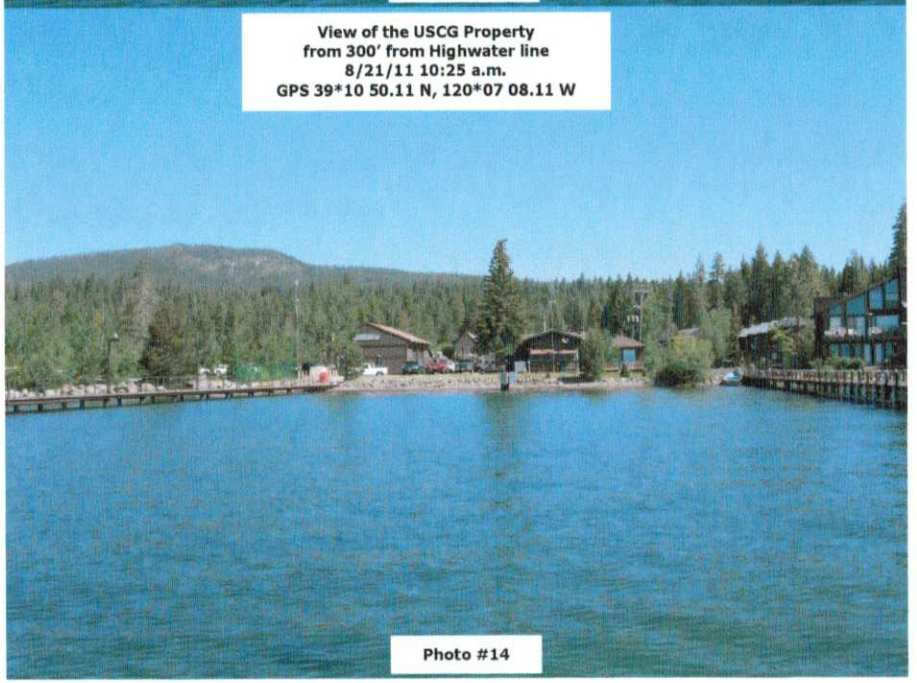

View of the USCG Property
from 300' from Highwater line
8/21/11 10:25 a.m.
GPS 39*10 50.11 N, 120*07 08.06 W
Photo #15


View of the USCG Property
from 300' from Highwater line
8/21/11 10:25 a.m.
GPS 39*10 50.11 N, 120*07 08.28 W
Photo #13


View of the USCG Property
from 300' from Highwater line
8/21/11 10:25 a.m.
GPS 39*10 50.11 N, 120*07 08.11 W
Photo #14

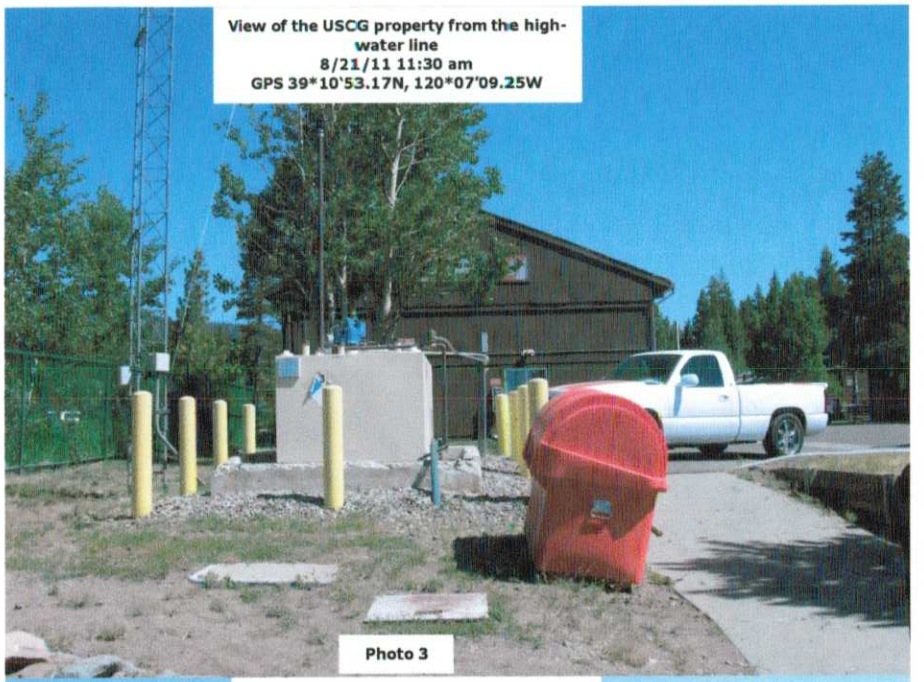


Photo 3

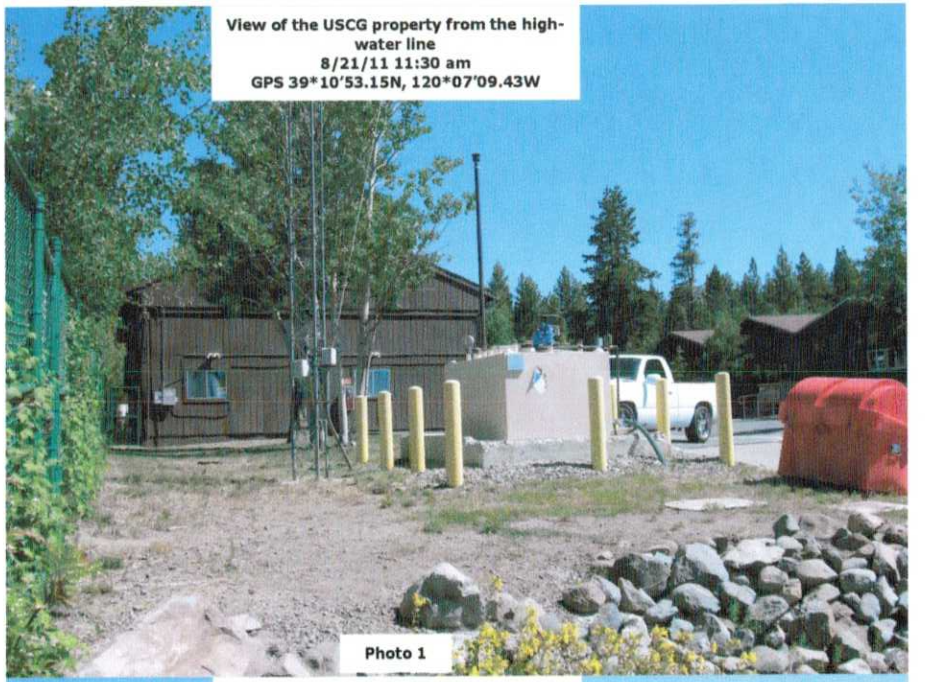
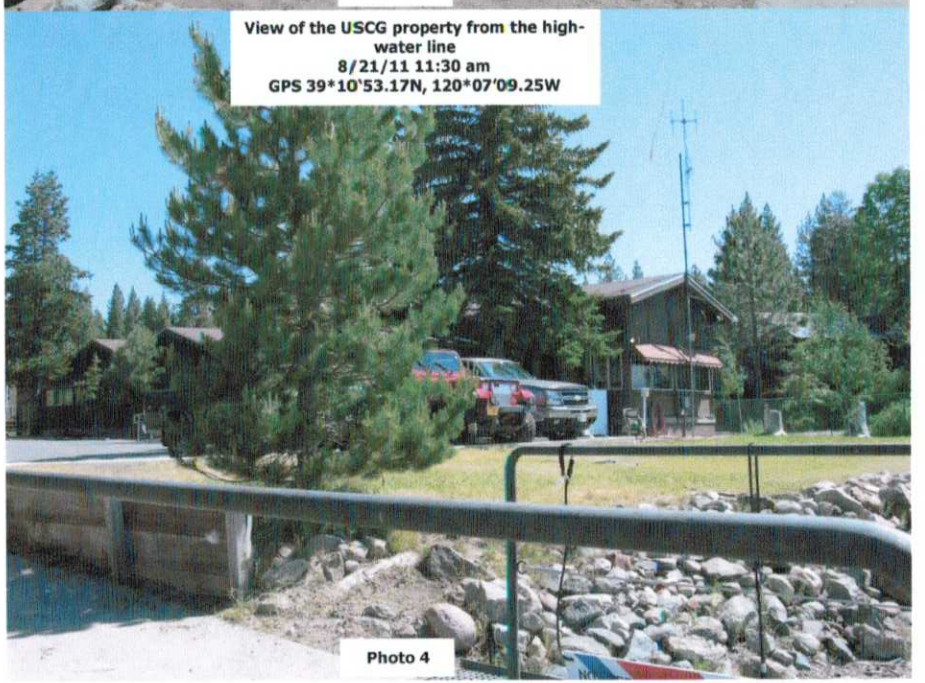


Photo 1



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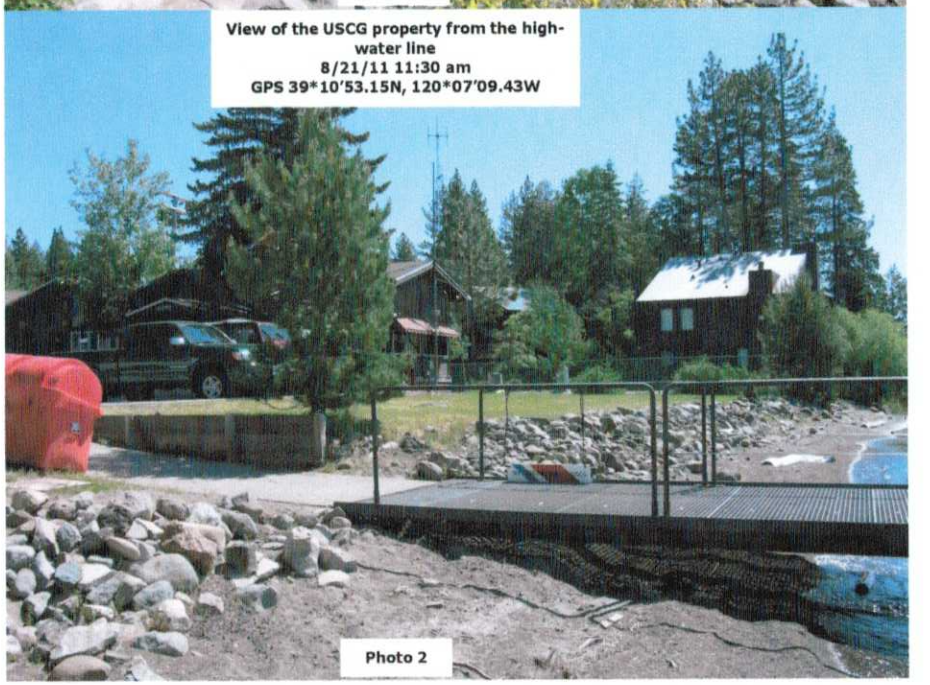

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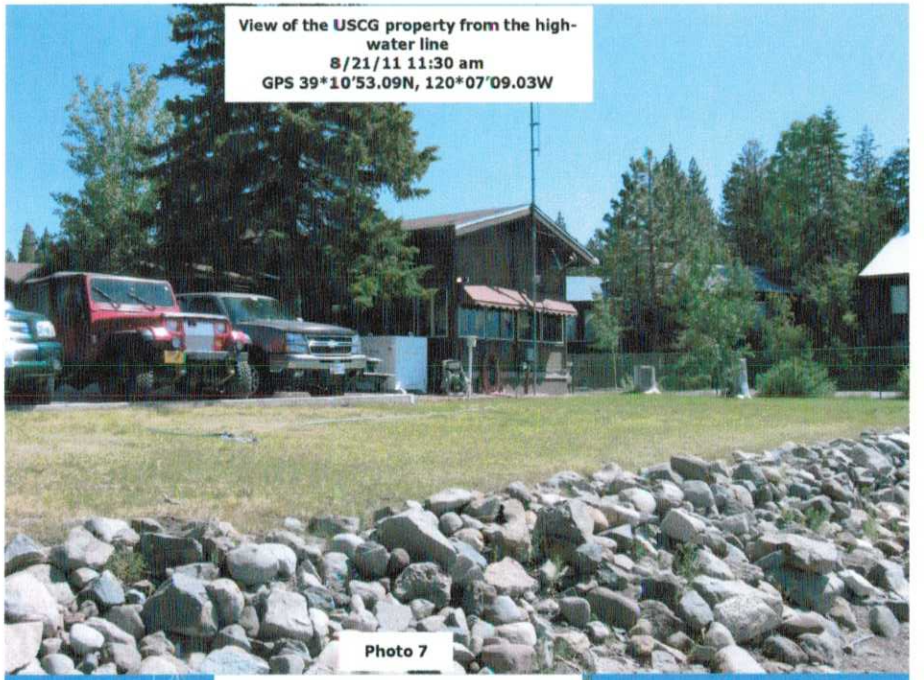


Photo 7

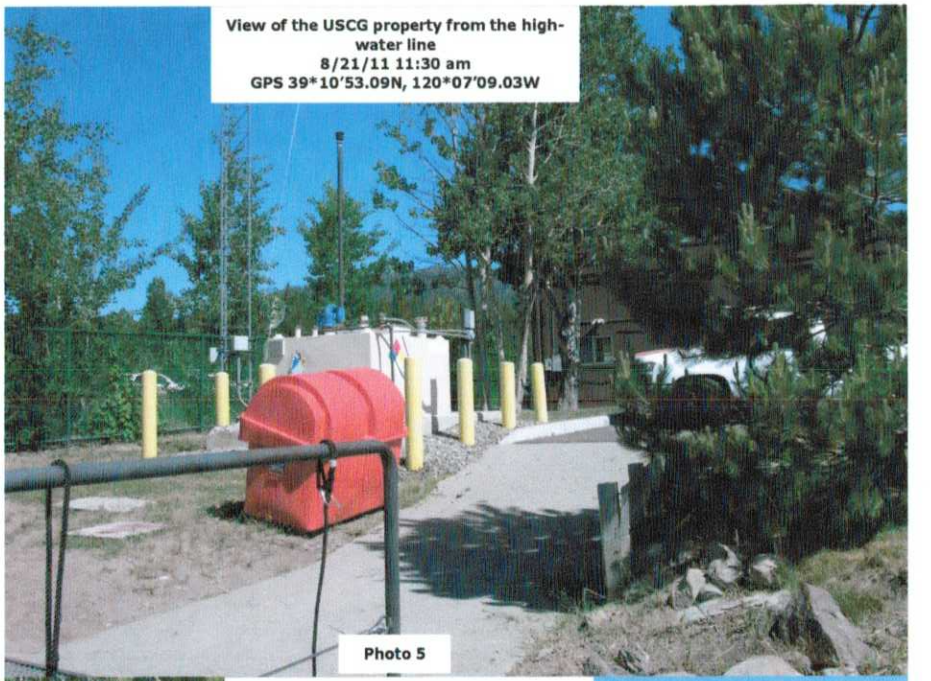


Photo 5

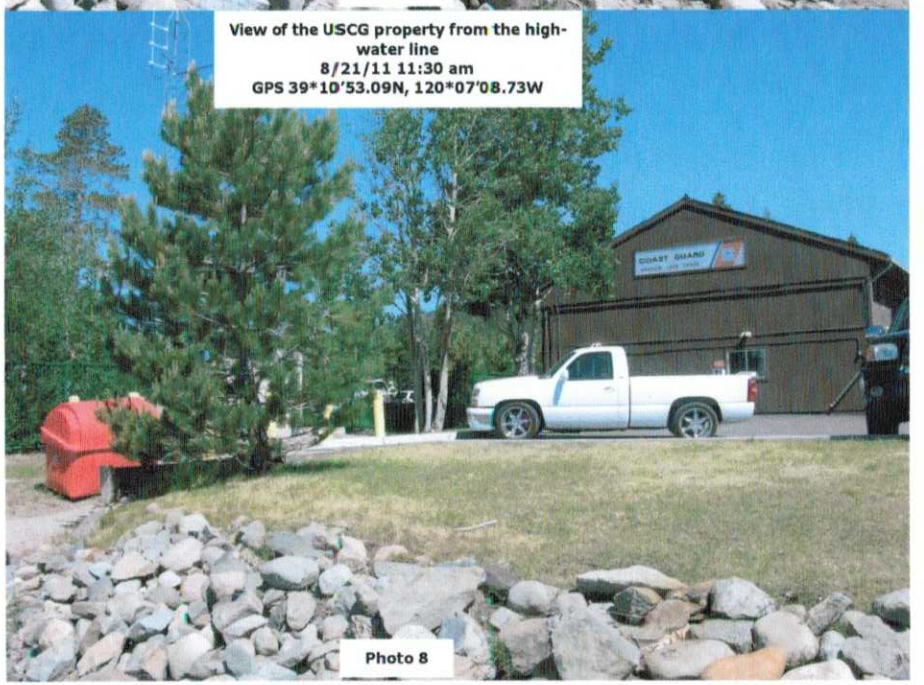
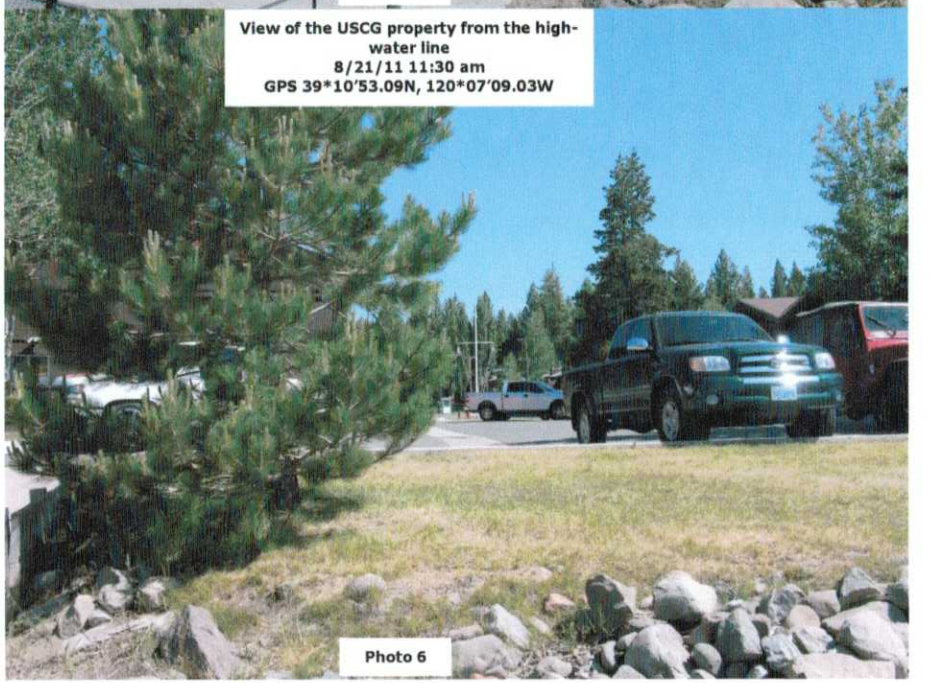


Photo 8



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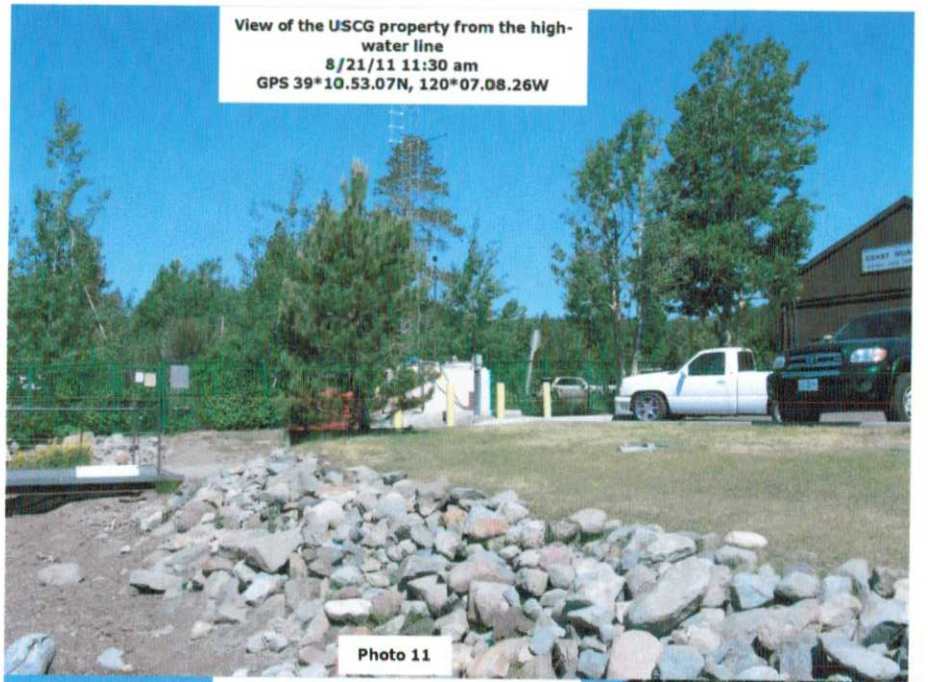


Photo 11

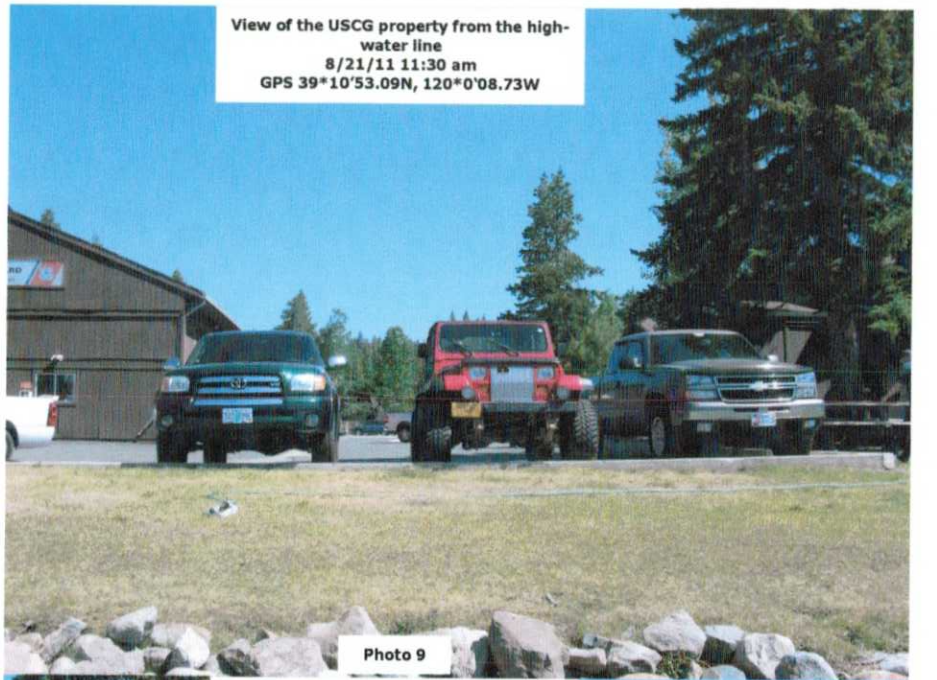


Photo 9

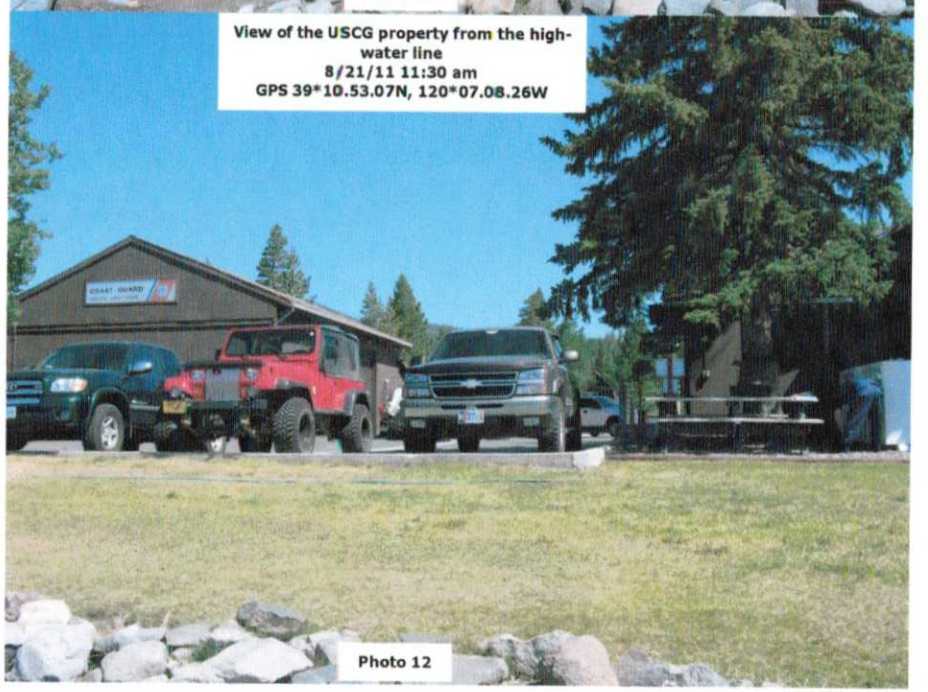


Photo 12

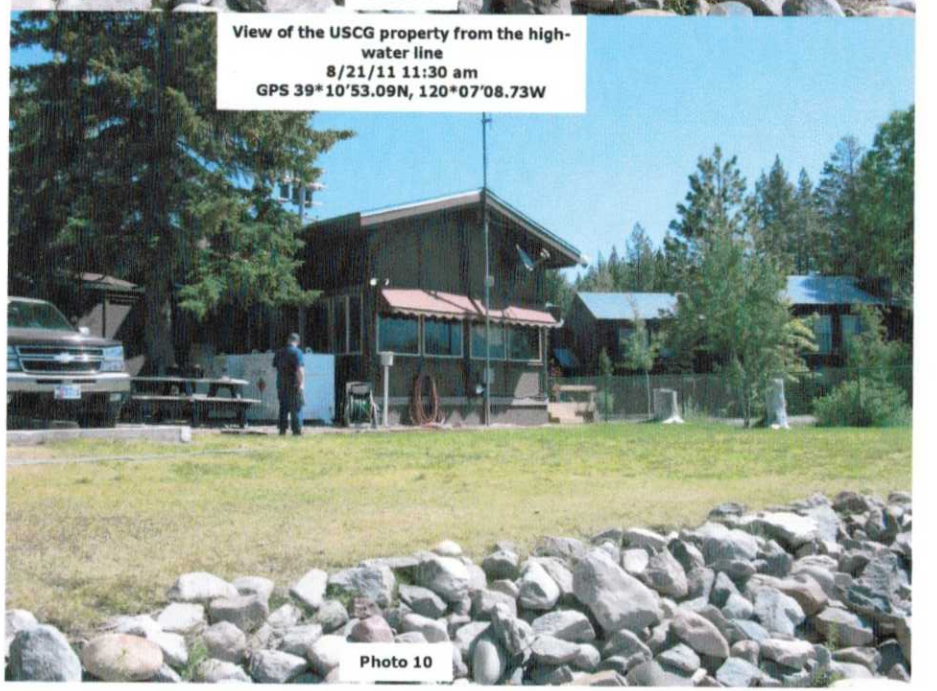


Photo 10

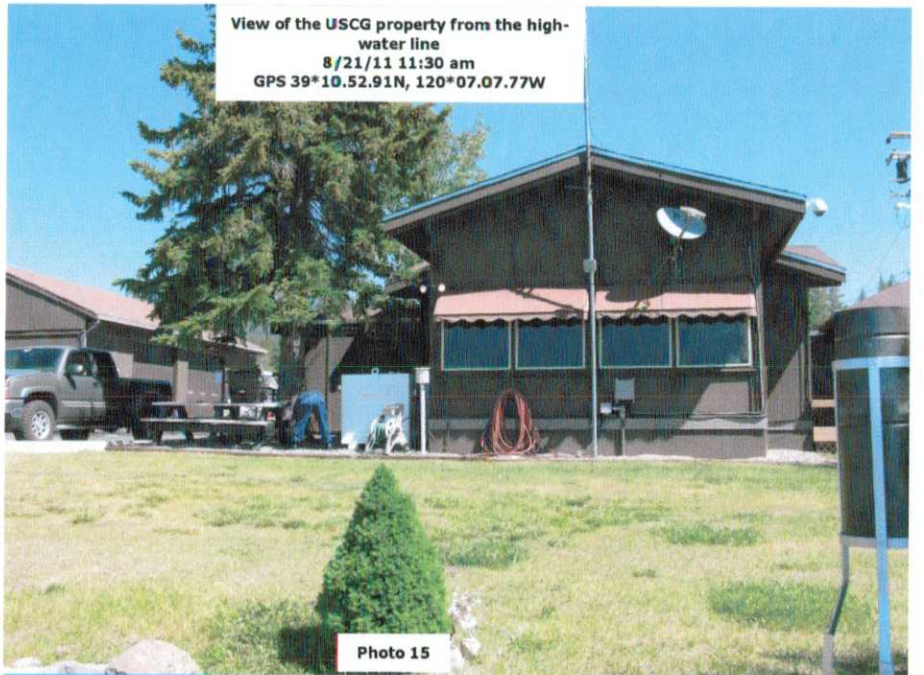


Photo 15

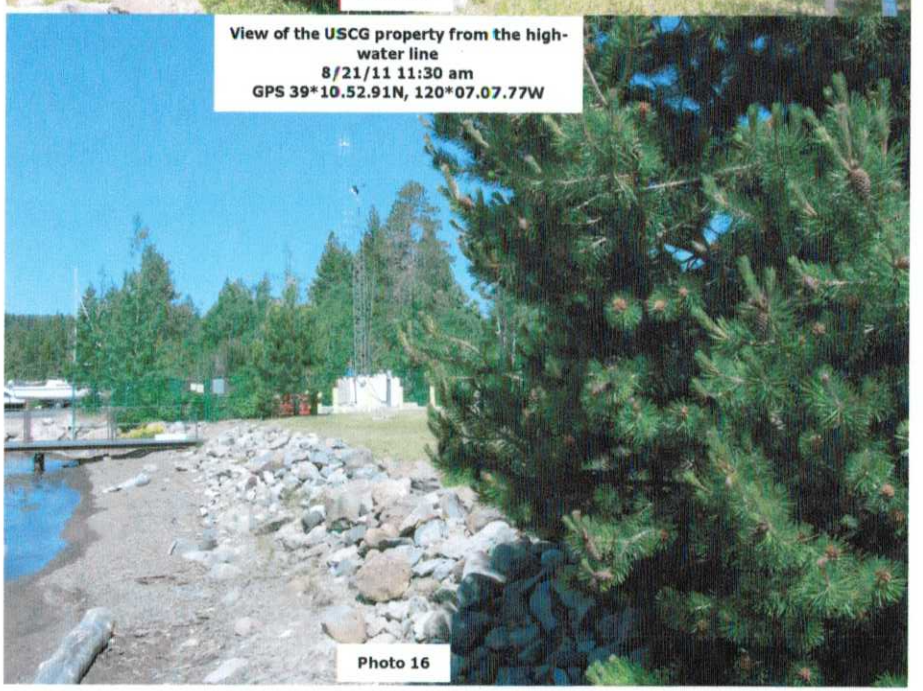


Photo 16

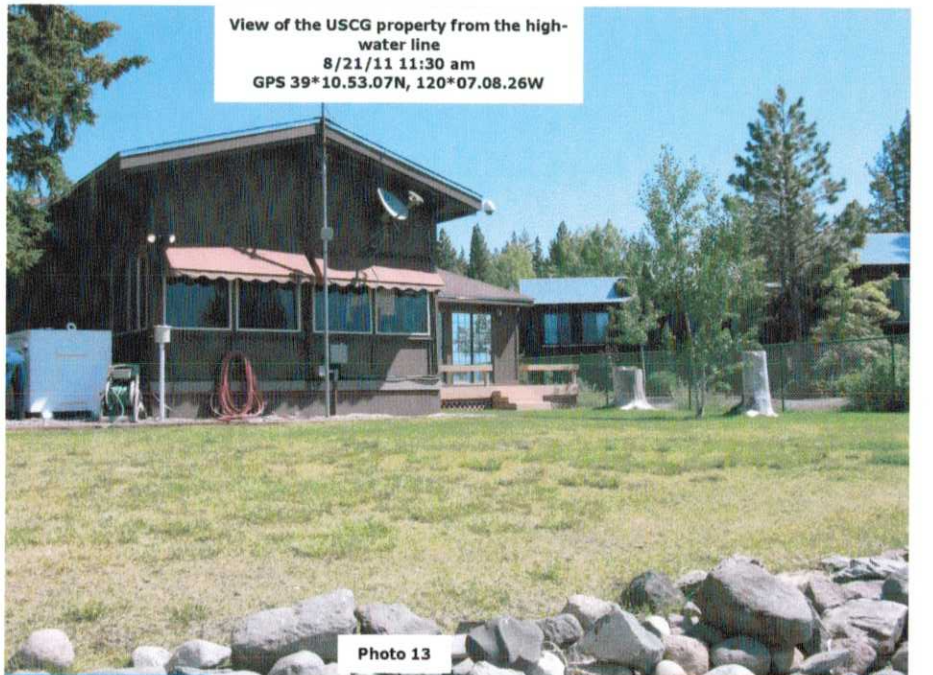


Photo 13

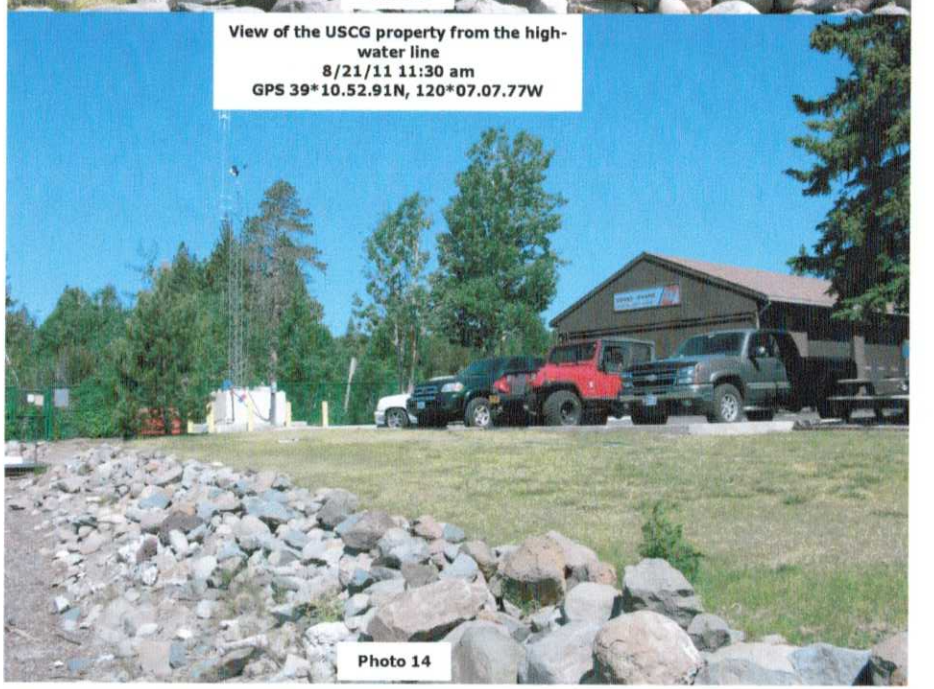
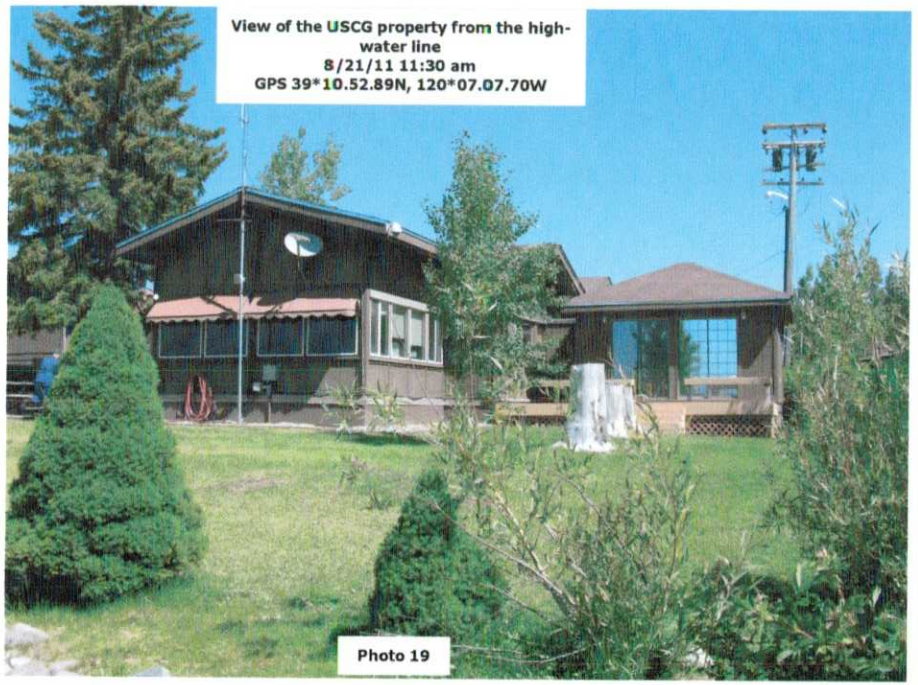
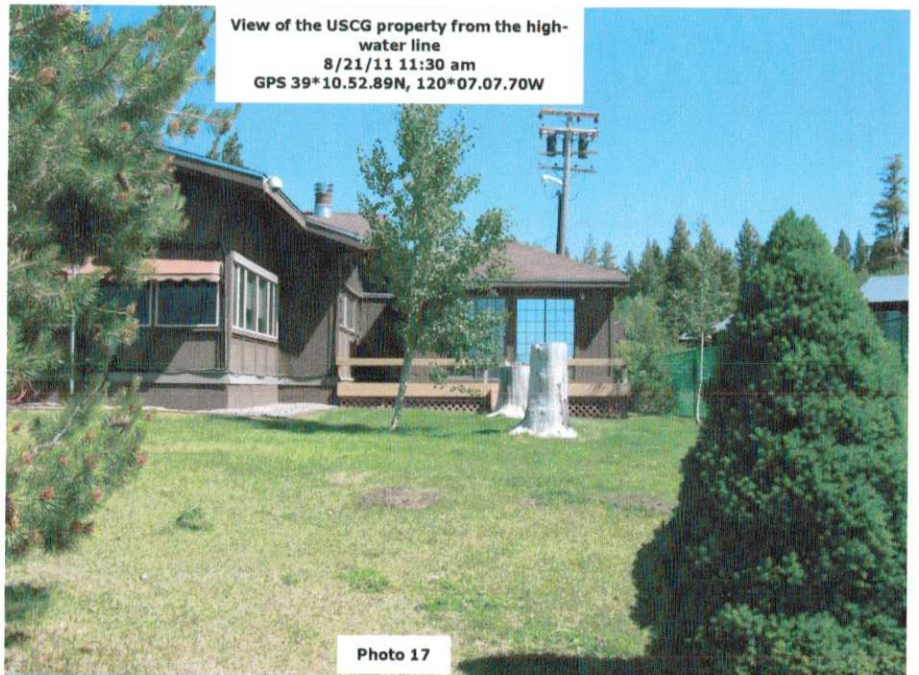
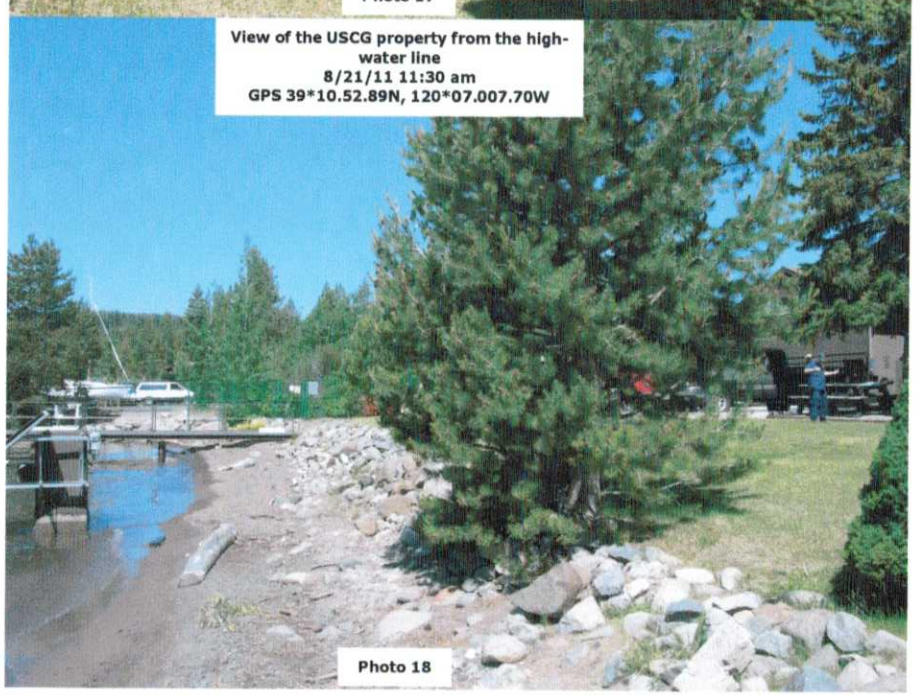


Photo 14


View of the USCG property from the high-water line
8/21/11 11:30 am
GPS 39*10.52.89N, 120*07.07.70W
Photo 19


View of the USCG property from the high-water line
8/21/11 11:30 am
GPS 39*10.52.89N, 120*07.07.70W
Photo 17


View of the USCG property from the high-water line
8/21/11 11:30 am
GPS 39*10.52.89N, 120*07.007.70W
Photo 18

COMPOSITE CONTRAST RATING

	Main office buil		garage		pier		fence		revetment		antennae		gas tank		flagpole		orange box		picnic bench		white box		solar panels		Total Lakefront Façade
Area SF	762	+	667	+	244	+	688	+	600	+	10	+	60		13	+	12	+	28	+	16	+	15	=	**3115**
Percentage	24%	x	21%	x	8%	x	22%	x	19%	x	0%	x	2%	x	0%	x	0%	x	1%	x	1%	x	0%	x	
CONTRAST RATING	23	=	20	=	24	=	24	=	15	=	11	=	6	=	8	=	11	=	12	=	11	=	7	=	
	5.5	+	4.2	+	1.9	+	5.3	+	2.9	+	0.0	+	0.1		0.0	+	0.0	+	0.1	+	0.1	+	0.0	=	19.9
																									=
																									20

COMPOSITE CONTRAST RATING

	EXISTING
LAKEFRONT FAÇADE:	3115
SCREENED AREA:	900
VISIBLE AREA:	2,215

CONTRAST RATING SHEET

solar panels

	solar panels		concrete stand		grey elec box										Total Lakefront Façade
Area SF	8.0	+	6.0	+	1.0	+		+		+		+		=	15
Percentage	53%		40%		7%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating [1]	9														
Munsell Color	6/n 1 gley		3/1 10r		8/n 1 gley										
	=		=		=		=		=		=		=		
	4.8	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	4.8
Percentage	53%		40%		7%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score [2]	1	+	1	+	1	+		+		+		+		=	
Texture	none		none		none										
# of Planes: 1															
	=		=		=		=		=		=		=		
	0.53	+	0.4	+	0.07	+	0	+	0	+	0	+	0	=	1.0
															+

Percent of Perimeter Visible: 100%
36 of 36

Perimeter Score [3] = 1

=

CONTRAST RATING 7

CONTRAST RATING SHEET

white box

	white box								Total Lakefront Façade
Area SF	16.0	+		+		+		+		+		+		=	**16**
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	9														
Munsell Color	8/5pb 2 gley														
	=		=		=		=		=		=		=		
	9.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+		=	
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
														+	
														=	1
														=	
															11

Percent of Perimeter Visible: 100%
14 of 14

Perimeter Score[3]

CONTRAST RATING

CONTRAST RATING SHEET

picnic bench

	wood frame		*trex bench, table*												*Total Lakefront Façade*
Area SF	4.0	+	24.0	+		+		+		+		+		=	**28**
Percentage	14%		86%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating [1] Munsell Color	17 2/1 10yr		8 7/2 10yr												
	=		=		=		=		=		=		=		
	2.4	+	6.9	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.3
Percentage	14%		86%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score [2] Texture	2 minimal	+	2 minimal	+		+		+		+		+			=
# of Planes: 2															
	=		=		=		=		=		=		=		
	0.28	+	1.72	+	0	+	0	+	0	+	0	+	0	=	2.0
															+
					Percent of Perimeter Visible:		100% 18 of 18		***Perimeter Score*** [3]					=	1
															=
									CONTRAST RATING						12

CONTRAST RATING SHEET

orange box

	box								Total Lakefront Façade
Area SF	12.0	+		+		+		+		+		+		=	12
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	8														
Munsell Color	4/8 2.5yr														
	=		=		=		=		=		=		=		
	8.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	8.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+		=	
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+
														=	2
															=
															11

Percent of Perimeter Visible: 80%
8 of 10

Perimeter Score[3]

CONTRAST RATING

CONTRAST RATING SHEET

flagpole

	flagpole														***Total Lakefront Façade***
Area SF	13.0	+		+		+		+		+		+		=	**13**
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	1														
Munsell Color	8/5pb 2 gley														
	=		=		=		=		=		=				
	1.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	1.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=				
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+

Percent of Perimeter Visible: 48%
12 of 25

Perimeter Score[3] = 6

=

CONTRAST RATING 8

CONTRAST RATING SHEET

above ground tank and acessories

	tank		bollards												Total Lakefront Façade
Area SF	32.0	+	28.0	+		+		+		+		+		=	60
Percentage	53%		47%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating[1]	1		2												
Munsell Color	7/1 2.5Y		8/6 5Y												
	=		=		=		=		=		=		=		
	0.5	+	0.9	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	1.4
Percentage	53%		47%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score[2]	3	+	3	+		+		+		+		+		=	
Texture	none		none												
# of Planes: 4															
	=		=		=		=		=		=		=		
	1.59	+	1.41	+	0	+	0	+	0	+	0	+	0	=	3.0
															+
															2
															=
															6

Percent of Perimeter Visible: 83%
20 of 24

Perimeter Score[3] = 2

CONTRAST RATING = 6

CONTRAST RATING SHEET

antennae

	antennae								Total Lakefront Façade
Area SF	10.0	+		+		+		+		+		+		=	**10**
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating [1]	9														
Munsell Color	5/n 1 gley														
	=		=		=		=		=		=		=		
	9.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	=	9.0
Percentage	100%		0%		0%		0%		0%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score [2]	1	+		+		+		+		+		+			=
Texture	none														
# of Planes: 1															
	=		=		=		=		=		=		=		
	1	+	0	+	0	+	0	+	0	+	0	+	0	=	1.0
															+

Percent of Perimeter Visible: 100%
20 of 20

Perimeter Score [3] = 1

=

CONTRAST RATING 11

CONTRAST RATING SHEET

Revetment

																														Total Lakefront Façade
	stone																													
Area SF	600.0	+		+		+		+		+		+		+		+		+		+		+		+		+		+		=	**600**
Percentage	100%		0%		0%		0%		0%		0%		0%																	
	x		x		x		x		x		x		x																	
Color Rating [1]	9																													
Munsell Color	5/1 2.5Y																													
	II		II		II		II		II		II		II																	
	9.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+	0.0	+																= 9.0
Percentage	100%		0%		0%		0%		0%		0%		0%																	
	x		x		x		x		x		x		x																	
Surface Plane/ Texture Score [2]	5	+		+		+		+		+		+																		=
Texture	heavy																													
# of Planes: 2																														
	II		II		II		II		II		II		II																	
	5	+	0	+	0	+	0	+	0	+	0	+	0	+																= 5.0
																														+
Percent of Perimeter Visible: 94%																														***Perimeter Score*** [3] = 1
290 of 306																														II
																														CONTRAST RATING 15

CONTRAST RATING SHEET

chain link fence

	fence							Total Lakefront Façade
Area SF	697.0 +	+	+	+	+	+	+	= 697
Percentage	100%	0%	0%	0%	0%	0%	0%	
	x	x	x	x	x	x	x	
Color Rating [1]	16							
Munsell Color	3/5g 1 gley							
	=	=	=	=	=	=	=	
	16.0 +	0.0 +	0.0 +	0.0 +	0.0 +	0.0 +	0.0	= 16.0
Percentage	100%	0%	0%	0%	0%	0%	0%	
	x	x	x	x	x	x	x	
Surface Plane/ Texture Score [2]	5 +	+	+	+	+	+	+	=
Texture	heavy							
# of Planes: 2								
	=	=	=	=	=	=	=	
	5 +	0 +	0 +	0 +	0 +	0 +	0	= 5.0
								+
				Percent of Perimeter Visible:	72%	***Perimeter Score*** [3]		= 3
					260 of 360			=
						CONTRAST RATING		24

CONTRAST RATING SHEET

pier

	lighting		railing, ladder		decking		cable railing		joists, pilings						Total Lakefront Façade
Area SF	28.0	+	60.0	+	108.0	+	15.0	+	33.0	+		+		=	244
Percentage	11%		25%		44%		6%		14%		0%		0%		
	x		x		x		x		x		x		x		
Color Rating [1]	17		17		12		7		17						
Munsell Color	2.5/n 1 gley		2.5/n 1 gley		4/n 1 gley		6n 1 gley		2.5/n 1 gley						
	=		=		=		=		=		=				
	1.9	+	4.3	+	5.3	+	0.4	+	2.4	+	0.0	+	0.0	=	14.3
Percentage	11%		25%		44%		6%		14%		0%		0%		
	x		x		x		x		x		x		x		
Surface Plane/ Texture Score [2]	3	+	3	+	6	+	3	+	3	+		+			=
Texture	no texture		no texture		heavy		no texture		no texture						
# of Planes: 3															
	=		=		=		=		=		=				
	0.33	+	0.75	+	2.64	+	0.18	+	0.42	+	0	+	0	=	4.3
															+
					Percent of Perimeter Visible: 50%						***Perimeter Score*** [3]			=	5
					200 of 400										=
											CONTRAST RATING				24

CONTRAST RATING SHEET

Garage Building

	siding	glass	aluminum windows	sign red	sign white	sign black	concrete foundation	Total Lakefront Façade
Area SF	600.0 +	14.0 +	5.0 +	2.0 +	32.0 +	2.0 +	12.0 =	667
Percentage	90%	2%	1%	0%	5%	0%	2%	
	x	x	x	x	x	x	x	
Color Rating [1]	15	1	15	10	1	17	15	
Munsell Color	4/2 7.5Y	glass	4/2 7.5yr	3/6 10r	8n 1 gley	2.5/N 1 gley	4/2 7.5Y	
	=	=	=	=	=	=	=	
	13.5 +	0.0 +	0.2 +	0.0 +	0.1 +	0.0 +	0.3 =	14.1
Percentage	90%	2%	1%	0%	5%	0%	2%	
	x	x	x	x	x	x	x	
Surface Plane/ Texture Score [2]	2 +	1 +	1 +	1 +	1 +	1 +	2	+
Texture	minimal	none	none	none	none	none	minimal	
# of Planes: 1	=	=	=	=	=	=	=	
	1.8 +	0.0 +	0.0 +	0.0 +	0.1 +	0.0 +	0.0 =	1.9
								+
			Percent of Perimeter Visible:		69%	**Perimeter Score** [3]	=	4
			72 of 104					=
						CONTRAST RATING		20

CONTRAST RATING SHEET

USCG Baseline Scenic

Main office building

	Roof	glass	siding	Alum windows	awning	roof flashing, chimney cap	deck, railings, stairs	lattice	belly band trim	antennae, satt dish, outlet	Total Lakefront Façade
Area SF	123.0	104.0	400.0	26.0	25.0	16.0	28.0	12.0	14.0	14.0	762
Percentage	16.1%	13.6%	52.5%	3.4%	3.3%	2.1%	3.7%	1.6%	1.8%	1.8%	
	x	x	x	x	x	x	x				
Color Rating[1]	15	1	15	1	12	7	10	10	12	9	
Munsell Color	4/4 5YR	glass	4/2 7.5YR	8/2 10YR	5/4 2.5YR	6N 1 gley	6/4 7.5YR	6/4 7.5YR	5/1 2.5 yr	5/N I gley	
	=	=	=	=	=	=					
	2.4 +	0.1 +	7.9 +	0.0 +	0.4 +	0.1 +	0.4	0.2	0.2	0.2	11.9
											+
Percentage	16.1%	13.6%	52.5%	3.4%	3.3%	2.1%	3.7%	1.6%	1.8%	1.8%	
	x	x	x	x	x	x	x				
Surface Plane/ Texture Score[2]	8 +	5 +	6 +	5 +	6 +	5 +	6	8	6	5	
Texture:	heavy	none	minimal	none	minimal	none	mnimal	heavy	minimal	none	
# of Planes: 9	=	=	=	=	=	=					
	1.3 +	0.7 +	3.2 +	0.2 +	0.2 +	0.1 +	0.2	0.1	0.1	0.1	6.2
											+
											5
											=
											23

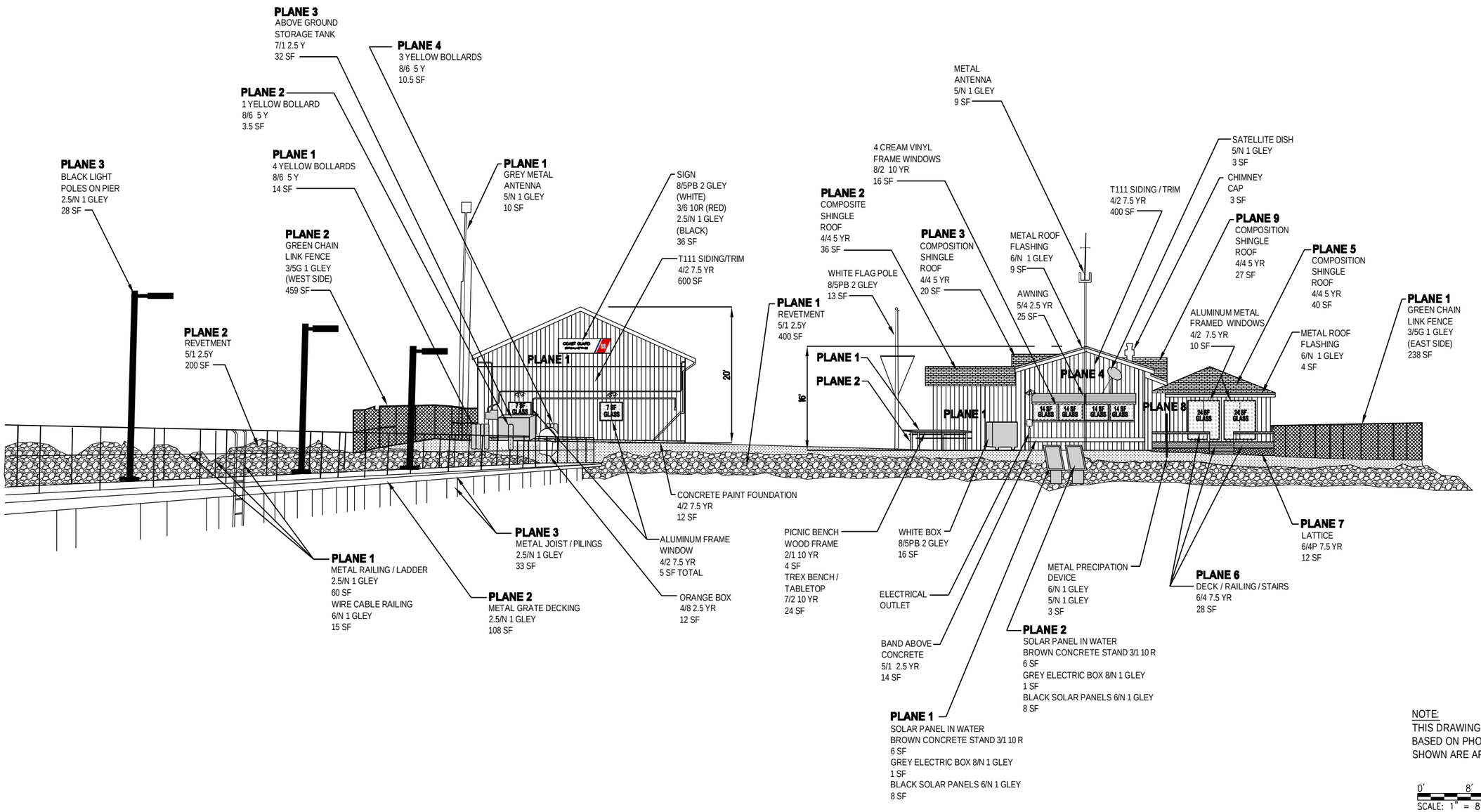
main

Percent of Perimeter Visible: 54%

70 of 130

Perimeter Score[3] =

CONTRAST RATING



NOTE:
THIS DRAWING IS A PERSPECTIVE VIEW BASED ON PHOTOS. DIMENSIONS SHOWN ARE APPROXIMATE.

0' 8' 16' 24'
SCALE: 1" = 8' FULL SIZE
1" = 16' HALF SIZE

PRELIMINARY

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

TRANSPORTATION

AECOM
2101 Webster St., Suite 1900
Oakland, CA 94612
T 510.622.6600 F 510.835.3464

AECOM
www.aecom.com

Drawn By: EM
Approved By:
Date: 01/03/12
Meeting: Meeting 1

U.S. Department of Homeland Security
United States Coast Guard
Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

EXISTING LAKEFRONT FACADE
LAKE TAHOE

Sheet Title: EXHIBIT A

Project Number: 60218657

Sheet Number: 1 of 2

Original inside border size 19" x 32" (483mm x 813mm)
\60218657-TahoePier\000_CAD\006_Civil\Sheets\C1-EXISTING LAKEFRONT FACADE.dwg 5/30/2012 10:39 AM meekse
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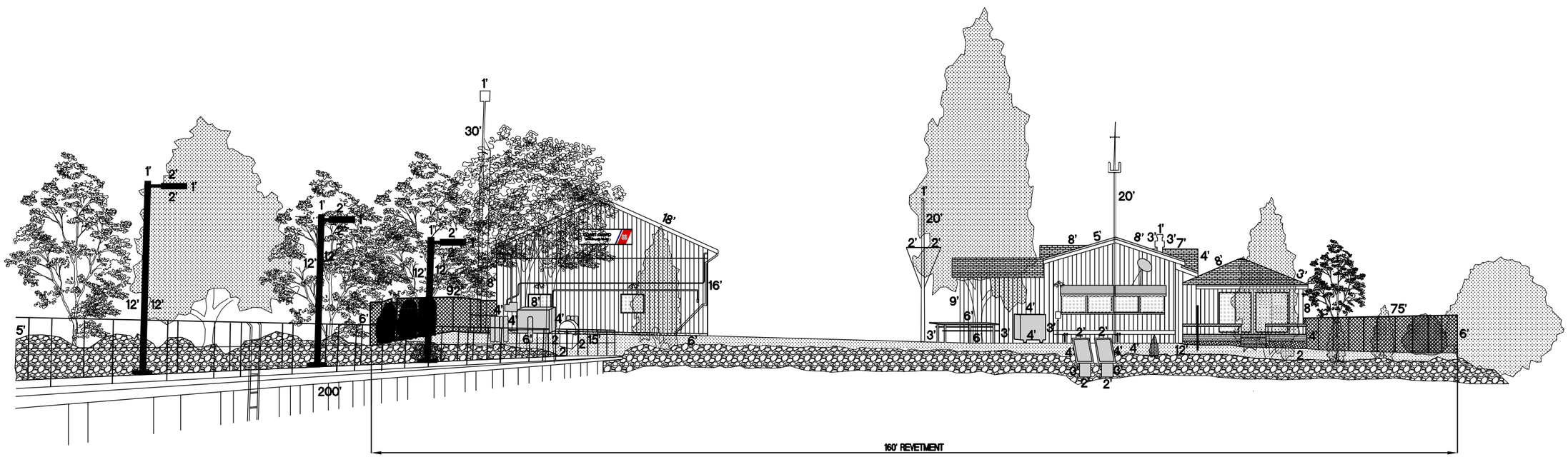
N:\ABCN\W93098\ACAD\Filename

TOTAL LAKE FRONT FACADE	**3,115 SF**
TOTAL SCREEN AREA	**900 SF**
TOTAL VISIBLE AREA	**2,215 SF**

STRUCTURE	PERIMETER	VISIBLE PERIMETER
OFFICE BUILDING	130 LF	70 LF
GARAGE	104 LF	72 LF
FENCE	360 LF	260 LF
REVETMENT	306 LF	290 LF
ANTENNA / GARAGE AREA	31 LF	31 LF
ANTENNA / OFFICE BLDG	20 LF	20 LF
GAS TANK / BOLLARDS	24 LF	20 LF
ORANGE STORAGE BOX	10 LF	10 LF
PIER	400 LF	200 LF
PIER LIGHT POLES	90 LF	90 LF
FLAG POLE	25 LF	12 LF
PICNIC BENCH	18 LF	18 LF
WHITE BOX	14 LF	14 LF
SOLAR PANELS	36 LF	36 LF



NOTE:
THIS DRAWING IS A PERSPECTIVE VIEW BASED ON PHOTOS. DIMENSIONS SHOWN ARE APPROXIMATE.

0' 8' 16' 24'
SCALE: 1" = 8' FULL SIZE
1" = 16' HALF SIZE

PRELIMINARY

Original inside border size 19" x 32" (483mm x 813mm)

\60218657-TahoePier\000_CAD\006_Civil\Sheets\C2-EXISTING VISIBLE AREA.dwg 5/30/2012 11:33 AM meekse

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N:\JOBS\W93098\ACAD\Filename

Revision	By	Approved	Date

U.S. COAST GUARD PROPERTY
2500 LAKE FOREST ROAD
TAHOE CITY, CA 96145
APN: 094-140-015-510

TRANSPORTATION

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2101 Webster St., Suite 1900
Oakland, CA 94612
T 510.622.6600 F 510.835.3464

www.aecom.com

Drawn By: EM
Approved By:
Date: 11/02/11
Meeting: Meeting 1

U.S. Department of Homeland Security
United States Coast Guard

Commanding Officer
United States Coast Guard
Civil Engineering Unit Oakland
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337
Staff Symbol: EVD

EXISTING LAKEFRONT VISIBLE AREA
LAKE TAHOE

Sheet Title: EXHIBIT B

Project Number: 60218657

Sheet Number: 2 of 2

Appendix F

Air Quality Modeling Results

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Max Daily Emissions Summary:

Alternative	Emission Sources	Maximum Daily* (pounds per day)					Annual (MT/yr)
		ROG	NO_x	CO	PM_{10}	$PM_{2.5}$	CO_2e
Alternative 1 - Dredging at Existing Pier	*Watercraft*	*2.68*	*19.69*	*10.53*	*0.78*	*0.72*	*36*
	Other Equipment	*1.78*	*20.69*	*16.07*	*1.01*	*0.69*	*99*
	Total	**4.46**	**40.38**	**26.60**	**1.79**	**1.41**	**135**
Alternative 2 - 350-ft Dog-Leg Pier Extension	*Watercraft*	*4.52*	*33.21*	*17.85*	*1.34*	*1.24*	*54*
	Other Equipment	*3.25*	*24.77*	*17.65*	*1.40*	*1.23*	*51*
	Total	**7.77**	**57.98**	**35.50**	**2.74**	**2.47**	**105**
Alternative 3 - 450-ft Straight Pier Extension	*Watercraft*	*4.52*	*33.21*	*17.85*	*1.34*	*1.24*	*62*
	Other Equipment	*3.25*	*24.77*	*17.65*	*1.40*	*1.23*	*58*
	Total	**7.77**	**57.98**	**35.50**	**2.74**	**2.47**	**120**
PCAPCD Thresholds		**82**	**82**	**NT**	**82**	**NT**	**10,000 MT/yr**

Notes: ROG = reactive organic gases; NOx = oxides of nitrogen; CO = carbon monoxide; PM_{10} = respirable particulate matter with a diameter of 10 microns or less; $PM_{2.5}$ = respirable particulate matter with a diameter of 10 microns or less; CO_{2e} = equivalent global warming potential for greenhouse gases measured relative to carbon dioxide; MT/yr = metric tons per year; PCAPCD = Placer County Air Pollution Control District; NT = no threshold (the air district is in attainment); N/A = not applicable.

* Maximum Daily Emissions shown in Section 2.1, *Overall Construction* , of CalEEMod output files may not match data presented in this table for "Other Equipment Emissions" due to a bug identified in software. Emissions for each phase of construction, as presented in Section 3, *Construction Detail* , of the CalEEMod output filesis accurate and is used to populate this table. These details are shown in the Calculation Spreadsheet in Appendix X along with the communication from CalEEMod Technical Support.

Source: Data modeled by AECOM in 2018.

Detailed Emissions Calculations:

Alternative 1:

	Maximum Daily (pounds per day)					Annual (MT/yr)
	ROG	Nox	CO	PM10	PM2.5	CO2e
Dredging	1.7752	20.6879	16.0712	1.0141	0.6945	96.7514
On-site	1.5113	15.7173	13.7622	0.6483	0.582	70.9015
Off-site	0.2639	4.9706	2.309	0.3658	0.1125	25.8499
Pier Installation	0.8213	5.9613	4.772	0.4206	0.3282	2.2662
On-site	0.711	5.651	3.9814	0.3059	0.2957	1.8345
Off-site	0.1103	0.3103	0.7906	0.1147	0.0325	0.4317

Alternative 2:

	Maximum Daily (pounds per day)					Annual (MT/yr)
	ROG	Nox	CO	PM10	PM2.5	CO2e
Pile Installation	1.3956	11.3971	7.2861	0.5898	0.4858	10.1356
On-site	1.2913	11.2122	6.554	0.4827	0.456	9.371
Off-site	0.1043	0.1849	0.7321	0.1071	0.0298	0.7646
Simultaneous Pile/Pier Installation	3.2534	24.7747	17.649	1.4037	1.2309	24.8667
On-site	3.0836	24.55	16.468	1.2302	1.1831	23.4384
Off-site	0.1698	0.2247	1.181	0.1735	0.0478	1.4283
Pier Installation	2.9784	21.966	15.6499	1.2587	1.1407	15.675
On-site	2.8741	21.7811	14.9178	1.1516	1.1109	14.9104
Off-site	0.1043	0.1849	0.7321	0.1071	0.0298	0.7646

Alternative 3:

	Maximum Daily (pounds per day)					Annual (MT/yr)
	ROG	Nox	CO	PM10	PM2.5	CO2e
Pile Installation	1.3956	11.3971	7.2861	0.5898	0.4858	11.695
On-site	1.2913	11.2122	6.554	0.4827	0.456	10.8127
Off-site	0.1043	0.1849	0.7321	0.1071	0.0298	0.8823
Simultaneous Pile/Pier Installation	3.2534	24.7747	17.649	1.4037	1.2309	27.975
On-site	3.0836	24.55	16.468	1.2302	1.1831	26.3682
Off-site	0.1698	0.2247	1.181	0.1735	0.0478	1.6068
Pier Installation	2.9784	21.966	15.6499	1.2587	1.1407	18.1226
On-site	2.8741	21.7811	14.9178	1.1516	1.1109	17.2403
Off-site	0.1043	0.1849	0.7321	0.1071	0.0298	0.8823

McFerran, Suzanne

From: CalEEMod_TechSupport <CalEEMod_TechSupport@trinityconsultants.com>
Sent: Sunday, November 18, 2018 1:03 PM
To: McFerran, Suzanne
Subject: RE: Max Daily Emissions Error

Suzanne,

Thanks for contacting CalEEMod Tech Support and sharing your input/output files. Looks like it is adding the emissions from the last two construction phases. I can replicate it on my end. It should be a bug. I will report it to our developer team and fix it in the next release. For now, please compute the maximum emissions manually based on section 3 or create three projects for each of the construction phases.

Regards,

Qiguo Jing, PhD, PE
Senior Environmental Software Specialist/Consultant
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HOT TOPICS!

- Sept 18: Register today for the Complimentary Webinar on Representative Meteorological Data for AERMOD: The Applicability of ADJ_U* to Onsite Meteorological Datasets that Include Partial Turbulence.
- Get access to the latest US EPA 18081 executables by upgrading to the new BREEZE AERMOD 8.1, AERMET 7.9 and AERSCREEN 1.9. Learn more!
- Upcoming Air Dispersion and Accidental Release Modeling Workshops available in the US and UK. Register today!

From: McFerran, Suzanne [mailto:suzanne.mcferran@aecom.com]
Sent: Friday, November 16, 2018 5:01 PM
To: CalEEMod_TechSupport <CalEEMod_TechSupport@trinityconsultants.com>
Subject: Max Daily Emissions Error

Hi –

I am getting incorrect max daily emissions with a run I am doing, and cannot figure out why.

No single phase overlaps with another in time, yet the max daily listed in Section 2.1, Overall Construction, lists max daily emissions that are much greater than the max daily emissions of any single phase. Files attached. Your help is appreciated.

Thanks!

Suzanne

Suzanne McFerran
Environmental Planner, Project Manager
M 805.451.8254 (Eastern Standard Time)
Suzanne.McFerran@AECOM.com

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Lake Tahoe Coast Guard Station - Alternative 1

Lake Tahoe Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Annual

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Assume boat lift/dock installation takes 1 week. Would take place after dredging.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Dredging to be conducted by barge-mounted excavator, assumed 500 HP.
2nd excavator to transfer dredged material from barge to conveyor.
Drill rig may be used if needed to break up dense sediments.
Generator set to power conveyor system.

Trips and VMT - Assumes typical work crew of 6
5041 cy dredged material (max) x 40% bulking factor = 7057 cy to haul (max)
Distance from Station to Landfill = ~13.5 miles

On-road Fugitive Dust - Dredged material moisture content increased.

Grading - Dredging footprint = 29,749 sq. ft. (max)

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	6.00
tblConstructionPhase	NumDays	6.00	42.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Annual

tblGrading	AcresOfGrading	0.00	0.68
tblGrading	MaterialExported	0.00	7,057.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	158.00	500.00
tblOffRoadEquipment	HorsePower	84.00	150.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOnRoadDust	MaterialMoistureContent	0.50	30.00
tblTripsAndVMT	HaulingTripLength	20.00	13.50
tblTripsAndVMT	HaulingTripLength	20.00	13.50

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0394	0.4526	0.3491	1.1000e-003	8.2000e-003	0.0141	0.0223	2.1100e-003	0.0134	0.0155	0.0000	98.5780	98.5780	0.0176	0.0000	99.0176
Maximum	**0.0394**	**0.4526**	**0.3491**	**1.1000e-003**	**8.2000e-003**	**0.0141**	**0.0223**	**2.1100e-003**	**0.0134**	**0.0155**	**0.0000**	**98.5780**	**98.5780**	**0.0176**	**0.0000**	**99.0176**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0394	0.4526	0.3491	1.1000e-003	8.2000e-003	0.0141	0.0223	2.1100e-003	0.0134	0.0155	0.0000	98.5780	98.5780	0.0176	0.0000	99.0175
Maximum	**0.0394**	**0.4526**	**0.3491**	**1.1000e-003**	**8.2000e-003**	**0.0141**	**0.0223**	**2.1100e-003**	**0.0134**	**0.0155**	**0.0000**	**98.5780**	**98.5780**	**0.0176**	**0.0000**	**99.0175**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Grading	10/3/2019	11/20/2019	6	42	
2	Boat Lift / Floating Dock Installation	Building Construction	11/21/2019	11/27/2019	6	6	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Bore/Drill Rigs	1	4.00	221	0.50
Dredging	Excavators	1	8.00	158	0.38
Dredging	Excavators	1	8.00	500	0.38
Dredging	Generator Sets	1	8.00	150	0.74
Dredging	Graders	0	0.00	187	0.41
Boat Lift / Floating Dock Installation	Air Compressors	2	3.00	78	0.48
Boat Lift / Floating Dock Installation	Cranes	1	4.00	231	0.29
Boat Lift / Floating Dock Installation	Other Construction Equipment	1	4.00	600	0.70
Boat Lift / Floating Dock Installation	Welders	2	2.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	4	12.00	0.00	882.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT
Boat Lift / Floating Dock Installation	6	12.00	2.00	0.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.8000e-004	0.0000	8.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.3301	0.2890	8.0000e-004		0.0127	0.0127		0.0121	0.0121	0.0000	70.4873	70.4873	0.0166	0.0000	70.9015
Total	**0.0317**	**0.3301**	**0.2890**	**8.0000e-004**	**8.8000e-004**	**0.0127**	**0.0136**	**1.2000e-004**	**0.0121**	**0.0122**	**0.0000**	**70.4873**	**70.4873**	**0.0166**	**0.0000**	**70.9015**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3900e-003	0.1035	0.0327	2.5000e-004	5.0200e-003	3.7000e-004	5.3900e-003	1.3800e-003	3.6000e-004	1.7400e-003	0.0000	23.9177	23.9177	5.5000e-004	0.0000	23.9314
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8100e-003	1.1500e-003	0.0134	2.0000e-005	1.9800e-003	2.0000e-005	2.0000e-003	5.3000e-004	2.0000e-005	5.5000e-004	0.0000	1.9161	1.9161	9.0000e-005	0.0000	1.9184
Total	**5.2000e-003**	**0.1046**	**0.0461**	**2.7000e-004**	**7.0000e-003**	**3.9000e-004**	**7.3900e-003**	**1.9100e-003**	**3.8000e-004**	**2.2900e-003**	**0.0000**	**25.8338**	**25.8338**	**6.4000e-004**	**0.0000**	**25.8499**

3.2 Dredging - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.8000e-004	0.0000	8.8000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.3301	0.2890	8.0000e-004		0.0127	0.0127		0.0121	0.0121	0.0000	70.4873	70.4873	0.0166	0.0000	70.9014
Total	**0.0317**	**0.3301**	**0.2890**	**8.0000e-004**	**8.8000e-004**	**0.0127**	**0.0136**	**1.2000e-004**	**0.0121**	**0.0122**	**0.0000**	**70.4873**	**70.4873**	**0.0166**	**0.0000**	**70.9014**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3900e-003	0.1035	0.0327	2.5000e-004	5.0200e-003	3.7000e-004	5.3900e-003	1.3800e-003	3.6000e-004	1.7400e-003	0.0000	23.9177	23.9177	5.5000e-004	0.0000	23.9314
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8100e-003	1.1500e-003	0.0134	2.0000e-005	1.9800e-003	2.0000e-005	2.0000e-003	5.3000e-004	2.0000e-005	5.5000e-004	0.0000	1.9161	1.9161	9.0000e-005	0.0000	1.9184
Total	**5.2000e-003**	**0.1046**	**0.0461**	**2.7000e-004**	**7.0000e-003**	**3.9000e-004**	**7.3900e-003**	**1.9100e-003**	**3.8000e-004**	**2.2900e-003**	**0.0000**	**25.8338**	**25.8338**	**6.4000e-004**	**0.0000**	**25.8499**

3.3 Boat Lift / Floating Dock Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1300e-003	0.0170	0.0117	2.0000e-005		9.2000e-004	9.2000e-004		8.9000e-004	8.9000e-004	0.0000	1.8256	1.8256	3.6000e-004	0.0000	1.8345
Total	**2.1300e-003**	**0.0170**	**0.0117**	**2.0000e-005**		**9.2000e-004**	**9.2000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.8256**	**1.8256**	**3.6000e-004**	**0.0000**	**1.8345**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	7.5000e-004	3.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1576	0.1576	0.0000	0.0000	0.1577
Worker	2.6000e-004	1.6000e-004	1.9200e-003	0.0000	2.8000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2737	0.2737	1.0000e-005	0.0000	0.2741
Total	**2.9000e-004**	**9.1000e-004**	**2.2500e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.4313**	**0.4313**	**1.0000e-005**	**0.0000**	**0.4317**

3.3 Boat Lift / Floating Dock Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.1300e-003	0.0170	0.0117	2.0000e-005		9.2000e-004	9.2000e-004		8.9000e-004	8.9000e-004	0.0000	1.8256	1.8256	3.6000e-004	0.0000	1.8345
Total	**2.1300e-003**	**0.0170**	**0.0117**	**2.0000e-005**		**9.2000e-004**	**9.2000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**1.8256**	**1.8256**	**3.6000e-004**	**0.0000**	**1.8345**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	7.5000e-004	3.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1576	0.1576	0.0000	0.0000	0.1577
Worker	2.6000e-004	1.6000e-004	1.9200e-003	0.0000	2.8000e-004	0.0000	2.9000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2737	0.2737	1.0000e-005	0.0000	0.2741
Total	**2.9000e-004**	**9.1000e-004**	**2.2500e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.4313**	**0.4313**	**1.0000e-005**	**0.0000**	**0.4317**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**					**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 1

Lake Tahoe Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Winter

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Assume boat lift/dock installation takes 1 week. Would take place after dredging.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Dredging to be conducted by barge-mounted excavator, assumed 500 HP.
2nd excavator to transfer dredged material from barge to conveyor.
Drill rig may be used if needed to break up dense sediments.
Generator set to power conveyor system.

Trips and VMT - Assumes typical work crew of 6
5041 cy dredged material (max) x 40% bulking factor = 7057 cy to haul (max)
Distance from Station to Landfill = ~13.5 miles

On-road Fugitive Dust - Dredged material moisture content increased.

Grading - Dredging footprint = 29,749 sq. ft. (max)

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	6.00
tblConstructionPhase	NumDays	6.00	42.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Winter

tblGrading	AcresOfGrading	0.00	0.68
tblGrading	MaterialExported	0.00	7,057.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	158.00	500.00
tblOffRoadEquipment	HorsePower	84.00	150.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOnRoadDust	MaterialMoistureContent	0.50	30.00
tblTripsAndVMT	HaulingTripLength	20.00	13.50
tblTripsAndVMT	HaulingTripLength	20.00	13.50

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.7752	20.6878	16.0711	0.0507	0.3886	0.6255	1.0141	0.0998	0.5946	0.6944	0.0000	5,037.3495	5,037.3495	0.9044	0.0000	5,059.9588
Maximum	**1.7752**	**20.6878**	**16.0711**	**0.0507**	**0.3886**	**0.6255**	**1.0141**	**0.0998**	**0.5946**	**0.6944**	**0.0000**	**5,037.3495**	**5,037.3495**	**0.9044**	**0.0000**	**5,059.9588**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.7752	20.6878	16.0711	0.0507	0.3886	0.6255	1.0141	0.0998	0.5946	0.6944	0.0000	5,037.3495	5,037.3495	0.9044	0.0000	5,059.9588
Maximum	**1.7752**	**20.6878**	**16.0711**	**0.0507**	**0.3886**	**0.6255**	**1.0141**	**0.0998**	**0.5946**	**0.6944**	**0.0000**	**5,037.3495**	**5,037.3495**	**0.9044**	**0.0000**	**5,059.9588**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Grading	10/3/2019	11/20/2019	6	42	
2	Boat Lift / Floating Dock Installation	Building Construction	11/21/2019	11/27/2019	6	6	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Bore/Drill Rigs	1	4.00	221	0.50
Dredging	Excavators	1	8.00	158	0.38
Dredging	Excavators	1	8.00	500	0.38
Dredging	Generator Sets	1	8.00	150	0.74
Dredging	Graders	0	0.00	187	0.41
Boat Lift / Floating Dock Installation	Air Compressors	2	3.00	78	0.48
Boat Lift / Floating Dock Installation	Cranes	1	4.00	231	0.29
Boat Lift / Floating Dock Installation	Other Construction Equipment	1	4.00	600	0.70
Boat Lift / Floating Dock Installation	Welders	2	2.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	4	12.00	0.00	882.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT
Boat Lift / Floating Dock Installation	6	12.00	2.00	0.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0420	0.0000	0.0420	5.6100e-003	0.0000	5.6100e-003			0.0000			0.0000
Off-Road	1.5113	15.7173	13.7622	0.0379		0.6064	0.6064		0.5763	0.5763		3,699.9520	3,699.9520	0.8695		3,721.6901
Total	**1.5113**	**15.7173**	**13.7622**	**0.0379**	**0.0420**	**0.6064**	**0.6483**	**5.6100e-003**	**0.5763**	**0.5820**		**3,699.9520**	**3,699.9520**	**0.8695**		**3,721.6901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1657	4.9110	1.6355	0.0118	0.2481	0.0182	0.2662	0.0680	0.0174	0.0854		1,237.1096	1,237.1096	0.0298		1,237.8547
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.2639**	**4.9706**	**2.3090**	**0.0128**	**0.3467**	**0.0191**	**0.3658**	**0.0942**	**0.0183**	**0.1125**		**1,337.3975**	**1,337.3975**	**0.0348**		**1,338.2687**

3.2 Dredging - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0420	0.0000	0.0420	5.6100e-003	0.0000	5.6100e-003			0.0000			0.0000
Off-Road	1.5113	15.7173	13.7622	0.0379		0.6064	0.6064		0.5763	0.5763	0.0000	3,699.9520	3,699.9520	0.8695		3,721.6901
Total	**1.5113**	**15.7173**	**13.7622**	**0.0379**	**0.0420**	**0.6064**	**0.6483**	**5.6100e-003**	**0.5763**	**0.5820**	**0.0000**	**3,699.9520**	**3,699.9520**	**0.8695**		**3,721.6901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1657	4.9110	1.6355	0.0118	0.2481	0.0182	0.2662	0.0680	0.0174	0.0854		1,237.1096	1,237.1096	0.0298		1,237.8547
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.2639**	**4.9706**	**2.3090**	**0.0128**	**0.3467**	**0.0191**	**0.3658**	**0.0942**	**0.0183**	**0.1125**		**1,337.3975**	**1,337.3975**	**0.0348**		**1,338.2687**

3.3 Boat Lift / Floating Dock Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7110	5.6510	3.8914	7.1300e-003		0.3059	0.3059		0.2957	0.2957		670.7922	670.7922	0.1315		674.0791
Total	**0.7110**	**5.6510**	**3.8914**	**7.1300e-003**		**0.3059**	**0.3059**		**0.2957**	**0.2957**		**670.7922**	**670.7922**	**0.1315**		**674.0791**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0120	0.2507	0.1171	5.5000e-004	0.0136	1.6100e-003	0.0152	3.9000e-003	1.5400e-003	5.4400e-003		56.9905	56.9905	1.8400e-003		57.0365
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1103**	**0.3103**	**0.7906**	**1.5600e-003**	**0.1121**	**2.5900e-003**	**0.1147**	**0.0301**	**2.4400e-003**	**0.0325**		**157.2783**	**157.2783**	**6.8800e-003**		**157.4505**

3.3 Boat Lift / Floating Dock Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7110	5.6510	3.8914	7.1300e-003		0.3059	0.3059		0.2957	0.2957	0.0000	670.7922	670.7922	0.1315		674.0791
Total	**0.7110**	**5.6510**	**3.8914**	**7.1300e-003**		**0.3059**	**0.3059**		**0.2957**	**0.2957**	**0.0000**	**670.7922**	**670.7922**	**0.1315**		**674.0791**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0120	0.2507	0.1171	5.5000e-004	0.0136	1.6100e-003	0.0152	3.9000e-003	1.5400e-003	5.4400e-003		56.9905	56.9905	1.8400e-003		57.0365
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1103**	**0.3103**	**0.7906**	**1.5600e-003**	**0.1121**	**2.5900e-003**	**0.1147**	**0.0301**	**2.4400e-003**	**0.0325**		**157.2783**	**157.2783**	**6.8800e-003**		**157.4505**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 1

Lake Tahoe Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Summer

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Assume boat lift/dock installation takes 1 week. Would take place after dredging.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Dredging to be conducted by barge-mounted excavator, assumed 500 HP.
2nd excavator to transfer dredged material from barge to conveyor.
Drill rig may be used if needed to break up dense sediments.
Generator set to power conveyor system.

Trips and VMT - Assumes typical work crew of 6
5041 cy dredged material (max) x 40% bulking factor = 7057 cy to haul (max)
Distance from Station to Landfill = ~13.5 miles

On-road Fugitive Dust - Dredged material moisture content increased.

Grading - Dredging footprint = 29,749 sq. ft. (max)

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	6.00
tblConstructionPhase	NumDays	6.00	42.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00

tblGrading	AcresOfGrading	0.00	0.68
tblGrading	MaterialExported	0.00	7,057.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	158.00	500.00
tblOffRoadEquipment	HorsePower	84.00	150.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Dredging
tblOffRoadEquipment	PhaseName		Boat Lift / Floating Dock Installation
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	8.00	2.00
tblOnRoadDust	MaterialMoistureContent	0.50	30.00
tblTripsAndVMT	HaulingTripLength	20.00	13.50
tblTripsAndVMT	HaulingTripLength	20.00	13.50

tblTripsAndVMT	VendorTripNumber	0.00	2.00
tblTripsAndVMT	WorkerTripNumber	10.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.7486	20.6788	15.8046	0.0511	0.3886	0.6247	1.0134	0.0998	0.5939	0.6937	0.0000	5,069.0181	5,069.0181	0.9019	0.0000	5,091.5656
Maximum	**1.7486**	**20.6788**	**15.8046**	**0.0511**	**0.3886**	**0.6247**	**1.0134**	**0.0998**	**0.5939**	**0.6937**	**0.0000**	**5,069.0181**	**5,069.0181**	**0.9019**	**0.0000**	**5,091.5656**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.7486	20.6788	15.8046	0.0511	0.3886	0.6247	1.0134	0.0998	0.5939	0.6937	0.0000	5,069.0181	5,069.0181	0.9019	0.0000	5,091.5656
Maximum	**1.7486**	**20.6788**	**15.8046**	**0.0511**	**0.3886**	**0.6247**	**1.0134**	**0.0998**	**0.5939**	**0.6937**	**0.0000**	**5,069.0181**	**5,069.0181**	**0.9019**	**0.0000**	**5,091.5656**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Dredging	Grading	10/3/2019	11/20/2019	6	42	
2	Boat Lift / Floating Dock Installation	Building Construction	11/21/2019	11/27/2019	6	6	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 1 - Lake Tahoe Air Basin, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Dredging	Bore/Drill Rigs	1	4.00	221	0.50
Dredging	Excavators	1	8.00	158	0.38
Dredging	Excavators	1	8.00	500	0.38
Dredging	Generator Sets	1	8.00	150	0.74
Dredging	Graders	0	0.00	187	0.41
Boat Lift / Floating Dock Installation	Air Compressors	2	3.00	78	0.48
Boat Lift / Floating Dock Installation	Cranes	1	4.00	231	0.29
Boat Lift / Floating Dock Installation	Other Construction Equipment	1	4.00	600	0.70
Boat Lift / Floating Dock Installation	Welders	2	2.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Dredging	4	12.00	0.00	882.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT
Boat Lift / Floating Dock Installation	6	12.00	2.00	0.00	10.80	7.30	13.50	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Dredging - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0420	0.0000	0.0420	5.6100e-003	0.0000	5.6100e-003			0.0000			0.0000
Off-Road	1.5113	15.7173	13.7622	0.0379		0.6064	0.6064		0.5763	0.5763		3,699.9520	3,699.9520	0.8695		3,721.6901
Total	**1.5113**	**15.7173**	**13.7622**	**0.0379**	**0.0420**	**0.6064**	**0.6483**	**5.6100e-003**	**0.5763**	**0.5820**		**3,699.9520**	**3,699.9520**	**0.8695**		**3,721.6901**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1577	4.9133	1.4631	0.0121	0.2481	0.0174	0.2655	0.0680	0.0166	0.0847		1,268.7587	1,268.7587	0.0277		1,269.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.2373**	**4.9615**	**2.0424**	**0.0132**	**0.3467**	**0.0184**	**0.3650**	**0.0942**	**0.0175**	**0.1117**		**1,369.0660**	**1,369.0660**	**0.0324**		**1,369.8755**

3.2 Dredging - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0420	0.0000	0.0420	5.6100e-003	0.0000	5.6100e-003			0.0000			0.0000
Off-Road	1.5113	15.7173	13.7622	0.0379		0.6064	0.6064		0.5763	0.5763	0.0000	3,699.9520	3,699.9520	0.8695		3,721.6901
Total	**1.5113**	**15.7173**	**13.7622**	**0.0379**	**0.0420**	**0.6064**	**0.6483**	**5.6100e-003**	**0.5763**	**0.5820**	**0.0000**	**3,699.9520**	**3,699.9520**	**0.8695**		**3,721.6901**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.1577	4.9133	1.4631	0.0121	0.2481	0.0174	0.2655	0.0680	0.0166	0.0847		1,268.7587	1,268.7587	0.0277		1,269.4504
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.2373**	**4.9615**	**2.0424**	**0.0132**	**0.3467**	**0.0184**	**0.3650**	**0.0942**	**0.0175**	**0.1117**		**1,369.0660**	**1,369.0660**	**0.0324**		**1,369.8755**

3.3 Boat Lift / Floating Dock Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7110	5.6510	3.8914	7.1300e-003		0.3059	0.3059		0.2957	0.2957		670.7922	670.7922	0.1315		674.0791
Total	**0.7110**	**5.6510**	**3.8914**	**7.1300e-003**		**0.3059**	**0.3059**		**0.2957**	**0.2957**		**670.7922**	**670.7922**	**0.1315**		**674.0791**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0112	0.2501	0.0999	5.6000e-004	0.0136	1.5700e-003	0.0151	3.9000e-003	1.5000e-003	5.4000e-003		58.5435	58.5435	1.7000e-003		58.5861
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0908**	**0.2983**	**0.6792**	**1.5700e-003**	**0.1121**	**2.5500e-003**	**0.1147**	**0.0301**	**2.4000e-003**	**0.0325**		**158.8508**	**158.8508**	**6.4100e-003**		**159.0112**

3.3 Boat Lift / Floating Dock Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7110	5.6510	3.8914	7.1300e-003		0.3059	0.3059		0.2957	0.2957	0.0000	670.7922	670.7922	0.1315		674.0791
Total	**0.7110**	**5.6510**	**3.8914**	**7.1300e-003**		**0.3059**	**0.3059**		**0.2957**	**0.2957**	**0.0000**	**670.7922**	**670.7922**	**0.1315**		**674.0791**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0112	0.2501	0.0999	5.6000e-004	0.0136	1.5700e-003	0.0151	3.9000e-003	1.5000e-003	5.4000e-003		58.5435	58.5435	1.7000e-003		58.5861
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0908**	**0.2983**	**0.6792**	**1.5700e-003**	**0.1121**	**2.5500e-003**	**0.1147**	**0.0301**	**2.4000e-003**	**0.0325**		**158.8508**	**158.8508**	**6.4100e-003**		**159.0112**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 2

Lake Tahoe Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Annual

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDays	200.00	16.00
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Annual

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0541	0.4149	0.2893	5.9000e-004	2.6200e-003	0.0205	0.0231	7.0000e-004	0.0197	0.0204	0.0000	50.3934	50.3934	0.0114	0.0000	50.6773
Maximum	**0.0541**	**0.4149**	**0.2893**	**5.9000e-004**	**2.6200e-003**	**0.0205**	**0.0231**	**7.0000e-004**	**0.0197**	**0.0204**	**0.0000**	**50.3934**	**50.3934**	**0.0114**	**0.0000**	**50.6773**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0541	0.4149	0.2893	5.9000e-004	2.6200e-003	0.0205	0.0231	7.0000e-004	0.0197	0.0204	0.0000	50.3933	50.3933	0.0114	0.0000	50.6773
Maximum	**0.0541**	**0.4149**	**0.2893**	**5.9000e-004**	**2.6200e-003**	**0.0205**	**0.0231**	**7.0000e-004**	**0.0197**	**0.0204**	**0.0000**	**50.3933**	**50.3933**	**0.0114**	**0.0000**	**50.6773**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/15/2019	6	13	
2	Simultaneous Pile/Pier Installation	Building Construction	10/16/2019	11/2/2019	6	16	
3	Pier Installation	Building Construction	11/4/2019	11/18/2019	6	13	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3900e-003	0.0729	0.0426	1.1000e-004		3.1400e-003	3.1400e-003		2.9600e-003	2.9600e-003	0.0000	9.3042	9.3042	2.6700e-003	0.0000	9.3710
Total	**8.3900e-003**	**0.0729**	**0.0426**	**1.1000e-004**		**3.1400e-003**	**3.1400e-003**		**2.9600e-003**	**2.9600e-003**	**0.0000**	**9.3042**	**9.3042**	**2.6700e-003**	**0.0000**	**9.3710**

3.2 Pile Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	8.2000e-004	3.6000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1707	0.1707	1.0000e-005	0.0000	0.1708
Worker	5.6000e-004	3.6000e-004	4.1600e-003	1.0000e-005	6.1000e-004	1.0000e-005	6.2000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5938
Total	**6.0000e-004**	**1.1800e-003**	**4.5200e-003**	**1.0000e-005**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.7638**	**0.7638**	**4.0000e-005**	**0.0000**	**0.7646**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.3900e-003	0.0729	0.0426	1.1000e-004		3.1400e-003	3.1400e-003		2.9600e-003	2.9600e-003	0.0000	9.3042	9.3042	2.6700e-003	0.0000	9.3710
Total	**8.3900e-003**	**0.0729**	**0.0426**	**1.1000e-004**		**3.1400e-003**	**3.1400e-003**		**2.9600e-003**	**2.9600e-003**	**0.0000**	**9.3042**	**9.3042**	**2.6700e-003**	**0.0000**	**9.3710**

3.2 Pile Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	8.2000e-004	3.6000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1707	0.1707	1.0000e-005	0.0000	0.1708
Worker	5.6000e-004	3.6000e-004	4.1600e-003	1.0000e-005	6.1000e-004	1.0000e-005	6.2000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5938
Total	**6.0000e-004**	**1.1800e-003**	**4.5200e-003**	**1.0000e-005**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.7638**	**0.7638**	**4.0000e-005**	**0.0000**	**0.7646**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0247	0.1964	0.1317	2.7000e-004		9.8400e-003	9.8400e-003		9.4700e-003	9.4700e-003	0.0000	23.3025	23.3025	5.4400e-003	0.0000	23.4384
Total	**0.0247**	**0.1964**	**0.1317**	**2.7000e-004**		**9.8400e-003**	**9.8400e-003**		**9.4700e-003**	**9.4700e-003**	**0.0000**	**23.3025**	**23.3025**	**5.4400e-003**	**0.0000**	**23.4384**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.0100e-003	4.4000e-004	0.0000	5.0000e-005	1.0000e-005	6.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2101	0.2101	1.0000e-005	0.0000	0.2102
Worker	1.1500e-003	7.3000e-004	8.5300e-003	1.0000e-005	1.2600e-003	1.0000e-005	1.2700e-003	3.3000e-004	1.0000e-005	3.5000e-004	0.0000	1.2166	1.2166	6.0000e-005	0.0000	1.2181
Total	**1.2000e-003**	**1.7400e-003**	**8.9700e-003**	**1.0000e-005**	**1.3100e-003**	**2.0000e-005**	**1.3300e-003**	**3.5000e-004**	**2.0000e-005**	**3.7000e-004**	**0.0000**	**1.4266**	**1.4266**	**7.0000e-005**	**0.0000**	**1.4283**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0247	0.1964	0.1317	2.7000e-004		9.8400e-003	9.8400e-003		9.4700e-003	9.4700e-003	0.0000	23.3025	23.3025	5.4400e-003	0.0000	23.4384
Total	**0.0247**	**0.1964**	**0.1317**	**2.7000e-004**		**9.8400e-003**	**9.8400e-003**		**9.4700e-003**	**9.4700e-003**	**0.0000**	**23.3025**	**23.3025**	**5.4400e-003**	**0.0000**	**23.4384**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.0100e-003	4.4000e-004	0.0000	5.0000e-005	1.0000e-005	6.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2101	0.2101	1.0000e-005	0.0000	0.2102
Worker	1.1500e-003	7.3000e-004	8.5300e-003	1.0000e-005	1.2600e-003	1.0000e-005	1.2700e-003	3.3000e-004	1.0000e-005	3.5000e-004	0.0000	1.2166	1.2166	6.0000e-005	0.0000	1.2181
Total	**1.2000e-003**	**1.7400e-003**	**8.9700e-003**	**1.0000e-005**	**1.3100e-003**	**2.0000e-005**	**1.3300e-003**	**3.5000e-004**	**2.0000e-005**	**3.7000e-004**	**0.0000**	**1.4266**	**1.4266**	**7.0000e-005**	**0.0000**	**1.4283**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0187	0.1416	0.0970	1.8000e-004		7.4900e-003	7.4900e-003		7.2200e-003	7.2200e-003	0.0000	14.8325	14.8325	3.1200e-003	0.0000	14.9104
Total	**0.0187**	**0.1416**	**0.0970**	**1.8000e-004**		**7.4900e-003**	**7.4900e-003**		**7.2200e-003**	**7.2200e-003**	**0.0000**	**14.8325**	**14.8325**	**3.1200e-003**	**0.0000**	**14.9104**

3.4 Pier Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	8.2000e-004	3.6000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1707	0.1707	1.0000e-005	0.0000	0.1708
Worker	5.6000e-004	3.6000e-004	4.1600e-003	1.0000e-005	6.1000e-004	1.0000e-005	6.2000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5938
Total	**6.0000e-004**	**1.1800e-003**	**4.5200e-003**	**1.0000e-005**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.7638**	**0.7638**	**4.0000e-005**	**0.0000**	**0.7646**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0187	0.1416	0.0970	1.8000e-004		7.4900e-003	7.4900e-003		7.2200e-003	7.2200e-003	0.0000	14.8324	14.8324	3.1200e-003	0.0000	14.9104
Total	**0.0187**	**0.1416**	**0.0970**	**1.8000e-004**		**7.4900e-003**	**7.4900e-003**		**7.2200e-003**	**7.2200e-003**	**0.0000**	**14.8324**	**14.8324**	**3.1200e-003**	**0.0000**	**14.9104**

3.4 Pier Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	8.2000e-004	3.6000e-004	0.0000	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	0.0000	2.0000e-005	0.0000	0.1707	0.1707	1.0000e-005	0.0000	0.1708
Worker	5.6000e-004	3.6000e-004	4.1600e-003	1.0000e-005	6.1000e-004	1.0000e-005	6.2000e-004	1.6000e-004	1.0000e-005	1.7000e-004	0.0000	0.5931	0.5931	3.0000e-005	0.0000	0.5938
Total	**6.0000e-004**	**1.1800e-003**	**4.5200e-003**	**1.0000e-005**	**6.5000e-004**	**2.0000e-005**	**6.7000e-004**	**1.7000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.7638**	**0.7638**	**4.0000e-005**	**0.0000**	**0.7646**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 2

Lake Tahoe Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Winter

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDays	200.00	16.00
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Winter

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.2317	46.7407	33.2989	0.0645	0.2764	1.2326	2.6625	0.0736	1.1854	2.3716	0.0000	6,050.6346	6,050.6346	1.2931	0.0000	6,082.9623
Maximum	**6.2317**	**46.7407**	**33.2989**	**0.0645**	**0.2764**	**1.2326**	**2.6625**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,050.6346**	**6,050.6346**	**1.2931**	**0.0000**	**6,082.9623**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.2317	46.7407	33.2989	0.0645	0.2764	1.2326	2.6625	0.0736	1.1854	2.3716	0.0000	6,050.6346	6,050.6346	1.2931	0.0000	6,082.9623
Maximum	**6.2317**	**46.7407**	**33.2989**	**0.0645**	**0.2764**	**1.2326**	**2.6625**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,050.6346**	**6,050.6346**	**1.2931**	**0.0000**	**6,082.9623**

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/15/2019	6	13	
2	Simultaneous Pile/Pier Installation	Building Construction	10/16/2019	11/2/2019	6	16	
3	Pier Installation	Building Construction	11/4/2019	11/18/2019	6	13	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560		1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**		**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.2 Pile Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560	0.0000	1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**	**0.0000**	**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831		3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**		**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.1638	0.0993	1.1225	1.6900e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1464	167.1464	8.4100e-003		167.3566
Total	**0.1698**	**0.2247**	**1.1810**	**1.9600e-003**	**0.1711**	**2.4500e-003**	**0.1735**	**0.0455**	**2.2800e-003**	**0.0478**		**195.6416**	**195.6416**	**9.3300e-003**		**195.8749**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831	0.0000	3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**	**0.0000**	**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.1638	0.0993	1.1225	1.6900e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1464	167.1464	8.4100e-003		167.3566
Total	**0.1698**	**0.2247**	**1.1810**	**1.9600e-003**	**0.1711**	**2.4500e-003**	**0.1735**	**0.0455**	**2.2800e-003**	**0.0478**		**195.6416**	**195.6416**	**9.3300e-003**		**195.8749**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109		2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**		**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.4 Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109	0.0000	2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**	**0.0000**	**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 2

Lake Tahoe Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Summer

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDays	200.00	16.00
tblConstructionPhase	NumDays	200.00	13.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Summer

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.1810	46.7097	33.0306	0.0645	0.2764	1.2326	2.6624	0.0736	1.1854	2.3716	0.0000	6,052.2396	6,052.2396	1.2921	0.0000	6,084.5416
Maximum	**6.1810**	**46.7097**	**33.0306**	**0.0645**	**0.2764**	**1.2326**	**2.6624**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,052.2396**	**6,052.2396**	**1.2921**	**0.0000**	**6,084.5416**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.1810	46.7097	33.0306	0.0645	0.2764	1.2326	2.6624	0.0736	1.1854	2.3716	0.0000	6,052.2396	6,052.2396	1.2921	0.0000	6,084.5416
Maximum	**6.1810**	**46.7097**	**33.0306**	**0.0645**	**0.2764**	**1.2326**	**2.6624**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,052.2396**	**6,052.2396**	**1.2921**	**0.0000**	**6,084.5416**

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/15/2019	6	13	
2	Simultaneous Pile/Pier Installation	Building Construction	10/16/2019	11/2/2019	6	16	
3	Pier Installation	Building Construction	11/4/2019	11/18/2019	6	13	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 2 - Lake Tahoe Air Basin, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560		1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**		**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.2 Pile Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560	0.0000	1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**	**0.0000**	**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831		3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**		**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.1326	0.0804	0.9656	1.6800e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1789	167.1789	7.8500e-003		167.3752
Total	**0.1382**	**0.2054**	**1.0155**	**1.9600e-003**	**0.1711**	**2.4300e-003**	**0.1735**	**0.0455**	**2.2600e-003**	**0.0478**		**196.4506**	**196.4506**	**8.7000e-003**		**196.6682**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831	0.0000	3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**	**0.0000**	**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.1326	0.0804	0.9656	1.6800e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1789	167.1789	7.8500e-003		167.3752
Total	**0.1382**	**0.2054**	**1.0155**	**1.9600e-003**	**0.1711**	**2.4300e-003**	**0.1735**	**0.0455**	**2.2600e-003**	**0.0478**		**196.4506**	**196.4506**	**8.7000e-003**		**196.6682**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109		2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**		**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.4 Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109	0.0000	2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**	**0.0000**	**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 3

Lake Tahoe Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Annual

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDays	200.00	18.00
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Annual

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0617	0.4731	0.3298	6.7000e-004	2.9900e-003	0.0234	0.0264	8.0000e-004	0.0225	0.0232	0.0000	57.4329	57.4329	0.0130	0.0000	57.7565
Maximum	**0.0617**	**0.4731**	**0.3298**	**6.7000e-004**	**2.9900e-003**	**0.0234**	**0.0264**	**8.0000e-004**	**0.0225**	**0.0232**	**0.0000**	**57.4329**	**57.4329**	**0.0130**	**0.0000**	**57.7565**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0617	0.4731	0.3298	6.7000e-004	2.9900e-003	0.0234	0.0264	8.0000e-004	0.0225	0.0232	0.0000	57.4328	57.4328	0.0130	0.0000	57.7565
Maximum	**0.0617**	**0.4731**	**0.3298**	**6.7000e-004**	**2.9900e-003**	**0.0234**	**0.0264**	**8.0000e-004**	**0.0225**	**0.0232**	**0.0000**	**57.4328**	**57.4328**	**0.0130**	**0.0000**	**57.7565**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/17/2019	6	15	
2	Simultaneous Pile/Pier Installation	Building Construction	10/18/2019	11/7/2019	6	18	
3	Pier Installation	Building Construction	11/8/2019	11/25/2019	6	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6800e-003	0.0841	0.0492	1.2000e-004		3.6200e-003	3.6200e-003		3.4200e-003	3.4200e-003	0.0000	10.7357	10.7357	3.0800e-003	0.0000	10.8127
Total	**9.6800e-003**	**0.0841**	**0.0492**	**1.2000e-004**		**3.6200e-003**	**3.6200e-003**		**3.4200e-003**	**3.4200e-003**	**0.0000**	**10.7357**	**10.7357**	**3.0800e-003**	**0.0000**	**10.8127**

3.2 Pile Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	9.4000e-004	4.1000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1969	0.1969	1.0000e-005	0.0000	0.1971
Worker	6.4000e-004	4.1000e-004	4.8000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6843	0.6843	3.0000e-005	0.0000	0.6852
Total	**6.8000e-004**	**1.3500e-003**	**5.2100e-003**	**1.0000e-005**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8813**	**0.8813**	**4.0000e-005**	**0.0000**	**0.8823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.6800e-003	0.0841	0.0492	1.2000e-004		3.6200e-003	3.6200e-003		3.4200e-003	3.4200e-003	0.0000	10.7357	10.7357	3.0800e-003	0.0000	10.8127
Total	**9.6800e-003**	**0.0841**	**0.0492**	**1.2000e-004**		**3.6200e-003**	**3.6200e-003**		**3.4200e-003**	**3.4200e-003**	**0.0000**	**10.7357**	**10.7357**	**3.0800e-003**	**0.0000**	**10.8127**

3.2 Pile Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	9.4000e-004	4.1000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1969	0.1969	1.0000e-005	0.0000	0.1971
Worker	6.4000e-004	4.1000e-004	4.8000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6843	0.6843	3.0000e-005	0.0000	0.6852
Total	**6.8000e-004**	**1.3500e-003**	**5.2100e-003**	**1.0000e-005**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8813**	**0.8813**	**4.0000e-005**	**0.0000**	**0.8823**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0278	0.2210	0.1482	3.1000e-004		0.0111	0.0111		0.0107	0.0107	0.0000	26.2153	26.2153	6.1100e-003	0.0000	26.3682
Total	**0.0278**	**0.2210**	**0.1482**	**3.1000e-004**		**0.0111**	**0.0111**		**0.0107**	**0.0107**	**0.0000**	**26.2153**	**26.2153**	**6.1100e-003**	**0.0000**	**26.3682**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.1300e-003	5.0000e-004	0.0000	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2363	0.2363	1.0000e-005	0.0000	0.2365
Worker	1.2900e-003	8.2000e-004	9.6000e-003	2.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3686	1.3686	7.0000e-005	0.0000	1.3703
Total	**1.3400e-003**	**1.9500e-003**	**0.0101**	**2.0000e-005**	**1.4800e-003**	**2.0000e-005**	**1.5000e-003**	**4.0000e-004**	**2.0000e-005**	**4.1000e-004**	**0.0000**	**1.6050**	**1.6050**	**8.0000e-005**	**0.0000**	**1.6068**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0278	0.2210	0.1482	3.1000e-004		0.0111	0.0111		0.0107	0.0107	0.0000	26.2153	26.2153	6.1100e-003	0.0000	26.3682
Total	**0.0278**	**0.2210**	**0.1482**	**3.1000e-004**		**0.0111**	**0.0111**		**0.0107**	**0.0107**	**0.0000**	**26.2153**	**26.2153**	**6.1100e-003**	**0.0000**	**26.3682**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-005	1.1300e-003	5.0000e-004	0.0000	6.0000e-005	1.0000e-005	7.0000e-005	2.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.2363	0.2363	1.0000e-005	0.0000	0.2365
Worker	1.2900e-003	8.2000e-004	9.6000e-003	2.0000e-005	1.4200e-003	1.0000e-005	1.4300e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.3686	1.3686	7.0000e-005	0.0000	1.3703
Total	**1.3400e-003**	**1.9500e-003**	**0.0101**	**2.0000e-005**	**1.4800e-003**	**2.0000e-005**	**1.5000e-003**	**4.0000e-004**	**2.0000e-005**	**4.1000e-004**	**0.0000**	**1.6050**	**1.6050**	**8.0000e-005**	**0.0000**	**1.6068**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0216	0.1634	0.1119	2.0000e-004		8.6400e-003	8.6400e-003		8.3300e-003	8.3300e-003	0.0000	17.1144	17.1144	3.6000e-003	0.0000	17.2043
Total	**0.0216**	**0.1634**	**0.1119**	**2.0000e-004**		**8.6400e-003**	**8.6400e-003**		**8.3300e-003**	**8.3300e-003**	**0.0000**	**17.1144**	**17.1144**	**3.6000e-003**	**0.0000**	**17.2043**

3.4 Pier Installation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	9.4000e-004	4.1000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1969	0.1969	1.0000e-005	0.0000	0.1971
Worker	6.4000e-004	4.1000e-004	4.8000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6843	0.6843	3.0000e-005	0.0000	0.6852
Total	**6.8000e-004**	**1.3500e-003**	**5.2100e-003**	**1.0000e-005**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8813**	**0.8813**	**4.0000e-005**	**0.0000**	**0.8823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0216	0.1634	0.1119	2.0000e-004		8.6400e-003	8.6400e-003		8.3300e-003	8.3300e-003	0.0000	17.1144	17.1144	3.6000e-003	0.0000	17.2043
Total	**0.0216**	**0.1634**	**0.1119**	**2.0000e-004**		**8.6400e-003**	**8.6400e-003**		**8.3300e-003**	**8.3300e-003**	**0.0000**	**17.1144**	**17.1144**	**3.6000e-003**	**0.0000**	**17.2043**

3.4 Pier Installation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.0000e-005	9.4000e-004	4.1000e-004	0.0000	5.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1969	0.1969	1.0000e-005	0.0000	0.1971
Worker	6.4000e-004	4.1000e-004	4.8000e-003	1.0000e-005	7.1000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6843	0.6843	3.0000e-005	0.0000	0.6852
Total	**6.8000e-004**	**1.3500e-003**	**5.2100e-003**	**1.0000e-005**	**7.6000e-004**	**2.0000e-005**	**7.7000e-004**	**2.0000e-004**	**2.0000e-005**	**2.2000e-004**	**0.0000**	**0.8813**	**0.8813**	**4.0000e-005**	**0.0000**	**0.8823**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 3

Lake Tahoe Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Winter

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDays	200.00	18.00
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Winter

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.2317	46.7407	33.2989	0.0645	0.2764	1.2326	2.6625	0.0736	1.1854	2.3716	0.0000	6,050.6346	6,050.6346	1.2931	0.0000	6,082.9623
Maximum	**6.2317**	**46.7407**	**33.2989**	**0.0645**	**0.2764**	**1.2326**	**2.6625**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,050.6346**	**6,050.6346**	**1.2931**	**0.0000**	**6,082.9623**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.2317	46.7407	33.2989	0.0645	0.2764	1.2326	2.6625	0.0736	1.1854	2.3716	0.0000	6,050.6346	6,050.6346	1.2931	0.0000	6,082.9623
Maximum	**6.2317**	**46.7407**	**33.2989**	**0.0645**	**0.2764**	**1.2326**	**2.6625**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,050.6346**	**6,050.6346**	**1.2931**	**0.0000**	**6,082.9623**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/17/2019	6	15	
2	Simultaneous Pile/Pier Installation	Building Construction	10/18/2019	11/7/2019	6	18	
3	Pier Installation	Building Construction	11/8/2019	11/25/2019	6	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560		1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**		**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.2 Pile Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560	0.0000	1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**	**0.0000**	**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831		3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**		**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.1638	0.0993	1.1225	1.6900e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1464	167.1464	8.4100e-003		167.3566
Total	**0.1698**	**0.2247**	**1.1810**	**1.9600e-003**	**0.1711**	**2.4500e-003**	**0.1735**	**0.0455**	**2.2800e-003**	**0.0478**		**195.6416**	**195.6416**	**9.3300e-003**		**195.8749**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831	0.0000	3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**	**0.0000**	**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.1638	0.0993	1.1225	1.6900e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1464	167.1464	8.4100e-003		167.3566
Total	**0.1698**	**0.2247**	**1.1810**	**1.9600e-003**	**0.1711**	**2.4500e-003**	**0.1735**	**0.0455**	**2.2800e-003**	**0.0478**		**195.6416**	**195.6416**	**9.3300e-003**		**195.8749**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109		2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**		**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

3.4 Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109	0.0000	2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**	**0.0000**	**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	6.0000e-003	0.1254	0.0586	2.7000e-004	6.7700e-003	8.1000e-004	7.5800e-003	1.9500e-003	7.7000e-004	2.7200e-003		28.4952	28.4952	9.2000e-004		28.5182
Worker	0.0983	0.0596	0.6735	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.2878	100.2878	5.0400e-003		100.4140
Total	**0.1043**	**0.1849**	**0.7321**	**1.2800e-003**	**0.1054**	**1.7900e-003**	**0.1071**	**0.0281**	**1.6700e-003**	**0.0298**		**128.7831**	**128.7831**	**5.9600e-003**		**128.9322**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Tahoe Coast Guard Station - Alternative 3

Lake Tahoe Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.00	1000sqft	1.80	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	72
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Summer

Project Characteristics -

Land Use - Upland area is 1.8 acres.

Construction Phase - Per project description regarding construction duration. Overall construction timeline = 8 weeks. Assuming overlap of pile and pier installation.

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig; only 2 piles to be driven; 205 HP Drill Rig may be used if pre-drilling for piles needed
Welder = torch to cut steel pipe piles
Air compressor for pneumatic tools for boat lift installation

Off-road Equipment - Air compressors for pneumatic tools

Off-road Equipment - 600 HP Other Const. Equip. + Crane = Pile Driving Rig
Bore/Drill Rig may be used if piles need pre-drilling
Welders = torches to cut piles to size

Off-road Equipment - 600 HP Other Const. Equip + 1 Crane = Pile Driving Rig
Bore/Drill rig may be used if piles need pre-drilling
Air compressors for pneumatic tools
Welder = torches to cut piles to size

Trips and VMT - Assumes typical work crew of 6 people; 10 when simultaneous work ongoing
Assumes occasional material deliveries.

On-road Fugitive Dust -

Grading -

Vehicle Trips - Zeroed out Operational Vehicle Trips. Only modeling construction emissions.

Consumer Products - Zeroed out Operational consumer product emission factors. Only modeling construction emissions.

Landscape Equipment - Zeroed out Operational landscape equipment use days. Only modeling construction emissions.

Energy Use - Zeroed out Operational energy use. Only modeling construction emissions.

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDays	200.00	18.00
tblConstructionPhase	NumDays	200.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Summer

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	LightingElect	3.45	0.00
tblEnergyUse	NT24E	3.98	0.00
tblEnergyUse	T24E	3.63	0.00
tblEnergyUse	T24NG	19.54	0.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	HorsePower	172.00	600.00
tblOffRoadEquipment	LoadFactor	0.42	0.70
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	PhaseName		Pile Installation
tblOffRoadEquipment	PhaseName		Simultaneous Pile/Pier Installation
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblTripsAndVMT	WorkerTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripNumber	0.00	12.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.1810	46.7097	33.0306	0.0645	0.2764	1.2326	2.6624	0.0736	1.1854	2.3716	0.0000	6,052.2396	6,052.2396	1.2921	0.0000	6,084.5416
Maximum	**6.1810**	**46.7097**	**33.0306**	**0.0645**	**0.2764**	**1.2326**	**2.6624**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,052.2396**	**6,052.2396**	**1.2921**	**0.0000**	**6,084.5416**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	6.1810	46.7097	33.0306	0.0645	0.2764	1.2326	2.6624	0.0736	1.1854	2.3716	0.0000	6,052.2396	6,052.2396	1.2921	0.0000	6,084.5416
Maximum	**6.1810**	**46.7097**	**33.0306**	**0.0645**	**0.2764**	**1.2326**	**2.6624**	**0.0736**	**1.1854**	**2.3716**	**0.0000**	**6,052.2396**	**6,052.2396**	**1.2921**	**0.0000**	**6,084.5416**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Pile Installation	Building Construction	10/1/2019	10/17/2019	6	15	
2	Simultaneous Pile/Pier Installation	Building Construction	10/18/2019	11/7/2019	6	18	
3	Pier Installation	Building Construction	11/8/2019	11/25/2019	6	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Tahoe Coast Guard Station - Alternative 3 - Lake Tahoe Air Basin, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Pile Installation	Bore/Drill Rigs	1	6.00	221	0.50
Pile Installation	Cranes	1	8.00	231	0.29
Pile Installation	Other Construction Equipment	1	8.00	600	0.42
Pile Installation	Welders	2	6.00	46	0.45
Simultaneous Pile/Pier Installation	Air Compressors	2	8.00	78	0.48
Simultaneous Pile/Pier Installation	Bore/Drill Rigs	1	6.00	221	0.50
Simultaneous Pile/Pier Installation	Cranes	2	8.00	231	0.29
Simultaneous Pile/Pier Installation	Other Construction Equipment	1	8.00	600	0.70
Simultaneous Pile/Pier Installation	Welders	4	6.00	46	0.45
Pier Installation	Air Compressors	2	8.00	78	0.48
Pier Installation	Cranes	2	8.00	231	0.29
Pier Installation	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Pile Installation	5	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Simultaneous Pile/Pier Installation	10	20.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pier Installation	7	12.00	1.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Pile Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560		1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**		**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.2 Pile Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2913	11.2122	6.5540	0.0166		0.4827	0.4827		0.4560	0.4560	0.0000	1,577.8721	1,577.8721	0.4528		1,589.1917
Total	**1.2913**	**11.2122**	**6.5540**	**0.0166**		**0.4827**	**0.4827**		**0.4560**	**0.4560**	**0.0000**	**1,577.8721**	**1,577.8721**	**0.4528**		**1,589.1917**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.3 Simultaneous Pile/Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831		3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**		**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.1326	0.0804	0.9656	1.6800e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1789	167.1789	7.8500e-003		167.3752
Total	**0.1382**	**0.2054**	**1.0155**	**1.9600e-003**	**0.1711**	**2.4300e-003**	**0.1735**	**0.0455**	**2.2600e-003**	**0.0478**		**196.4506**	**196.4506**	**8.7000e-003**		**196.6682**

3.3 Simultaneous Pile/Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.0836	24.5500	16.4680	0.0342		1.2302	1.2302		1.1831	1.1831	0.0000	3,210.8274	3,210.8274	0.7489		3,229.5505
Total	**3.0836**	**24.5500**	**16.4680**	**0.0342**		**1.2302**	**1.2302**		**1.1831**	**1.1831**	**0.0000**	**3,210.8274**	**3,210.8274**	**0.7489**		**3,229.5505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.1326	0.0804	0.9656	1.6800e-003	0.1643	1.6400e-003	0.1659	0.0436	1.5100e-003	0.0451		167.1789	167.1789	7.8500e-003		167.3752
Total	**0.1382**	**0.2054**	**1.0155**	**1.9600e-003**	**0.1711**	**2.4300e-003**	**0.1735**	**0.0455**	**2.2600e-003**	**0.0478**		**196.4506**	**196.4506**	**8.7000e-003**		**196.6682**

3.4 Pier Installation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109		2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**		**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

3.4 Pier Installation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.8741	21.7811	14.9178	0.0271		1.1516	1.1516		1.1109	1.1109	0.0000	2,515.3825	2,515.3825	0.5289		2,528.6048
Total	**2.8741**	**21.7811**	**14.9178**	**0.0271**		**1.1516**	**1.1516**		**1.1109**	**1.1109**	**0.0000**	**2,515.3825**	**2,515.3825**	**0.5289**		**2,528.6048**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	5.5900e-003	0.1250	0.0499	2.8000e-004	6.7700e-003	7.9000e-004	7.5600e-003	1.9500e-003	7.5000e-004	2.7000e-003		29.2717	29.2717	8.5000e-004		29.2930
Worker	0.0796	0.0482	0.5793	1.0100e-003	0.0986	9.8000e-004	0.0996	0.0262	9.0000e-004	0.0271		100.3073	100.3073	4.7100e-003		100.4251
Total	**0.0852**	**0.1732**	**0.6293**	**1.2900e-003**	**0.1054**	**1.7700e-003**	**0.1071**	**0.0281**	**1.6500e-003**	**0.0298**		**129.5791**	**129.5791**	**5.5600e-003**		**129.7182**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.466081	0.042504	0.233260	0.143787	0.043435	0.008764	0.022841	0.025051	0.003020	0.001351	0.007290	0.000826	0.001789

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
General Office Building	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Appendix G

Hydroacoustic Assessment

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Memorandum

To: Amanda Velasquez, US Coast Guard, CEU Oakland

From: Issa Mahmodi, Cynthia M. Le Doux-Bloom, and Justin Westrum

Date: February 29, 2016

Subject: Underwater Sound Level Prediction - CG Station Lake Tahoe Pier Project

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INTRODUCTION

This technical memorandum presents results of predicted underwater sound pressure levels at the U.S. Coast Guard (CG) Station Lake Tahoe (Station) pier during proposed construction activities for the Year-Round Mooring Project. The Station is located on the northwest shore of Lake Tahoe at 2500 Lake Forest Road, Tahoe City, California. The Project involves proposed modifications at the Station pier that would provide year-round mooring capabilities. The CG requires year-round, 24-hour, immediate access to the Station's rapid response boats in order to provide essential emergency search and rescue, law enforcement, and marine safety services to the boating public of Lake Tahoe. Cyclical droughts and seasonal low water levels at the current pier do not allow for on-site mooring of the CG's rapid response boats year-round. When water levels are low (generally October through January), rapid response boats must be moored at alternate sites, which increases response times and creates security issues. The CG is considering three action alternatives[1] to achieve year-round mooring capabilities at the Station, including:

- Alternative 1: Dredging at the Existing Pier
- Alternative 2: 350-Foot Dogleg Pier Extension with Dolphin Piles
- Alternative 3: 450-Foot Straight Pier Extension with Dolphin Piles

The hydroacoustic analysis discusses the predicted sound levels that would be generated during proposed Project construction activities and the potential for Project noise to impact special-status fish species. The analysis primarily focuses on noise from pile driving, since that is expected to be the construction activity with the greatest potential for causing noise impacts. The pile driving analysis is based on the pile size and material, and includes an estimate of the rate at which anticipated noise levels would decrease with distance, with and without attenuation methods such as cushion blocks and bubble curtains. The analysis also discusses other potential Project noise-producing activities including dredging and pile drilling.

The three action alternatives are designed to provide a lake bottom elevation of approximately 6,215 feet (ft), Lake Tahoe Datum, at the pier head. Alternative 1 (Dredging at Existing Pier) would involve mechanical

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[1] The CG is also analyzing a "no action" alternative in the Project's Environmental Assessment and other impact assessment documents. Under the no action alternative, no modifications to the existing pier would be made and operations at the Station would continue as they do currently. The no action alternative would have no noise impacts, and so it is not discussed further in this document.

dredging as well as the installation of two 10-inch steel h-piles for a new boat lift. Under Alternative 2 (350-Foot Dogleg Extension with Dolphin Piles), a total of 24 steel pipe piles (10-inch diameter) would be installed. Under Alternative 3 (450-Foot Straight Extension with Dolphin Piles), a total of 28 steel pipe piles (10-inch diameter) would be installed. The following analyses are based on underwater sound data compiled by Caltrans and shown in Table 1. The sound levels for 12-inch steel pipe piles were used in this analysis, as data for 10-inch diameter piles were not available. These levels result in a conservative analysis, as the sound levels for 12-inch diameter piles would be slightly higher than those of 10-inch diameter steel pipe or h-piles.

Table 1. Summary of Near-Source (10-Meter) Un-attenuated Sound Pressures for In-Water Pile Driving of 12-inch Steel Pipe Piles

Pile Driving Method	Average Sound Pressure[1] (Decibels [dB])		
	Peak	SEL	RMS
Impact Hammer	192	167[2]	177
Vibratory Driver	171	155[3]	155[4]

Notes:
RMS = root mean square (of instantaneous pressures measured over a fixed time period [e.g., 1 second])
SEL = sound exposure level
[1] Assuming a water depth of <5 meters.
[2] Caltrans 2012 does not provide an SEL for impact driving of 12-inch steel piles, but it is assumed to be 167 based on NMS guidance that, if no direct measurement is available, then SEL = peak pressure minus 15.
[3] SEL for 1 second of continuous driving
[4] Impulse level (35 millisecond average)
Source: Caltrans 2012, Tables I.2-1 and I.2-2; NMFS 2009.

APPLICABLE NOISE CRITERIA

On July 8, 2008, the Fisheries Hydroacoustic Working Group (FHWG)—whose members include the National Marine Fisheries Service (NMFS); California, Washington, and Oregon Departments of Transportation; California Department of Fish and Wildlife; US Fish and Wildlife (USFWS); and US Federal Highways Administration —issued an agreement on interim threshold criteria for the effects of high-intensity sound from pile driving on fish species listed as threatened or endangered under the federal or state Endangered Species Acts ("listed species"). Although these criteria are not formal regulatory standards, they generally are accepted as viable criteria for underwater noise effects on listed fish species. The established FHWG thresholds are summarized in Table 2.

Table 2. Sound Level Threshold Summary

Taxa	Sound Threshold Level (dB)	Effect
Fish ≥2 grams	206 peak, 187 cumulative (SEL)	Acute Barotraumas
Fish <2 grams	206 peak, 183 cumulative (SEL)	Acute Barotraumas
All fish	150 (RMS)	Avoidance Behavior
Source: FHWG 2008, NMFS 2009		

The FHWG's threshold criteria for impact pile driving are 206 dB peak and 187 dB cumulative SEL for fish weighing 2 grams or more, and 206 dB peak and 183 dB cumulative SEL for fish less than 2 grams (FHWG 2008). There are no formally agreed upon criteria for vibratory pile driving, but the continuous non-impulsive sound generated by vibratory driving is generally considered less injurious to fish than impact driving. Caltrans suggests 220 dB cumulative SEL as a "reasonable starting point for identifying a threshold for vibratory driving" (Caltrans 2009), and more recent work by Hastings (2010) recommends 234 dB cumulative SEL as a vibratory driving threshold for species such as trout that are hearing generalists. To provide a conservative assessment, 220 dB cumulative SEL is used in the following analysis as the threshold for vibratory driving. There are currently no formal sound thresholds for other underwater construction activities, such as dredging, drilling, or jetting.

The FHWG has determined that noise at or above the 206 dB peak level can cause barotrauma (i.e., bloat and internal organ damage caused by pressure change to auditory tissues, the swim bladder, or other sensitive organs). Noise levels above the cumulative SEL thresholds may cause temporary hearing threshold shifts in fish. Behavioral effects are not addressed by the FHWG criteria but NMFS and USFWS consider 150 dB RMS as the threshold for potential adverse behavioral effects on federally-listed fish species (NMFS 2009). Behavioral effects may include fleeing and the temporary cessation of feeding or spawning behaviors. Mitigation is not typically required for sound levels that are above the behavioral effect threshold but below the FHWG thresholds (Caltrans 2009).

Note that the FHWG and NMFS criteria only apply to potential noise effects on listed species. The only listed fish species with some potential to occur in the Project area is the Lahontan cutthroat trout (*Oncorhynchus clarkia henshawi*), which is listed as endangered under the federal Endangered Species Act. The Lahontan cutthroat trout is expected to have only low potential to be present in the Project vicinity because wild populations of the species were extirpated from Lake Tahoe in the 1930s, and there are currently no known self-sustaining populations of the species in the Project vicinity. However, there have been attempts in recent years to stock Lahontan cutthroat trout into the southeastern portion of Lake Tahoe for recreational purposes, and so the USFWS has requested that potential impacts to the species be analyzed for the proposed Project. Juvenile Lahontan cutthroat trout are expected to be greater than 2 grams in mass during the proposed in-water work window (October to May), and so 187 dB is used as the cumulative SEL threshold for impact pile driving in this analysis.

PILE DRIVING ANALYSIS ASSUMPTIONS AND METHODOLOGY

Generally, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used to complete pile installation.

Vibratory pile driving involves continuous operation of a vibratory hammer to seat the pile. The piles are hoisted into position with a crane and stabilized by a deck-mounted jig, or template, on the working barge. The vibratory hammer, mounted on the crane, then attaches to the pile. The pile is then driven until the pile is at a sufficient depth to no longer require the support of the jig. The hammer then pauses for the jig to be removed and then operates continuously until the pile is driven to the final depth.

In the case of impact pile driving, an impact hammer installs piles by striking them from above, driving them into the sediment from the downward force of the hammer on the top of the pile. Impact hammers have a

lead that holds the hammer and pile in place while a heavy rod moves up and down, striking the surface of the pile. Impact hammers are typically either hydraulic or diesel-powered. Pile caps and/or cushion blocks are often used with impact hammers to protect the top of the pile and reduce noise.

Due to the variety of substrate types present at the Project site, techniques such as pre-drilling or jetting may also be required during pile installation. It may be necessary to pre-drill holes to facilitate pile driving if substrates are unusually stiff or hard. In that case, holes would be drilled slightly smaller than the diameter and depth of the pile. The pile is then inserted, and the weight of the hammer forces the pile down near the bottom of the drill hole, displacing any slurry. The pile is then driven to the required depth.

Jetting is a method of forcing water and/or compressed air around and under a pile to loosen and displace the surrounding soils. Jetting is particularly useful in soils which will settle firmly around the pile. Sands, silty sands, and some gravels provide conditions suitable for jetting, as driving through these materials in a dense state results in pile damage. Jetting is performed by inserting the jet pipe to the desired depth and forcing water through the pile to loosen the soil, then placing the pile into the jetted hole and driving the pile to its resistance. If the pile freezes before the final embedment, jetting can be resumed. Typically, the pile is placed into position with the hammer resting on it to give increased weight, and then the jet is operated so that the soil is loosened and displaced evenly from under the tip of the pile. Both pile drilling and jetting can reduce the sound levels associated with pile installation by reducing the number of strikes needed to seat the pile.

Based on Caltrans sound levels (Table 1 above), average sound levels for vibratory pile driving method were assumed to be 171 dB Peak, 155 dB SEL, and 155 dB RMS. For impact pile driving method, the average sound levels were assumed to be 192 dB Peak, 167 dB SEL, and 177 dB RMS.

The practical spreading loss model, which is recommended by NMFS, was used to calculate the attenuation of underwater sound over distance. The basic equation used for the practical spreading loss model is:

$TL = 15 * \log (D_1/D_2)$

Where:

- TL = Transmission Loss - the change in sound pressure level between D_1 and D_2;
- D_1 = The distance at which the targeted transmission loss occurs; and,
- D_2 = The reference distance from which transmission loss is calculated (10 meters is used in this analysis as the default reference distance for assessing impacts, following the convention used by Caltrans and NMFS).

The analysis below includes estimates for sound levels during pile driving with the use of a wood cushion block (for impact driving) and/or air bubble curtains (for both impact and vibratory driving) as potential attenuation methods. Cushion blocks consist of blocks of material placed atop a pile during impact driving to minimize noise and prevent damage to the pile. Materials typically used for cushion blocks include wood, nylon, and micarta. According to data reported in the Caltrans Guidance Manual (Caltrans 2009), wood cushion blocks provide 11 to 26 dB of attenuation. To provide a conservative assessment, the analysis below assumes that a wood cushion block would provide attenuation at the lower end of the reported range (11 dB).

Air bubble curtains infuse the area surrounding the pile with air bubbles, creating a screen that inhibits the propagation of sound from the pile. The effectiveness of air bubble curtains in reducing sound pressure

waves is varied. The available data generally indicate that an air bubble curtain used on a steel or concrete pile with a maximum cross-section dimension of 24 inches or less will provide about 5 dB of noise reduction (Caltrans 2009). Therefore, for the purpose of this analysis, noise levels attenuated by bubble curtains were assumed to be 5 dB less than the un-attenuated noise levels.

PILE DRIVING ANALYSIS RESULTS

Based on the above assumptions, sound pressure and sound energy levels were predicted for Project pile driving and are summarized below in Table 3.

As shown in Table 3, the peak sound pressure levels at a 10 meter distance for both vibratory and impact pile driving are below the FHWG's 206 dB threshold. For the vibratory method, which will be used as the preferred method for the Project, the estimated cumulative SELs for both the attenuated and un-attenuated conditions for all Alternatives are below the 220 dB threshold even immediately adjacent to the pile, using conservative assumptions about the required daily duration of pile driving. The range that vibratory pile driving may affect fish behavior is 22 meters with no attenuation and 10 meters with the use of a bubble curtain.

For un-attenuated impact pile driving, more than approximately 90 strikes per day would exceed the 187-dB cumulative SEL threshold. With attenuation, the maximum number of strikes that results in a cumulative SEL below the threshold increases to 1,120 strikes per day if a wood cushion block is used and 3,550 strikes per day if both a cushion block and bubble curtains are used. Since up to 100 strikes per day may occur during pile driving for Alternative 1, and up to 500 strikes per day for Alternatives 2 and 3, the use of a cushion block will be incorporated as a required best management practice (BMP) for the Project construction contractor, in order to ensure that sound pressure levels stay below the cumulative SEL threshold. Use of a bubble curtain would not be required for sound pressure levels to stay before the threshold.

With the use of a cushion block, the range that impact pile driving may affect fish behavior is 117 meters. Pile driving would only take place temporarily during the construction period, which would occur outside of the fish spawning season per the proposed Project BMPs, and therefore pile driving would not affect spawning behavior in the Project vicinity. Also note that pre-drilling and jetting may be used to further reduce the noise from impact pile driving, though no specific data were available to indicate the amount of noise reduction expected with the use of these techniques.

Alternative 1 would have considerably less potential for behavioral impacts due to increased sound pressure levels from pile driving than the pier construction alternatives, since only two piles will be driven. Both Alternative 2 and 3 are expected to have similar potential for hydroacoustic impacts, though Alternative 3 would have affects over a slightly longer period, since it involves the driving of 4 more piles than Alternative 2.

ANALYSIS OF OTHER POTENTIAL CONSTRUCTION ACTIVITIES

Although pile driving is expected to be the construction activity with the greatest potential for causing noise impacts, a wide range of other Project construction activities could also cause elevated underwater sound levels, including dredging, pile drilling, jetting, and other associated activities. Relatively little information is available on the sound levels produced by underwater construction activities other than pile driving, but a review of the available literature found several studies that can be used to assess potential sound levels from dredging and pile pre-drilling. The US Army Corps of Engineers' Dredging Operations and Environmental

Table 3. Predicted Underwater Sound Levels for Pile Driving (for 12-inch diameter steel pipe piles)

Pile Driving Method	Attenuation	Assumed Average Sound Pressure Levels[1] (dB)			Maximum # of Seconds/Strikes per Day Not Exceeding Cumulative SEL Threshold[2]	Maximum # of Strikes/ Seconds per Day Expected during Project Construction[3]		Distance (meters) to threshold[4]					
								Onset of Physical Injury[5]				Behavioral Changes (150 dB RMS)	
								Peak (206 dB)		Cumulative SEL[2]			
		Peak	SEL	RMS		Alt 1	Alts 2&3	Alt 1	Alts 2 & 3	Alt 1	Alts 2 & 3	Alt 1	Alts 2 & 3
Vibratory	Un-attenuated	171	155	155	2,818,380	7,200	32,400	0	0	0	0	22	22
	w/ Bubble Curtain	166	150	150	8,912,510	7,200	32,400	0	0	0	0	10	10
Impact	Un-attenuated	192	167	177	90	100	500	0	1	**10**	**29**	631	631
	w/ Cushion Block	181	156	166	1,120	100	500	0	0	2	5	117	117
	w/ Cushion Block & Bubble Curtain	176	151	161	3,550	100	500	0	0	1	3	54	54

Notes:

[1] For 1 strike (impact driving) or 1 second (vibratory driving) at 10 meters from the pile assuming a water depth less than 5 meters. Based on Tables I.2-1 and I.2-2 in Caltrans 2012.

[2] Threshold is 187 dB for impact driving or 220 dB for vibratory driving, based on FHWG 2008 and Caltrans 2009.

[3] Conservatively assumes: 1) for Alternative 1, that installation of each of the two total piles would require up to one hour of vibratory driving and up to 50 strikes for impact driving, and 2) for Alternatives 2 and 3, that up to nine hours of continuous vibratory pile driving could occur and, for impact pile driving, that a maximum of 10 piles would be installed per day and would require 50 strikes per pile. The actual number of strikes/seconds per day would likely be less than assumed in these conservative scenarios.

[4] Assuming the expected maximum number of strikes/seconds per day shown in previous column.

[5] Potentially significant impacts are judged to be present if the distance to threshold is 10 meters or greater, and are indicated in **bold text**.

Source: Underwater sound pressure level calculations conducted by AEOM using the NMFS Underwater Noise Calculation Spreadsheet (NMFS 2009) and the practical spreading loss model, as applicable.

..

Research Program (DOER) has issued sound level data for a variety of dredging techniques and scenarios. The dredging proposed under Project Alternative 1 would be conducted by a barge-mounted excavator (i.e., backhoe) dredge and would include the dredging of soft sediments and some rock and gravel. Therefore, the data from the DOER white paper "*Characterization of Underwater Sounds Produced by a Backhoe Dredge Excavating Rock and Gravel*" (Reine et al. 2012) was used as a conservative approximation for the sound levels potentially occurring during Project dredging. Note, however, that the sound levels from Project dredging are likely to be lower than those reported in the DOER paper, since the size of the dredge used for the Project is likely to be smaller than large-scale dredge used in the DOER study and the majority of sediments to be dredged at the Project site are composed of clay, silt and sand, rather than rock and gravel. Table 4 provides a summary of the data from the DOER paper.

Table 4. Sound Levels Associated with Excavator Dredging Activities

Noise Source	Recorded Sound Levels		Calculated Sound Levels at 10 meters[1] (dB)		
	Peak (dB)	Distance (meters)	Peak	SEL	RMS
Engine/Generator	134.0	135	151.0	126.0	136.0
Bottom Grabs	148.8	110	164.4	139.4	149.4
Hydraulic Ram	137.5	60	149.2	124.2	134.2
Barge Loading	139.5	60	151.2	126.2	136.2
Spud Anchoring[2]	137.6	220	157.7	132.7	142.7
Spud Walking[2]	136.6	75	149.7	124.7	134.7

Notes:
[1] Sound levels were back-calculated from the recorded sound levels using the practical spreading loss model and guidance for determining SEL and RMS from NMFS 2009.
[2] Spuds are temporary piles used to anchor and move the dredge barge. Anchor spuds are lowered into the sediment to keep the barge in place during dredging. Walking spuds are used to move the dredge around the dredging area as dredging progresses.
Source: Reine et al. 2012

The highest sound levels shown in Table 4 are for bottom grab sounds associated with the excavator bucket removing sediment from the bottom of the water body. The sound levels for bottom grabs are expected to be 164.4 dB peak and 139.4 SEL at a distance of 10 meters. These levels are substantially less than those expected during pile driving (up to 192 dB peak and 167 dB cumulative SEL), and so Project Alternative 1 is expected to have lower potential for noise impacts than Alternatives 2 or 3. The sound levels for bottom grabs and all other dredging activities in Table 4 are below the threshold for behavioral disturbance (150 dB RMS) and also below the level that NMFS considers "effective quiet". NMFS' concept of effective quiet establishes a limit on the maximum distance from a noise producing activity where injury to fishes is expected – the distance at which the single-event SEL attenuates to 150 dB SEL. Since all of the dredging-related sources in Table 4 have RMS sound levels and SELs of below the 150-dB threshold, noise from dredging activities is not expected to have significant effects on fish.

For pile pre-drilling activities, Dazey et al. (2012) provide a collection of sound level data for both auger and pneumatic percussion drilling methods in a shallow-water marine environment. The average sound pressure level reported for drilling activities was 154.2 dB RMS at a distance of 1 meter, which translates to approximately 139.2 dB RMS at 10 meters using the practical spreading loss model and an SEL at 10 meters of approximately 129.2 dB using NMFS' recommended conversion factor. Since these levels are

below the thresholds for behavioral disturbance and effective quiet, noise from pile drilling activities is not expected to have significant effects on fish.

No sound level data was available for pile jetting, but jetting is often used as a method for reducing the noise impacts of pile driving and is not expected to cause significant noise impacts in and of itself.

CONCLUSION

The predicted underwater noise levels of Project activities discussed above demonstrate that the only construction scenario that is expected to exceed the applicable thresholds is un-attenuated impact pile driving. Therefore, vibratory pile driving will be used as the preferred method for the Project unless an impact hammer is required due to substrate type. With implementation of these BMPs, none of the Project Alternatives has the potential to physically injure or kill fish as a result of hydroacoustic effects. Potential behavioral effects also would be reduced by use of the proposed BMPs, as well as avoiding work during the spawning season, and these behavioral effects would be localized, short-term, and less than significant.

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Appendix H

Prime Fish Habitat Mitigation and Monitoring Plan

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Prepared for:
US Coast Guard
CEU Oakland
Oakland, CA

Prepared by:
AECOM
San Francisco, CA
March 2016

Coast Guard Station Lake Tahoe Year-Round Mooring Project Prime Fish Habitat Mitigation, Monitoring, and Reporting Plan

Contents

List of Tables

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List of Acronyms and Abbreviations

BMPs	Best Management Practices
CDFW	California Department of Fish and Wildlife
CG	United States Coast Guard
ft	foot
lb	pound
LRWQCB	Lahontan Regional Water Quality Control Board
LTD	Lake Tahoe Datum
mg/L	milligrams per liter
mm	millimeter
PFH	Prime Fish Habitat
sq ft	square foot
Station	United States Coast Guard Station Lake Tahoe
TN	total nitrogen
TP	total phosphorus
TRPA	Tahoe Regional Planning Agency
U.S.	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

1.0 Introduction

The United States (U.S.) Coast Guard (CG) is proposing a project that will allow them to consistently moor their response boats at Station Lake Tahoe (Station) year-round (Project). The Station is located at 2500 Lake Forest Road, Tahoe City, California, on the northwest shore of Lake Tahoe in Placer County (*Figure 1-1*). The existing pier is 312 (feet) ft long and extends to a lake-bottom elevation of approximately 6,220 ft, Lake Tahoe Datum (LTD). The pier is meant to provide access to the Station's two rapid response boats and ancillary equipment. However, due to cyclical droughts and seasonal low water levels at Lake Tahoe, water depths at the existing pier head are not sufficient for the CG to consistently keep their boats at the Station.

This Prime Fish Habitat (PFH) Mitigation, Monitoring, and Reporting Plan has been prepared to outline the proposed measures that the CG would implement to mitigate for the Project's impacts on PFH, as designated by the Tahoe Regional Planning Agency (TRPA), occurring in the Project Area. This Plan also describes measures that would be implemented to monitor and report on the effectiveness of the proposed mitigation.

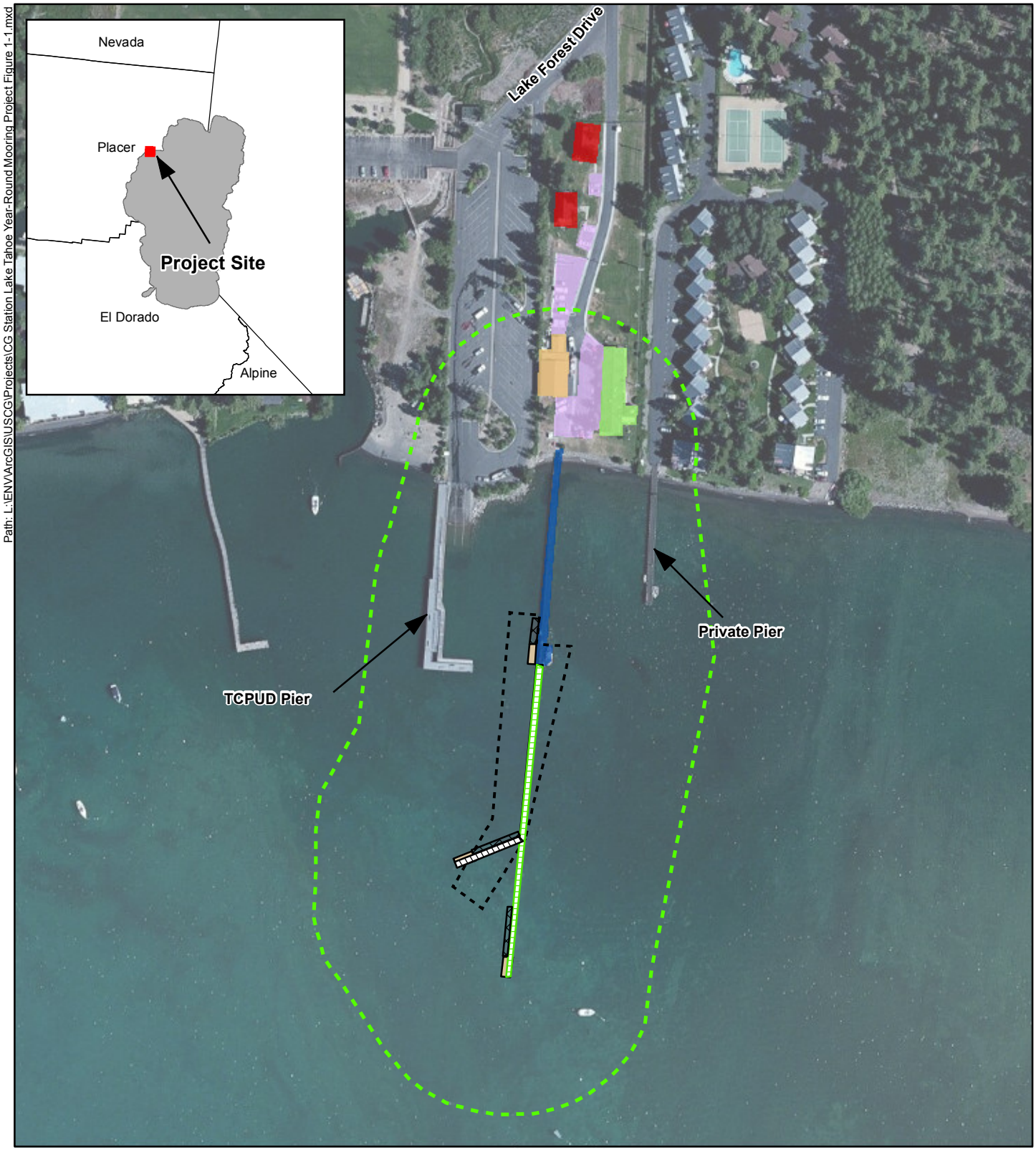
1.1 Project Purpose and Need

The purpose of the proposed Project is to provide mooring capabilities at the Station pier at a suitable depth so that the CG's rapid response boats can consistently moor there year round, including in drought conditions. The proposed Project would improve the CG's ability to protect and serve the boating public and agencies that use Lake Tahoe and is in furtherance of the CG's mission of protecting public safety and security. The purpose of the Project is also to enhance the CG's ability to respond to incidents on Lake Tahoe that involve the discharge, or potential discharge, of petroleum products and/or other deleterious materials and to thereby help protect the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe.

The CG needs year-round, 24-hour, immediate access to the Station's rapid response boats in order to provide essential emergency search and rescue, law enforcement, commercial and recreational boating safety, and environmental protection services to the boating public and agencies that use Lake Tahoe. Under current conditions, when water levels are low (generally October through January, and year round during drought conditions), rapid response boats must be moored at alternate sites, which increases response times and creates safety and security issues. Presently, CG crews must keep their response boats at the Tahoe City Marina and drive from the Station to the Marina to access their boats after receiving a call for assistance on the lake. This adds a minimum of 15 to 20 minutes of loading, travel, and unloading time each time the CG responds to an incident on the lake, and up to 40 minutes during the height of the tourist traffic seasons. In addition to securing an alternative mooring site at the Tahoe City Marina, The CG has attempted to deal with current drought conditions by procuring special-purpose vessels with a shallower draft and installing emergency lights on their response vehicle to minimize traffic delays in reaching their boats, but these measures have not fully eliminated delays in response times, and, in the long term, the CG will require year-round mooring capabilities at the Station pier to continue to effectively fulfill their missions.

The Station responds to an average of over 150 incidents on Lake Tahoe each year. When the CG is required to moor their response boats away from the Station, it is often difficult or impossible to meet the CG's search and rescue standards, which require the CG boat to be underway in less than 30 minutes after a distress call is received. The survival rate of a person in the water decreases as temperatures decrease, and rapid response time can be vital to saving a person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency on the lake that has staff and equipment available to respond to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

In addition to protecting public safety, consistent rapid access to the CG's response boats is needed to allow the CG to more effectively provide spill response, search and rescue, boating safety, and law enforcement



0 200 400
Feet

Alternative 1 Dredging Footprint
Alternative 2 Dogleg Extension
Alternative 3 Straight Extension
Project Area (200-ft Buffer)
TCPUD = Tahoe City Public Utility District

USCG Facilities
Existing Pier
Garage
Housing
Offices
Parking

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 1-1
Project Site Location

services that help protect the water quality and clarity, shorezone conditions, and other environmental values of Lake Tahoe. The CG serves as a first responder for damaged and submerged vessels which could release fuel and other deleterious materials to the lake. Spill response equipment is kept at the Station, and the Station staff is trained in spill response procedures. Larger recreational vessels on Lake Tahoe can contain more than 350 gallons of fuel (up to 2,000 gallons for commercial vessels) as well as other deleterious materials which could be discharged to Lake Tahoe during a boating incident, and rapid response to such incidents can be crucial in avoiding or limiting the spread of a spill. Through their role in boating safety and law enforcement, the CG also helps prevent incidents from occurring in the first place. The CG also shares responsibility for coordinating spill response on the lake with the U.S. Environmental Protection Agency (USEPA) and State and local emergency response agencies. Ideally, the Station would be able to serve as an Incident Command Post in the event of a larger incident and has sufficient road access and communications and meeting facilities to do so; however, the current lack of access to the CG pier could hinder the Station's ability to serve in such a role.

In summary, the purpose of the proposed Project is to provide sufficient depth at the Station pier so that the CG can moor their response boats there on a consistent basis, which is needed so that the CG can effectively protect public safety and security and the environmental values of Lake Tahoe.

1.2 Project Alternatives

The CG is considering three alternatives to achieve year-round mooring capabilities at the Station, including a dredging alternative and two pier extension alternatives. These alternatives are designed to provide a lake-bottom elevation of approximately 6,215 ft, LTD, at the pier head. This would give a water depth of approximately 5 ft under conditions equivalent to the lowest recorded lake level (6,220.2 ft in November 1992; United States Geological Survey 2016). Each of the alternatives is described briefly as follows:

Alternative 1: Dredging at Existing Pier

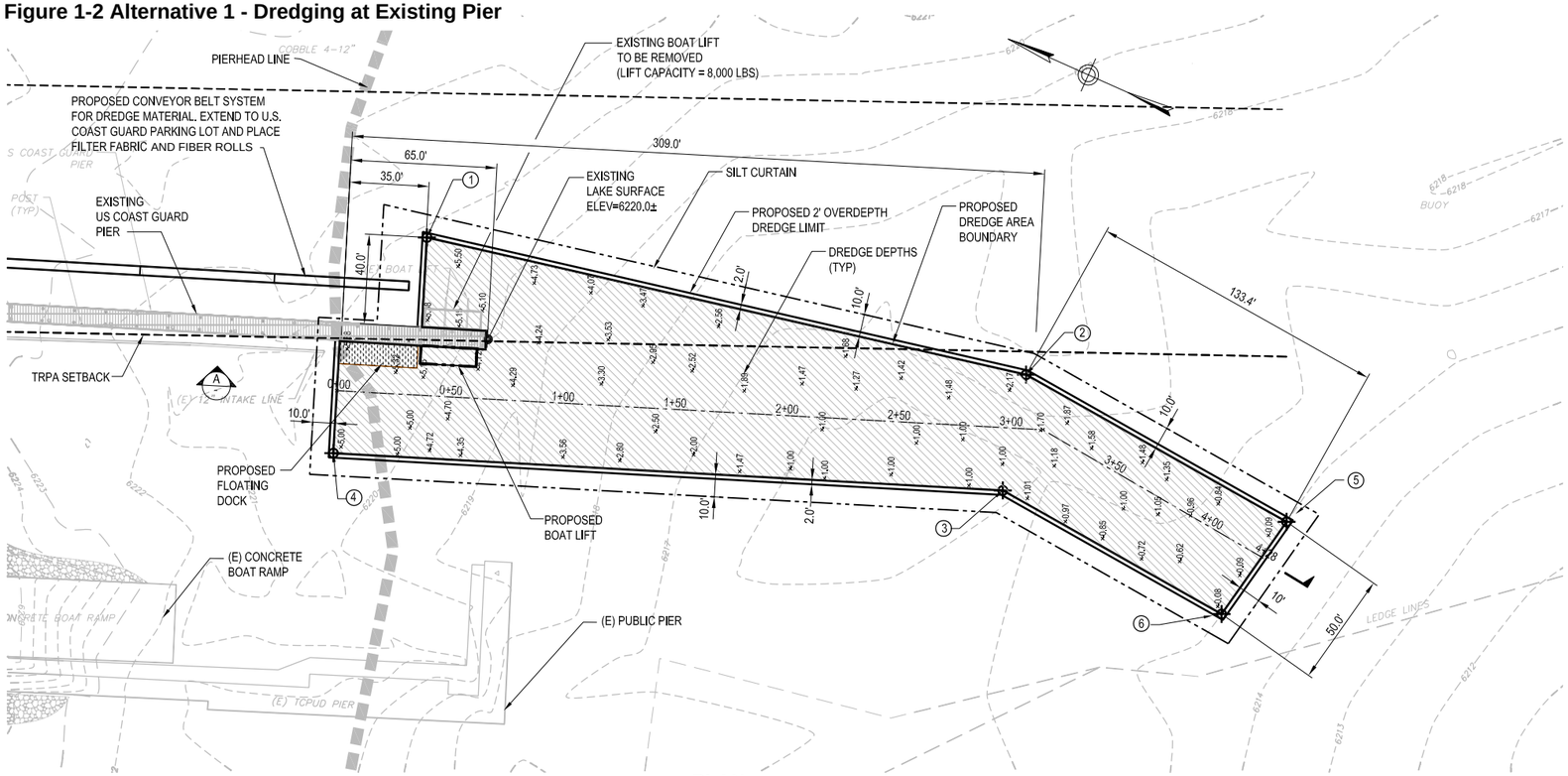
Alternative 1 consists of dredging a channel to allow access to the existing pier during low-water conditions (*Figure 1-2*). The channel would be dredged to an elevation of 6,215 ft, LTD, with 2 ft of overdepth allowance. The proposed channel would cover an area of approximately 27,816 to 29,749 square feet (sq ft), and approximately 2,656 to 5,041 cubic yards of material would be removed from the lakebed (upper limits include dredging of full overdepth allowance as a conservative case).

The dredging would be conducted with a barge-mounted long-reach excavator. Dredging would be conducted in accordance with applicable regulatory requirements. The excavator would place the dredged material on a second barge, where the material would be stockpiled temporarily while it dewaters. The work barges would be anchored by spuds (i.e., temporary piles), as needed, and a small tugboat may be used to move the barges.

The dredged material would be transported from the dredging area to the shore by a conveyor belt system mounted on temporary stands. A second excavator may be used to move the material from the barge onto the conveyor. The conveyor system would be composed of overlapping 60-ft long units. Six of these units would be required to cover the distance between the dredging footprint and the Station parking lot. The supports for the conveyor would sit on the surface of the lakebed and would be positioned in a manner that minimizes disturbance to aquatic vegetation and spawning habitat. The total temporary lake-bottom footprint for the stands that would support the conveyor units would be approximately 38 sq ft. The conveyor system would load the dredged materials into lined trucks in the Station parking lot. Once the dredged material is loaded into the lined trucks, it would be transported to the Eastern Regional Material Recovery Facility, located near the junction of State Route 89 and Cabin Creek Road, Truckee, California, or to another licensed, TRPA-approved, upland disposal facility.

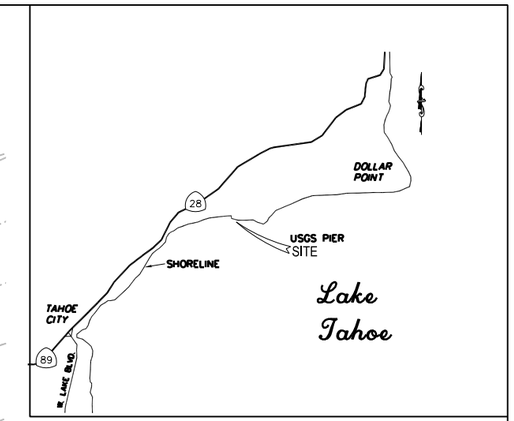
The duration of the dredging is expected to be approximately 8 weeks. Maintenance dredging would be required approximately once every 10 to 15 years to remove accumulated sediments from the previously dredged channel and maintain an elevation of 6,215 ft, LTD, at the pier head. The CG would obtain appropriate regulatory approvals before conducting maintenance dredging.

Figure 1-2 Alternative 1 - Dredging at Existing Pier



PLAN

SCALE: 1" = 20'



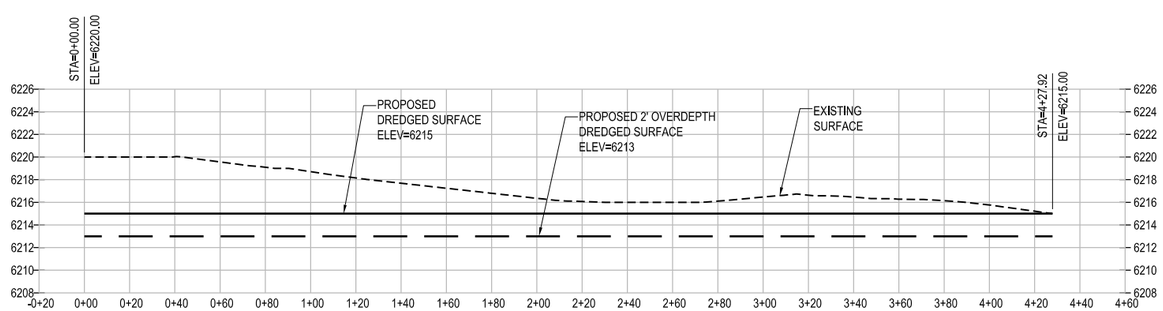
VICINITY MAP

DREDGE VOLUME SUMMARY

NAME	AREA	CUT	FILL	NET
PROPOSED DREDGE VOLUME	27,816.00 Sq. Ft.	2,656 Cu. Yd.	0.00 Cu. Yd.	2,656 Cu. Yd.<Cut>
PROPOSED OVERDREDGE ALLOWANCE	29,749.00 Sq. Ft.	5,041 Cu. Yd.	0.00 Cu. Yd.	5,041 Cu. Yd.<Cut>

DREDGE BOUNDARY COORDINATES

POINT #	NORTHING	EASTING
1	3636.23	6413.99
2	3369.25	6352.90
3	3379.61	6301.34
4	3677.92	6317.94
5	3253.14	6287.37
6	3282.10	6246.30



PROFILE

SCALE: 1" = 20' HORIZ
1" = 4' VERT

A

0' 20' 40' 60'
SCALE: 1" = 20' FULL SIZE
1" = 40' HALF SIZE

PRELIMINARY

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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 1 DREDGING AT EXISTING PIER
Project Number: 60218657
Sheet Number: C1.0

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L:\Projects\Legacy\Trans\60218657-TahoePier\000_CAD\006_Civil\Sheets Current Dredging\C1.0_C1.1_C1.2 ALT 1 DREDGING AT EXIST PIER.dwg, 11/30/2015 9:57:40 AM, Adobe PDF

In addition to dredging, Alternative 1 would also include removing the pier's existing 8,000-pound (lb) capacity boat lift from the east side of the pier head and replacing it with an 18,000-lb lift and installing a 35-ft by 8-ft floating dock. The replacement boat lift and floating dock would be placed on the west side of the existing pier head to minimize the amount of dredging needed, since current lakebed elevations are lower to the west and southwest of the pier. The larger-capacity lift and new floating dock are needed to accommodate the Station's response boats and a range of potential visiting vessels, including those of other first responder and law enforcement agencies, as well as vessels that must be towed back to the Station in order to evacuate injured boaters or lawbreakers or contain a potential discharge. Since the replacement boat lift and new floating dock will be placed on the west side of the pier, the location of some existing pier-head structures (e.g., lighting, ladders, railing, meteorology station, fueling station) may also need to be reconfigured to allow full functionality of the boat lift and floating dock.

Two steel h-piles would be installed on the western side of the existing pier head to support the replacement boat lift. Piles would be installed using a pile driver mounted on the work barge. A vibratory hammer would be used as the preferred pile-driving method unless an impact hammer is required due to substrate type. Techniques such as pre-drilling or jetting may also be required, to assist pile driving, though the need for these techniques is unlikely based on past experience installing piles for the existing Station pier.

Alternative 2: 350-ft Dog-Leg Extension with Dolphins

Alternative 2 would involve extending the Station's existing pier 350 ft in a dog-leg formation (*Figure 1-3*). The proposed pier extension would consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. Each of these components is described as follows:

Span Connecting to Existing Pier: The connecting span would extend 250 ft south from the existing pier in and would be 5 ft wide. The pier decking material for the span would consist of pre-fabricated grated metal. The connecting span would be supported by a dolphin pile configuration. The dolphin configuration would consist of 10-inch diameter steel pipe battered piles (two opposing piles installed at an angle toward each other). The dolphins would be spaced 50 ft apart, for a total of 5 dolphins (total of 10 piles).

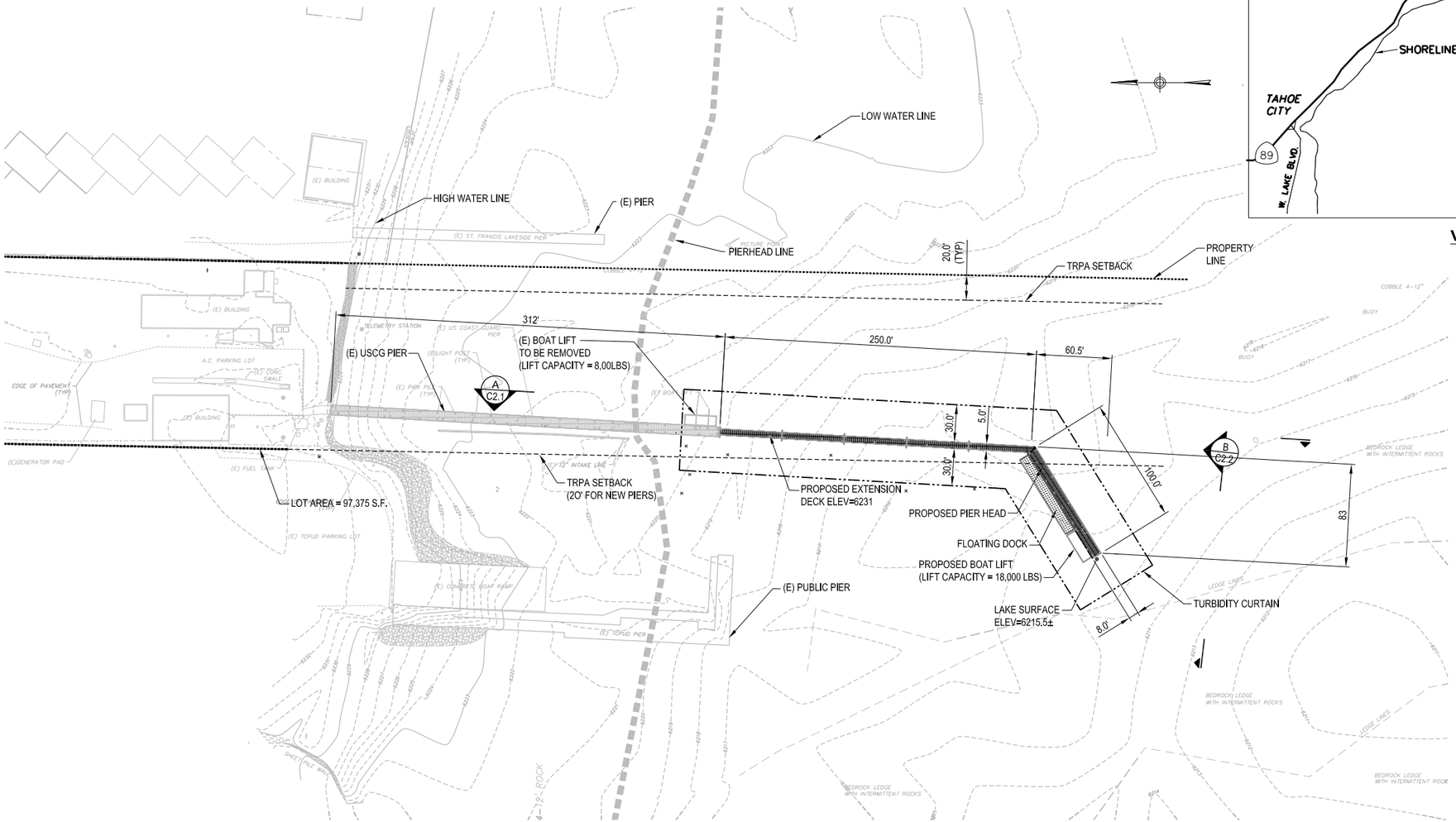
New Pier Head: The new pier head would be 100 ft long and 8 ft wide and would angle west at an approximate 45° angle from the connecting span. The pier head would have a grated metal deck supported by 10 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 ft, LTD. The dog-leg orientation of the pier head is designed to reach a sufficient depth while minimizing the length of the connecting span, based on site bathymetry. Facilities on the pier head would include one 18,000-lb capacity boat lift (which would replace the pier's existing 8,000-lb lift) supported by 2 piles 10 inches in diameter; a 70-ft by 8-ft floating dock; a fueling station; and utility lines that would run underneath the pier.

The total net footprint for Alternative 2 would be approximately 2,615 sq ft. The grated decking would create approximately 70% less shading than a solid deck, and thus the shaded footprint of Alternative 2 would be equivalent to roughly 1,180 sq ft. The total lake-bottom footprint for the 22 total piles would be approximately 12 sq ft. The anticipated construction duration for Alternative 2 would be approximately 7 weeks.

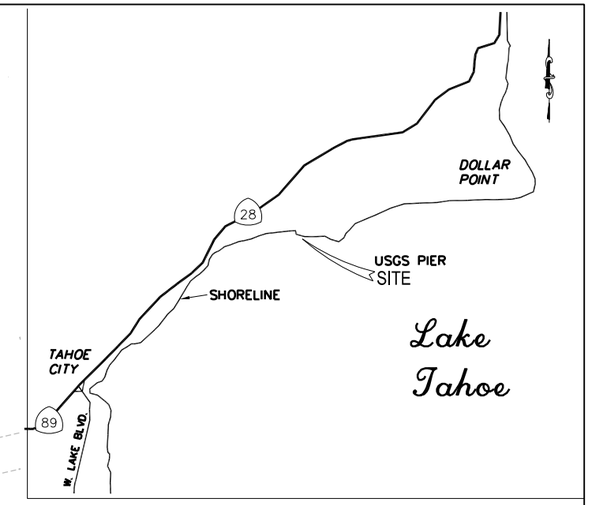
Construction of the pier extension would involve installing the supporting piles and pile caps, followed by installation of the pier decking and accessory structures. Piles would be installed using pile driving equipment mounted on a barge. A vibratory hammer would be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. Due to the presence of stiff clay substrates within the Project Area, techniques such as pre-drilling or jetting may also be required to assist pile driving, though the need for these techniques is unlikely based on the past experience installing the piles for the existing Station pier and other pier construction projects in the Project vicinity.

Once the new piles have been driven, the tops of the piles would be cut to the required elevation using a welding torch. After the piles are cut, the steel cap is placed and joined by welding or riveting. After the pile caps are installed, the aluminum gangway elements and the pier head stringers, decking, and handrails would be placed and attached. Gangway elements would arrive on site pre-fabricated, including handrails and utility supports.

Figure 1-3: Alternative 2 350-ft Dogleg Pier Extension



PLAN



VICINITY MAP

SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

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USCG STATION LAKE TAHOE
YEAR-ROUND MOORING PROJECT

Sheet Title: ALTERNATIVE 2 350 FOOT DOGLEG EXTENSION WITH DOLPHIN PILES
Project Number: 60218657
Sheet Number: C2.0 of

After the gangway and pier head decking are installed, accessory structures, including the floating dock, boat lift, fueling station, lighting, and utility lines would be installed.

Alternative 3: 450-ft Straight Extension with Dolphins

Alternative 3 is to extend the Station's pier 450 ft in a straight formation (*Figure 1-4*). The pier extension proposed for Alternative 3 would also consist of two components: 1) the span connecting the existing pier to the new pier head, and 2) the pier head itself. Each of these components is described as follows:

Span Connecting to Existing Pier: The connecting span for Alternative 3 would extend 350 ft south. The span would be 5 ft wide and be composed of grated sections supported by 10-inch diameter steel pipe pile dolphins. The dolphins would be spaced 50 ft apart, for a total of 7 dolphins (total of 14 piles).

New Pier Head: The new pier head would be 100 ft long by 8 ft wide and would extend straight south from the connecting span. The pier head would have a grated metal deck supported by 10 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 ft, LTD, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include an 18,000-lb capacity boat lift (which would replace the existing boat lift) supported by 2 steel pipe piles 10 inches in diameter, a 70-ft by 8-ft floating dock, a fueling station, and utility lines that would run underneath the pier. The total footprint of Alternative 3 would be 3,115 sq ft, and, due the grated deck, the shaded footprint would be equivalent to 1,330 sq ft. Alternative 3 would require a total of 26 piles, which would result in a lake-bottom footprint of approximately 14 sq ft. Construction duration would be approximately 8 weeks. The construction techniques used for Alternative 3 would be identical to those described for Alternative 2.

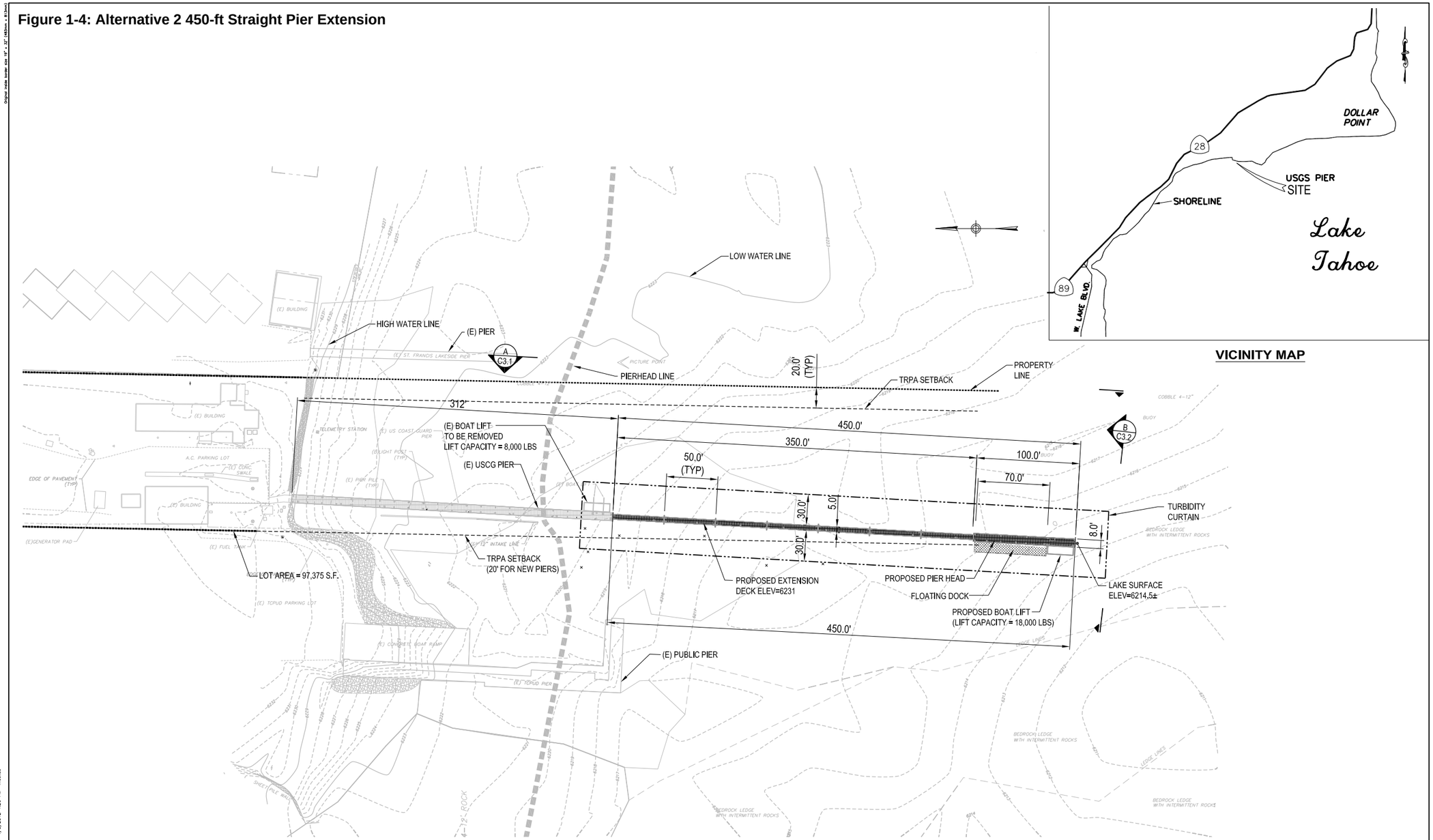
1.3 Potential Project Impacts on Prime Fish Habitat

TRPA defines PFH as "the zone of water and substrate less than 30 ft deep where suitable habitat exists for purposes of spawning, feeding, or escape cover, or as designated on TRPA Prime Fish Habitat Maps" (TRPA 2013). TRPA defines two types of PFH: 1) spawning habitat, which consists of substrate composed primarily of gravels (i.e., rocks smaller than 64 millimeters [mm] but larger than 2mm in diameter), and 2) feed and cover habitat, which consists of substrate composed primarily of cobble, rocks, and boulders (i.e., rocks greater than 64mm in diameter) (TRPA 2012b).

TRPA PFH maps indicate the presence of spawning and feed and cover habitat in the Project area (TRPA 2012b). The portion of the Project Area designated as spawning habitat on the TRPA maps is restricted to areas immediately adjacent to the shoreline, while most of the Project Area is designated as feed and cover habitat. The TRPA's PFH map is based on satellite data that is reasonably accurate for determining the distribution and status of potential PFH lake-wide (TRPA 2012a, Metz et al. 2006), but does not provide sufficient resolution for determining project-specific impacts. Therefore, the TRPA Shorezone Permit application process typically requires that a project applicant perform a field verification to provide site-specific data on whether PFH occurs within a project site. To fulfill this requirement, qualified fisheries biologists performed a field verification dive survey in July 2011 to collect detailed data on the current habitat conditions within the Project Area (AECOM 2011). The biologists mapped the various substrate types within the Project Area in order to verify the presence and extent of PFH (*Figure 1-5*).

The field verification found that most of the lakebed that would be removed or displaced by the Project Alternatives has substrates of clay silt, and fine sand, which do not provide high-quality spawning or feed and cover habitat and would not fall under the TRPA's definition of PFH. However, the field verification did identify some areas of potential spawning PFH (gravel substrate) and feed and cover PFH (cobble, boulders, and large woody debris) within the Project Area, including feed and cover PFH that would be removed or displaced by the proposed Project Alternatives. The potential spawning PFH within the Project Area occurs close to shore and would not be removed, displaced, or otherwise permanently affected by the proposed Project. Substantial spawning activity is unlikely to occur in the area due to disturbance from high levels of existing boat traffic from the adjacent public boat ramp. No spawning activity was observed during the field verification survey.

Figure 1-4: Alternative 2 450-ft Straight Pier Extension



PLAN

0' 30' 60' 90'
SCALE: 1" = 30' FULL SIZE
1" = 60' HALF SIZE

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Meeting
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USCG STATION LAKE TAHOE
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Sheet Title
ALTERNATIVE 3
450 FOOT STRAIGHT EXTENSION
WITH DOLPHIN PILES

Project Number: 60218657
Sheet Number: C3.0 of

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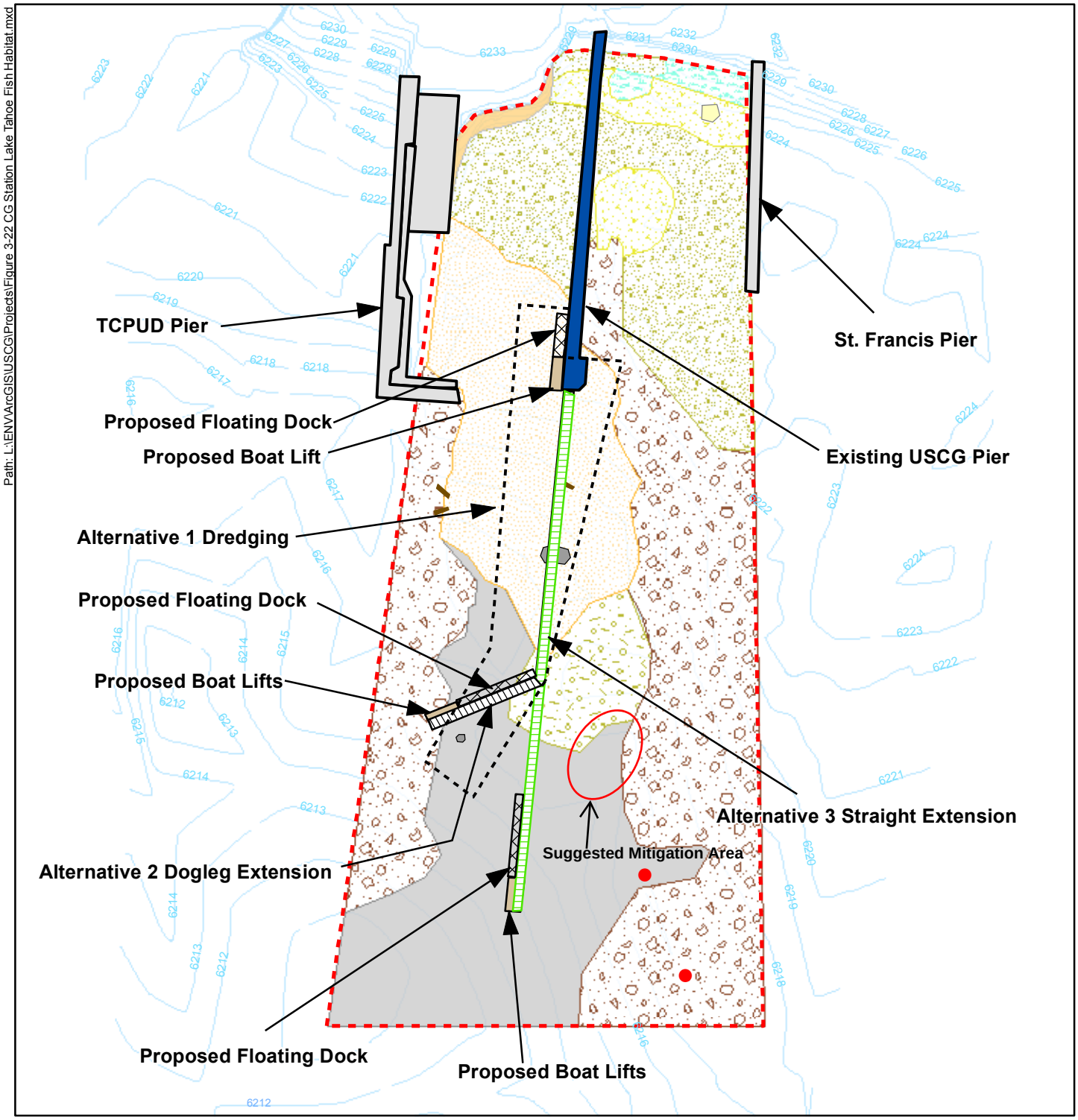

Existing Pier
Alternative 1 Dredging Footprint
Alternative 2 Dogleg Extension
Alternative 3 Straight Extension
Fish Habitat Study Area
Buoy
Large Boulders
Large Wood Debris (>30cm)

TCPUD = Tahoe City Public Utility District

Contours
Sand with Aquatic Macrophyte Cover
Cobble
Cobble with Small Boulders
Fines
Gravel Course
Gravel, Course with Aquatic Macrophyte Cover
Lacustrine Clay Deposits

Rip Rap (Boulder, Small)
Sand

0 125 250
Feet

REFERENCE:
Webb Land Surveying 2011, AECOM 2011

CG Station Lake Tahoe Year-Round Mooring Project
Figure 1-5
Fish Habitat in the Project Area

TRPA has a non-degradation threshold standard for PFH in Lake Tahoe. As a condition of the Partial Shorezone Permitting Program currently in place, impacts to PFH must be mitigated by replacement of the area of PFH removed at a ratio of 1:1.5 in order to achieve the non-degradation threshold. *Table 1-1* provides a summary of the surface area of potential PFH within the disturbance area of each proposed Project Alternative and the amount of habitat replacement necessary to meet TRPA mitigation requirements.

Table 1-1 Area of PFH (sq ft) within the Long-Term Disturbance Areas of the Project Alternatives

Alternative	Total Lake-Bottom Footprint	Feed & Cover PFH	Mitigation Required (at 1:1.5)
Alternative 1 – Dredging*	29,749	1,895	2,843
Alternative 2 – Dog-Leg Extension	12	4	6
Alternative 3 – Straight Extension	14	3	5
*In order to analyze potential worst-case impacts, the areas indicated for Alternative 1 include the full overdepth allowance, which also includes a 2-ft allowance for potential overdredging of side slopes. The area dredged is likely to be smaller, but the full overdepth area would be accounted for during mitigation as a conservative measure.			

In addition to the long-term removal of PFH through dredging and/or pile installation, construction of the Project Alternatives also has the potential to temporarily affect PFH. Temporary impacts during construction could include decreased water quality due to increased turbidity, subsequent sedimentation of habitat, increased potential for accidental spills, and increased noise and disturbance due to the presence of construction equipment. Additionally, for Alternative 1, the temporary stands for the conveyor system would be placed within areas of PFH during dredging – of the 38 sq ft lake-bottom footprint for the stands, roughly 13 sq ft would be placed within potential spawning PFH and 13 sq ft would be placed within potential feed and cover PFH. Measures to be implemented during construction to avoid or minimize these temporary impacts are described in *Section 1.4*. The CG's proposed plan for providing the required 1:1.5 mitigation for permanent PFH impacts is described in *Section 2.0*.

1.4 Avoidance and Minimization Measures

In order to avoid and minimize temporary impacts to PFH during construction, the CG would implement the following best management practices (BMPs) to avoid and minimize temporary impacts to PFH during construction. These BMPs would apply to all of the Action Alternatives, except for certain measures that only apply to Alternative 1, which are indicated *by italicized text*:

- *Sediment samples will be collected from within the dredging footprint prior to dredging and analyzed for physical and chemical parameters and potential constituents of concern using methods consistent with USACE and USEPA guidelines for dredged material evaluation (USACE 2003, USEPA and USACE 1998). Both bulk sediment and elutriate tests will be conducted to identify appropriate dredged material handling and disposal procedures and to assess potential water quality impacts during dredging. The sampling results will be provided to the USACE, Lahontan Regional Water Quality Control Board (LRWQCB), and TRPA prior to dredging. Contaminated sediments, if any are identified, would be handled in accordance with applicable regulations and disposed of at a properly-licensed facility.*
- Prior to initiating construction, the construction contractor will be required to document whether there are any subsurface utilities in the disturbance area. This can be accomplished by: 1) contacting all utilities (both public and private) that provide service in the area, documenting these contacts; 2) contacting Underground Service Alert (USA), documenting this contact; or, 3) some other equivalent affirmative action to determine whether there are subsurface utilities in the area of construction. If subsurface utilities are located in the area of excavation, the construction contractor must provide a utility avoidance plan before work begins.
- The disturbance area will be limited to the minimum required to complete the Project. *To the extent practicable, dredging will be kept to the minimum area necessary to achieve the target channel width and depth, and overdepth dredging will be minimized. A final bathymetric survey will be performed,*

within 1 week after dredging is completed, that describes the actual final elevations within and dimensions of the dredging prism and the volume of material removed. The final bathymetric survey report will be provided to the USACE, LRWQCB, and TRPA.

- To avoid the spread of turbidity and the sedimentation of surrounding sensitive habitats, a turbidity curtain will be installed around the construction area. The bottom of the turbidity curtain will be securely anchored to the lakebed, and the top will include a floating boom with adequate freeboard to contain turbid waters in high wave and wind conditions. A double turbidity curtain may be used if required by the TRPA Compliance Inspector. Per TRPA BMP handbook guidelines (TRPA 2014), the turbidity curtain will be installed at least 10 ft from work activities to prevent equipment from damaging the curtain. *Filter fabric will be placed under the conveyor belts, and fiber rolls will be installed along both sides of the belts to control the spread of sediment.* Prior to daily work activities, the turbidity barriers will be checked to ensure proper installation and functionality. This will include checking that the base of the turbidity curtain is securely anchored, that there are no gaps in the floating boom *or fiber rolls*, and that all turbidity barriers are in good condition. Needed repairs or replacements will be performed before work for that day begins. The turbidity curtain would be removed only when construction is completed and turbidity returns to background levels.
- Work will cease immediately if inclement weather or high wave and/or wind action threatens to cause turbidity to spread beyond the turbidity-curtained area. Work would only resume once weather conditions improve. The construction contractor will be required to take immediate action to ensure that turbidity outside the curtained area is kept to a minimum at all times, including during inclement weather, to the extent that this can be done safely.
- *The contractor will ensure that the dredge operator is familiar with and skilled in using operational controls for minimizing turbidity, including minimizing bucket speed, avoiding jerking the bucket, deliberate placement of material on the conveyor, and avoiding smoothing the bottom at the end of dredging*.
- A Spill Prevention and Response Plan will be prepared and implemented during construction. Petroleum products and other hazardous materials will be kept in non-leaking containers stored within secondary containment on an impermeable surface (on either the work barge or the upland staging area) and covered in a manner that will prevent stormwater from contacting the container. Material Safety Data Sheets for hazardous materials used during construction and operations will be available on site to provide information on storage, disposal, protective equipment, and spill-handling procedures. If a spill occurs, it will be contained and cleaned up immediately to the extent that this can be accomplished safely. A supply of suitable spill control and cleanup materials, such as absorbent booms and pads, will be available on site for prompt cleanup of spills. Coatings for new structures will be applied in advance and not over the lake. Application of paints, sealers, and coatings over water will be limited to minor touch up that must be done after structures are constructed and in place.
- Construction equipment will be kept in good repair and will be inspected (prior to construction) and monitored (during construction) for leaks and invasive species and removed from service for maintenance or cleaning if necessary to prevent water quality or invasive species impacts. Any mechanical equipment that will be submersed in Lake Tahoe during construction will be steam cleaned and inspected for leaks prior to use.
- *To minimize turbidity impacts to Lake Tahoe, handling and dewatering of dredged materials over the lake will occur only within the areas confined by turbidity barriers. Any dredged material spilled onto the ground or pavement during dredged material transfer or loading will be cleaned up in a manner that minimizes discharges to storm drains or the lake. Temporary filter inserts will be installed in storm drains in the Station parking lot to further avoid potential discharges to the stormwater system or lake during dredged material transfer and loading. The dredged materials will be transported off site in lined trucks to avoid discharges during transportation*.
- Staging and use of construction equipment and materials will be limited to paved upland areas and areas contained by turbidity barriers. Materials subject to wind or stormwater displacement will be secured. Upland staging areas will be centralized and delineated with construction boundary fencing as

needed to minimize impacts to soil and vegetation. *The stands for the conveyor system will also be placed in a manner that minimizes disturbance of soil and vegetation, to the extent practicable.*

- A Water Quality Monitoring Plan will be prepared and implemented during construction. Continuous visual inspection will be conducted to check that the turbidity curtain is functioning properly and that construction equipment is in good working order. If a turbidity plume or petroleum product sheen is detected outside the turbidity-curtained area, work will be suspended and action will be taken to correct the problem. At least once every 2 hours, the turbidity level will be measured at a point no more than 5 ft outside the turbidity-curtained area. If turbidity levels outside the curtain exceed 3 nephelometric turbidity units, the LRWQCB's water quality objective for clarity in Lake Tahoe, or more than 10% of the background concentration, whichever is greater, actions will be taken to reduce turbidity from the work activity to below the require limits. Additionally, lake water samples will be collected weekly at a point no more than 5 ft outside the turbidity-curtained area and analyzed for total nitrogen (TN) and total phosphorus (TP). If levels exceed the LRWQCB's water quality objectives for these constituents (0.15 milligrams per liter [mg/L] TN or 0.008 mg/L TP) or background concentrations, whichever is greater, corrective actions, such as use of a double turbidity curtain or modification of work rate or methodology, would be taken to reduce these levels to below the required limits. Additional parameters may be added to the monitoring program if the need is indicated by the results of the pre-construction sediment analysis. A daily written record will be kept documenting inspections, water sampling, exceedances (if any), and corrective actions (if any) and provided to the LRWQCB and TRPA at the end of construction.
- No chitosan or other flocculants will be used within the lake to reduce turbidity.
- Construction crew members will keep the work area free from trash or litter. Waste material from will be transported off site and disposed of in accordance with Federal, State, and local regulations.
- Construction activities will be limited to daytime hours to avoid the use of bright lights at night that could affect the behavior of fish and other aquatic organisms.
- To reduce noise impacts, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used. If the use of an impact hammer is required, a wooden cushion block would be used to muffle sound from the hammer strike. Use of pre-drilling or jetting will be limited to situations where these techniques are required for proper pile installation and/or to minimize environmental impacts. The construction contractor will follow Occupational Safety and Health Administration and California Division of Occupational Safety and Health requirements for occupational noise exposure and the provision of hearing protection to construction workers during pile driving, drilling, and other noise-producing activities.
- In-water work will only occur during the non-spawning season (October 1st to May 1st) unless written authorization is obtained from the California Department of Fish and Wildlife (CDFW) and TRPA to work outside of those dates.
- The CG will inform the construction contractor of these BMPs and the specific conditions of Project permits and approvals and be responsible for maintaining compliance with those BMPs and permit conditions. A Worker Environmental Awareness Program will be mandated for personnel involved in construction activities. Training will include the importance of the aquatic environment to special-status species and the environmental protection measures that are being implemented to avoid and minimize adverse environmental impacts.

After construction is completed, operations at the Station will continue largely unchanged from current conditions. Under Alternative 1, maintenance dredging will be undertaken roughly every 10 to 15 years. The CG would obtain the appropriate regulatory approvals before conducting future maintenance dredging and would implement BMPs similar to those listed above, as applicable, when conducting maintenance dredging. For Alternatives 2 and 3, a new fueling station would be installed at the new pier head (replacing the existing fueling station) and the following BMP would be implemented:

- A Fueling Plan would be prepared and implemented for operation of the fueling station and other activities at the pier. Spill prevention and response measures would be implemented during operations,

and if a spill occurs, it would be contained and cleaned up immediately to the extent work can be accomplished safely. A supply of suitable cleanup materials, such as absorbent booms and pads, would be available on site for prompt cleanup of spills. Signs would be posted at the pier head to educate personnel on proper fueling and materials handling techniques to avoid and minimize spills.

2.0 Mitigation and Monitoring Plan

Impacts to PFH due to the proposed Project will be mitigated as required by TRPA. The following mitigation and monitoring plan will be implemented:

- In consultation with TRPA, an area within the nearshore zone (i.e., between a lake-bottom elevation of 6,193 and 6,223 ft, LTD) at the Station will be designated for placing new feed and cover habitat to replace that which will be removed or displaced by the Project. Areas of the lakebed that currently have substrate types that are not considered PFH (e.g., clay) but which are adjacent to the PFH remaining on site after Project construction would be prioritized for habitat enhancement in order to provide habitat continuity. Littoral processes, human disturbance factors, and potential water level fluctuations will also be considered when choosing the location of the replacement habitat to increase the likelihood that it will remain functional habitat over the long term. (A suggested area for mitigation is indicated in *Figure 1-5*).
- In accordance with TRPA requirements, the area of PFH permanently removed or displaced due to implementation of the proposed Project will be replaced at a ratio of 1:1.5 to ensure no net loss of habitat. To accomplish the required mitigation, substrate similar to that currently present in the affected PFH (i.e., cobble and small boulders) will be placed in the area designated for habitat creation. The replacement habitat will be designed to provide equal or greater function and value as the PFH removed or displaced by the proposed Project.
- To the extent practicable, cobble, boulders, and large woody debris removed or displaced during construction would be recovered, separated from finer sediments, and used to create the replacement habitat. If additional material is required, it will be washed and free of invasive species or other deleterious materials. As applicable, the CG will obtain approval from the USACE under CWA Section 404 for the placement of additional fill in a water of the U.S.
- The new substrate will be placed within the designated area in an appropriate manner that minimizes lake-bottom disturbance and turbidity (e.g., lowered by excavator, cargo net, or similar equipment and/or placed by hand) and replicates the characteristics of naturally-occurring habitat.
- An inspection will be conducted just after placement of the replacement substrate and then annually for 3 years thereafter to determine the effectiveness of the mitigation. The inspections will be performed by a qualified fisheries biologist, who will conduct a dive survey to determine whether the condition of the replaced substrate is suitable to provide equal or greater habitat function and value as the PFH removed or displaced by the Project (e.g., in place and not excessively silted over or infested with invasive aquatic organisms). The biologist will also observe whether fish and/or benthic prey organisms are present and utilizing the created habitat.
- If the Project biologist determines during the annual inspection that the restored substrate is not meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, then the CG would implement corrective actions, which may include removing silt or invasive organisms, installing additional replacement substrate, or undertaking other actions agreed upon by TRPA.
- A PFH Mitigation Monitoring Report will be prepared annually for 3 years after Project completion and submitted to TRPA, USFWS, and CDFW. The report will include photographs of the restored habitat, a description of observations made during the monitoring, a determination of the replacement habitat's effectiveness in meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, and a description of any corrective actions taken or proposed.

3.0 References

AECOM 2016. U.S. Coast Guard Station Lake Tahoe Year-Round Mooring Project, Draft Environmental Assessment.

AECOM. 2011. Fish Habitat Survey, U.S. Coast Guard, Station Lake Tahoe Pier Project, Lake Tahoe, Placer County, California. October.

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TRPA. 2012. 2011 Threshold Evaluation Report. Accessed at: http://www.trpa.org/regional-plan/threshold-evaluation/

U.S. Army Corps of Engineers (USACE). 2003. Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities — Testing Manual (Upland Testing Manual). Engineer Research and Development Center Publication ERDC/EL TR-03-1. Accessed at: http://el.erdc.usace.army.mil/dots/pdfs/trel03-1.pdf

U.S. Environmental Protection Agency (USEPA) and USACE. 1998. Evaluation of Dredged Material Proposed For Discharge in Waters of the U.S. – Testing Manual (Inland Testing Manual). EPA-823-B-98-004. Accessed at: http://water.epa.gov/type/oceb/oceandumping/dredgedmaterial/ upload/2009_10_09_ oceans_regulatory_dumpdredged_itm_feb1998.pdf

U.S. Geological Survey. 2016. Water-Year Summary for Site USGS 10337000. Accessed at http://waterdata.usgs.gov/ca/nwis/wys_rpt/?site_no=10337000&agency_cd=USGS.

Appendix I

Cultural Records Search Results

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NORTH CENTRAL INFORMATION CENTER

916-278-6217 ncic@csus.edu FAX 916-278-5162

CSU-SACRAMENTO - 6000 J STREET, ADAMS BLDG. SUITE #208 - SACRAMENTO, CA 95819-6100

Amador, El Dorado, Nevada, Placer, Sacramento, and Yuba Counties

May 11, 2012 NCIC File No.: PLA-12-37

Patricia Ambacher
AECOM
2020 L Street
Suite 400
Sacramento, CA 95811

Records Search Results Summary
PROJECT # 60218657.102
T15N/R17E, Section 5
USGS 7.5' Kings Beach Quad, Placer County

- **NCIC Resources Within ½ Mile Search Radius:**
  P-31-414 CA-PLA-288
  P-31-415 CA-PLA-289
  P-31-2931 CA-PLA-2011-H
  P-31-5451 CA-PLA-2430
- **NCIC Reports Within ½ Mile Radius:**
  348
  1616
  1921
  4388
  4389
  7290
  8072
  8630
  9326
  10005
  10367
  10503
  10914
- **OHP Historic Property Data File (2012):** Kings Beach properties enclosed
- **Determination of Eligibility (2012)**: Placer County pages copied
- **NRHP/CRHR listings (2006 & updates):** Nothing listed
- **California Inventory of Historic Resources (1976):** Nothing listed
- **California State Historical Landmarks (1996):** Nothing listed
- **Points of Historic Interest (1992):** Nothing listed
- **Caltrans Bridge Inventory**: Not requested

- **Historic Maps:**
  1865 GLO Plat
  1866 GLO Plat
  1955 USGS Tahoe quad

Thank you for using our services. An invoice confidentiality agreement is enclosed; please sign and return a copy for our files.

Appendix J

Geotechnical Report

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GEOTECHNICAL ENGINEERING REPORT
for
U.S. Coast Guard Lake Tahoe Pier Extension
Tahoe City/Placer County, California

[illegible] Engineering [illegible]
[illegible] State Street, Suite E
Portsmouth, New Hampshire 03801

Prepared by:
Holdrege & Kull
10775 Pioneer Trail Suite 213
Truckee, California 96161

Project No. 41336-01
September 1, 2009

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

Project No. 41336-01
September 1, 2009

Appledore Marine Engineering, Inc.
600 State Street, Suite E
Portsmouth, NH 03801

Attention: Noah J. Elwood, P.E.

Reference: ***U.S. Coast Guard Lake Tahoe Pier Extension***
Tahoe City/Placer County, California

Subject: ***Geotechnical Engineering Report***

Dear Mr. Elwood:

This report presents the results of our geotechnical engineering investigation for the proposed U.S. Coast Guard pier extension to be constructed at 2500 Lake Forest Road in Tahoe City/Placer County, California. The proposed project will involve extending the existing Coast Guard pier an additional 300 to 400 feet into Lake Tahoe.

Due to environmental constraints, it was not possible to perform a subsurface investigation along the proposed pier alignment. As an alternative, we explored the subsurface conditions on land at the north end of the existing pier by advancing a single boring to a depth of about 41 feet below the existing ground surface. The recommendations and conclusions provided in this report are based on the assumption that subsurface conditions along the proposed pier alignment will be similar to those encountered in our boring. Based on our experience at other nearby lakefront project sites we believe that this is a reasonable assumption; however, there is a potential that different subsurface conditions may be encountered along the pier alignment that require foundation modification and/or re-design.

With the exception of the aforementioned issue, our professional opinion is that the site is suitable for the proposed pier extension using conventional pile construction techniques. No weak or highly compressible soil conditions were encountered during our subsurface exploration. Specific recommendations regarding the geotechnical aspects of project design and construction are presented in the following report.

(530) 587-51[illegible] • FAX (530) 587-5196 • E-mail: handk@HandK.net • 10775 Pioneer Trail, Suite 213 • Truckee, CA 96161 • A California Corporation

The findings presented in this report are based on our subsurface exploration, laboratory test results, and experience in the project area. We recommend retaining our firm to provide construction monitoring services during pier construction to observe pile driving conditions encountered with respect to our recommendations provided in this report. As plans develop, we should be consulted concerning the need for additional services.

Please contact us if you have any questions regarding this report or if we can be of additional service.

Sincerely,
Holdrege & Kull

Prepared By:

Allison K. Hathon
Staff Engineer

Reviewed By:

Daniel L. Keller, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
DANIEL L. KELLER
No. 69022
Exp. 6-30-10
CIVIL
STATE OF CALIFORNIA

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FIGURES

APPENDICES

1. INTRODUCTION

This report presents the results of our geotechnical engineering investigation for the proposed U.S. Coast Guard pier extension to be constructed at 2500 Lake Forest Road in Tahoe City/Placer County, California. We performed our investigation in general accordance with our August 7, 2009 proposal for the project. A copy of the proposal is included as Appendix A of this report. For your review, Appendix B contains a document prepared by ASFE entitled *Important Information About Your Geotechnical Engineering Report.* This document summarizes the general limitations, responsibilities, and use of geotechnical engineering reports.

1.1 Purpose

The purpose of our investigation was to explore and evaluate the subsurface conditions at the project site, and to provide our geotechnical engineering recommendations for project design and construction.

Our findings are based on our subsurface exploration, laboratory test results, and our experience in the project area. We recommend retaining our firm to provide construction monitoring services during pier construction to observe pile driving conditions encountered with respect to our recommendations.

1.2 Scope of Services

To prepare this report we performed the following scope of services:

- We performed a site reconnaissance, literature review, and subsurface exploration involving one exploratory boring advanced to a depth of 41 feet below ground surface (bgs).
- We logged the subsurface conditions encountered and collected relatively undisturbed soil samples for classification and laboratory testing.
- We performed laboratory tests on selected soil samples obtained during our subsurface investigation to evaluate material properties.
- Based on our subsurface exploration and the results of our laboratory testing, we performed engineering analyses to develop geotechnical engineering recommendations for project design and construction.

1.3 Site Description

The project site is located within and adjacent to the Lake Tahoe U.S. Coast Guard Station, located in Tahoe City/Placer County, California. The approximate location of the site is shown on Figure 1, Site Vicinity Map. As currently proposed, the project consists of extending the existing Coast Guard pier an additional 300 to 400 feet into Lake Tahoe. A plan view of the project site is shown on Figure 2, Test Pit Location Plan.

The Coast Guard Station is bounded by Lake Forest Road to the north, private property to the east, Lake Tahoe to the south, and the Lake Forest public boat ramp and recreation area to the west. Several administrative, maintenance, and storage buildings are located at the site. The existing pier is located in the southwest corner of the site. A sewer main runs in an east-west direction near the southern property boundary, adjacent to the shore of Lake Tahoe. Site access is provided by a driveway leading from Lake Forest Road.

The existing pier consists of an approximately 6-foot wide deck supported by approximately 10-inch diameter side-by-side steel pipe piles connected with cross bracing. According to Tom Regan of Pacific Built, the existing piles extend about 15 feet below the lakebed.

According to the 1992 edition of the Kings Beach, California 7.5-minute quadrangle map published by the United States Geological Survey (USGS); the subject site comprises a portion of Section 5, Township 15 north, and Range 17 east. The average and high water surface elevation of Lake Tahoe is approximately 6,225 feet and 6,229 feet above MSL, respectively. The site is relatively level, and the beach area on the southern side of the site slopes very gently down to Lake Tahoe.

1.4 Proposed Improvements

Information about the project was obtained from our site visits, conversations with Noah Elwood, P.E. of Appledore Marine and Tom Regan of Pacific Built, and a site plan provided by Auerbach Engineering dated March 8, 2006. As currently proposed, the project consists of extending the existing Coast Guard pier an additional 300 to 400 feet into Lake Tahoe. The pier extension will have a similar deck width to the existing pier. Total vertical deck loads (dead plus live), will be about 9.5 to 14.5 kips per pile. Lateral wind loads will be about 4.4 to 6.4 kips applied at the top of each pile. Lateral loads will be applied at a maximum height of about 15 feet above the lakebed. One of three pile configurations listed below are being considered to support the pier extension:

- A row of 10-inch diameter mono-piles with 20 foot spacing;

- Side-by-side 10-inch diameter pier head piles with 20 foot spacing; or
- Side-by-side 10-inch diameter cat walk piles with 50 foot spacing;

At least one boat lift will be constructed along the alignment.

2. LITERATURE REVIEW

We reviewed available geologic and soil literature in our files to evaluate geologic and anticipated subsurface conditions at the project site.

2.1 Site Geology

We reviewed the *Geologic Map of the Chico Quadrangle, California*, by G.J. Saucedo and D.L. Wagner, California Division of Mines and Geology, 1992 and the *Geological Map of the Lake Tahoe Basin, California and Nevada,* compiled by George J. Saucedo, California Geological Survey, 2005. The geologic maps indicate that the project site is underlain by Pleistocene to Holocene aged lake deposits.

In addition, we reviewed reports in our files from geotechnical investigations performed at seven sites located along the lakefront west of the project site. The sites are all located less than about ½-mile from the project site. Subsurface conditions encountered during investigations performed at the sites generally consisted of stiff to hard elastic silt and fat clay consistent with lacustrine deposits.

2.2 Regional Faulting

The project is located in a potentially active seismic area. To evaluate the location of mapped faults relative to the project site, we reviewed the following maps:

- *Fault Activity Map of California and Adjacent Areas;* by Charles W. Jennings, California Department of Conservation, Division of Mines and Geology, 1994
- *Geological Map of the Lake Tahoe Basin, California and Nevada,* compiled by George J. Saucedo, California Geological Survey, 2005
- *Geologic Map of the Chico Quadrangle, California*, by G.J. Saucedo and D.L. Wagner, California Division of Mines and Geology, 1992

The potential risk of fault rupture is based on the concept of recency and recurrence. The more recently a particular fault has ruptured, the more likely it will rupture again. The California State Mining and Geology Board define an "active fault" as one that has

had surface displacement within the past 11,000 years (Holocene). Potentially active faults are defined as those that have ruptured between 11,000 and 1.6 million years before the present (Quaternary). Faults are generally considered inactive if there is no evidence of displacement during the Quaternary.

The referenced geologic maps show several active and potentially active faults located near the project site, including the West Tahoe – Dollar Point Fault (active, approximately 1.6 miles east and a splay approximately 800 feet southwest), the North Tahoe Fault (active, approximately 4.3 miles east of the site), a group of unnamed faults southeast of Truckee (potentially active, approximately 7 miles northwest), and the Dog Valley Fault (active, approximately 14 miles northwest). Earthquakes associated with these faults could cause strong ground shaking at the project site.

The potential hazard associated with earthquake faults involves surface rupture and strong ground motion. No faults are mapped as crossing or trending towards the site; therefore, the potential for surface rupture at the site is considered low. Earthquakes centered on regional faults in the area, such as the Genoa Fault, would likely result in higher ground motion at the site than earthquakes centered on smaller faults that are mapped closer to the site.

2.3 Secondary Seismic Hazards

Secondary seismic hazards include liquefaction, lateral spreading, and seismically induced slope instability and rock fall. Liquefaction is a phenomenon where loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup. Cyclic loading, such as an earthquake, typically causes the increase in pore water pressure and subsequent liquefaction. Based on the results of our subsurface investigation, near-surface soil at the site consists of stiff to hard fine-grained soil. This soil profile will have a low potential for liquefaction.

Lateral spreading is the lateral movement of fractured rock or soil resulting from liquefaction of subadjacent materials. Since we anticipate that there is a low potential for liquefaction of soil at the site, the potential for lateral spreading to occur is also considered low.

Slope instability includes landslides, debris flows, and rock fall. No landslides, debris flows or rock fall hazards were observed in the site area. Based on our experience in the area, down-slope creep movement of the near-surface soil is possible at the site. However, based on surface observations, there are no visible signs of creep movement apparent and it appears the existing pier is performing as intended.

3. SUBSURFACE EXPLORATION

We performed our subsurface exploration to characterize typical subsurface conditions at the site.

3.1 Field Exploration

The subsurface conditions at the site were investigated on August 11, 2009 by drilling one exploratory boring to a depth of 41 feet below the ground surface (bgs). The boring was drilled with a B-61 drill rig equipped with a 6-inch hollow stem auger. The boring location was selected based on site access.

An engineer from our firm logged the soil conditions observed in the cuttings and the sampler, visually classified soil, and collected soil samples for laboratory testing. Relatively undisturbed samples were collected using a 2.5-inch diameter California Modified split-spoon sampler lined with brass sampling tubes. Relative soil consistency and unconfined compressive strength of select soil samples were evaluated in the field using a pocket penetrometer. Soil samples were subsequently packaged and sealed in the field to reduce moisture loss and were returned to our laboratory for testing. Upon completion the boring was backfilled with cement grout to within 12 inches of the ground surface. The upper 12 inches of the boring was backfilled with soil cuttings and a piece of sod was placed over the top of the soil. The approximate location of our boring is shown on Figure 2, Boring Location Plan.

3.2 Subsurface Soil and Groundwater Conditions

Soil encountered in our boring generally consisted of soft to hard fat clay (CH) with varying amounts of sand. The fat clay contained thin interbedded layers elastic silt and fine sand. We encountered an approximately 10 inch thick layer of poorly graded sand with clay (SP-SC) at a depth of approximately 8.5 feet bgs. More detailed descriptions of the subsurface conditions observed are presented in our Test Pit Logs in Appendix C.

We observed groundwater during our subsurface exploration at a depth of 36.5 feet bgs; however, it is likely that the augers sealed the boring and kept groundwater from entering at higher elevations. The majority of the piles for the proposed pier will be driven below the surface of Lake Tahoe.

4. LABORATORY TESTING

We performed laboratory tests on soil samples collected from our exploratory borings to help evaluate their engineering properties. The following laboratory tests were performed:

- Atterberg Limits/Plasticity (ASTM Test Method D4318)
- Moisture and Density (ASTM D2216 and ASTM D2937)
- No. 200 Wash Sieve Analysis (ASTM D1140)
- Unconsolidated-Undrained Triaxial Compression (ASTM D2850)
- Unconfined Compression (ASTM D2166)

Sieve analysis and Atterberg Limits data typically resulted in USCS classifications of Fat Clay (CH) and Fat Clay with Sand (CH). More specific soil classification and laboratory test data is included in Appendix D. USCS classification, Atterberg indices, and soil strength data are summarized below.

Table 4.1 – Summary of Laboratory Test Results

Boring Number	Depth (feet)	USCS Classification	Liquid Limit	Plastic Limit	Shear Strength (psf)
B-1	4.5	Fat Clay with Sand (CH)	80	25	1,046.5
B-1	10.5	Fat Clay (CH)	--	--	2,358.7
B-1	13.5	Fat Clay (CH)	--	--	1,726.1
B-1	14.5	Fat Clay (CH)	--	--	--
B-1	16	Fat Clay with Sand	--	--	--
B-1	22.5	Fat Clay with Sand	--	--	2,044.8

5. CONCLUSIONS

The following conclusions are based on our field observations, laboratory test results, and our experience in the project area.

1. Due to environmental constraints, it was not possible to perform a subsurface investigation along the proposed pier alignment. As an alternative, we explored the subsurface conditions on land at the north end of the existing pier by advancing a single boring to a depth of about 41 feet below the existing ground surface. The recommendations and conclusions provided in this report are based on the assumption that subsurface conditions along the proposed pier alignment will be similar to those encountered in our boring. Based on our experience at other nearby lakefront project sites we believe that this is a reasonable assumption; however, there is a potential that different subsurface conditions may be encountered along the pier alignment that require foundation modification and/or re-design. Changes to project design or construction methods could result in project delays and/or significant changes to project cost. The project owner should consider driving test piles along the proposed pier

alignment prior to construction to provide additional information regarding subsurface conditions and constructability.

2. With the exception of the aforementioned issue, our professional opinion is that the site is suitable for the proposed pier extension from a geotechnical engineering standpoint using conventional pile construction techniques. No weak or highly compressible soil conditions were encountered during our subsurface exploration.

6. RECOMMENDATIONS

The following geotechnical engineering recommendations are based on our understanding of the project as currently proposed, our field observations, the results of our laboratory tests, engineering analysis, and our experience in the project area.

6.1 Pile Design Criteria

We understand that the pier extension will be supported on 10-inch diameter open-ended pipe piles, similar to those supporting the existing pier. Based on the subsurface soil conditions encountered in our boring as well as the strength data obtained from field and laboratory testing, for 10-inch diameter piles we recommend using the following formula to calculate allowable axial pile capacity in pounds:

$$Q_a = 2000 + 900(Z-2)$$

Where:
Z = depth of the pile below the ground surface in feet

This allowable capacity includes the weight of the piles. We can provide additional pile capacity formulas for larger diameter piles upon request. No reduction in the axial capacity of an individual pile is necessary within pile groups provided a center-to-center spacing of at least 3 diameters is used. Allowable downward capacities may be increased by 1/3 for short-term loads due to wind of seismic. To provide adequate resistance to lateral loads, we recommend driving all piles to a minimum depth of 12 feet below ground surface.

Total settlement of individual piles will vary depending on the plan dimensions of the foundation and actual structural loading. Based on anticipated pier dimensions and loads, we estimate that total post-construction settlement of piles designed and constructed in accordance with our recommendations will be on the order of ½-inch. Differential settlement between similarly loaded, adjacent piles is expected to be less than ¼ -inch, provided piles are driven in similar materials. Differential settlement

between adjacent piles founded on dissimilar materials (e.g., one pile on soil and an adjacent pile on rock) may approach the maximum anticipated total settlement. Settlement of pile foundations is expected to occur rapidly and should be essentially complete shortly after initial application of loads. We should review these settlement estimates when final pier configuration and loading is known.

Resistance to lateral loads will be provided by the resistance of the soil against the piles and by the bending stiffness of the piles themselves. The lateral loads will be applied to the top of the piles at an estimated height of 15 feet above the lake bottom, resulting in high moment arms and overturning forces. Therefore, the structural engineer may want to consider lateral restraints between the piles at the lake bottom to create a fixed head or rigid cap pier. This could be performed with steel beams with slip collars, or cross bracing. If lateral restraints are not installed on the lake bottom, the pile group should be evaluated as an elevated flexible (free head) cap. Estimated lateral resistance values and maximum induced deflections and moments for driven piles with the free and fixed head conditions described above are presented in the table below:

Allowable Lateral Resistance

Pile Description		Lateral Load (Kips)		Max. Induced Deflection (in.)		Max. Induced Moment (Ft-Kips)		Depth to Max. Moment (feet)		Depth to Zero Moment (feet)	
Pile Diameter (inches)	Wall Thickness (Inches)	Fixed Head	Free Head	Fixed Head	Free Head	Fixed Head	Free Head	Fixed Head	Free Head	Fixed Head	Free Head
10	0.179	4.35	4.35	0.2	2.0	2	11.7	7.2	4.6	11.5	11.5
10	0.179	6.4	6.4	0.3	2.8	3	17.2	7.2	4.6	11.5	11.5

Lateral resistance values provided above are for a single, isolated pile subjected to a short-term lateral load. The capacity of a single, isolated pile subjected to a sustained lateral load may be taken as 80 percent of the values provided above. Additionally, the lateral resistance of each individual pile within a pile group should be reduced by the factors provided below to account for group action effects (in direction of load only).

Center to Center Pile Spacing (Diameters)	Lateral Capacity Reduction Factor
6	0.9
5	0.8
4	0.7
3	0.6

The above vales were obtained using an assumed embedded pile length of 12 feet. Piles in excess of 12 feet should be re-evaluated for lateral resistance and moments; however, we anticipate that lateral resistance will generally increase with increased pile length. Depths specified above are depths below the bottom of the existing lake bed. Above values of maximum moment are due only to a lateral load (equal to the lateral resistance) imposed at the pile head. Depth to zero moment refers to the first point of counterflexure for a free-head pile and the second point of counterflexure for a fixed-head pile.

6.1.2 Seismic Design Criteria

In accordance with the 2007 CBC, the mapped maximum considered earthquake spectral response acceleration at short periods (S_s) and at the 1-second period (S_1) shown in the table below should be used for the project site. The values were obtained for the site using the USGS Earthquake Hazards Program Ground Motion Calculator. The values were generated based on the site's approximate latitude and longitude (39.1806^{0}N and 120.1193^{0}W, respectively) obtained from Google Earth.

S_s = 125.4%g	Figure 1613.5(3), 2007 CBC
S_1 = 46.4%g	Figure 1613.5(4), 2007 CBC
F_a = 1.0	Table1613.5.3(1), 2007 CBC
F_v = 1.536	Table 1613.5.3(2), 2007 CBC

Based on our literature review, our site reconnaissance, and our experience in the area, we recommend using Site Class D (Table 1613.5.2, 2007 CBC) to evaluate seismic loads.

6.1.3 Plan Review and Construction Monitoring

Construction monitoring includes review of plans and specifications and observation of onsite activities during construction as described below. We should review final pier plans prior to construction to evaluate whether our recommendations have been implemented and to provide additional and/or modified recommendations, if necessary. We also recommend that our firm be retained to provide construction monitoring and testing services during pier construction to observe pile driving conditions with respect to our engineering recommendations.

7. LIMITATIONS

Our professional services were performed consistent with the generally accepted geotechnical engineering principles and practices employed in the site area at the time the report was prepared. No warranty, express or implied, is provided by our services.

Our services were performed consistent with our agreement with our client. We are not responsible for the impacts of changes in environmental standards, practices or regulations subsequent to performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report. This report is solely for the use of our client. Reliance on this report by a third party is at the risk of that party.

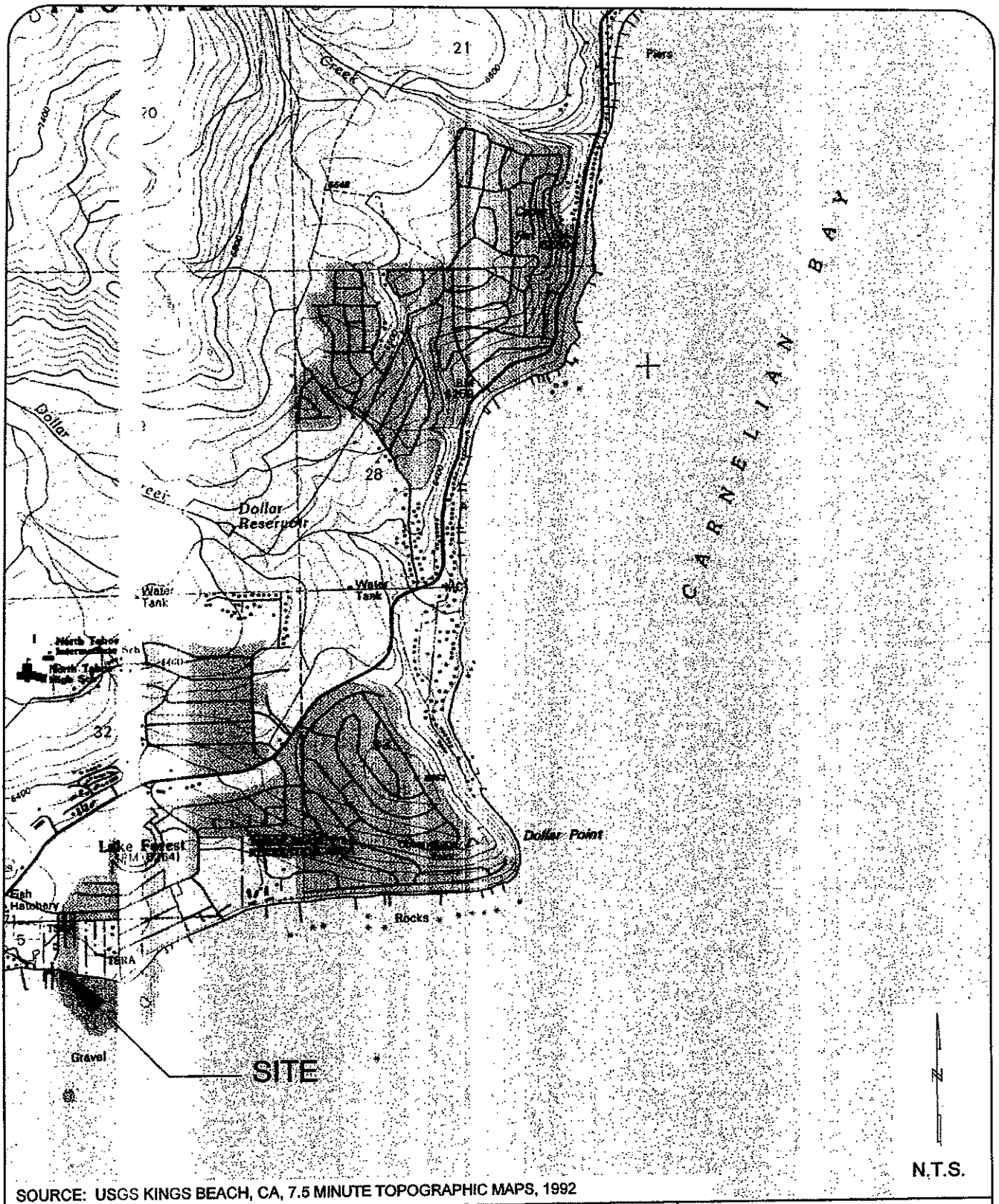
If changes are made to the nature or design of the project as described in this report, then our conclusions and recommendations presented in the report should be reviewed by Holdrege & Kull to review our conclusions and recommendations. Additional field work and laboratory tests may be required to revise our recommendations. Costs to review project changes, perform additional field work and laboratory testing necessary to modify our recommendations are beyond the scope of services provided for this report. Additional work will be performed only after receipt of an approved scope of services, budget, and written authorization to proceed.

Analyses, conclusions and recommendations presented in this report are based on site conditions as they existed at the time we performed our subsurface exploration. We assumed that subsurface soil conditions encountered at the location of our exploratory boring are generally representative of subsurface conditions across the project site. Actual subsurface conditions at locations beyond our exploratory boring may differ. If subsurface conditions encountered during construction are different than those described in this report, we should be notified so that we can review and modify our recommendations as needed.

Our scope of services did not include evaluating the project site for the presence of hazardous materials or petroleum products. Although we did not observe evidence of hazardous materials or petroleum products at the time of our field investigation, project personnel should take necessary precautions should hazardous materials be encountered during construction.

The findings of this report are valid as of the present date. Changes in the conditions of the property can occur with the passage of time. These changes may be due to natural processes or works of man, at the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

FIGURES



SOURCE: USGS KINGS BEACH, CA, 7.5 MINUTE TOPOGRAPHIC MAPS, 1992

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SITE VICINITY MAP
U.S. COAST GUARD PIER
TAHOE CITY/PLACER COUNTY, CALIFORNIA

PROJECT NO.: 41336-01
DATE: SEPTEMBER, 2009
FIGURE NO.: 1

HOMEOWNERS ASSOCIATION

HOMEOWNERS ASSOCIATION

EXISTING TREE (TYP.)

NEW TYPE 1A CURB AND GUTTER (TYP.)

094-140-015
U.S. COAST GUARD

EW AC OVERLAY
YP.)

NEW VALLEY GUTTER (TYP.)

NEW AC OVERLAY OVERLAY (TYP.)

NEW PAVEMENT REMOVAL AND REPLACEMENT (TYP.)

REVEGETATE AREA OF GRAVEL REMOVAL SEE LANDSCAPE/REVEGETATION NOTES, SHEET G2

11+00

12+00

13+00

14+00

NEW AC PAVING

BUILDING

NEW TYPE A1-6 BARRIER CURB (TYP.)

NEW TYPE A1-6 BARRIER CURB (TYP.)

BUILDING

NEW AC PAVING (TYP.)

RELOCATED SHED AND LOCKERS

NEW DRAIN ROCK BENEATH DECKING (TYP.)

NEW DRIPLINE TRENCH AROUND ALL BUILDINGS (TYP.)

NEW TYPE 1A CURB AND GUTTER (TYP.)

EXISTING GRAVEL

HOT TUB

BUILDING

EXISTING GRAVEL

NEW PAVEMENT REMOVAL AND REPLACEMENT (TYP.)

EXISTING BARRIER CURB

B-1

NEW STRIPING

NEW DRAINAGE INLET (TYP.)

NEW VALLEY GUTTER (TYP.)

NEW STORM DRAIN MANHOLE (TYP.)

EXISTING PUMP STATION

EXISTING CONVAULT PAD

EXISTING EAVE (TYP.)

BUILDING

NEW STORM DRAIN PIPE (TYP.)

NEW CONCRETE PAD FOR RELOCATED SHED AND LOCKER

REVEGETATE AREA OF SHED AND LOCKER REMOVAL SEE LANDSCAPE/REVEGETATION NOTES, SHEET G2

EXISTING MEAN HIGH WATER

EXISTING ROCK SLOPE PROTECTION (TYP.)

NEW CONCRETE CURB (TYP.)

NEW CONCRETE CURB (TYP.)

EXISTING FUEL TANK (TYP.) TO REMAIN

PIER

EXISTING BOLLARDS (TYP.) TO REMAIN

EXISTING 24" STORM DRAIN CULVERT

094-140-014
STATE OF CALIFORNIA

LEGEND:

B-1 APPROXIMATE BORING LOCATION

NOT TO SCALE

DRAWING MODIFIED FROM SITE PLAN CREATED BY AUERBACH ENGINEERING CORP DATED MARCH 8, 2006

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TEST PIT LOCATION PLAN

U.S. COAST GUARD PIER EXTENSION

TAHOE CITY/PLACER COUNTY, CALIFORNIA

DRAWN BY: AKH	CHECKED BY: DLK
PROJECT NO.: 41336-01	
DATE: SEPTEMBER, 2009	
FIGURE NO.: 2	

APPENDIX C Boring Log

BORING B-1

PROJECT NO.	PROJECT NAME	ELEVATION (APPROX)	DATE	PAGE	BORING NO.
41336-01	US COAST GUARD PIER	~6230 FT	08/11/09	1 OF 3	B-1

DRILLING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
MOBILE B-61	HOLLOW STEM AUGER MODIFIED CALIFORNIA (2.5" DIA.)	YES	NO

POCKET PENET-ROMETER (TSF)	BLOW COUNTS (N/6in)	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
					--	5 TO 6 INCHES SOD
				1	CH	BROWN SANDY CLAY (CH); DRY TO MOIST, MEDIUM STIFF TO STIFF, MEDIUM PLASTICITY, FINE TO MEDIUM SAND, SOME FINE TO COARSE GRAVEL
				2		
	2					
	3			3		
	4				CH	GRAY BROWN SANDY CLAY (CH); MOIST, SOFT, MEDIUM PLASTICITY, FINE SAND, SOME COARSE GRAVEL, ORANGE OXIDATION PRESENT
	5					
	3			4	CH	DARK GRAY SANDY CLAY (CH); MOIST, MEDIUM STIFF, LOW PLASTICITY, FINE SAND LENSES OF SANDY CLAY AND ELASTIC SANDY SILT
2.0	5	76.0	31.8			
	3			5		
0.5	6			6		
1.0	7				CH	BLUE GRAY FAT CLAY WITH SAND (CH); MOIST, MEDIUM STIFF, VARYING AMOUNTS OF FINE SAND, SOME FINE GRAVEL, TRACE ORGANICS
1.5	4			7		
2.0	8				CH	GRAY FAT CLAY (CH); MOIST, STIFF, MEDIUM PLASTICITY, SOME FINE SAND, LENSES OF SANDY CLAY
	8			8		
	3					
	9			9	SP-SC	DARK YELLOW BROWN POORLY-GRADED SAND WITH CLAY (SP-SC); WET, MEDIUM DENSE, FINE TO MEDIUM SAND, MICA FLAKES
	13					
	5			10	CH	LIGHT GRAY BROWN FAT CLAY (CH); MOIST, STIFF, MEDIUM PLASTICITY, VARVED, TRACE FINE SAND, TRACE ORGANICS, LAYERS OF SILT
2.5	11					
3.0	12			11		
	4				CH	GRAY FAT CLAY (CH); MOIST, STIFF, MEDIUM PLASTICITY, VARVED, SOME FINE SAND, MICA FLAKES, THIN LAYERS OF SANDY CLAY AND ELASTIC SANDY SILT
3.5	6			12		
3.5	9					
	4			13		
2.75	10					
3.0	14	67.4	49.1	14		
	2					
0.5	4	56.4	69.0	15		
1.0	7				CH	LIGHT GRAY FAT CLAY (CH); MOIST, SOFT, MEDIUM PLASTICITY, ORANGE OXIDATION PRESENT AT 15 FEET
	2			16	CH	DARK BLUE GRAY FAT CLAY WITH SAND (CH); MOIST, VERY STIFF, VARVED. VARYING AMOUNTS OF FINE SAND, LENSES OF SANDY CLAY AND ELASTIC SANDY SILT
3.5	5	59.2	67.0			
4.0	9			17		
	3					
>4.5	8			18		BLACK ORGANIC LENS
>4.5	13					
	5			19		MICA FLAKES
	9					
	11			20		

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BORING B-1

PROJECT NO.	PROJECT NAME	ELEVATION (APPROX)	DATE	PAGE	BORING NO.
41336-01	US COAST GUARD PIER	~6230 FT	08/11/09	2 OF 3	B-1

DRILLING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
MOBILE B-61	HOLLOW STEM AUGER MODIFIED CALIFORNIA (2.5" DIA.)	YES	NO

SAMPLE NO.	BLOW COUNTS (N) *	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
	2					
	5			21		BECOMING WET, SOFT
1.0	8					
	4			22		
>4.5	11					DARK BLUE GRAY SANDY FAT CLAY (CH); MOIST, HARD, FINE SAND, TRACE MICA FLAKES
>4.5	19			23		
	5				CH	
>4.5	13			24		
>4.5	18					
				25		GRAY FAT CLAY WITH SAND (CH); MOIST, VERY STIFF, LOW PLASTICITY, FINE SAND, MICA FLAKES, VARVED, LENSES OF FINE TO MEDIUM SAND
				26		
				27		
				28		
				29		
	6			30		
2.5	7					THIN LENSES OF FINE TO MEDIUM SAND
3.0	13			31		
					CH	
				32		
				33		
				34		
3.0	5			35		4 INCH LAYER OF RED BROWN WELL-GRADED CLAYEY SAND (SW-SC); WET, MEDIUM DENSE
3.5	5					
>4.5	12			36		
					▽	BECOMING HARD, WITH FINE SAND
				37		
				38		
				39		
	5			40		

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BORING B-1

PROJECT NO.	PROJECT NAME	ELEVATION (APPROX)	DATE	PAGE	BORING NO.
41336-01	US COAST GUARD PIER	~6230 FT	08/11/09	3 OF 3	B-1

DRILLING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
MOBILE B-61	HOLLOW STEM AUGER MODIFIED CALIFORNIA (2.5" DIA.)	YES	NO

SAMPLE NO.	BLOW COUNTS (N) *	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)			USCS	DESCRIPTIONS/REMARKS
9-1-2	10							
9-1-2	36			41				BORING TERMINATED AT 41 FEET
				42				
				43				
				44				
				45				
				46				
				47				
				48				
				49				
				50				
				51				
				52				
				53				
				54				
				55				
				56				
				57				
				58				
				59				
				60				

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APPENDIX D Laboratory Test Results

Moisture & Density

ASTM D2216 & D2937

Project No.: 41336-01 Project Name: US Coast Guard Pier Date: 8/21/2009

Lab No.: 15-09-276 Performed By: BLK Checked By: JHA

SAMPLE LOCATION DATA										
Boring/Trench No.	Units	B-1	B-1	B-1	B-1					
Sample No.										
Depth Interval	(ft.)	4.5	13.5	16	14.5					
Sample Description		Dark Gray Fat Clay with Sand (CH)	Dark Blue Gray Fat Clay (CH)	Dark Blue Gray Fat Clay with Sand (CH)	Gray Fat Clay (CH)					
USCS Symbol										
SAMPLE DIMENSION AND WEIGHT DATA										
Sample Length	(in)	6.000	6.000	6.000	6.000					
Sample Diameter	(in)	2.430	2.430	2.430	2.430					
Sample Volume	(cf)	0.0161	0.0161	0.0161	0.0161					
Wet Soil + Tube Wt.	(gr)	1021.00	1023.80	1012.00	845.90					
Tube Wt.	(gr)	290.00	289.50	290.00	150.20					
Wet Soil Wt.	(gr)	731.00	734.30	722.00	695.70					
MOISTURE CONTENT DATA										
Tare No.		A	JA3	MD	B-4					
Tare Wt.	(gr)	155.24	156.31	51.00	150.20					
Wet Soil + Tare Wt.	(gr)	291.26	231.38	167.00	845.90					
Dry Soil + Tare Wt.	(gr)	258.47	206.65	120.46	561.89					
Water Wt.	(gr)	32.79	24.73	46.54	284.01					
Dry Soil Wt.	(gr)	103.23	50.34	69.46	411.69					
Moisture Content	(%)	31.8	49.1	67.0	69.0					
TEST RESULTS										
Wet Unit Wt.	(pcf)	100.1	100.5	98.8	95.2					
Moisture Content	(%)	31.8	49.1	67.0	69.0					
Dry Unit Wt.	(pcf)	76.0	67.4	59.2	56.4					
MOISTURE CORRECTION DATA										
Gauge Moisture	(%)									
K Value Correction Factor										
COMPACTION CURVE DATA (ASTM D698, ASTM D1557, or CAL216)										
Test Method										
Curve No.										
Max Wet Unit Wt.	(pcf)									
Max Dry Unit Wt.	(pcf)									
Optimum Moisture	(%)									
Wet Relative Comp.	(%)									
Dry Relative Comp.	(%)									

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Atterberg Indices

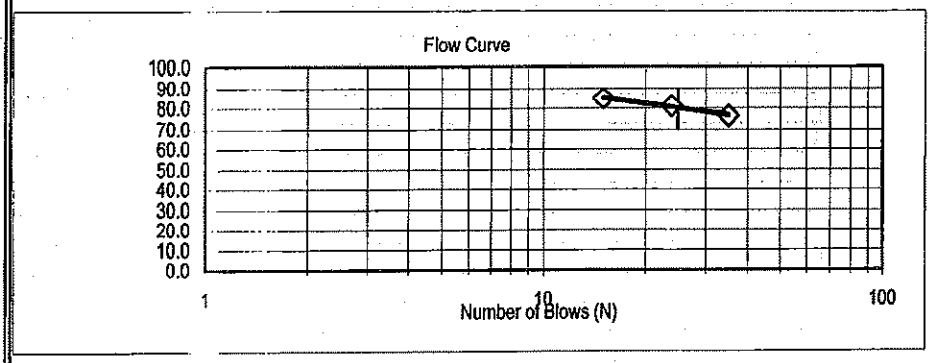
ASTM D4318

Project No.:	41336-01	Project Name:	US Coast Guard Pier		Date: 8/21/2009
Sample No.:	N/I	Boring/Trench:	B-1	Depth, (ft.): 4.5	Tested By: BLK
Description:	Dark Gray Fat Clay with Sand (CH)				Checked By: JHA
Sample Location:					Lab. No.: 15-09-276

Estimated % of Sample Retained on No. 40 Sieve: _____ Sample Air Dried: yes

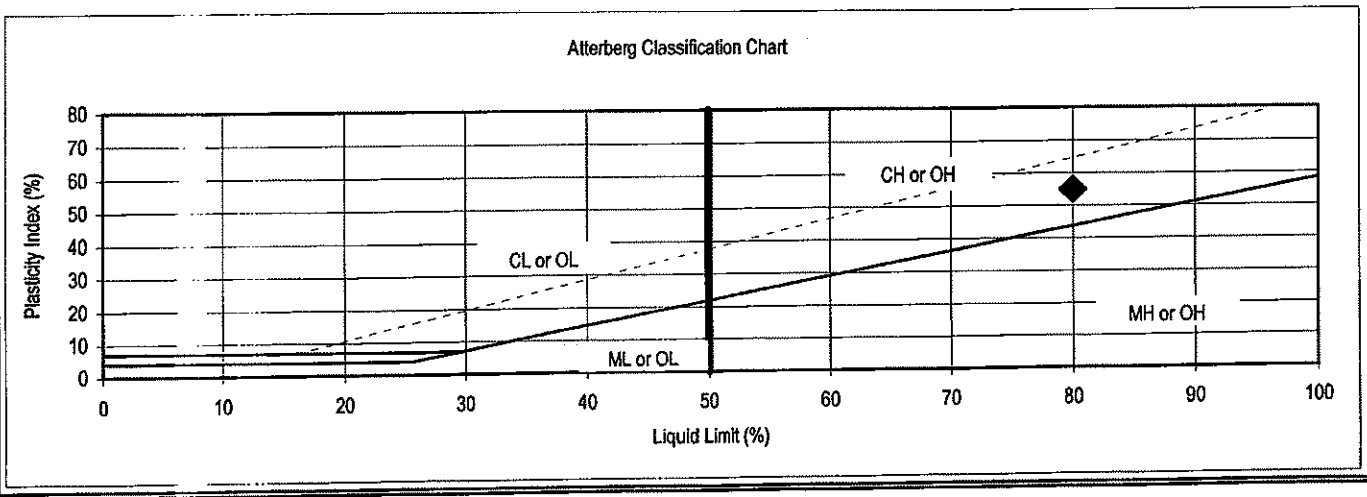
Test Method A or B: A

	LIQUID LIMIT:					PLASTIC LIMIT:		
Sample No.:	1	2	3	4	5	1	2	3
Pan ID:	LB	HK	LE			LA	I	
Wt. Pan (gr)	15.32	15.02	15.10			11.07	11.30	
Wt. Wet Soil + Pan (gr)	21.90	20.92	20.87			15.17	15.84	
Wt. Dry Soil + Pan (gr)	18.88	18.28	18.37			14.36	14.95	
Wt. Water (gr)	3.02	2.64	2.50			0.81	0.89	
Wt. Dry Soil (gr)	3.56	3.26	3.27			3.29	3.65	
Water Content (%)	84.8	81.0	76.5			24.6	24.4	
Number of Blows, N	15	24	35					
				LIQUID LIMIT =	80		PLASTIC LIMIT =	25



Plasticity Index = 55

Group Symbol = CH



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PARTICLE SIZE DISTRIBUTION TEST WORK SHEET

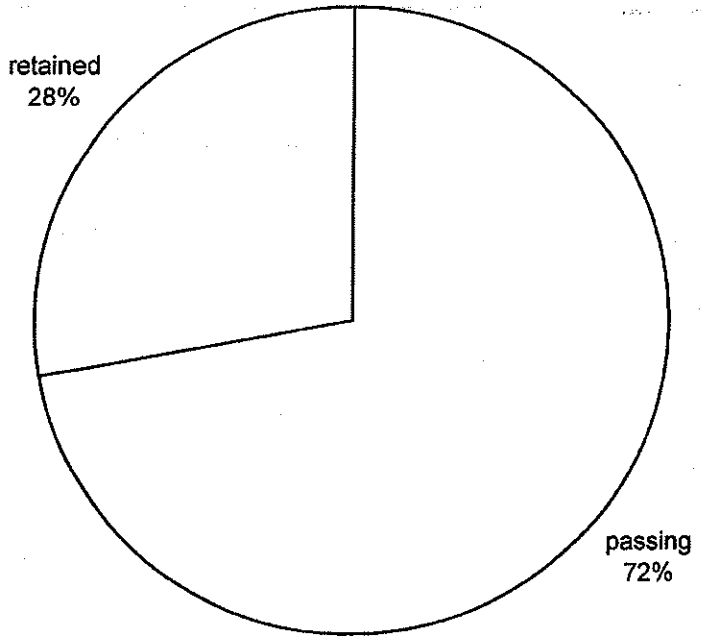
ASTM D1140

Sieve Only Analysis Worksheet

Project No.:	41336-01	Project Name:	US Coast Guard Pier		Date: 8/21/2009
Sample No.:	N/I	Boring/Trench:	B-1	Depth, (ft.): 16	Tested By: BLK
Description:	Dark Blue Gray Fat Clay with Sand (CH)				Checked By: JHA
Sample Location:					Lab. No.: 15-09-276

Moisture Content Data:			Total Material Sample Data:		
Pan ID	PO		Pan ID	B	
Pan Weight	51.00	(gm)	Pan Weight	320.00	(gm)
Wet Soil + Pan	156.00	(gm)	Wet Soil + Pan Wt.	523.00	(gm)
Dry Soil + Pan	118.08	(gm)	Wet Weight	203.00	(gm)
Water Weight	37.92	(gm)	Dry Weight	129.69	(gm)
Dry Soil Weight	67.08	(gm)	Dry Wt.> #200 Sieve & Pan	355.94	(gm)
Moisture Content	56.5	(%)	Dry Wt.> #200 Sieve	35.94	
			Total Percent <#200 Sieve	72.29	(%)

Percent Passing/Retained
 # 200 Sieve



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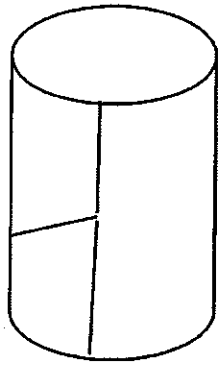
UNCONFINED COMPRESSION

ASTM D2166

Project No.:	41336-01	Project Name:	US Coast Guard Pier	Date:	8/21/2009
Sample No.:	N/I	Boring/Trench No.:	B-1	Depth (ft.) 13.5	Tested By: BLK
Soil Description:	Dark Blue Gray Fat Clay (CH)				Check By: JHA
Sample Location:					Lab No.: 15-09-276

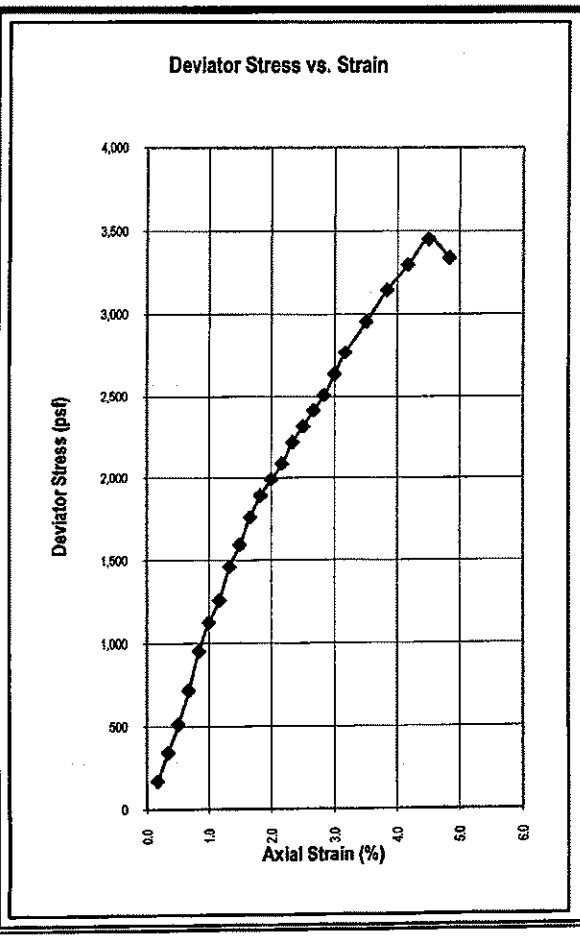
Sample Data		
Tare Tube Number	I.D.	JA3
Tare Weight	(gm)	289.50
Wet Soil + Tare	(gm)	1023.80
Dry Soil + Tare	(gm)	781.34
Weight of Water	(gm)	242.46
Dry Soil Weight	(gm)	491.84
Moisture Content	(%)	49.30
Soil Height	(cm)	15.24
Sample Diameter	(cm)	6.17
Wet Unit Weight	(pcf)	100.61
Dry Unit Weight	(pcf)	67.39
Specific Gravity	(dim)	2.70
Saturation	(%)	88.73
Strain Rate	(%)	0.01
Proving Ring Constant	(lbs/unit)	1.108

Sample Sketch At Failure



Unconfined Shear Strength = 1,726.1 psf

Elapsed Time (Minutes)	Strain Units (0.001in/unit)	Strain Percent (%)	Area (cm^2)	Load Dial (units)	Load Force (lbs)	Deviator Stress (psf)
12:00:00	10	0.17	29.95	5	5.54	171.85
12:00:30	20	0.33	30.00	10	11.08	343.13
12:01:00	30	0.50	30.05	15	16.62	513.84
12:01:30	40	0.67	30.10	21	23.27	718.16
12:02:00	50	0.83	30.15	28	31.02	955.95
12:02:30	60	1.00	30.20	33	36.56	1124.76
12:03:00	70	1.17	30.25	37	41.00	1258.97
12:03	80	1.33	30.30	43	47.64	1460.66
12:04:00	90	1.50	30.35	47	52.08	1593.84
12:04:30	100	1.67	30.41	52	57.62	1760.41
12:05:00	110	1.83	30.46	56	62.05	1892.61
12:05:30	120	2.00	30.51	59	65.37	1990.62
12:06:00	130	2.17	30.56	62	68.70	2088.28
12:06:30	140	2.33	30.61	66	73.13	2219.22
12:07	150	2.50	30.67	69	76.45	2316.13
12:07:30	160	2.67	30.72	72	79.78	2412.70
12:08:00	170	2.83	30.77	75	83.10	2508.93
12:08:30	180	3.00	30.82	79	87.53	2638.20
12:09:00	190	3.17	30.88	83	91.96	2767.02
12:09:30	210	3.50	30.98	89	98.61	2956.83
12:10:00	230	3.83	31.09	95	105.26	3145.27
12:10:30	250	4.17	31.20	100	110.80	3299.33
12:11:00	270	4.50	31.31	105	116.34	3452.25
12:11:30	290	4.83	31.42	102	113.02	3341.91



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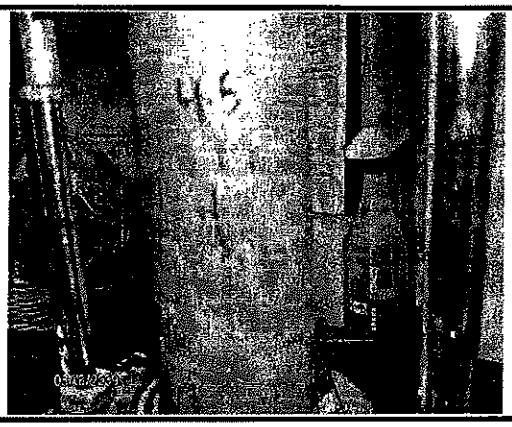
UNCONFINED COMPRESSION

ASTM D2166

Project No.:	41336-01	Project Name:	US Coast Guard Pier	Date:	8/21/2009
Sample No.:	N/I	Boring/Trench No.: B-1	Depth (ft.) 4.5	Tested By:	BLK
Soil Description:	Dark Gray Fat Clay with Sand (CH)			Check By:	JHA
Sample Location:				Lab No.:	15-09-276

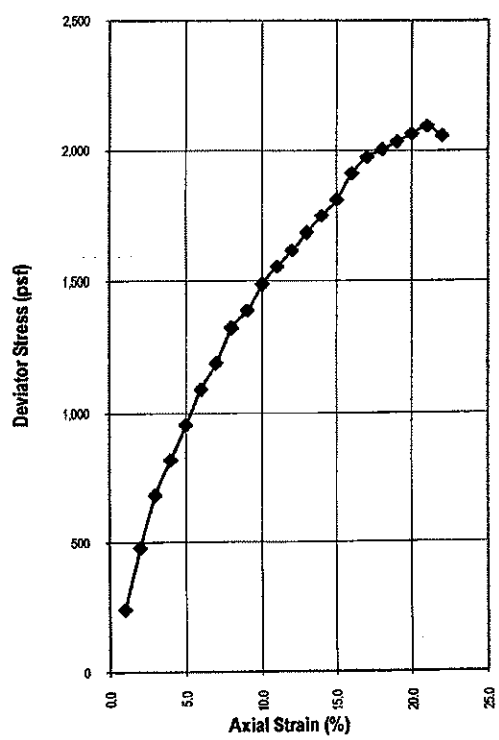
Sample Data		
Tare Tube Number	I.D.	A
Tare Weight	(gm)	290.00
Wet Soil + Tare	(gm)	1021.00
Dry Soil + Tare	(gm)	844.62
Weight of Water	(gm)	176.38
Dry Soil Weight	(gm)	554.62
Moisture Content	(%)	31.80
Soil Height	(cm)	15.24
Sample Diameter	(cm)	6.17
Wet Unit Weight	(pcf)	100.16
Dry Unit Weight	(pcf)	75.99
Specific Gravity	(dim)	2.70
Saturation	(%)	70.55
Strain Rate	(%)	0.01
Proving Ring Constant	(lbs/unit)	1.108

Sample Sketch At Failure



Unconfined Shear Strength = 1,046.5 psf

Elapsed Time (Minutes)	Strain Units (0.001in/unit)	Strain Percent (%)	Area (cm^2)	Load Dial (units)	Load Force (lbs)	Deviator Stress (psf)
12:00:00	10	0.17	29.95	7	7.76	240.59
12:00:30	20	0.33	30.00	14	15.51	480.38
12:01:00	30	0.50	30.05	20	22.16	685.11
12:01:30	40	0.67	30.10	24	26.59	820.76
12:02:00	50	0.83	30.15	28	31.02	955.95
12:02:30	60	1.00	30.20	32	35.46	1090.67
12:03:00	70	1.17	30.25	35	38.78	1190.92
12:03	80	1.33	30.30	39	43.21	1324.78
12:04:00	90	1.50	30.35	41	45.43	1390.37
12:04:30	100	1.67	30.41	44	48.75	1489.58
12:05:00	110	1.83	30.46	46	50.97	1554.65
12:05:30	120	2.00	30.51	48	53.18	1619.48
12:06:00	130	2.17	30.56	50	55.40	1684.09
12:06:30	140	2.33	30.61	52	57.62	1748.47
12:07	150	2.50	30.67	54	59.83	1812.62
12:07:30	160	2.67	30.72	57	63.16	1910.06
12:08:00	170	2.83	30.77	59	65.37	1973.69
12:08:30	180	3.00	30.82	60	66.48	2003.70
12:09:00	190	3.17	30.88	61	67.59	2033.59
12:09:30	200	3.33	30.93	62	68.70	2063.37
12:10:00	210	3.50	30.98	63	69.80	2093.04
12:10:30	220	3.67	31.04	62	68.70	2056.26
12:11:00					0.00	
12:11:30					0.00	



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Unconsolidated-Undrained Triaxal Compression Test

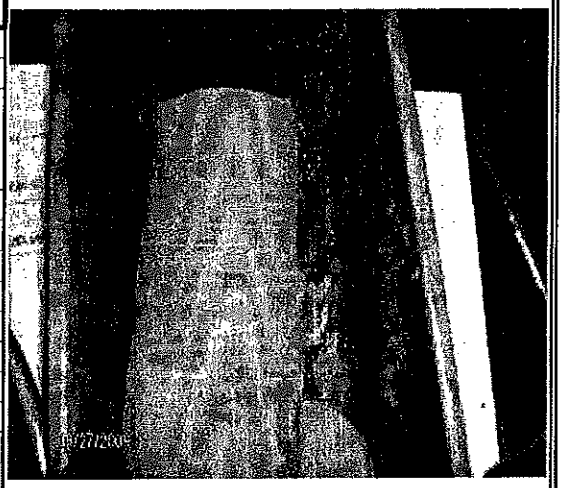
ASTM D 2850

Project No: 41336-01 Project Name US Coast Guard Pier Date: 8/27/2009
Sample No: N/I Boring/Trench No: B-1 Depth ft. 10.5 Tested By: BLK
Soil Description: Gray Brown Fat Clay (CH) ecked By: Draft
Sample Location: Lab No: 15-09-288

		Initial	Final			
Sample Height	in	6.00	5.50	Cell Pressure	psi	0
Sample Diameter	in	2.43	2.43	Chamber Pressure	psi	2.69
Sample Area	in	4.64	4.64	load value	lbs./rdg.	1.19
Sample Volume	cf	0.0161	0.0148			

Time hr:mn:sec	Strain .001 div/in	Load Dial lbs./rdg	Strain %	Area in	Principle psi	Major psi	Minor psi
0:01:47	10	19	0.00182	4.646	4.87	7.56	2.69
0:03:31	20	27	0.00364	4.654	6.90	9.59	2.69
0:05:16	30	33	0.00545	4.663	8.42	11.11	2.69
0:07:04	40	38	0.00727	4.672	9.68	12.37	2.69
0:08:39	50	42	0.00909	4.680	10.68	13.37	2.69
0:10:21	60	46	0.01091	4.689	11.67	14.36	2.69
0:12:06	70	50	0.01273	4.697	12.67	15.36	2.69
0:13:27	78	52	0.01418	4.704	13.15	15.84	2.69
0:13:51	80	53	0.01455	4.706	13.40	16.09	2.69
0:15:29	90	56	0.01636	4.715	14.13	16.82	2.69
0:17:10	100	59	0.01818	4.723	14.86	17.55	2.69
0:18:51	110	62	0.02	4.732	15.59	18.28	2.69
0:20:31	120	64	0.02182	4.741	16.06	18.75	2.69
0:22:13	130	67	0.02364	4.750	16.79	19.48	2.69
0:23:53	140	69	0.02545	4.759	17.25	19.94	2.69
0:25:40	150	71	0.02727	4.768	17.72	20.41	2.69
0:29:00	170	76	0.03091	4.785	18.90	21.59	2.69
0:32:00	190	80	0.03455	4.803	19.82	22.51	2.69
12:33:50	210	85	0.03818	4.822	20.98	23.67	2.69
0:35:39	240	92	0.04364	4.849	22.58	25.27	2.69
0:36:41	260	97	0.04727	4.868	23.71	26.40	2.69
0:37:30	280	101	0.05091	4.886	24.60	27.29	2.69
0:38:09	300	106	0.05455	4.905	25.72	28.41	2.69
0:39:00	330	112	0.06	4.934	27.01	29.70	2.69
0:39:57	360	118	0.06545	4.962	28.30	30.99	2.69
0:40:48	390	123	0.07091	4.992	29.32	32.01	2.69
0:41:37	420	128	0.07636	5.021	30.34	33.03	2.69
0:42:11	440	131	0.08	5.041	30.93	33.62	2.69
0:42:42	460	134	0.08364	5.061	31.51	34.20	2.69
0:43:15	480	136	0.08727	5.081	31.85	34.54	2.69
0:43:46	500	139	0.09091	5.101	32.42	35.11	2.69
0:44:33	530	141	0.09636	5.132	32.69	35.38	2.69
0:45:19	560	142	0.10182	5.163	32.73	35.42	2.69
0:46:04	590	143	0.10727	5.195	32.76	35.45	2.69
0:46:27	600	142	0.10909	5.205	32.46	35.15	2.69

Sketch/Photo at failure



Unconsolidated-Undrained Triaxal Compression Test

ASTM D 2850

Project No: 41336-01 Project Name US Coast Guard Pier Date: 8/27/2009
Sample No: N/I Boring/Trench No: B-1 Depth ft. 22.5 Tested By: BLK
Soil Description: Dark Blue Gray Fat Clay with Sand (CH) ecked By: AKH
Sample Location: Lab No: 15-09-288

		Initial	Final			
Sample Height	in	5.75	5.50	Cell Pressure	psi	0
Sample Diameter	in	2.43	2.43	Chamber Pressure	psi	5.76
Sample Area	in	4.64	4.64	load value	lbs./rdg.	1.19
Sample Volume	cf	0.0154	0.0148			

Time hr:mn:sec	Strain .001 div/in	Load Dial lbs./rdg	Strain %	Area in	Principle psi	Major psi	Minor psi
0:00:11	10	17	0.00182	4.646	4.35	10.11	5.76
0:00:30	20	27	0.00364	4.654	6.90	12.66	5.76
0:00:46	30	37	0.00545	4.663	9.44	15.20	5.76
0:01:16	50	48	0.00909	4.680	12.20	17.96	5.76
0:01:33	60	53	0.01091	4.689	13.45	19.21	5.76
0:01:49	70	58	0.01273	4.697	14.69	20.45	5.76
0:02:06	80	62	0.01455	4.706	15.68	21.44	5.76
0:02:22	90	66	0.01636	4.715	16.66	22.42	5.76
0:02:38	100	70	0.01818	4.723	17.64	23.40	5.76
0:02:56	110	73	0.02	4.732	18.36	24.12	5.76
0:03:10	120	75	0.02182	4.741	18.83	24.59	5.76
0:03:27	130	77	0.02364	4.750	19.29	25.05	5.76
0:03:42	140	79	0.02545	4.759	19.76	25.52	5.76
0:03:57	150	81	0.02727	4.768	20.22	25.98	5.76
0:04:14	160	83	0.02909	4.777	20.68	26.44	5.76
0:04:30	170	85	0.03091	4.785	21.14	26.90	5.76
0:04:46	180	86	0.03273	4.794	21.35	27.11	5.76
0:05:01	190	89	0.03455	4.803	22.05	27.81	5.76
0:05:30	210	93	0.03818	4.822	22.95	28.71	5.76
0:06:03	230	96	0.04182	4.840	23.60	29.36	5.76
0:06:33	250	99	0.04545	4.858	24.25	30.01	5.76
0:07:04	270	101	0.04909	4.877	24.64	30.40	5.76
0:07:33	290	104	0.05273	4.896	25.28	31.04	5.76
0:08:22	320	107	0.05818	4.924	25.86	31.62	5.76
0:09:08	350	109	0.06364	4.953	26.19	31.95	5.76
0:09:57	380	110	0.06909	4.982	26.28	32.04	5.76
0:10:39	410	112	0.07455	5.011	26.60	32.36	5.76
0:11:24	440	112	0.08	5.041	26.44	32.20	5.76
0:12:13	460	113	0.08364	5.061	26.57	32.33	5.76
0:12:49	480	120	0.08727	5.081	28.10	33.86	5.76
0:13:39	510	122	0.09273	5.112	28.40	34.16	5.76
0:14:30	540	115	0.09818	5.142	26.61	32.37	5.76

Sketch/Photo at failure

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Appendix K

Littoral Drift Study

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Prepared for:
U.S. Coast Guard
CEU Oakland
Oakland, CA

Prepared by:
AECOM
Chelmsford, MA
60218657-102
June 2015

Coast Guard Station Lake Tahoe Year-Round Mooring Project Littoral Drift Impact Assessment

Contents

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1.0 Introduction

The U.S. Coast Guard (CG) is proposing a project that would allow CG Station Lake Tahoe (Station) to moor their response boats at the Station year-round. The Station is located at 2500 Lake Forest Road, Tahoe City, California, on the northwest shore of Lake Tahoe in Placer County. **Figure 1** shows Lake Tahoe and the location of the Station. The existing pier at the Station is 312 feet (ft) long and 8 ft wide. The pier extends south into the lake, and the lake bottom elevation at the end of the existing pier is 6,220 ft, Lake Tahoe Datum (LTD). The pier includes one boat lift and one fueling station. A set of steel piles spaced at 5-ft intervals supports the pier.

The CG requires year-round, 24-hour, immediate access to rapid response boats in order to provide essential emergency search and rescue (SAR), law enforcement and marine safety services to the boating public of Lake Tahoe. Cyclical droughts and seasonal low water levels at the current pier do not allow for on-site mooring of the CG's rapid response boats year-round. When water levels are low (generally October through January) rapid response boats must be moored at alternate sites which increases response times and creates security issues. This is contrary to CG SAR standards which require the CG rapid response boat to be underway less than 30 minutes after a distress call is received. When the CG is required to moor their response boats away from the Station this response time increases and it is often difficult to get underway within the CG SAR standards. The survival rate of a person in the water decreases as temperatures decrease and response time can be vital to saving a person's life. From Labor Day to Memorial Day, when lower temperatures are more likely, the CG is the only agency that has response boats moored on Lake Tahoe and is capable of responding to distress calls. From Memorial Day to Labor Day, when boating traffic is heaviest, there are other local agencies that also respond to distress calls; however, none of these agencies have a full crew able to respond to distress calls at night. The CG is on duty 24 hours a day and is the only agency capable of responding within a reasonable timeframe at night.

The purpose of the proposed project is to provide mooring capabilities at a suitable depth so that rapid response boats can moor at the Station year-round. The proposed project would improve the CG's ability to protect and serve the boating public of Lake Tahoe and is in furtherance of the CG's mission of protecting maritime safety and security at Lake Tahoe.

The CG is considering three action alternatives to achieve year-round mooring capabilities at the Station, including one *dredging alternative* and *two pier extension alternatives*. AECOM has performed a study to evaluate the potential impact of these three alternatives on the littoral drift processes in Lake Tahoe, as required by the Tahoe Regional Planning Agency (TRPA). This report summarizes the findings of the study and provides recommendations to the CG on the three alternatives.

The details of each of the three analyzed alternatives are described below.

Alternative 1: Dredging at Existing Pier

Alternative 1 consists of dredging a channel to allow access to the existing pier under low water conditions (Figure 2). The channel would be dredged to an elevation of 6,215 feet, LTD, and would cover an area of approximately 29,565 square feet (sq. ft.). The dredging would increase water depths by between 1 ft and 5 ft in the littoral zone of Lake Tahoe. A volume of up to 2,990 cubic yards of material would be removed from the lake bottom.

In addition to dredging, Alternative 1 would also include the addition of a 30-ft by 8-ft boat lift and a 70-ft by 8-ft floating dock to the west side of the existing pier head to accommodate the Station's two response boats and visiting vessels.

Alternative 2: 350-ft Dog-leg Pier Extension with Dolphin (angled) Piles

Each of the pier extension alternatives would be composed of two parts: 1) a span connecting the existing pier to a new pier head, and 2) the new pier head itself. The specifications for each of these components for Alternative 2 are described below:

Span Connecting to Existing Pier: The connecting span would extend from the existing pier 250 ft south into Lake Tahoe and would be 5 ft wide (**Figure 3**). The pier decking material for the connecting span would consist of pre-fabricated grated metal. The connecting span would be supported by a dolphin pile configuration. The dolphin configuration would consist of 10-inch diameter steel pipe battered piles (two opposing piles installed at an angle toward each other). The dolphins would be spaced 50 ft apart, for a total of 5 dolphins (total of 10 piles).

New Pier Head: The new pier head would be 100 ft long and 8 ft wide and would dog-leg west at an approximate 45° angle from the connecting span. The pier head would have a grated metal deck supported by 14 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 ft, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include two 30-ft by 8-ft boat lifts, a 70-ft by 8-ft floating dock, a fuel station and utility lines that would run underneath the pier.

Alternative 3: 450-ft Straight Extension with Dolphins

Span Connecting to Existing Pier: The connecting span for this alternative would extend 350 ft south from the existing pier (**Figure 3**). The span would be 5 ft wide and be composed of grated sections supported by 10-inch diameter steel pipe pile dolphins. The dolphins would be spaced 50 ft apart, for a total of 7 dolphins (total of 14 piles).

New Pier Head: The new pier head would be 100 ft long and 8 ft wide and would extend straight south from the connecting span. The pier head would have a grated metal deck supported by 14 steel pipe piles 10 inches in diameter. The end of the pier head would reach a lake-bottom elevation of approximately 6,215 ft, LTD, which is expected to be sufficient for year-round mooring during drought years. Facilities on the pier head would include two 30-ft by 8-ft boat lifts, a 70-ft by 8-ft floating dock, a fuel station and utility lines that would run underneath the pier.

Table 1 summarizes the three proposed alternatives.

Table 1 Summary of Proposed Project Alternatives

Alternative	Surface Area over Lake (sq. ft.)	Number of Piles	Lake-Bottom Footprint (sq. ft.)
Alternative 1: Dredging at Existing Pier	690	0	29,565
Alternative 2: 350-ft Dog-Leg Extension w/ Dolphins	2,870	24	14
Alternative 3: 450-ft Straight Extension w/ Dolphins	3,370	28	16

The CG had also originally considered two additional pier extension alternatives that would have used 1-ft diameter steel pipe monopiles, instead of the currently proposed dolphin piles, to support the connecting span of the pier extension. However, the monopile designs would have required 2.5 times more piles for the connecting span than the dolphin pile designs. AECOM modeled these two alternatives and concluded that the additional piles would result in increased impacts on littoral drift. Since the monopile designs' large disturbance footprint would have resulted in increased impacts on littoral drift, as well as

other resources (e.g., fish habitat, aesthetics, water quality), and presented no advantages over the dolphin designs, the two monopile alternatives were eliminated from further analysis.

The purpose of this study is to evaluate if the various alternative designs result in a significant impact on littoral drift in Lake Tahoe's littoral zone. The littoral zone is typically defined as the area along a coastline where wave action can cause the transport of sediment (typically sands) along the shoreline or perpendicular to the shoreline. The "drift" of these sediments can lead to areas of erosion or deposition. For the purposes of this study, AECOM has defined "impacts to littoral drift" as any change to existing erosional/depositional patterns in Lake Tahoe. AECOM investigated impacts from the alternative designs on the hydrodynamic parameters that drive littoral drift (wave height, orbital velocity, and long-shore current velocity) in order to evaluate the potential for changes to erosion and deposition. The following section provides an overview of important characteristics of Lake Tahoe relative to littoral drift processes.

2.0 Ambient Conditions

Historic Water Levels - The water depth in the littoral zone of Lake Tahoe will dictate breaking heights of wind-generated waves, and it will also influence long-shore current speeds in the littoral zone. The water depth in Lake Tahoe varies annually and seasonally. **Figure 4** shows a time series of daily average water levels recorded at the US Geological Survey (USGS) Station (ID 10337000 Tahoe City) from 1957 to 2015. The mean water level over this period is 6225.9 ft, LTD, and water levels varied from 6220.6 ft, LTD, in November 1992, to 6229.4 ft, LTD, in January 1997 (USGS 2015).

Bathymetry - While Lake Tahoe is deep in the middle, the area near the northwest shore is shallow and wide, creating a large littoral zone. **Figure 5** shows the Lake Tahoe bathymetry in the vicinity of the existing CG pier. The bathymetry is based on sounding data in the shoal region of Lake Tahoe collected by the USGS during July 2000 (USGS 2001 and US Army Corps of Engineers [USACE] 2001). The USGS shoal survey measured water depth to a maximum of approximately 114 ft (35 meters [m]). AECOM determined the lake bottom elevations by referencing the measurements of depth to the water surface elevation during July 2000. The Lake Tahoe water level during July 2000 ranged between 6,228.57 ft, LTD, and 6,228.97 ft, LTD. The July 2000 water level had a small range of 0.4 ft and for the purposes of this study, the July 2000 water level was considered to be constant using the average value of 6,228.8 ft, LTD. Using this value AECOM subtracted the surveyed water depth from the water surface elevation to determine the lake bed elevation throughout the shoal region of Lake Tahoe.

The Lake Tahoe shoreline changes depending on the water level in Lake Tahoe. For the purposes of this study AECOM defined the shoreline corresponding to the lake water level elevation at 6,223 ft, LTD, which is the natural rim of Lake Tahoe as defined by the USGS and the low water line as defined by TRPA. AECOM made this assumption in order to conservatively evaluate the case where water levels are at a minimum and the proposed alternatives are closest to the shoreline.

Wind - Waves and circulation patterns on Lake Tahoe are generated primarily by wind blowing over the Lake. AECOM used two adjacent meteorological stations for the South Lake Tahoe Airport (call sign TVL/KTVL) to understand wind patterns at Lake Tahoe. The South Lake Tahoe Airport stations are the closest stations to the Project site with sufficient data to make a determination of typical wind patterns. The two South Lake Tahoe Airport stations do not overlap in time, but they are both located near each other, to the south of Lake Tahoe. Combining wind data from the two stations make up a period of record that spans from 1973 to 2010. The South Lake Tahoe Airport meteorological stations provide an acceptable period of record to evaluate likely wind speeds over Lake Tahoe, but the wind speeds recorded at South Lake Tahoe are influenced by obstructions in the vicinity of the meteorological station and the wind speeds must be adjusted to match wind speeds expected on the relatively obstruction free surface of Lake Tahoe.

AECOM used the log wind profile relationship in order to appropriately scale up the wind speed from the South Lake Tahoe Airport meteorological station to expected wind speeds on Lake Tahoe. Details of this approach are summarized in **Appendix A**. AECOM then compared the scaled up wind speeds to a one month period of data from the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) meteorological station, which is located in open water on Lake Tahoe. AECOM used this comparison to fine tune calibration parameters for the log wind profile relationship. **Figure 6** shows a comparison of the scaled up South Lake Tahoe data and the NASA JPL open water data. Generally, the two data sets show good agreement and AECOM concluded that the scaled up wind speeds from the South Lake Tahoe meteorological stations were appropriate for use in this study.

Figure 7 is a wind rose of the scaled up South Lake Tahoe wind data. According to the wind rose, the dominant wind direction in Lake Tahoe is blowing from the north. This means that the largest waves can be expected to occur in the southern portion of Lake Tahoe. Although average wind speeds are generally within the range of 8-12 miles per hour (mph), wind speeds as high as 20-28 mph were recorded blowing from north. Wind blowing from the south is generally mild and less than 16 mph.

Lake Tahoe Currents – AECOM was not able to find any publically available data of circulation patterns and current speeds in Lake Tahoe. A number of studies have evaluated circulation patterns looking at measured and predicted velocities in Lake Tahoe. Strub and Powell (1986) described wind driven circulation in Lake Tahoe that results in an anti-cyclonic gyre in the northern portion of the Lake and a weaker cyclonic gyre in the southern portion of the Lake. The results of the numerical modeling conducted by Strub and Powell showed that the wind-driven residual current speeds range from under 2 centimeter per second (cm/s) to over 40 cm/s. According to Strub and Powell, these results showed good agreement with observed satellite data.

Lake Tahoe Sediment Transport – Wind, water depths, and circulation currents all interact to create a specific sediment transport regime in the Lake Tahoe littoral zone near the Station. The definitive study about sediment transport in Lake Tahoe was completed by Osborne et al. (1985) for the California State Lands Commission. Osborne et al. examined: substrata, contributing watersheds areas, sediment loads, and transport generated by circulation, waves, and bathymetry. While the study examined the entire lake, there are a number of regionally specific findings that are pertinent to the current study of sediment transport in the littoral zone near the Station. In the immediate vicinity of the Station Osborne et al. identified a general transport pattern moving from west to east along the shore. This pattern is consistent with dominant circulation patterns within the Lake as described by Strub and Powell. Osborne et al. do not provide a quantitative estimate of littoral drift near the Station. In addition to a net transport direction, Osborne et al. also noted that the area near the Station is mostly sand. The overriding conclusion made by Osborne et al. (1985) was that Lake Tahoe is typically a low energy environment where littoral transport is limited.

A more recent study on Lake Tahoe Sediment Loadings and Channel Erosion was performed by the United States Department of Agriculture (USDA)-Agricultural Research Services at the National Sedimentation Laboratory (Simon et al. 2003). The study combined detailed geomorphic and numerical modeling investigations of representative watersheds with reconnaissance level evaluation of approximate 300 sites around the Lake Tahoe shoreline to determine sediment loadings from contributing basins. The study investigated sediment production and delivery from individual watersheds and between different sites around the Lake. Fine-grained sediment transport was determined from historical data based on relationships derived from particle-size distributions across the range of measured flows. Reduced lake clarity is attributed to the delivery and transport of fine-grained sediments emanating from upland and channel erosion. Simon's study (2003) defined fine-grained sediments as particles 0.062 mm or finer which typically consist of silt and clay. In Barton Creek, the nearest watershed to the Station, fine-grain particles account for approximately 2.81-5.50% in various sediment sources. Simon's study (2003) provided internal bank material and bank toe particle size data at various sample locations of contributing streams. The nearest monitoring stations to the Project Area are at Ward Creek, located approximately 7 kilometers southwest of the Station. Ward Creek sampling stations showed a significant percent of fine-grained particles. Information from Simon's study (2003) was used to develop particle size parameters for the analyses below. Although Simon et al (2003) reported a wide range of particles sizes in stream banks and bed materials near the Station, sediment transport and deposition are highly dependent up on the ambient conditioning in the Lake. Given the low current spend commonly observed in Lake Tahoe, fine grain particles remain in suspension longer in water column and serve to provide good indication on change in sediment transport due to the proposed dredging. AECOM's modeling approach therefore focuses primarily on fine-grain particles in the modeling approach.

3.0 Modeling Approach

Based on the ambient conditions described above, AECOM developed a modeling approach to evaluate the proposed project's potential impacts to littoral drift in Lake Tahoe. For the purposes of this study AECOM defined "impacts to littoral drift" as any change to existing erosional/depositional patterns in Lake Tahoe. A study that quantifies littoral drift patterns in terms of volumetric transport would require extensive field data collection including water quality samples and long-term monitoring. In the absence of such extensive data, AECOM's modeling approach focuses on quantifying the forces that drive littoral drift in the vicinity of the proposed project, including relative changes in wave heights, orbital velocities, and long-shore current velocities. Erosion and saltation of sediments from the lake bed are caused by shear stresses applied by the movement of water over the lake bed (currents). Deposition and horizontal transport of sediment are a function of the particle (sediment) fall velocities and horizontal current velocities in the water column. Therefore, impacts to littoral drift can be evaluated by changes to currents and wave patterns.

This study answers the following three questions.

- Do the proposed project alternatives significantly change the wave height along the shoreline?
- Do the proposed project alternatives significantly change the orbital velocities occurring in the littoral drift zone?
- Do the proposed project alternatives significantly change the current velocities in the littoral drift zone?
- Does the proposed dredging alternative significantly increase the amount of sediment that would be deposited in the dredging area?

In order to answer these questions, AECOM developed a set of numerical models to investigate changes in wave and circulation patterns attributable to the proposed alternative designs. AECOM developed a model of wind-generated waves, a model of wave diffraction and reflection, a model of the hydrodynamics driven by the Lake circulation patterns, and a model of particle transport near the pier.

Wind Wave Generation Model - AECOM used the Steady State Spectral Wave (STWAVE) model, which was originally developed by the USACE Engineering Research and Development Center (ERDC). STWAVE is a finite difference and phase-averaged spectral wave model used to estimate near-shore wave propagation and transformation processes such as refraction, shoaling, breaking, and wave generation.

Wave Diffraction and Reflection Model – AECOM used the CGWAVE model originally developed by the USACE ERDC. CGWAVE is a finite element wave prediction model which simulates wave propagation in the near-shore scale and incorporates the transformation of waves due to diffraction, reflection, refraction, and dissipation. CGWAVE is commonly used to model the transformation of waves in harbors and inlets or near man-made structures such as piers, breakwaters, and floating docks.

Hydrodynamic Model – AECOM used the RMA2 model, which was developed by the USACE ERDC. RMA2 is a two-dimensional depth averaged finite element hydrodynamic model. RMA2 is typically used to model time-varying or steady-state water levels and depth-averaged current velocities in lakes, rivers, and coastal areas.

Particle Transport Model (PTM) – AECOM used the PTM, which was developed for the USACE ERDC. PTM is a Lagrangian particle tracker that models suspended sediment as a discretized finite number of particles. The transport and eventual deposition of these representative particles can then be used to determine how suspended sediment might settle in response to ambient conditions.

All four models were run within the Surface-Water Modeling System (SMS), which provides a graphical user interface for pre- and post-processing.

4.0 Model Application

Wind Wave Generation Model Results – The objective of the STWAVE modeling was to understand wave generation as a result of the winds over Lake Tahoe. STWAVE is a finite difference model, and the model domain is discretized into a rectilinear grid of nodes. The resolution of the model depends on the spacing of these nodes. AECOM spaced model nodes appropriately for the scale of wind-wave generation. Node spacing for the STWAVE model was set to 328 ft in order to capture the influence of bathymetry changes on model results. AECOM developed multiple model domains for the STWAVE model and the total number of elements in the STWAVE model depends on the model domain.

AECOM used the scaled up wind data from the South Lake Tahoe meteorological station to determine 90th percentile wind speeds for wind directions (wind directions were based on 30 degree [deg] increments) that blow towards the Station. The scaled up wind speeds were applied as boundary conditions in the STWAVE model to simulate wave generation and determine predicted wave heights near the proposed project site. AECOM developed multiple model domains for the STWAVE model to ensure that the maximum fetch length was used for each wind direction. **Figure 8** shows each model domain for the STWAVE model. **Table 2** summarizes the 90th percentile wind speed for each wind direction and the predicted wave height from the STWAVE model. The wind direction shown in both **Figure 8** and **Table 2** are wind directions oriented along the shoreline near the CG pier. Zero deg is parallel to the shoreline at the Station, with wind blowing from the northeast. 90 deg is perpendicular to the shoreline with wind blowing from the southeast. The results shown in **Table 2** indicate that the largest waves can be expected to occur when the wind direction is 90 deg even though higher wind speeds were used for other wind directions. The wave height is a function of fetch length, wind speed, and bathymetry. AECOM concluded that 90 deg was the critical wind direction and AECOM developed a critical case model run using the critical wind direction and the 90th percentile wind speed for all wind directions (21.0 mph). This critical case resulted in a wave height of 2.6 ft, and AECOM used this critical case as the boundary condition wave height for the CGWAVE modeling.

Table 2 Predicted Wave Heights at CG Station Lake Tahoe

Wind Direction[1]	Wind Speed[2] (mph)	Wave Height (ft)
0	13.2	0.6
30	15.5	1.0
60	13.2	1.0
90	17.7	2.2
120	19.9	1.2
150	19.9	-
180	16.6	-
Critical Case Model Run		
90	21.0	2.6

Notes:

1. Wind Direction – wind is “blowing from”, 0 degrees is parallel to shoreline, clockwise positive - e.g. 90 degrees is perpendicular to the shore and 120 degrees is wind blowing from the South.
2. Wind Speed – sustained wind speed, 90th percentile hourly average wind speed for particular direction over period of record A: 21.0 mph is the 90th percentile wind speed observed during the period of record regardless of wind direction

Wave Diffraction and Reflection Modeling Results – The STWAVE model results provide a prediction of maximum expected wave heights (critical case model run) near the proposed project site. STWAVE is not capable of predicting how wave patterns would be affected by small structures such as the proposed pier extension. Therefore, AECOM used the CGWAVE model in order to evaluate how wave patterns would be affected by the proposed pier extension and proposed dredging. CGWAVE requires a model domain that includes the coastline for a given water level and a semi-circular open water boundary (commonly called an "open ocean" boundary in CGWAVE, but in this case called an open wave boundary). **Figure 9** shows the CGWAVE model domain for the proposed project alternatives including the bathymetry of Lake Tahoe.

CGWAVE is a finite element model and the model domain is discretized into a finite element mesh consisting of triangular and rectangular elements. The resolution of the model depends on the size of these elements. The final grid for the CGWAVE model included more than 475,000 elements. The sizes of the elements vary between 0.3 ft and 8.2 ft. The grid elements that represent the already in-place piles of the CG's existing pier and the locations of the proposed piles for the pier extension were removed from the model domain as appropriate for evaluating each alternative pier extension configuration. The removal of elements creates a new boundary that incorporates the sub-water surface impacts of the proposed pier extension. All boundaries (the shoreline and the piles) require an assumed reflection coefficient. The shoreline was assigned a reflection coefficient of 0.5, which is consistent with a natural coastline, while the piles were assigned a reflection coefficient of 0.9, which is consistent with a fixed solid surface structure.

In addition to the piles, the floating dock also influences the wave patterns. In order to incorporate the floating dock, the elements that make up the area of the floating dock are not removed. They are instead coded as a floating dock, which requires a dock draft depth and energy loss coefficient. The assumed draft depth is 1 ft and the calculated energy loss coefficient is 0.5147 (per guidance from Aquaveo [2013]).

The open wave boundary in the model is used to incorporate the STWAVE model results. It is a semi-circular boundary that is used to assign a wave amplitude, period, and direction. The results of the STWAVE model indicated that the simulated critical case condition would result in a wave height of 2.6 ft with a period of 3.7 seconds (s). The critical case condition included the incident angle of the wave as perpendicular to the shore. In CGWAVE the wave direction convention is that zero is towards the east with counter-clockwise being positive. Therefore, the boundary conditions used in the CGWAVE model included a wave amplitude equal to 1.3 ft, a wave period of 3.7 s and an incident angle of 110 deg.

Table 3 CGWAVE Model Input Parameters

Parameter	Value
Water Level Elevation	6,223 ft, LTD
Minimum Water Depth	2.13 ft
Maximum Element Size	8.2 ft
Minimum Element Size	0.3 ft
Reflection Coefficient - Shoreline	0.5
Reflection Coefficient - Piles	0.9
Floating Dock – Draft	1.0 ft
Floating Dock – Energy Loss Coefficient	0.5147
Open Boundary – Wave Amplitude	1.3 ft
Open Boundary – Wave Period	3.7 s
Open Boundary – Wave Angle	110 deg

The output from CGWAVE includes steady state predictions of water surface elevation, wave height and phase, and the maximum particle velocity. The output also includes time varying predictions of pressure, particle velocity, water surface elevation, and wave velocity (celerity). **Figure 10** shows the predicted water surface elevation (relative to the base elevation of 6,223, LTD) in the entire CGWAVE model domain. The wave pattern is transformed as the wave front approaches the shoreline. Wave fronts bend and dissipate in response to the changing bathymetry and shoreline. As the water depth decreases, the wave length decreases. Weak diffraction is present where the wave fronts are bent around portions of the shoreline that extend out into the water. Wave reflection is accounted for in the model, but not evident in **Figure 10**.

Figure 11 shows a close up of predicted wave patterns for pier extension alternatives in the immediate vicinity of the proposed pier head and floating dock. **Figure 12** shows a plot of water surface elevation as a wave passes immediately in front of a pile (3 ft in front of structure), immediately behind a pile (3 ft behind structure), and at a distance in front of the existing pier (before pier extension).

All pier extension alternatives involve work at least 100 ft from the shoreline. Based on this fact, AECOM defined a minimum water depth of 2.13 ft for these model runs. The dredging alternative involves changes to conditions substantially closer to the shoreline. Therefore, AECOM adjusted both the minimum water depth in the model and the model grid. The CGWAVE model input parameters described in Table 3 remain unchanged with the exception of the minimum water depth, which was set to 0.3 ft for evaluating the dredging alternative.

AECOM ran the CGWAVE model under existing conditions (no dredged area) and proposed conditions (dredged area and floating dock). Wave patterns are very similar to what was described for the pier extension alternatives.

Figure 13 shows a close up of predicted wave patterns in the immediate vicinity of the proposed dredging area and floating dock. The model results shown on the left of **Figure 13** are the predicted water surface elevation under existing conditions. The model results shown on the right of **Figure 13** are the predicted water surface elevations under the dredged condition. The upper portion of the figure assumes that the waves do not break as they approach the shoreline. As waves approach the shoreline, shoaling occurs and the wave height above the mean water level increases, but the dredged area stops that process. Wave energy dissipates and the waves that reach the shoreline are smaller than the waves that would reach the shoreline without dredging. In the case of the dredging alternative, shoaling is acting to increase wave heights, wave breaking is acting to causes waves to break and dissipate wave energy.

It was not necessary to consider wave breaking for the pier extension alternatives because the extension would be placed so much farther from shoreline, but for the dredging alternative this phenomena becomes relevant due to how close the dredging area would be to the shoreline. The model results shown in the upper portion of **Figure 13** represent a hypothetical case with no wave breaking. The no wave breaking condition is a conservative case representing the theoretical maximum area of impact. Given the relatively flat bathymetry and shallow water depths near the Station, it is most likely that waves would break prior to reaching the shoreline. The lower portion of the **Figure 13** shows model results that represent a more realistic case where wave breaking is allowed to occur. The wave breaking ratio (wave height divided by water depth) is 0.64. Wave breaking is a highly dynamic process and actual wave breaking will vary throughout the model domain and in time. The wave breaking ratio was selected so that the upper boundary (no wave breaking) and lower boundary of wave heights at the shoreline could be determined.

Figure 14 compares existing conditions to the dredging alternative by showing a single wave passing by three different observation locations (observation locations shown in **Figure 13**) that are approximately 20 ft from the shoreline. **Figure 14** reinforces the same patterns shown in **Figure 13**. The presence of the dredged area would serve to reduce wave heights as waves approach the shoreline. The effect is most clear for the upper bound wave height (no wave breaking) on the left hand side of **Figure 14**. The right hand side of the figure shows the results assuming wave breaking. In this condition the dredged area would have virtually no impact on wave heights approaching the shoreline.

Figures 10 through 14 help answer the first question posed in the Modeling Approach:

Do the proposed project alternatives significantly change the wave height along the shoreline?

For pier extension alternatives, the model results shown in **Figure 11** and **Figure 12** indicate that small changes in wave heights exist in the immediate vicinity of the piles, but none of these changes propagate to the shoreline. **Figure 11** shows the predicted wave patterns at the pier head for each alternative. There is no visible impact to the wave pattern by the piles in any configuration. The top graph in **Figure 12** shows the modeled wave height for one wave period at a location 3 ft in front of a pile. The middle graph in **Figure 12** shows the wave height for one wave period at a location 3 ft in back of the pile. The wave height near the pile is altered slightly. The bottom graph on **Figure 12** shows the modeled wave height for a location approximately 32 ft towards the shore from the proposed pier extension. The wave height is the same under both existing conditions and alternative pile configurations. **Table 4** summarizes the wave height shown in each of the graphs in **Figure 12**. **Table 4** quantitatively demonstrates that the influence of the piles on the wave pattern is minimal and that the minimal change does not propagate to the shoreline. The proposed floating dock does suppress waves in the immediate vicinity of the dock, but just as is the case with the individual piles, the impact on wave patterns does not propagate to the shoreline.

Table 4 CGWAVE Modeled Wave Height Comparison

Location	Existing Conditions	Dolphin Structure
	Wave Height (ft)	
3 ft in front of structure	1.7	1.7
3 ft behind structure	1.5	1.5
32 ft from pier extension	1.8	1.8

AECOM addressed the question of whether the proposed project alternatives would significantly change the wave height along the shoreline. The answer for the two pier extension alternatives is that they do not impact wave heights along the shoreline. In the case of the dredging alternative, the answer is that the dredging may influence wave patterns along the shoreline. The magnitude of the impact to wave patterns depends on wave breaking patterns close to the shoreline and is therefore uncertain, but AECOM's modeling provides a range of potential impact. The impact on wave height at the shoreline would be between approximately 0.5 ft, for the conservative no wave breaking condition, and 0 ft, for the more typical wave breaking condition. Under the conservative case, the length of affected shoreline would be approximately 440 ft. Under the more typical wave breaking condition, the shoreline would not be affected. Since this is the more realistic case, it is expected that the dredging alternative would not have a significant impact on wave heights at the shoreline.

Figure 15 shows the orbital velocity modeled by CGWAVE for the four design configurations. **Figure 16** shows the orbital velocity modeled by CGWAVE for proposed dredging alternative. **Figures 15** a**nd 16** help address the second question posed in the Modeling Approach:

Do the proposed project alternatives significantly change the wave pattern occurring in the littoral drift zone?

The CGWAVE model provides maximum predicted orbital velocities through a full wave period. Orbital velocities are instantaneous current speeds caused by wave motion and contribute to particle transport. In order to assess whether a particular location in the model domain experiences changes to littoral drift patterns, AECOM defined threshold values for erosion and deposition. AECOM assumed that velocities above 15 cm/s are erosional and velocities below 0.5 cm/s are depositional. Velocities between 0.5 cm/s and 15 cm/s are neutral (Ji 2008). **Figure 15** shows the predicted orbital velocities from the CGWAVE for each proposed pier extension alternative.

The maximum orbital velocities from the predicted wave behavior are erosional for existing conditions. The presence of the piles and the floating dock in all cases causes maximum orbital velocities to change, but only in a very few locations does the orbital velocity drop below the critical value of 15 cm/s. **Figure 15** shows the areas within the model domain where orbital velocities are altered enough to cause impacts to littoral drift patterns. The only areas that change their littoral drift patterns occur in the immediate vicinity of the floating dock in the dog-leg configuration. This is evident in the two right panels on **Figure 15**. For the dredging alternative, the dredged area changes the pattern from erosional to neutral, but this change is primarily limited to the dredged area and does not propagate substantially beyond the dredging limits. **Figure 16** shows the area that would change from erosional to neutral for the dredging alternative.

Orbital velocities are affected by the proposed pier configurations and proposed dredging. In order to quantitatively evaluate the net impact, AECOM measured the size of the areas that modeling indicates would have their littoral drift pattern changed. **Table 5** summarizes the total area within the littoral zone that may be affected. The dog-leg configuration results in an affected area of approximately 370 sq. ft., whereas the straight configuration does not show any impact. Differences between the straight configuration and the dog-leg configuration are caused by the direction of the wave in the critical case. The angle between incoming waves and the straight configuration is close to parallel, while the angle between the dog-leg configuration and incident waves is closer to perpendicular. These model results indicate that the impacts from a smaller wave coming from a different direction might increase the area of impact for the straight configuration pier extension, but a wave coming from a different angle would be smaller than the critical case and in no case perpendicular to the proposed pier extension in the straight configuration. Therefore, AECOM concluded that the affected area from the dog-leg configuration represents an appropriate estimate of maximum impacts to wave patterns due to the proposed pier extension alternatives.

Both pier extension alternatives have a much smaller area of impact than the dredging alternative. The affected area for the dredging alternative, assuming the more conservative no wave breaking condition, is approximately 19,000 sq. ft. where the orbital velocity regime would change from erosional to neutral. This is largely limited to the area that would be dredged. The estimate of the area affected by dredging shown in **Table 5** and **Figure 16** represents a theoretical maximum assuming that no wave breaking was to occur. Given the relatively flat bathymetry and shallow water depths near the Station, it is most likely that waves would break prior to reaching the shoreline and impacts to the littoral zone from the dredging alternative would be limited to within the dredged area and would not change wave patterns at the shoreline. In summary, none of the proposed project alternative would significantly change wave patterns in the littoral drift zone.

Table 5 Area of Orbital Velocity Change According to CGWAVE Model Results (No Wave Breaking)

Design Configuration	Affected Area (sq. ft.)
Alternative 1: Dredging	19,000
Alternative 2: Dog-Leg w/ Dolphins	370
Alternative 3: Straight w/ Dolphins	~0

Hydrodynamic Modeling Results – AECOM applied the two-dimensional model RMA2 to evaluate the impact of the proposed project alternatives on currents generated by circulation patterns in Lake Tahoe. **Figure 17** shows the RMA2 model domain with bathymetric contours. RMA2 is a finite element model and the model domain is composed of a mesh of triangular and rectangular elements. The necessary grid resolution depends on many factors including predicted velocities and the size of physical features to be modeled. Areas surrounding the existing and proposed pier locations required the smallest element sizes due to the size of piles. For pier extension alternative runs, the final mesh for the RMA2 model included

approximately 17,500 elements with the size of the elements ranging from approximately 0.3 ft to approximately 266 ft. For evaluation of dredging, the RMA2 model finite element mesh had to be reconfigured to accommodate the geometry of the dredging area. There are approximately 15,850 elements in the model domain for the dredging alternative.

AECOM developed flow boundary conditions for the model based on the current speeds presented by Strub and Powell (1986). AECOM set boundary conditions such that the long-shore current speed was approximately 30 cm/s. After the RMA2 model was set up (boundary conditions, bathymetry, etc.), steady-state simulations were run for the existing and proposed pier configurations.

Results from the RMA2 model include steady-state predictions of current velocity and water depth within the model domain. **Figure 18** shows typical current velocities in the vicinity of the Station from the RMA2 model. The results from the RMA2 model help to answer the third question from the Modeling Approach:

Do the proposed project alternatives significantly change the current velocities in the littoral drift zone?

In order to answer this question AECOM compared currents near the proposed project site for each proposed pier extension alternative. **Figure 19** shows the current velocities near the existing CG pier. **Figure 20** shows areas within the model domain where the proposed pier extension alternatives would alter current speeds enough to impact littoral drift patterns. **Table 6** provides the area affected for each pier extension alternative. The RMA2 model results indicate that the straight extension shows less impact than the dog-leg extension. Although both pier extension alternatives would affect long-shore current velocities to some extent, the overall impact on littoral processes and backshore stability is expected to be minor for both alternatives.

Table 6 Cumulative Area of Current Regime Change According to RMA2 Model Results

Design Configuration	Affected Area (sq. ft.)
Alternative 2: Dog-Leg w/ Dolphins	72,150
Alternative 3: Straight w/ Dolphins	41,500

The approach that AECOM used to evaluate current velocities in response to each pier extension alternative is not appropriate for evaluating the dredging alternative. AECOM evaluated the pier extension alternatives based on the assumption that erosion and deposition in the littoral zone are primarily controlled by the current speed. The modeling of the existing conditions indicates that the area near the Station is primarily depositional or neutral. Given that the dredging alternative includes a change to the bathymetry, this would impact both the current velocities and deposition patterns. For the pier extension alternatives, it was not necessary to look directly at deposition patterns because looking at current velocities was an adequate proxy for deposition patterns. This is not the case for the dredging alternative. Therefore, AECOM look at depositional patterns directly in order to adequately assess the littoral zone impacts of the dredging alternative. AECOM accomplished this through particle tracking modeling.

Particle Tracking Modeling Results – AECOM applied the PTM to evaluate the impact of the proposed dredging alternative on deposition patterns near the existing pier. The PTM requires a hydrodynamic model in order to simulate particle transport. AECOM adjusted the previously developed RMA2 model to appropriately incorporate the proposed dredging alternative. The PTM also requires a description of the released particles, including median grain size and density. According to the study by Simon et al. (2003) most of the suspended sediments in water column are fine-grain particles consisting of silt and clay with a median grain size of 0.062 mm. In order to look at the difference between pre- and post-dredging conditions AECOM used 0.062 mm as the median grain size and an assumed material density of 2,000

kilograms per cubic meter. AECOM selected these model parameters in order to provide an acceptable distribution of particles passing over and falling into the footprint of the proposed dredging area.

AECOM then ran the PTM in order to look at whether the proposed dredging would increase the amount of sediment that becomes deposited within the footprint of the proposed dredging area. **Figure 21** shows the modeled particles passing over the dredged area. The background color represents the water depth. In order to assess whether the dredged area would impact deposition patterns, the PTM modeled the transport of 10,000 particles released into the water column approximately 30 meters west of the dredged area. AECOM then counted how many particles were deposited in the proposed dredging footprint in both the pre- and post-dredging conditions. The results indicate that the dredging alternative would result in an increase in the deposition of fine-grained particles of approximately 6.7%, assuming a median particle size of 0.062 mm.

It is important to note that the model results are sensitive to the selection of grain size and density. Therefore, AECOM evaluated multiple median grain sizes (0.035, 0.062, and 0.1 mm) in order to understand the importance of these model parameters. The results of this modeling provide an indication in the difference between pre- and post-dredging conditions over a range of grain sizes (**Table 7**). Note that due to the randomness of particle diffusion, particle counts generated in each PTM run can vary slightly. For each median grain size, AECOM performed 12 identical PTM runs and calculated mean particle counts and the coefficient of variance (defined as the ratio of standard deviation to the mean). The percent changes in mean particle count were then calculated to compare the particle deposition count between the existing and dredged conditions. **Table 7** shows that the number of particles that are deposited in the dredging area averages approximately 10.5% for fine grain particles with median grain size from 0.035 mm to 0.1 mm, with a range of 6.7% to 12.7%. PTM results show that dredging has an impact on suspended fine particles passing through the dredged area. Generally, the dredged area would act as a sediment sink, causing more fine-grained particles, i.e., silt, clay, and very fine sand, to deposit.

Table 7 Sensitivity Analysis of PTM Particle Trap with Varying Median Grain Sizes

Total Particles	Median Grain Size (mm)	Existing Condition		Dredged Condition		Percent Change in Particle Count
		Mean Particle Count	Coefficient of Variance	Mean Particle Count	Coefficient of Variance	
9969	0.035	1370	2%	1536	2%	12.1%
9969	0.062	1488	3%	1587	3%	6.7%
9969	0.100	1003	3%	1131	3%	12.7%

The PTM results help answer the fourth question posed in the Modeling Approach:

Does the proposed dredging alternative significantly increase the amount of sediment that would be deposited in the dredging area?

The PTM results provide insight into how dredging at the CG pier would affect littoral drift patterns. The results indicate that dredging would result in an increase of the amount of sediment deposited in the dredged area by between 6.7% and 12.7% depending on grain size.

That increase in deposition is applicable to the hydrodynamic conditions that AECOM used as boundary conditions in the RMA2 model, which are consistent with the findings of Strub and Powell (1986). It is not appropriate to apply these results universally to conditions near the CG pier. The goal of the study was to understand if there was an impact to the littoral drift zone, and the answer to that for the dredging alternative is yes.

There is a second question of whether this impact would be significant to the littoral zone in the vicinity of the project area.

It is difficult to determine a threshold for significance for increased deposition without substantial information about existing deposition rates in the same area. Whether a 6.7% to 12.7% increase is significant in actual sediment deposition in the dredged area depends on the suspended sediment concentration in the water column, which would have to be determined by a program of onsite sampling. Such sampling was beyond the scope of the current study. However, water clarity in Lake Tahoe is generally very good, and therefore suspended sediment concentrations are likely low. As a result of this condition, deposition rates are also expected to be low. A 6.7% to 12.7% increase over the current low levels of deposition is not likely to result in a significant change to the littoral zone. Based on the information presently available, AECOM concluded that the increase in deposition resulting from implementation of the dredging alternative would not be significant.

It was not possible to determine from the modeling how often maintenance dredging will be required if the dredging alternative is implemented. Quantification of sediment deposition rate requires site specific information on suspended sediment concentrations in water column, which was not available to this study. Due to these limitations, it is not possible to determine sediment accumulation over time with the current modeling approach. However, it is known that maintenance dredging at the adjacent public pier has been conducted approximately every 25 years, though the optimal cycle for maintaining sufficient depth is likely shorter than that.

5.0 Summary

AECOM conducted a littoral drift study of three proposed project alternatives including: 1) dredging at existing pier, 2) dog-leg pier extension with dolphins, and 3) straight pier extension with dolphins. In place of directly measuring littoral drift, AECOM compared how each design alternative would change the processes that drive littoral drift - including wave heights and orbital velocities and long-shore current velocities - for all three alternatives and depositional patterns for the dredging alternative.

AECOM concluded that neither of the pier configurations would impact wave patterns at the shoreline. The dredging alternative may impact wave patterns along the shoreline, depending on the wave breaking patterns close to the shore. Under a worst-case scenario with no waves breaking at the shoreline, the dredging alternative would decrease wave heights along a 440-ft length of shoreline; the magnitude of change would vary depending on distance from the dredging footprint but would be on the order of 0.5 ft in the areas shoreward of the dredged area. Under the more typical wave-breaking condition, wave heights at the shoreline would not be affected. Since this is the more realistic case, it is expected that the dredging alternative would not have a significant impact on wave heights at the shoreline.

The pier extension alternatives would alter orbital wave velocities over a small region in the immediate vicinity of the proposed floating dock but would not affect orbital velocities at the shoreline. The dredging alternative would decrease orbital velocities over a much larger area than the pier extension alternatives, but the impact of dredging on orbital velocities also would not extend to the shoreline. Under both the conservative no wave breaking condition, and the more likely wave breaking case, the affect on orbital velocities is largely limited to the area of the dredging footprint. The area where dredging would decrease orbital velocities is small relative to the area over which the proposed pier extensions would decrease long-shore current velocities, which appear to be a more important factor in determining overall impacts to littoral drift in the Project vicinity. Of the two pier extension alternatives analyzed, the dog-leg extension with dolphins had the most impact on long-shore current velocities.

Looking at impacts to current velocities alone is not appropriate for evaluating the dredging alternative. Therefore, AECOM used particle tracking modeling to understand how much deposition would increase as a result of dredging near the CG pier. The results indicate that the dredging alternative would result in an increase in deposition of fine sediments out of the water column by 6.7% to 12.7%, depending on particle size. The increase in deposition would be largely limited to the area occupied by the dredging footprint. Additionally, given the generally low existing levels of suspended sediment in Lake Tahoe, the slight increase in deposition in the local area is not likely to result in a significant change to the littoral zone.

Results of the study indicate that none of the project alternatives are likely to lead to significant harm by adversely impacting littoral processes or shoreline or backshore stability. In general, the area of Lake Tahoe near the Station is a low energy environment in terms of littoral processes (Osborne et al. 1985), and the relatively small changes to these processes resulting from the proposed Project Alternatives are unlikely to have significant impacts on conditions in the littoral drift zone.

6.0 References

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Figures

Figure 1. Project Location, CG Station Lake Tahoe

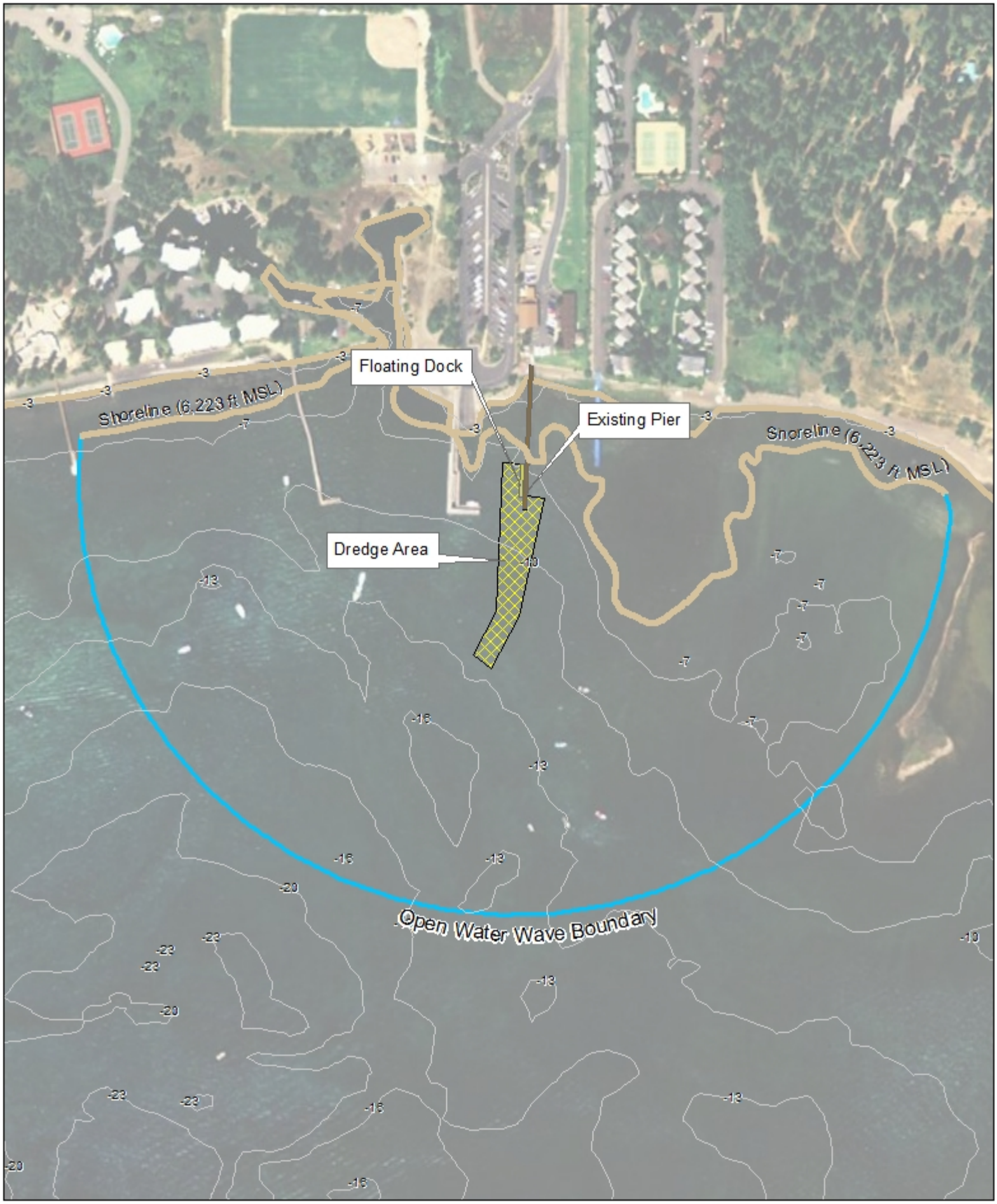
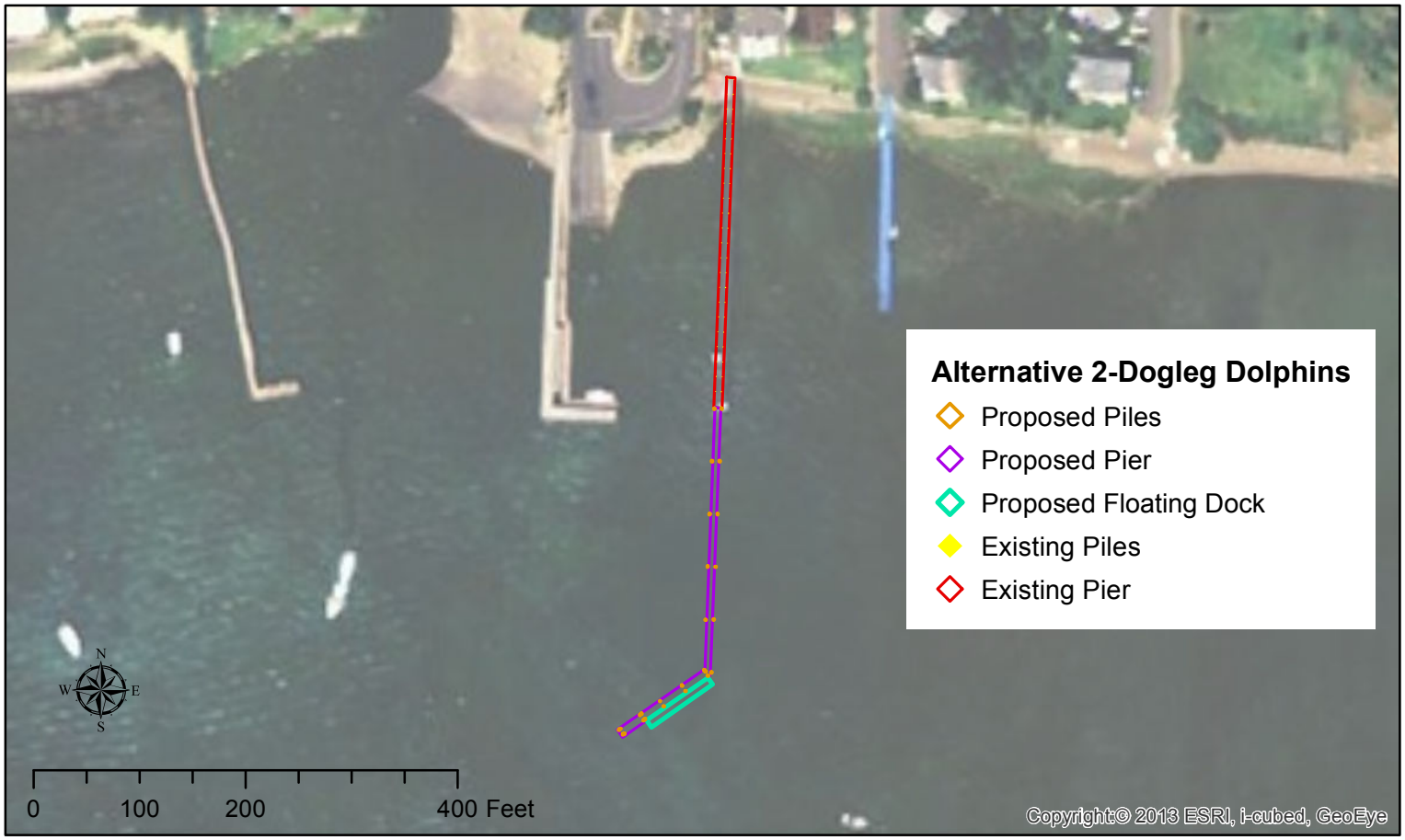


Figure 2. Proposed Dredging Alternative and CGWAVE Model Domain

Service Layer Credits: Copyright:© 2013 ESRI, i-cubed, GeoEye

Water Depth in Feet based on July, 2000 Survey



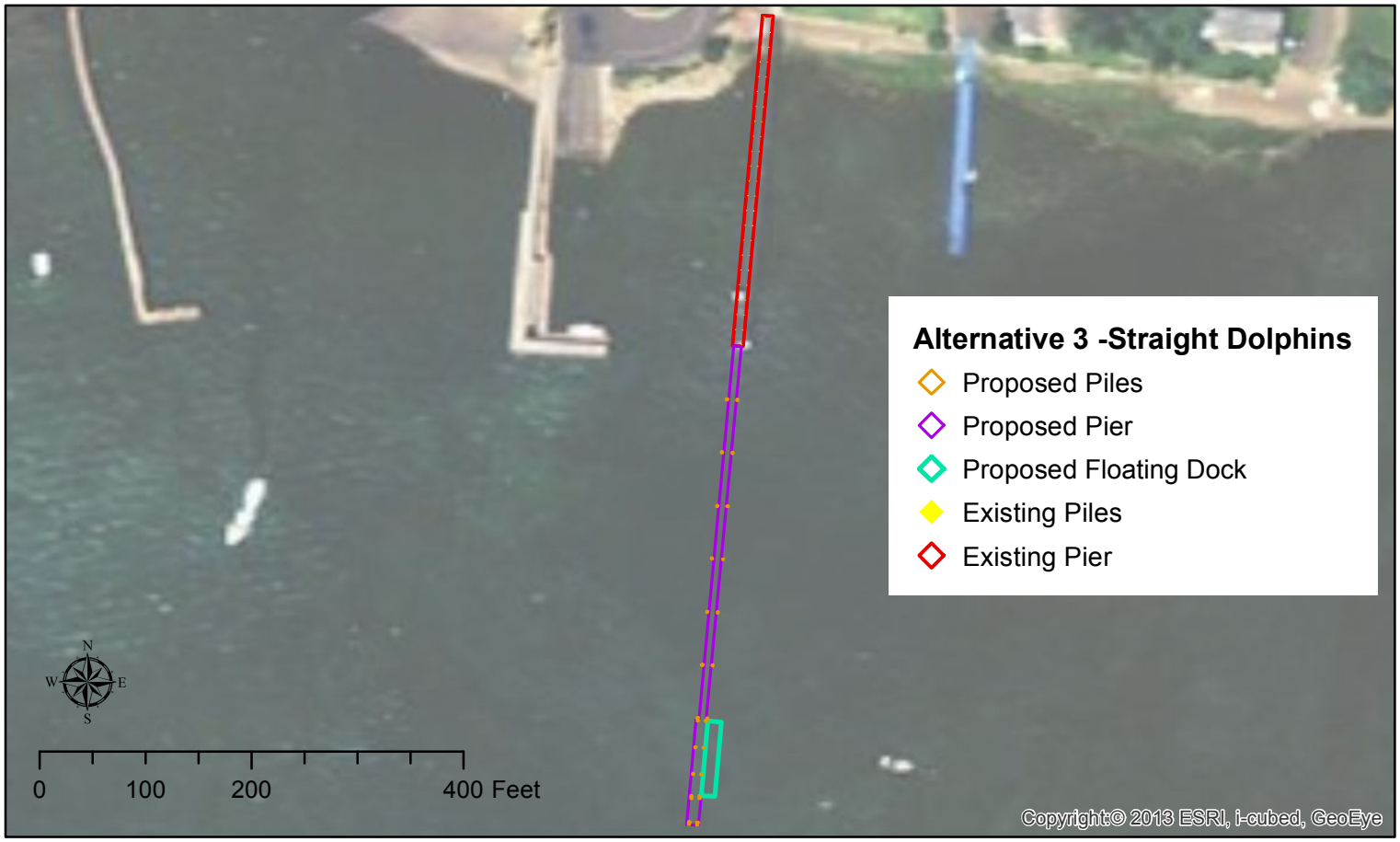


Figure 3. Alternatives 2 and 3 for Pier Extension Configurations

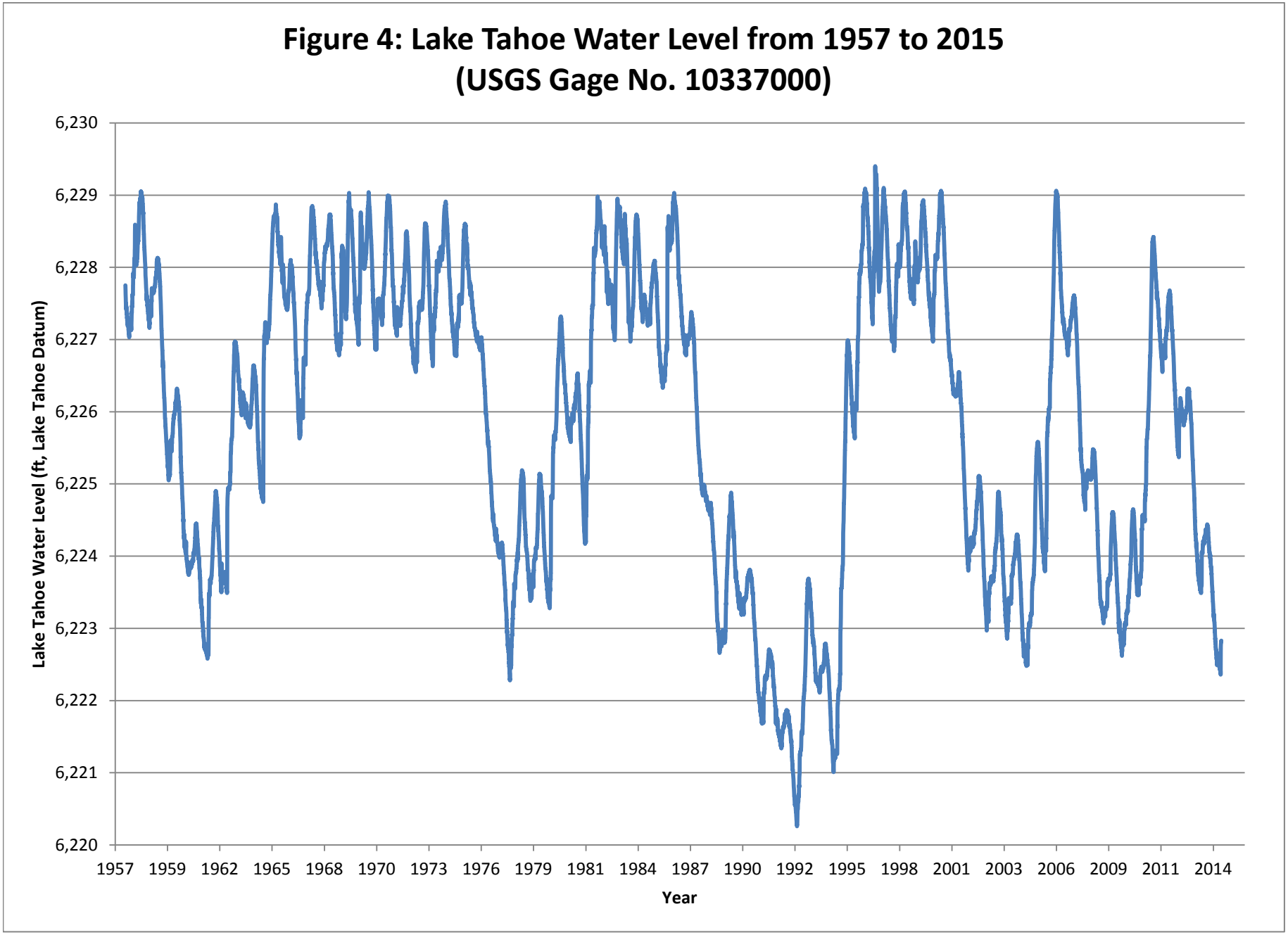


Figure 4: Lake Tahoe Water Level from 1957 to 2015
(USGS Gage No. 10337000)
Lake Tahoe Water Level (ft, Lake Tahoe Datum)
6,230
6,229
6,228
6,227
6,226
6,225
6,224
6,223
6,222
6,221
6,220
1957
1959
1962
1965
1968
1970
1973
1976
1979
1981
1984
1987
1990
1992
1995
1998
2001
2003
2006
2009
2011
2014
Year

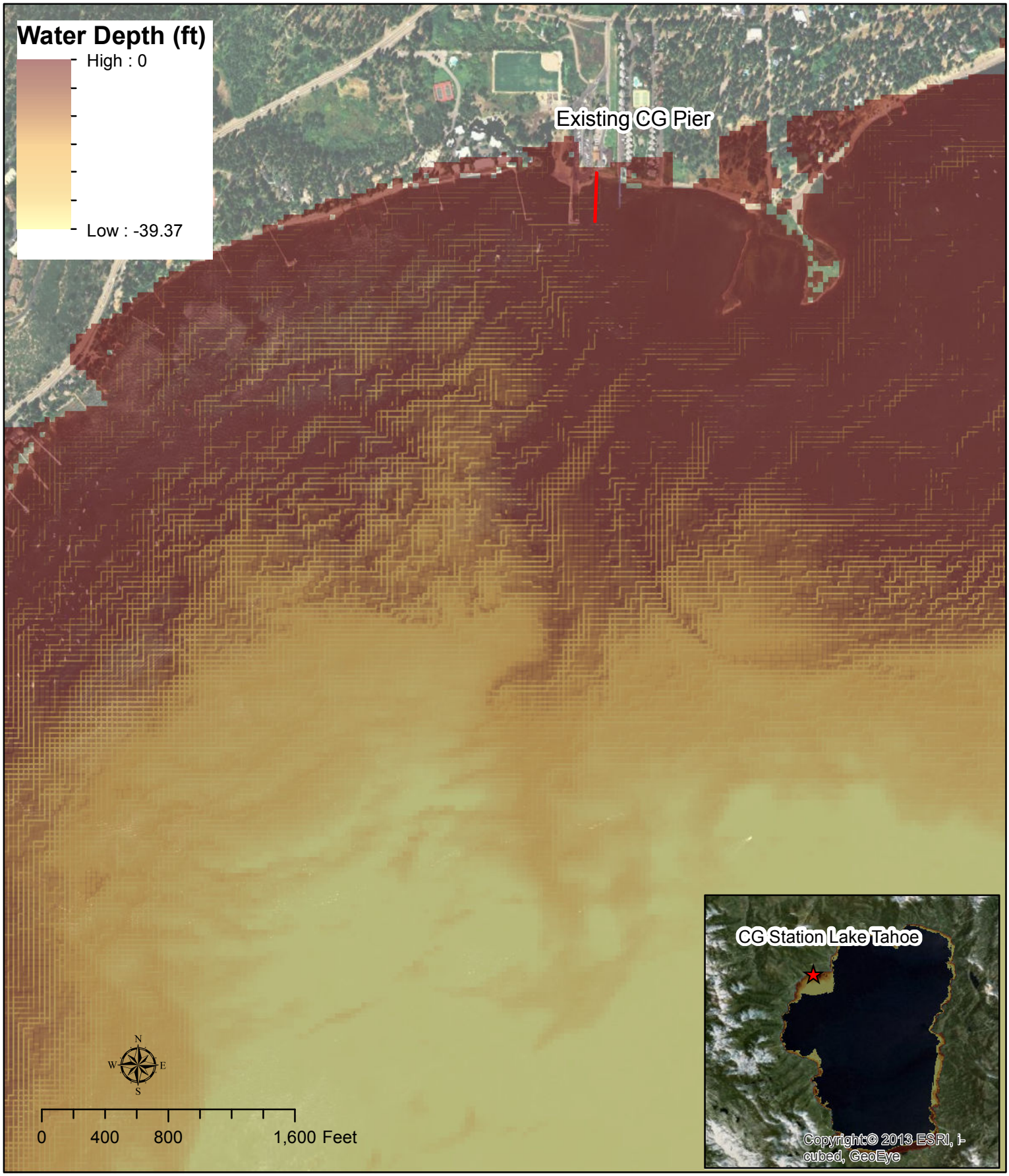


Figure 5. Lake Tahoe Bathymetry (Data Source: USGS Shoal Survey, July 2000)

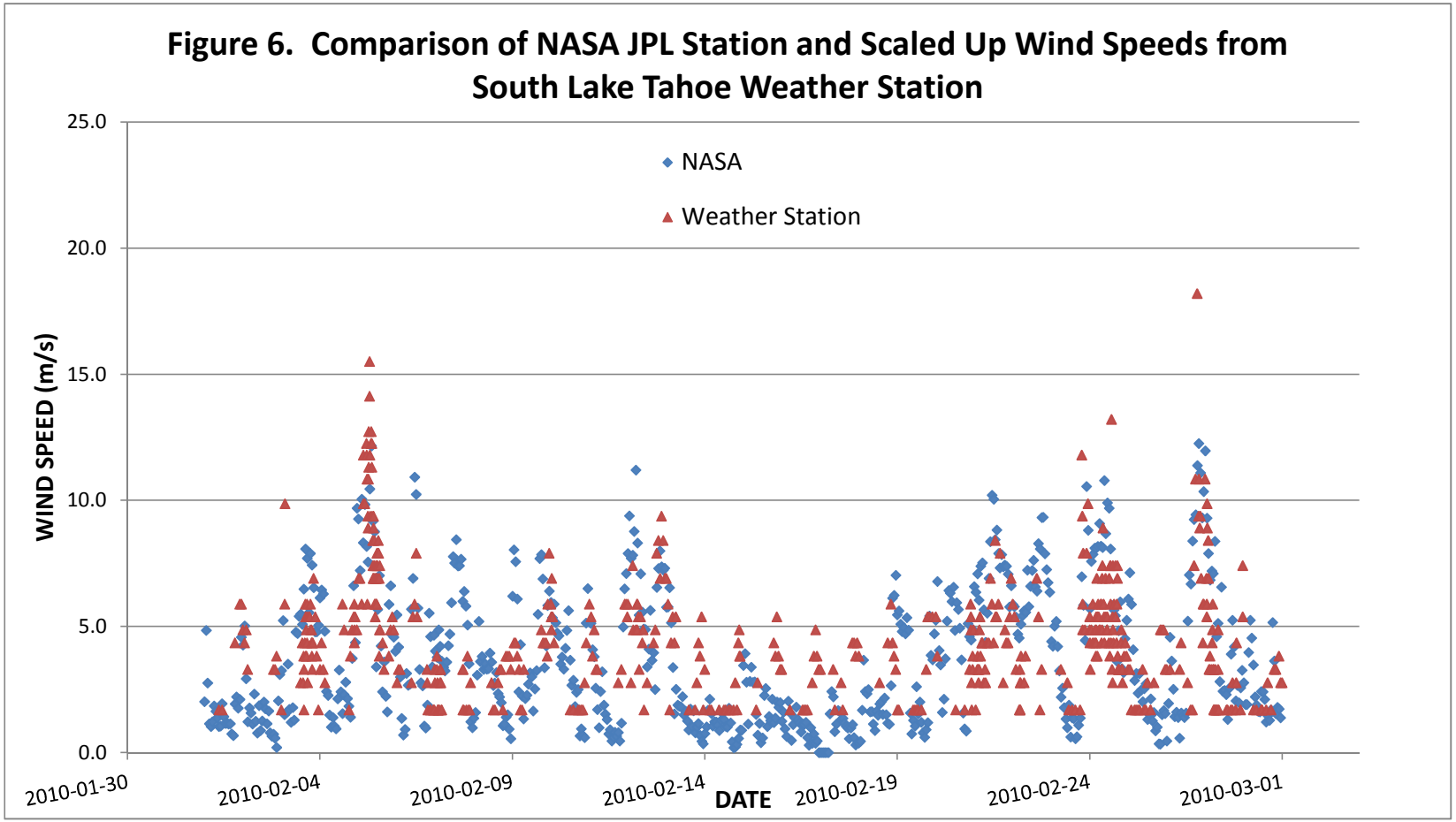


Figure 6. Comparison of NASA JPL Station and Scaled Up Wind Speeds from South Lake Tahoe Weather Station
NASA
Weather Station
WIND SPEED (m/s)
25.0
20.0
15.0
10.0
5.0
0.0
2010-01-30
2010-02-04
2010-02-09
2010-02-14
2010-02-19
2010-02-24
2010-03-01
DATE

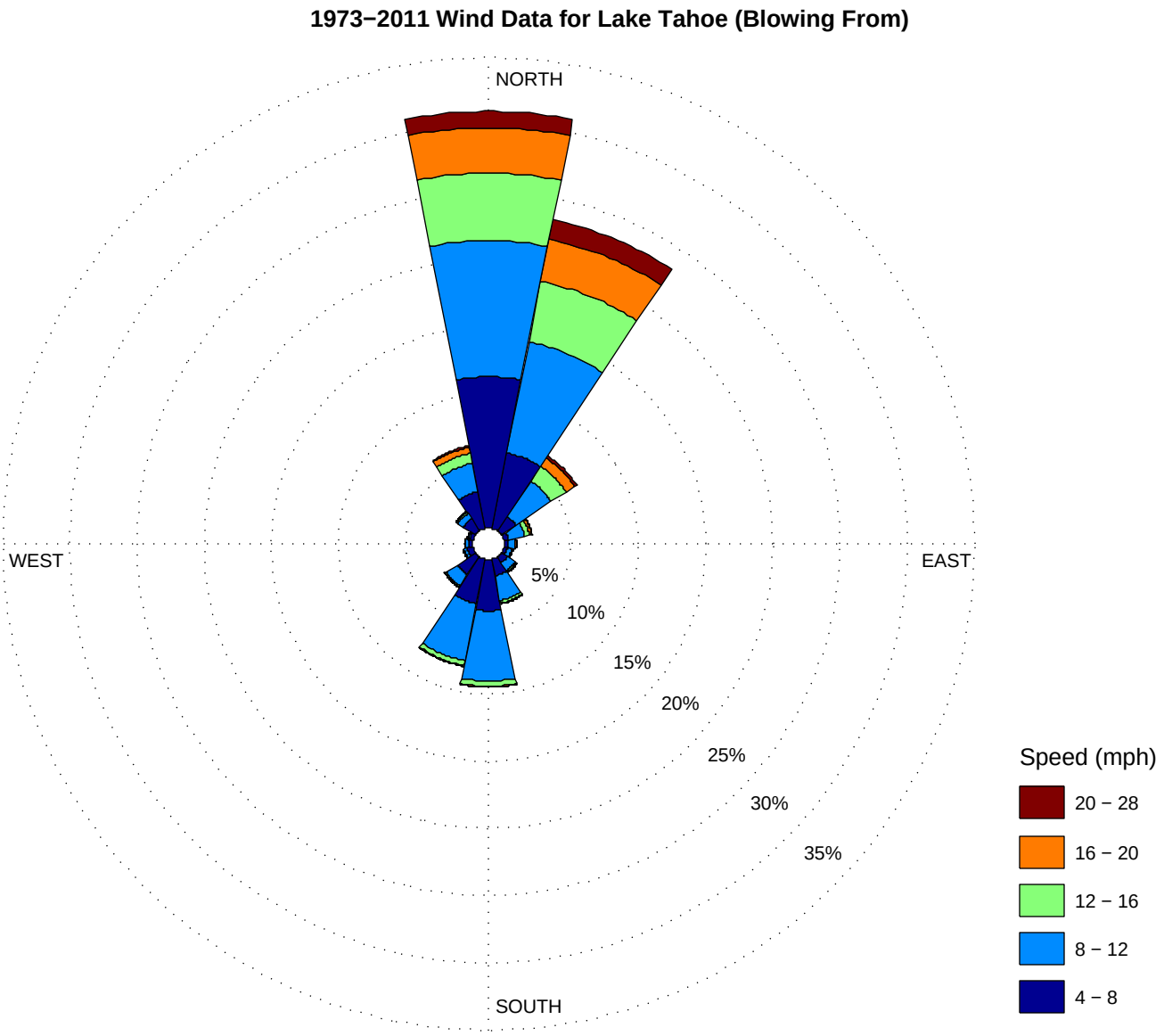


Figure 7. South Lake Tahoe Airport Meteorological Station Wind Rose

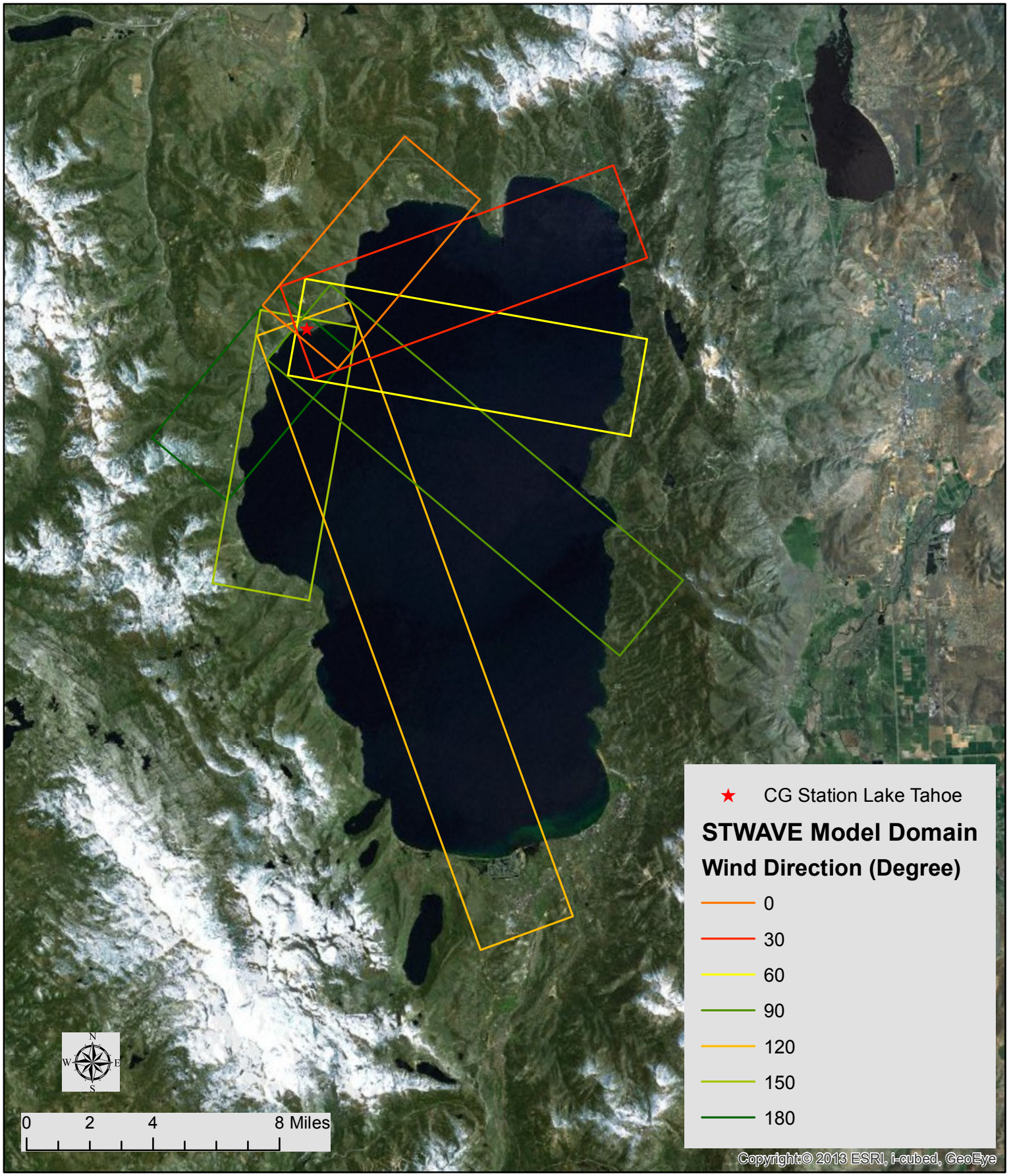


Figure 8. STWAVE Model Domains

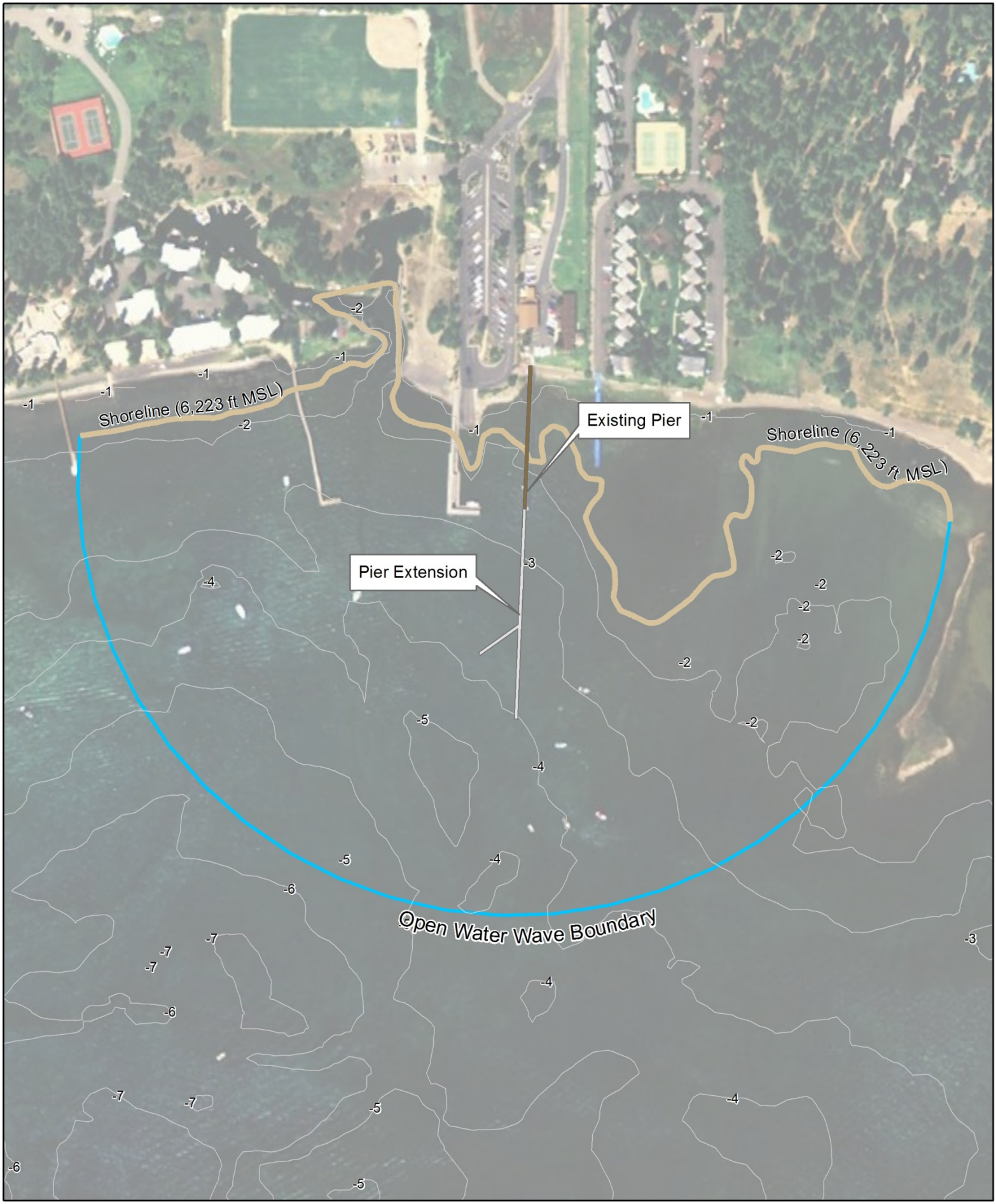


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Figure 9 . CGWave Model Domain

Water Depth in Meters based on July 2000 Survey

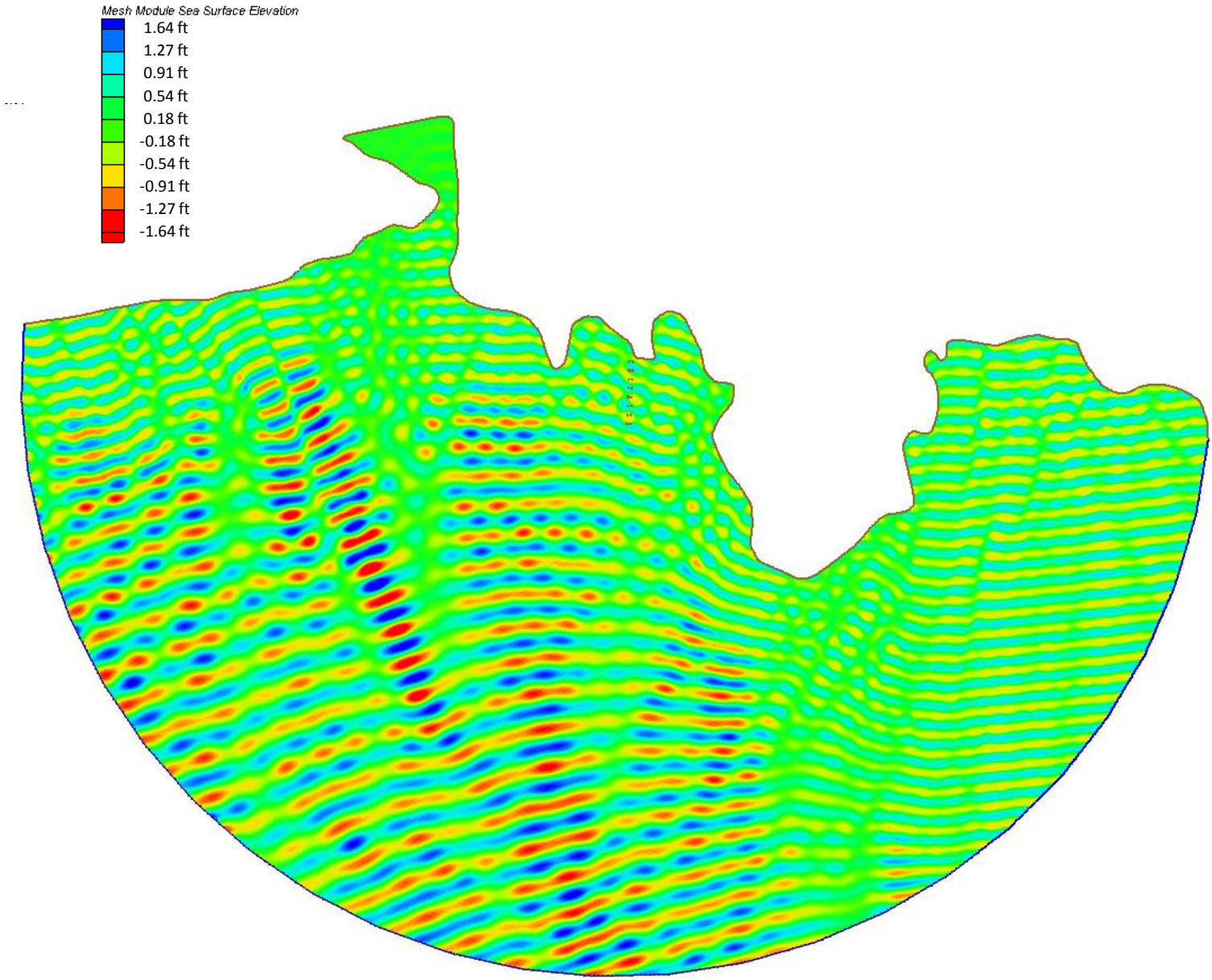


Figure 10. Predicted Water Surface Elevation Relative to 6223 ft MSL by CGWAVE Model

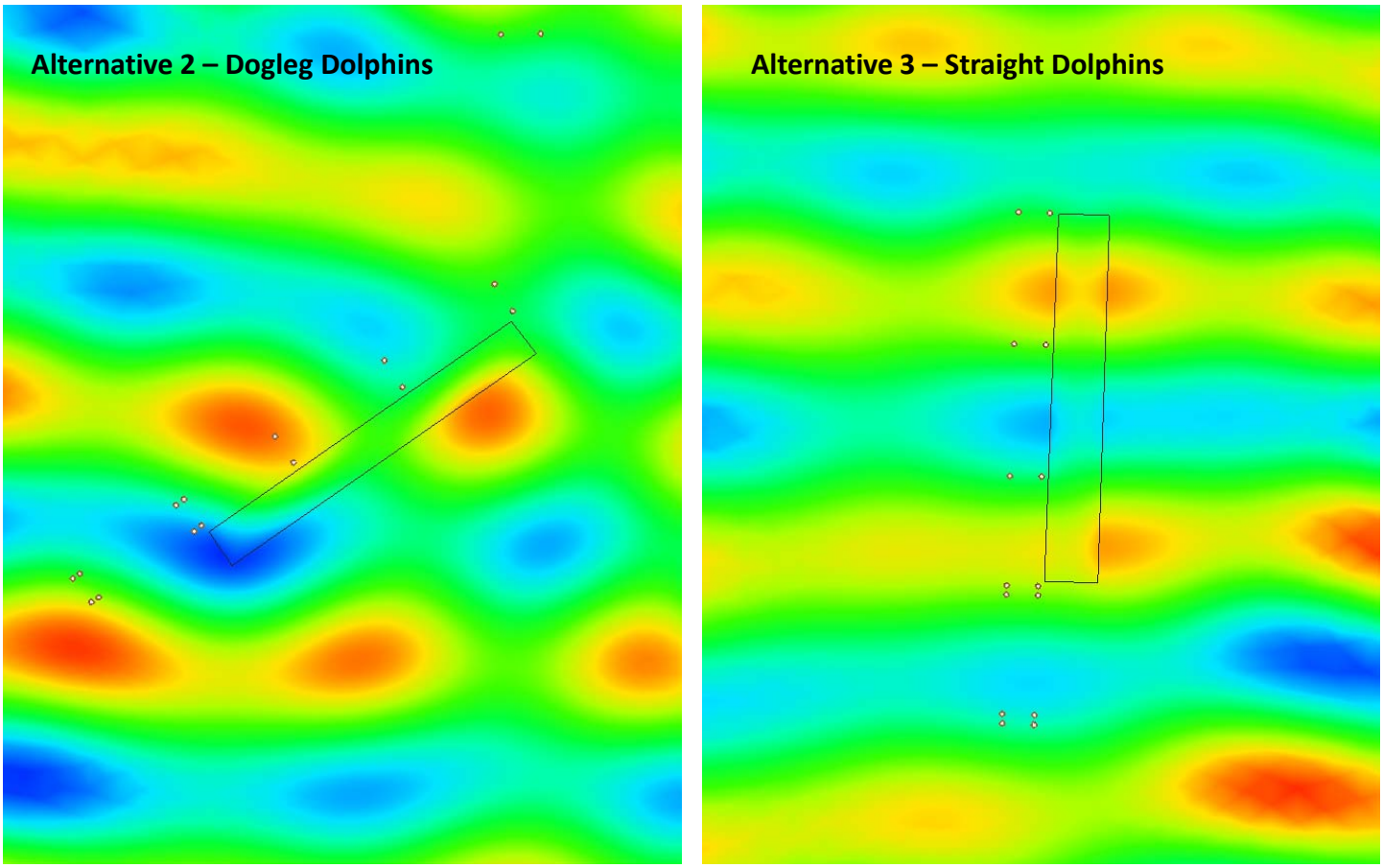


Figure 11. Predicted Wave Patterns at the Pier Head for Pier Extension Alternatives

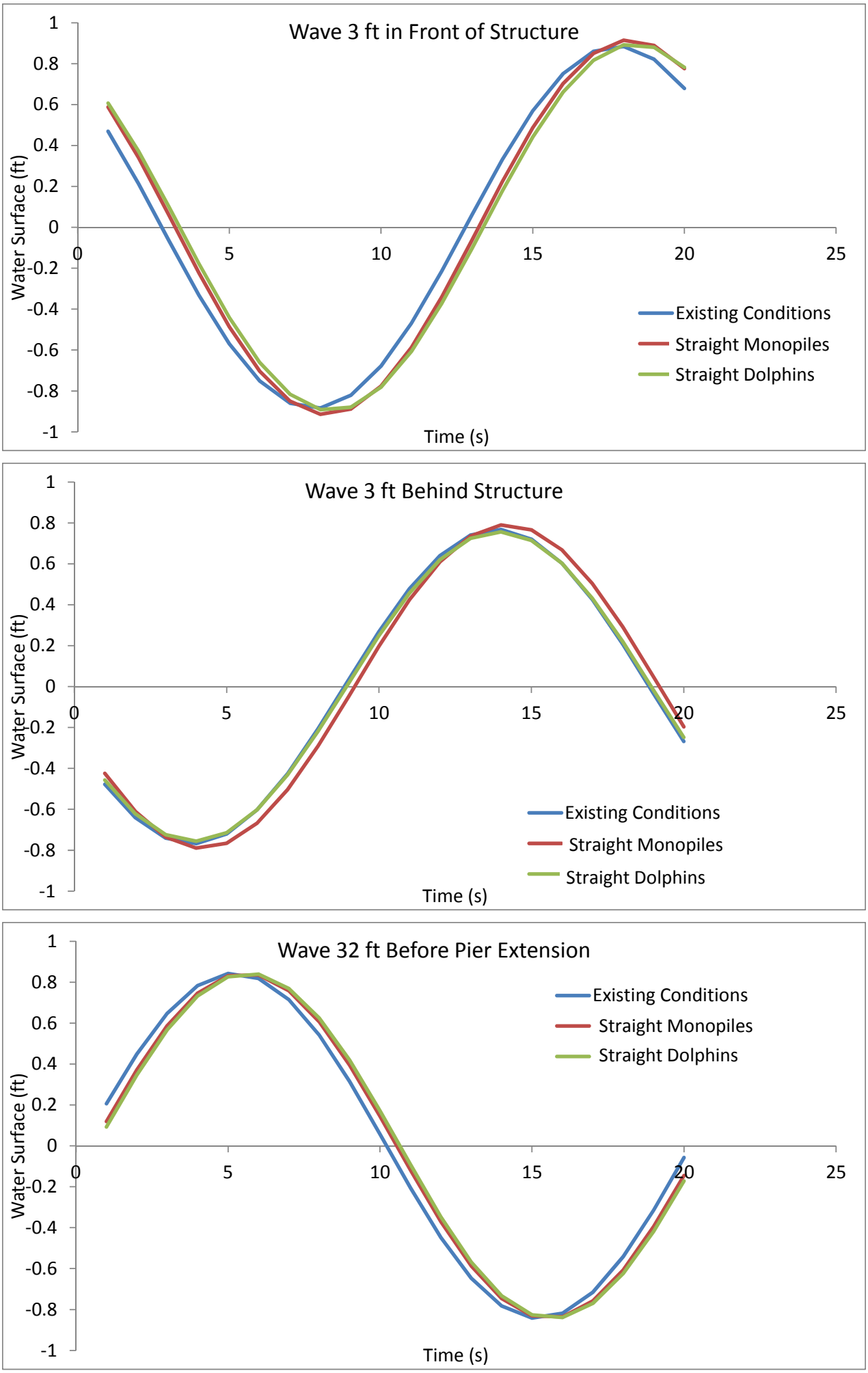


Figure 12. Predicted Wave Heights for One Wave Period near Proposed Pier Head

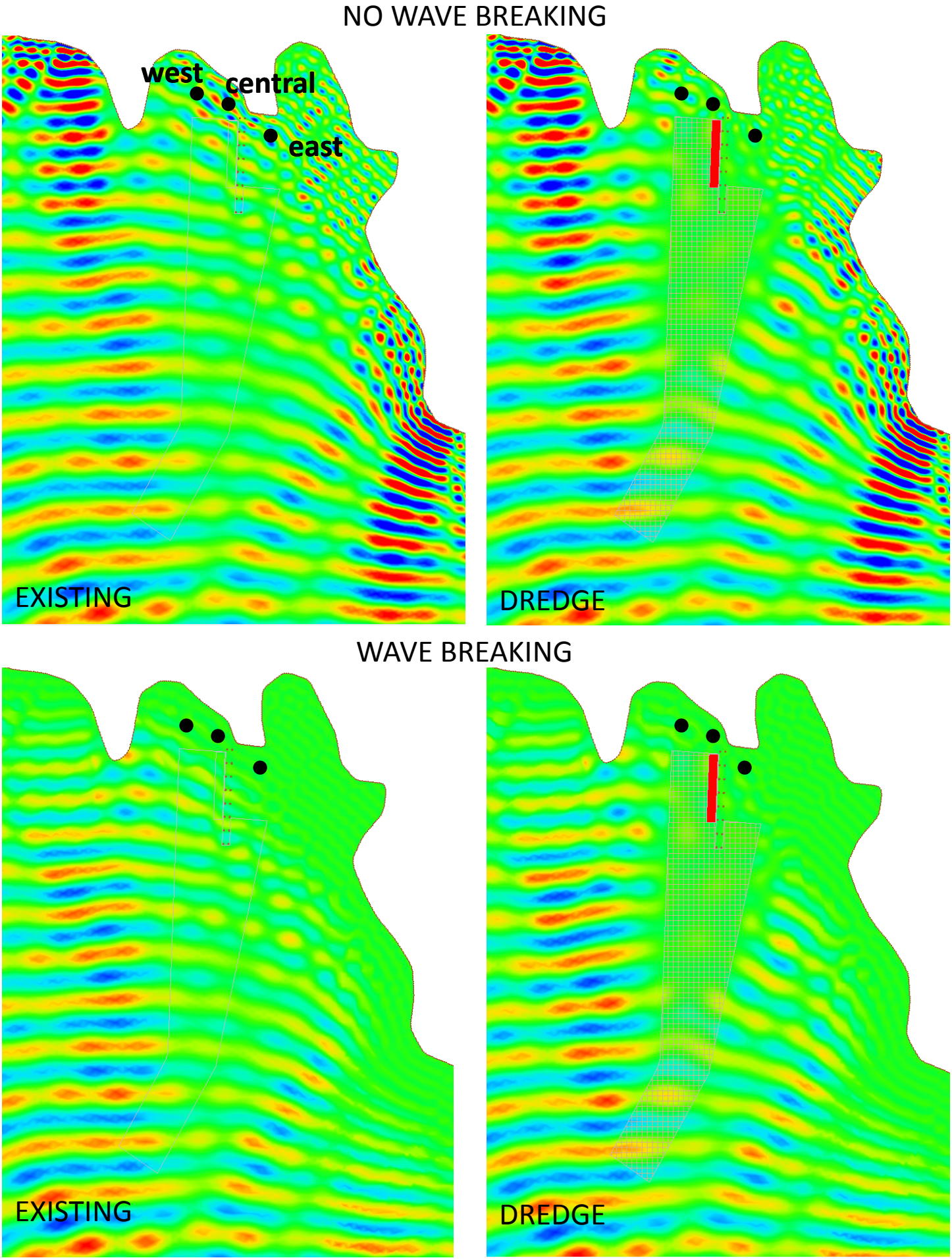


Figure 13 . Comparison of CGWAVE Predicted Wave Patterns at the Pier Head between the Existing Condition and Proposed Dredging Alternative

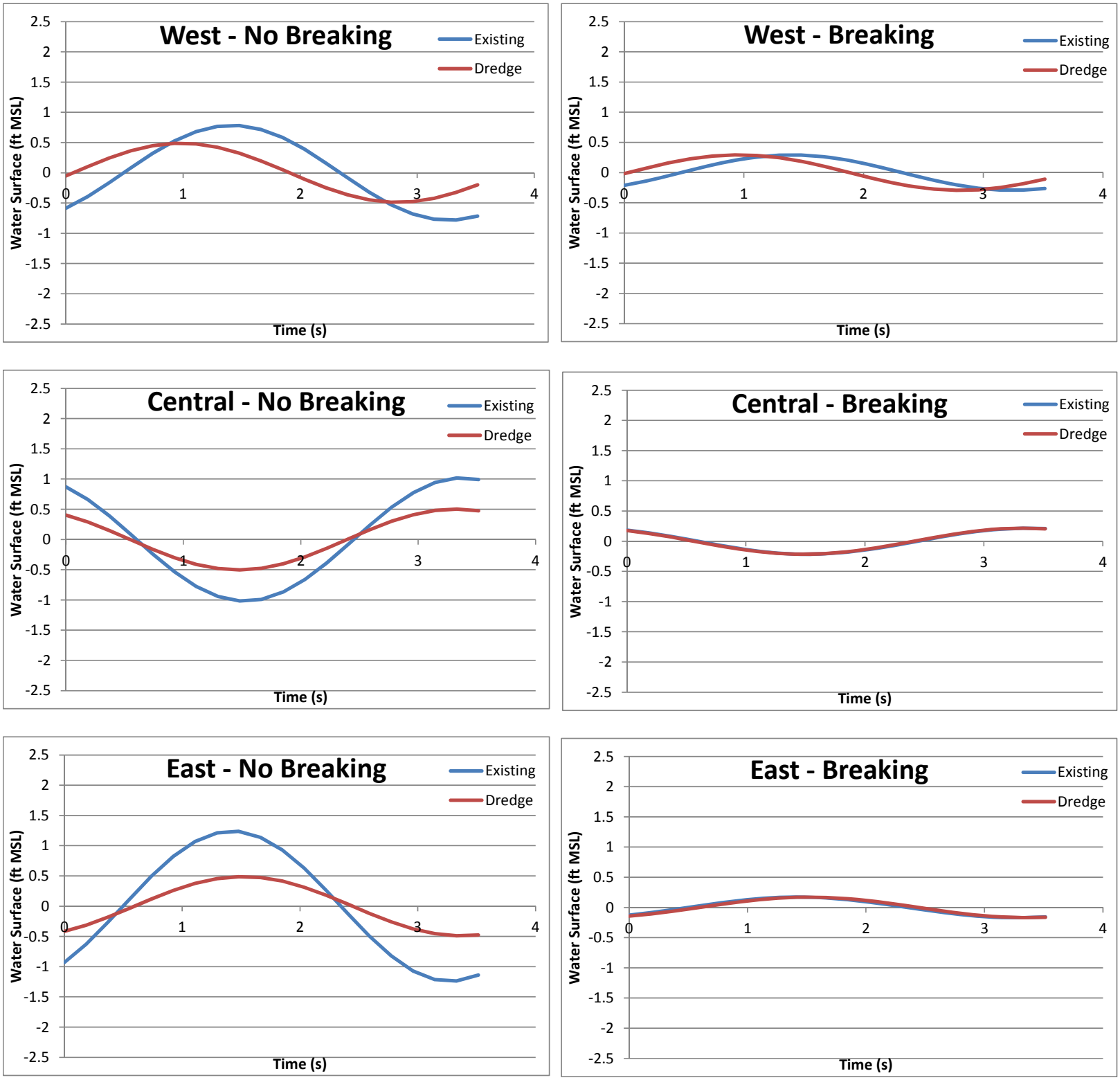


Figure 14 . Comparison of Wave Heights for One Wave Period at Three Observation Locations near Pier Head between the Existing Condition and Proposed Dredging Alternative

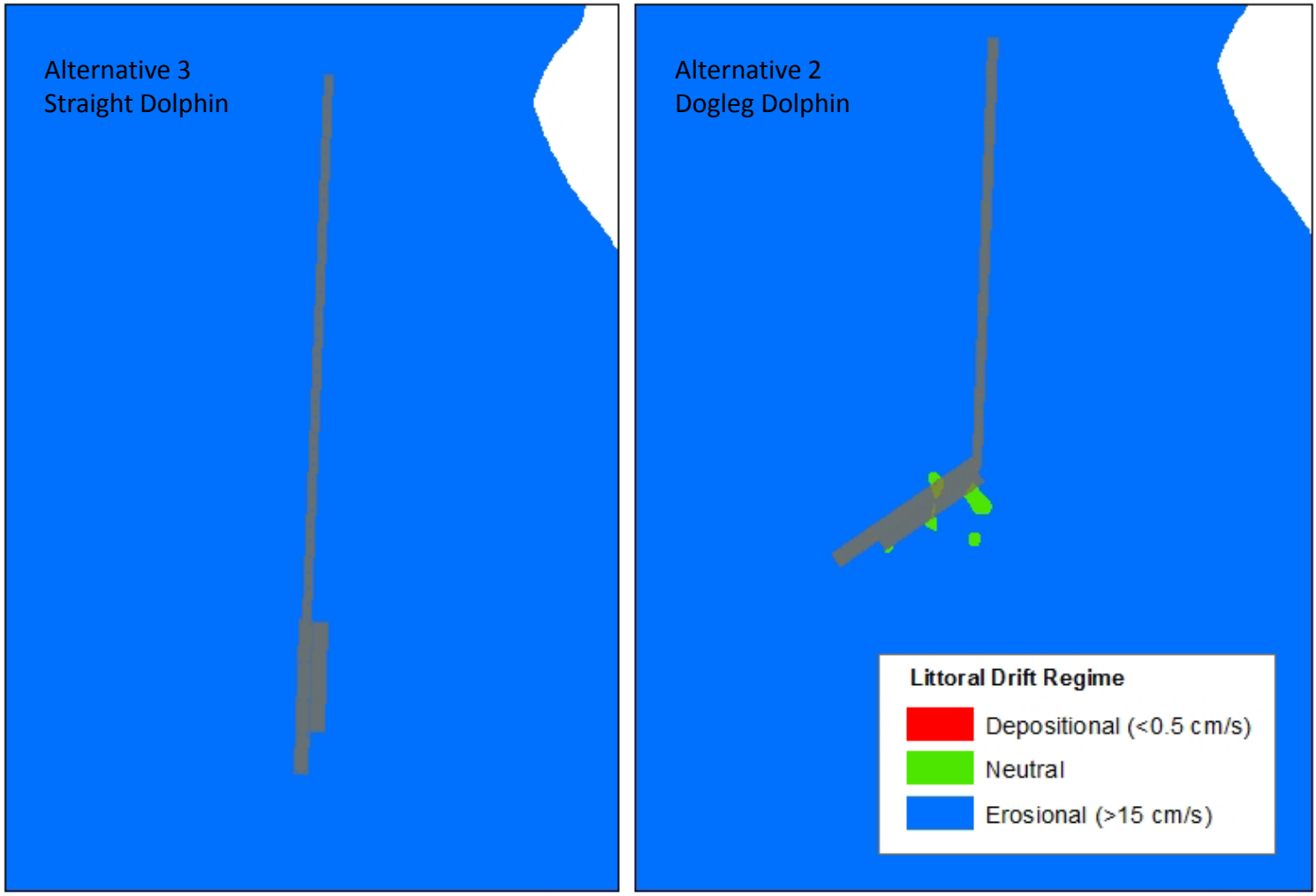


Figure 15. Predicted CGWAVE Orbital Velocity Results For Proposed Pier Extension Alternatives (No Wave Breaking)

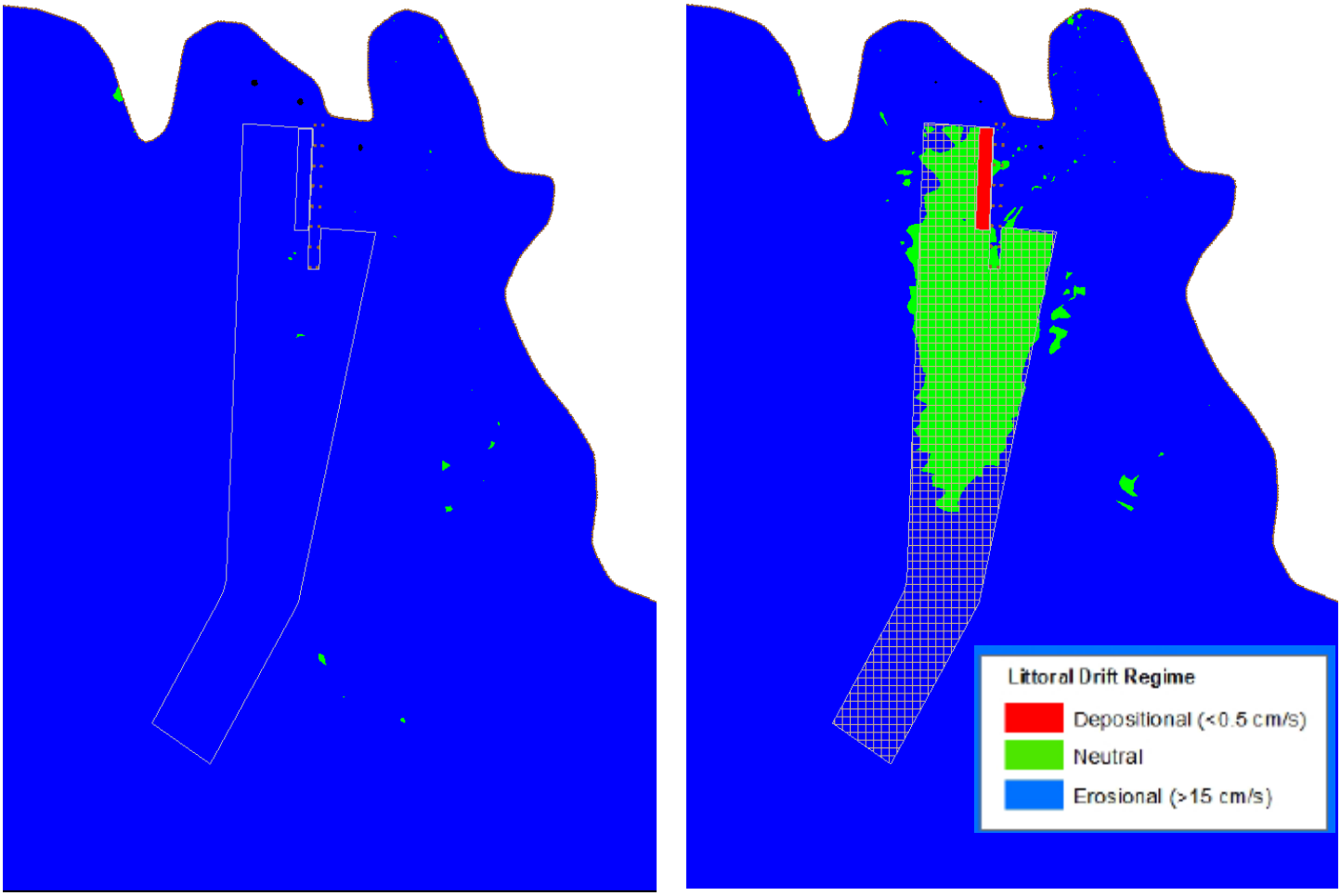


Figure 16. Comparison of CGWAVE Predicted Orbital Velocities between the Existing Condition and Proposed Dredging Alternative (No Wave Breaking)

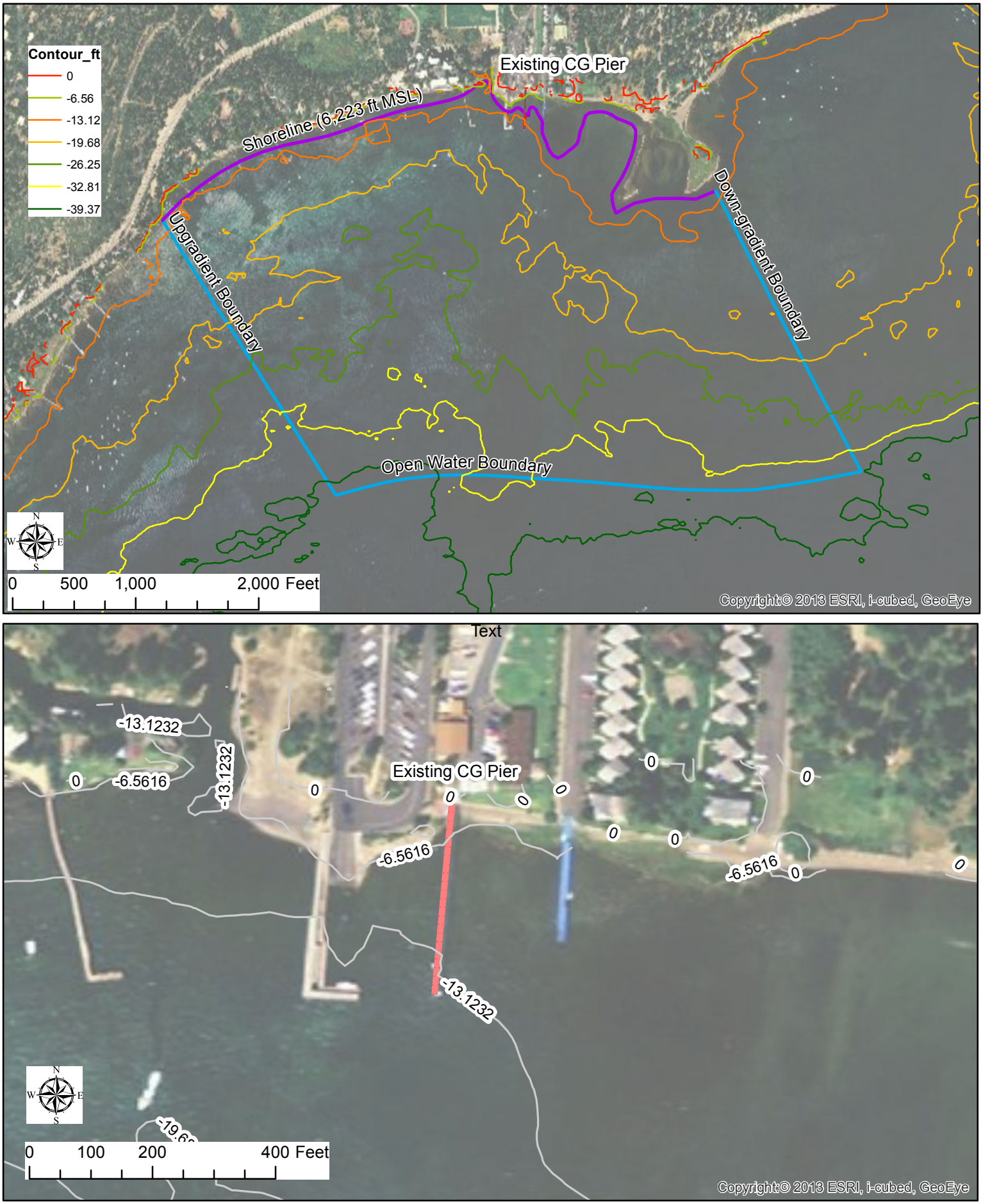


Figure17. Hydrodynamic (RMA-2) Model Domain

Water Depth in feet based on July 2000 Survey

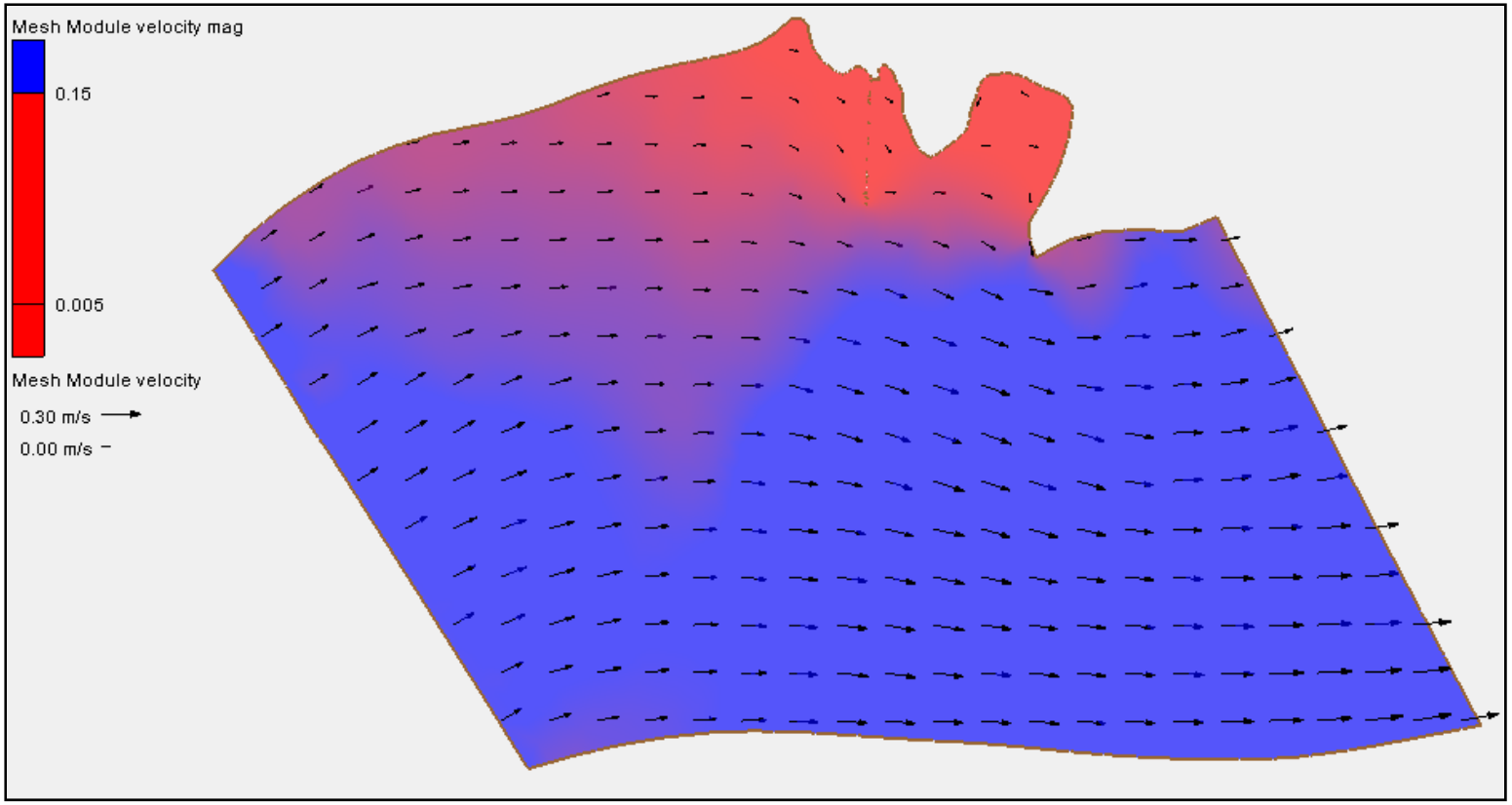


Figure 18. Typical RMA2 Model Results

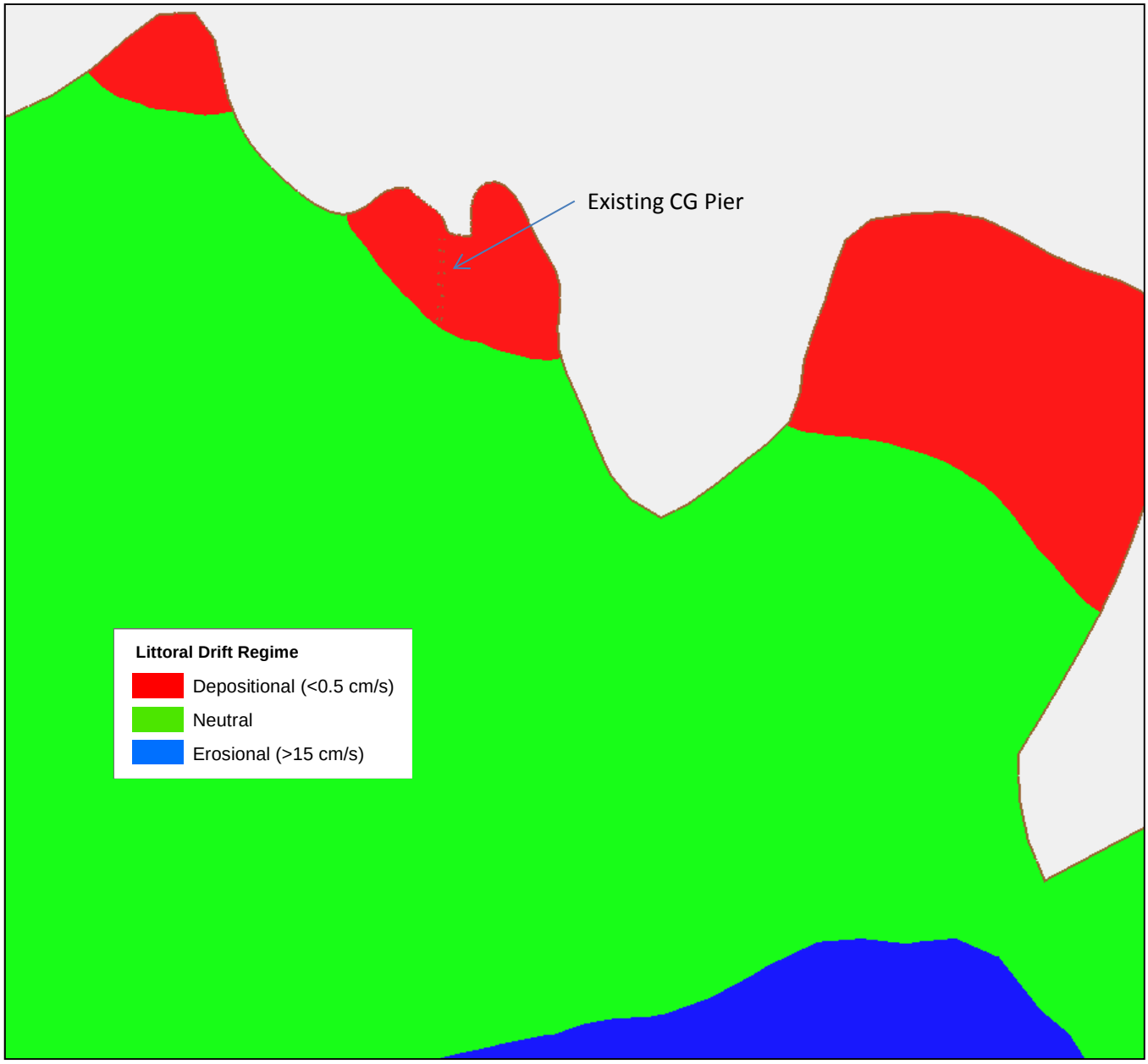


Figure 19. Current Velocities near Existing CG Pier Simulated by RMA2

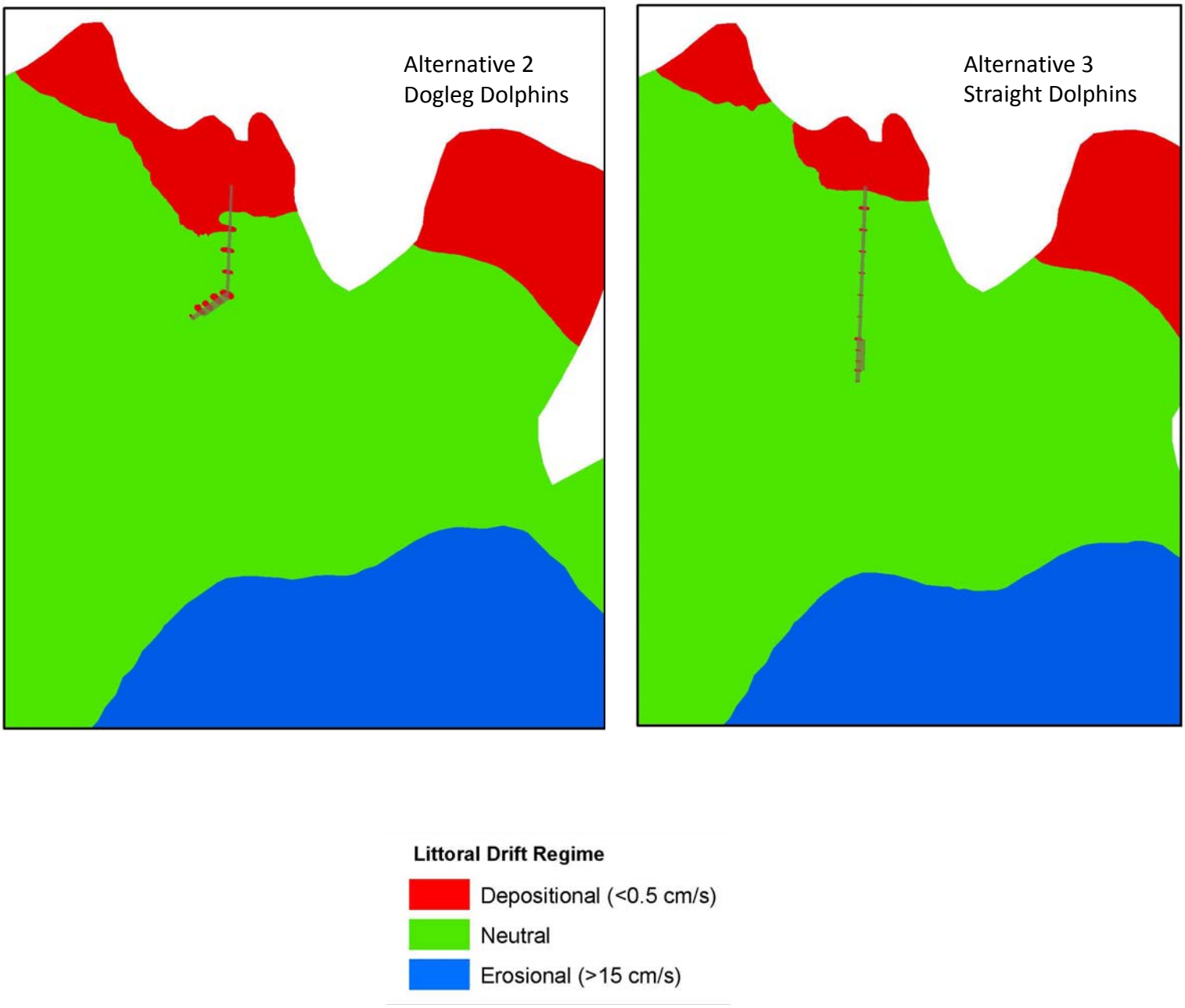


Figure 20. Comparison of Current Velocities among Proposed Pier Extension Alternatives Simulated by RMA2.

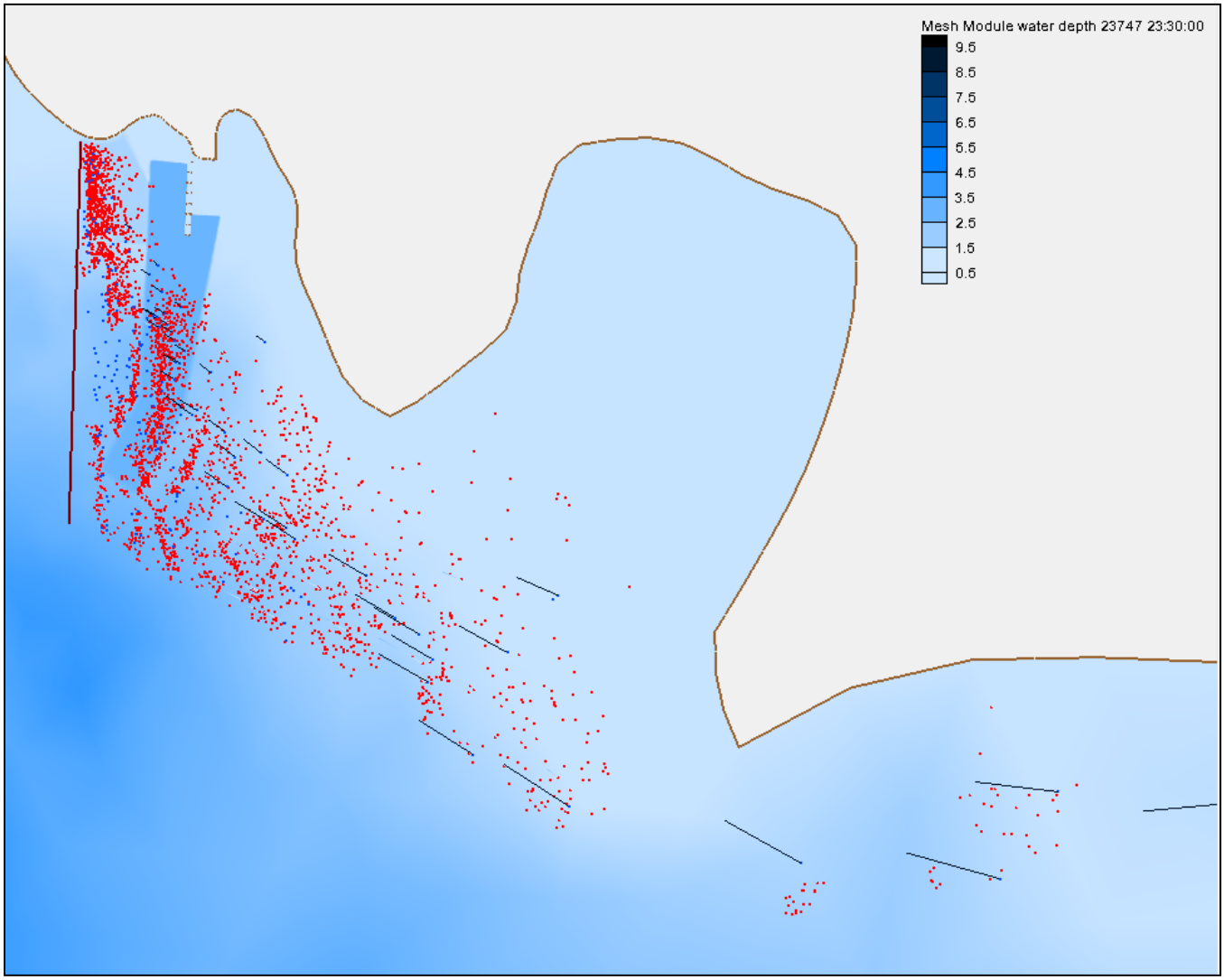


Figure 21. PTM Model Results for Proposed Dredged Alternative, Medium Grain Size = 0.062 mm

Appendix A

Technical Procedures to Estimate Offshore Winds from Onshore Meteorological Measurements

Problem Statement:
There is a difference between onshore and offshore winds. For engineering purposes it is necessary to determine offshore wind speeds in the absence of offshore data.

Required:
Demonstrate the calculation of offshore wind from onshore data.

Solution:
Using the velocity profile of turbulent fluid the near no slip surface boundary equation (Hsu 1981):

$$u_z = \frac{u_*}{k}\ln(\frac{z}{z_0})$$

where:

u_z = velocity at a given height
u_* = friction velocity (fn of fluid and velocity)
k = von Karman's constant (0.41, not disputed)
z = given height
z_0 = roughness height (parameter derived from drag coefficient ranges from 0.01 cm for frozen lake to 5+m for urban landscapes)

Without knowing the friction velocity it is still possible to determine a relationship between the velocity at multiple heights (say height 1 and 2). Assuming that the friction velocity is constant, you can set the two equations equal, yielding u_2 as a function of u_1.

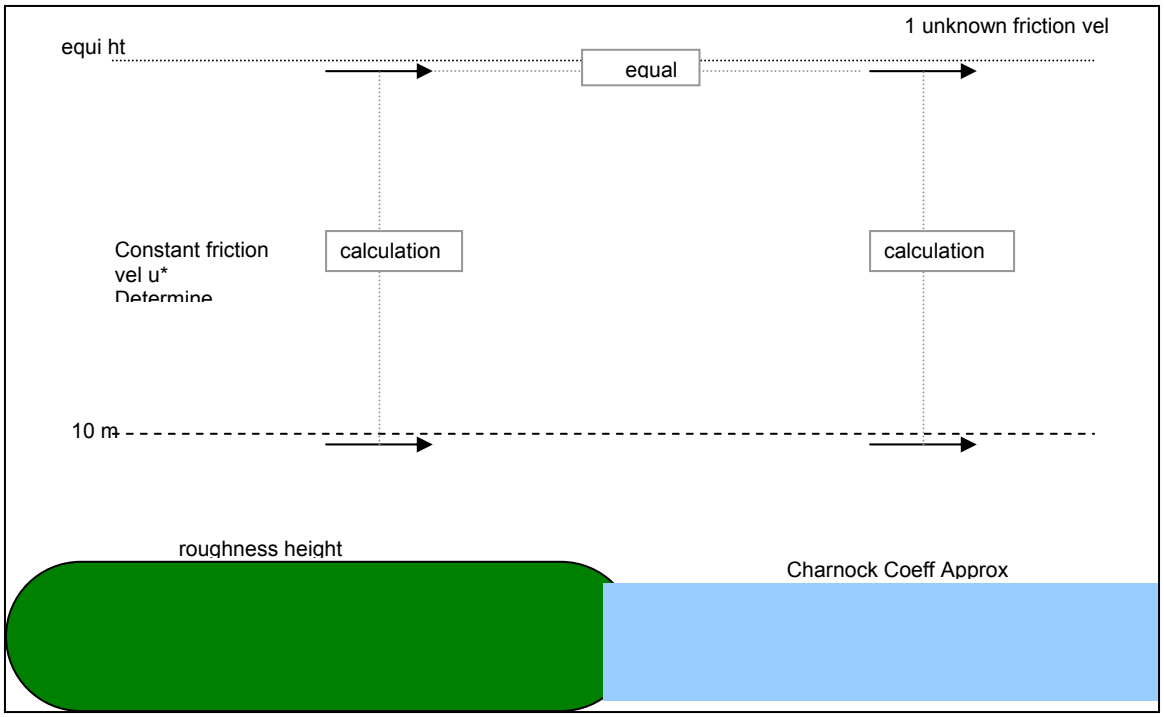
Assume that at some height above the land surface and open water surface, the wind velocity is equal over both surfaces. Then the friction velocity over the water can be calculated by knowing u_1. One change must be made to the velocity profile equation because water is not a non-slip boundary like land. The roughness height is a function of both objects on the surface, but also their shape and size of these obstructions. To account for this Charnock (1955) introduced the equation:

$$z_0 = \frac{\beta u_*^{\ 2}}{g}$$

where:

β = Charnock coefficient (supposed constant but range of values used approx e-2)
g = gravity (9.82 m/s^2)

By substituting in Charnock's equation and using the friction velocity from the previous calculation the velocity at any height can be calculated. The following figure is a schematic of the logic used in this series of calculations.



Assumptions:
There are 4 areas that require assumptions. Each one causes variations in the relationship between the wind speed at 10 m above the land and 10 m above the open water. These unknowns are:

Variable	Name	Appropriate Values	Base Values
$u_{10,\ land}$	wind speed (land	--	15 m/s
z_0	roughness coefficient (land)	0.0001 – 5+ m	.03 m
$z_{equilibrium}$	equilibrium height	--	60 m
B	Charnock Coefficient	0.001 – 0.1	.032

The last point to make is that in the last 30 years there have been multiple studies that have demonstrated methods of calculating a roughness height for open waters that are dynamic and more accurately calculate near surface wind velocities, but they require substantial knowledge about wave parameters. The Charnock method is perhaps the most appropriate method in this case.

References:
Charnock, H. "Wind stress on a water surface." Quart. J. Roy. Meteor. Soc. 81(1955), 639–640.
Hsu, S.A. "Models for Estimating Offshore Winds from Onshore Meteorological Measurements." Boundary Layer Meterology. 20(1981) 341-351.

Results:
The attached sheet demonstrates the sensitivity of the relationship between land wind speeds and open water wind speeds to variations in these assumptions. The base case values (above) were varied one at a time to see the change in the increase of wind velocity over open water as compared to over land.

The relationship is most sensitive to the roughness height used for the land calculations, if a roughness of 0.1 m is appropriate for the data from Lakefront then an appropriate sensitivity check for the model is probably 15%, and with the uncertainty associated with the other assumptions, perhaps a higher value of approximately 20% is more appropriate. It is probably

not appropriate to check sensitivity at wind speed less than the observed data at Lakefront because both the theoretical model and real data indicate that wind speeds will always be higher over open water than over land.

STEPS TO CALCULATING INCREASE IN WIND SPEED FROM OVER LAND TO OVER SEA:

Known constants:

k	0.41	
g	9.81	m/s^2

Assumed values:

β	0.1	
$Z_{0,L}$	0.03	m
Z_{10}	10	m
$Z_{equil,L}$	60	m
$Z_{equil,W}$	60	m
$u_{10,L}$	15	m/s

Spreadsheet notation:

k = von Karman's constant

g = gravitational constant

β = Charnock coefficient (can vary but assumed constant at 0.1)

$Z_{0,L}$ = roughness height over land (ranges from 0.0001m - 5+ m)

$Z_{0,W}$ = roughness height over water

Z_{10} = 10 m above surface (could apply to land or water surface)

$u_{10,L}$ = wind velocity at 10 m above land surface (usually known from observational data)

$u_{10,W}$ = wind velocity at 10 m above water surface

$Z_{equil,L}$: height above land at velocity equilibrium between land and sea

$Z_{equil,W}$ height above water at velocity equilibrium between land and sea

u_{equil} = wind velocity at equilibrium between land and sea

$u_{*,W}$ = friction velocity over water

1) Calculate u_{equil} using modified Hsu's equation:

$$u_{equil} = u_{10,L} * [\ln(Z_{equil,L}) - \ln(Z_{0,L})] / [\ln(Z_{10}) - \ln(Z_{0,L})]$$

$$u_{equil} = u_{10,L} * [\ln(60) - \ln(0.03)] / [\ln(10) - \ln(0.03)]$$

$$u_{equil} = 1.30844 * u_{10,L}$$

$$u_{equil} = 19.6266 \text{ m/s}$$

2) Calculate $u_{*,W}$ using combination of Hsu's equation and Charnock's equation:

$$u_{equil} = (u_{*,w} / k) * [\ln(Z_{equil,W}) - \ln(Z_{0,W})]$$

$$Z_{0,W} = (\beta * u_{*,W}^2) / g$$

$$u_{equil} = (u_{*,W} / k) * [\ln(Z_{equil,W}) - \ln((\beta * u_{*,W}^2) / g)]$$

$$19.627 = (u_{*,W} / 0.41) * [\ln(60) - \ln((0.1 * u_{*,W}^2) / 9.81)]$$

using solver, $u_{*,w}$ = 0.9065291 m/s

equation set to equal 0: 8.1E-10

$Z_{0,W}$ = 0.0083771 m

3) Calculate $u_{10,w}$ using Hsu's equation:

$$u_{10,w} = (u_{*,w} / k) * [\ln(Z_{10}) - \ln(Z_{0,W})]$$

$u_{10,w}$ = 15.6649 m/s

4) Calculate wind speed increase over open water:

$u_{10,L}$ = 15 m/s

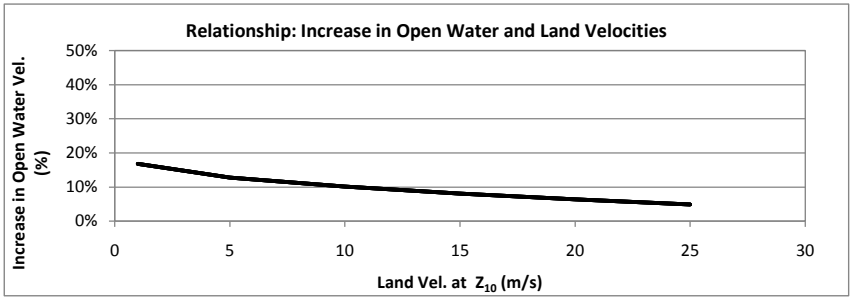
$u_{10,w}$ = 15.6649 m/s

increase = 4.43%

EFFECTS OF VARYING MODEL PARAMETERS:

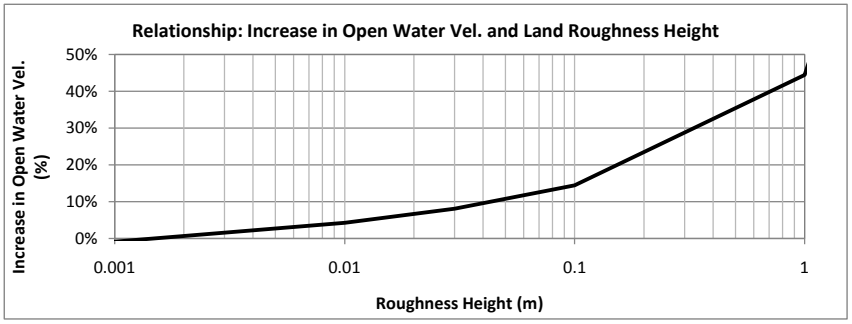
Vary Land Velocity:

Velocity (m/s)	% Increase
1	16.80%
5	12.77%
10	10.12%
15	8.12%
20	6.42%
25	4.88%



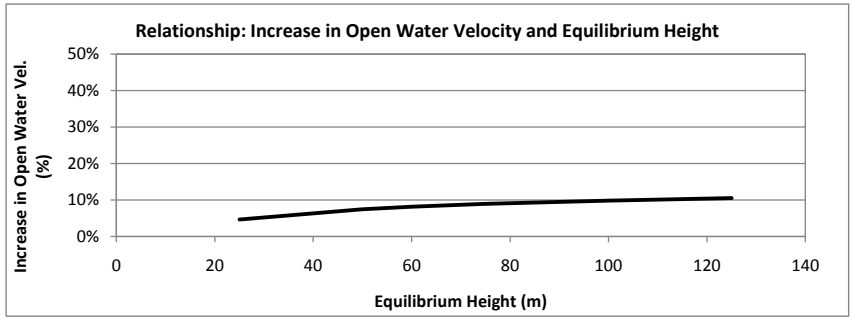
Vary Land Roughness:

Height (m)	% Increase
0.001	-0.85%
0.01	4.27%
0.03	8.13%
0.1	14.43%
1	44.45%
5	175.32%



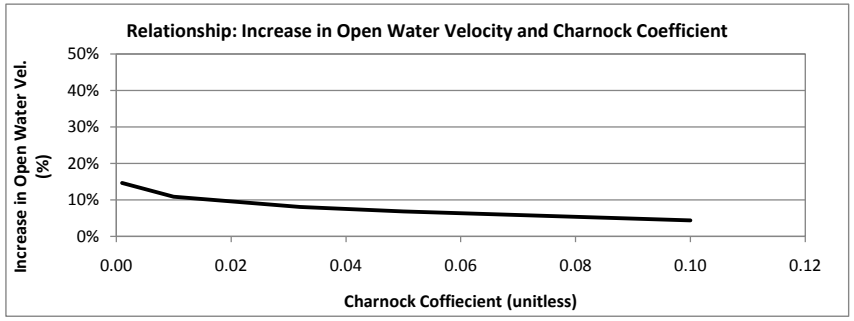
Vary Equilbrium Height (L and W)

Height (m)	% Increase
25	4.64%
50	7.46%
60	8.12%
75	8.89%
100	9.83%
125	10.52%



Vary Beta:

β	% Increase
0.001	14.63%
0.010	10.87%
0.032	8.12%
0.050	6.82%
0.100	4.44%



Appendix L

LUST Closure Letters

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California Regional Water Quality Control Board
Lahontan Region

Winston H. Hickox
Secretary for Environmental Protection

Internet Address: http://www.mscomm.com/~rwqcb6
2501 Lake Tahoe Boulevard, South Lake Tahoe, California 96150
Phone (530) 542-5400 • FAX (530) 544-2271

Gray Davis
Governor

June 28, 1999

Dave Stalters
Chief, Environmental Division
U.S. Coast Guard
2000 Embarcadero, Suite 200
Oakland, CA 94606-5337

Dear Mr. Stalters:

UNDERGROUND STORAGE TANK (UST) CASE CLOSURE, U.S. COAST GUARD STATION, 2500 LAKE FOREST ROAD, TAHOE CITY, PLACER COUNTY, LUSTIS NO. 6T0270A

This letter confirms the completion of a site investigation and remedial action for the underground gasoline storage tank formerly located at the above-described location. Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground gasoline storage tank release is required.

This notice is issued pursuant to a regulation contained in Section 2721(e) of Title 23 of the California Code of Regulations. Because you are the only fee titleholder of the affected property, this case closure also complies with Sections 25297.15 and 25299.37.2 of the California Health and Safety Code and Section 13307.1 of the California Water Code.

Please be advised that this letter does not relieve you of the responsibility to clean up existing, additional, or previously unidentified conditions at the site which are determined to cause or threaten to cause pollution or nuisance or otherwise pose a threat to water quality or public health.

Please contact our office at (530) 542-5400 if you have any questions regarding this matter.

Sincerely,

Robert S. Dodds
Assistant Executive Officer

cc: Placer County Division of Environmental Health, Rob Palmer
Tahoe Regional Planning Agency, Doug Smith
Tetra Tech, Robert Cotton

CC/sht: uscg.doc + enc.
[31/UGT/US Coast Guard, UGT #6T0270A]

Case Closure Summary (revised 2/1/99)

I. Regional Board Contact

Agency Name/Phone: California Regional Water Quality Control Board, Lahontan Region	
Address: 2501 Lake Tahoe Blvd, South Lake Tahoe, CA 96150	
Responsible Staff: Chuck Curtis	Phone: 530/542-5428

II. Case Information

Site Facility Name: US Coast Guard Station Lake Tahoe			
Site Facility Address: 2500 Lake Forest Road, Tahoe City, CA			
LUSTIS Case No.: 6T0270A	Local Agency No.:	Cleanup Fund No.:	
Unauthorized Release Form Date: 10/10/97			
Responsible Party:	Name:	Address:	Phone Number
Property Owner(s)	U.S. Coast Guard	2000 Embarcadero, Suite 200, Oakland, CA 94606-5337	510/535-7239
Operator(s)	U.S. Coast Guard	2500 Lake Forest Road, Tahoe City	
Were all Landowners listed on the Fee Title informed of remedial and closure decisions? Yes			

III. Release and Site Characterization Information

Cause of Release:	Chemical Type Released:	
Tank Size:	Tank Contents	Date Removed/Replaced/Upgraded
4000 gallons	Fuel Oil	October 10, 1997

IV(a). Maximum Soil Contaminant Concentrations

Contaminant	Method	Before (mg/kg)	After (mg/kg)	Contaminant	Method	Before (mg/kg)	After (mg/kg)
TPHg				Benzene	8020		<2
TPHd	8015M		340	Toluene	8020		<2
Other Fuel				Ethylbenzene	8020		<2
Heavy Metals				Xylene	8020		16
MTBE				Other--			

Soil Type At The Site: Sands, Silt, Clay	
Soil Remediation Method(s): Excavation	
Duration of Remediation: 1 day	
Volume Treated/Removed: Unknown	Disposal Location: Landfill
Maximum Depth of Remaining Petroleum Hydrocarbon Affected Soil: Approx. 10 feet	
Depth of Maximum Concentration of Petroleum Hydrocarbons Remaining in Soil: 4 feet	

IV(b). Maximum Ground Water Contaminant Concentrations

Contaminant	Method	Before (µg/l)	After (µg/l)	Contaminant	Method	Before (µg/l)	After (µg/l)
TPHg				Benzene	8260	<2	<0.5
TPHd	8015M	1,400	<100	Toluene	8260	<2	<0.5
Other Fuel				Ethylbenzene	8260	<2	<0.5
Heavy Metals				Xylene	8260	<2	<0.5
MTBE	8260		<0.5	Other[1]--			

Min Depth To Ground Water: 2 feet	Ground Water Flow Direction: South
Max Depth To Ground Water: 3.5 feet	
Number and Type of Monitoring Wells Installed: 2 2" PVC	
Number of Monitoring Wells not Decommissioned at time of Closure: 2	
Were (Domestic, Municipal, Ag, etc.) Supply Wells Affected? No	
Location of closest municipal well: NA	
Depth of aquifer currently used: NA Use of Aquifer: NA	
Ground Water Remediation Method(s): Natural attenuation	
Volume Treated/Removed: NA	Duration of Remediation: NA
Number of Consecutive Sampling Events Reporting Concentrations Less than Water Quality Protection Standards? 4	
Sampling Frequency: Quarterly	
Comments:	

IV(c). Surface Water Impacts

Was Surface Water Affected? No	Name of Water Body Affected:
Comments:	

IV(d). Maximum Extent of Any Remaining Contamination

Environment	Lateral (ft)	Vertical (ft)	Contaminant
Soil	Unknown	Unknown	TPH-Diesel
Ground Water	None		NA

V. Free Product

Was Free Product Encountered? No	Has Free Product Been Adequately Recovered? No

Human Health and Ecological Risk Evaluation

Was Quantitative or Qualitative Risk Evaluation Performed? (briefly describe below) No	If Land Use changes should risk be re-evaluated? (briefly describe below) No
Has vapor migration pathway to living receptors been evaluated? No	

VI. Remediation Summary and Closure Rationale

Remediation Summary: Tank and most affected soil excavated and disposed. Groundwater contamination detected in tank pit, but not detected in monitoring wells.

Closure Rationale: All but small quantity of petroleum contaminated soil was removed. Groundwater samples in monitoring wells at site did contain petroleum hydrocarbons or MTBE. Therefore, the former underground storage tank site no longer poses a threat to water quality.

List of Acronyms

TPH - total petroleum hydrocarbons
TPHg - total petroleum hydrocarbons as gasoline
TPHd - total petroleum hydrocarbons as diesel
CRWQCB - California Regional Water Quality Control Board
LUSTIS - Leaking Underground Storage Tank Information System
ND - non-detectable
NA - not applicable
NS - not sampled
MTBE - methyl-tert-butyl ether
fbg - feet below grade

COUNTY OF PLACER
DEPARTMENT OF HEALTH AND HUMAN SERVICES

RAYMOND J. MERZ
DIRECTOR OF HEALTH AND HUMAN SERVICES

ENVIRONMENTAL
HEALTH SERVICES

RICHARD BURTON, M.D.
PUBLIC HEALTH OFFICER

RICHARD H. SWENSON, R.E.H.S.
DIRECTOR

August 25, 1997

Mr. Jack Beckman
Tahoe City Public Utility District
Post Office Box 33
Tahoe City, CA 96145

RE: Underground Storage Tank Closure Status of One-550 Gallon Diesel Tank at the Coast Guard Station, Tahoe City.

Dear Mr. Beckman:

This letter is to advise you that all work to comply with the California Underground Storage Tank Regulations at subject location has been completed for the permanent closure of one-550 gallon underground storage tank. This Department appreciates your cooperation in this program.

The closure of the underground tank does not preclude any remedial responsibilities mandated by the California Health & Safety Code, California Water Code and the California Code of Regulations if additional or previously unidentified contamination is encountered at or from the site.

If you have any questions, please contact this Department.

Very truly yours,

Rob Palmer

Richard Swenson, R.E.H.S., Director
Division of Environmental Health

by Rob Palmer
Environmental Health Specialist
Lake Tahoe Area
Hazardous Materials Section

RP:clk
REF: CLOSURE.LTR/WP F:ROB

REPLY TO OFFICE CHECKED
☐ 11454 B AVENUE, AUBURN, CA 95603, (916) 889-7335, FAX (916) 889-7370
☐ P.O. BOX 1909, TAHOE CITY, CA 96145, (916) 581-6240

Coast Guard
94-140-15

Cal/EPA

Lahontan Regional Water Quality Control Board

South Lake Tahoe Office

2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(916) 542-5400
FAX (916) 544-2271

Pete Wilson
Governor

August 6, 1997

Ref No.: LUSTIS # 6T0261A

Jack Beckman
Tahoe City Public Utility District
Post Office Box 33
Tahoe City, California 96145

RECEIVED
AUG 14 1997
PLACER COUNTY
ENV. HEALTH
TAHOE OFFICE

Dear Mr. Beckman:

UNDERGROUND STORAGE TANK (UST) CASE CLOSURE U.S. COAST GUARD SEWER LIFT STATION, 2500 LAKE FOREST ROAD, TAHOE CITY, PLACER COUNTY, LUSTIS REF NO.: 6T0261A

This letter confirms the completion of a site investigation and remedial action for the underground storage tank(s) formerly located at the above-described location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground storage tank(s) are greatly appreciated.

Based on information in the above referenced file, and with the provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank release is required.

This notice is issued pursuant to a regulation contained in Section 2721(e) of Title 23 of the California Code of Regulations.

Please be advised that this letter does not relieve you of the responsibility to clean up existing, additional, or previously unidentified conditions at the site, which are determined to cause or threaten to cause pollution or nuisance, or, to otherwise pose a threat to water quality or public health.

Please contact our office if you have any questions regarding this matter.

Sincerely,

Robert S. Dodds
Assistant Executive Officer

cc: Attached Mailing List

KEK/shT:uscg.cls+ Enclosure
[31/ugt/TCPUD US Coast Guard Lift Station]

94-140-15

TAHOE REGIONAL PLANNING AGENCY

308 Dorla Court
Elks Point, Nevada
www.ceres.ca.gov/trpa

P.O. Box 1038
Zephyr Cove, Nevada 89448-1038

(775) 588-4547
Fax (775) 588-4527
Email: trpa@trpa.org

April 5, 2001

Tahoe City Public Utility District
ATTN: Jim Dykstra
P. O. Box 33
Tahoe City, CA 96145

Dear Mr. Dykstra:

SECURITY RETURNS, APN 94-140-15, LAKE FOREST, TANK REMOVAL, FILE NUMBER 940844, APN 530-302-94, ADJACENT TO 4990 WEST LAKE BLVD, TANK REMOVAL, FILE NUMBER 940053, APN 17-021-06, RUBICON GOLD COAST, TANK REMOVAL, FILE NUMBER 940052, APN 98-330-01, CHAMBERS LANDING, TANK REMOVAL, FILE NUMBER 940054, APN 83-100-04, SEQUOIA AVE., TANK REMOVAL, FILE NUMBER 940056, APN 16-142-30, NORTH LANE, TANK REMOVAL, FILE NUMBER 950552

Tahoe Regional Planning Agency (TRPA) staff has inspected the above-referenced projects and found them to be in compliance with the required TRPA Best Management Practices and the conditions of your permit.

The security amounts have been added to the balance of your revolving account. Your current revolving account balance is $6,520.00. Please refer to the attached worksheet.

Should you have any questions, please feel free to contact me.

Sincerely,

Linda Allen
Securities Administrator
Environmental Compliance Division

Encl.

Cal/EPA

Lahontan Regional Water Quality Control Board

South Lake Tahoe Office

2092 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(916) 542-5400
FAX (916) 544-2271

MS

Pete Wilson
Governor

October 24, 1996

RECEIVED
OCT 1996
TAHOE REGIONAL PLANNING AGENCY

Mr. Jack Beckman
Tahoe City Public Utility District
Post Office Box 33
Tahoe City, California 96145

Dear Mr. Beckman:

NOTICE TO SUBMIT A GROUND WATER MONITORING PLAN FOR THE PETROLEUM CONTAMINATED GROUND WATER AT THE COAST GUARD LIFT STATION, PLACER COUNTY

On September 20, 1994, TCPUD removed a 500 gallon diesel UST, used as an emergency backup power source for the Coast Guard Lift Station. During the tank removal, a water line was broken and domestic water and storm water runoff flooded the excavation. Analyses of the water in the excavation tested positive for Total Petroleum Hydrocarbons - Extractable (TPH-E). The TPH-E analyses includes diesel and motor oil range hydrocarbons. Water samples taken on 9/29/94 and 10/4/94 were determined to contain 3,680 and 980 µg/l TPH-E. The taste and odor threshold for diesel fuel in water is 100 µg/l. The Regional Board requires that ground water be cleaned-up to background (none deteceted) or the most restrictive threshold, which in the case of diesel fuel is the taste and odor threshold.

Subsequent to the initial investigation, TCPUD worked with Placer County Environmental Health to ascertain if the petroleum product detected in the ground water samples was from the underground tank or the asphalt shingles on the roof of the pump station. The investigation was inconclusive. Ground water quality at the site needs to be adequately addressed, and remediated if necessary, before this tank case can be closed.

94-140-15

Pursuant to Section 13267 of the California Water Code, TCPUD is to submit a workplan to this office by **November 14, 1994** which includes a plan for investigating and monitoring the ground water at the site. The workplan shall also include an implementation schedule.

Please contact Kevin Kratzke at (916) 542-5421 or me at (916) 542-5426 if you have any questions.

Sincerely,

Ranjit S. Gill

Dr. Ranjit S. Gill
Chief, Planning and Toxics Unit

cc: Placer County Environmental Health\Rob Palmer
TRPA

KEK/T:cgaurd.ltr
[31/ugt/TCPUD Coast Guard Lift Station]

TRPA SECURITY RETURN INSPECTION FORM

Date Requested: 9-18-95 Reinspection _____ APN 94-140-15

Physical Address: _____ County: PL

Type of Project: Underground Storage Tank removal

Person who posted the security: TCPUD

Mailing Address: _____

_____ (Zip Code) _____

Work Phone (916) 583-3796 Home Phone _____

Person Calling in request (If different from above):

Name: _____ Phone ( ) _____

Copy of Letter to caller (if applicable) Yes _____ No _____

Mailing address _____

Special Request, description of site _____

_____

Date Field Inspection Completed: _____

Field Inspection Performed By: _____

Recommended for Security Return Yes _____ No _____

Check Scope of this Inspection:

_____ Coverage is as approved.

_____ Infiltration devices installed as approved.

_____ Revegetation complete.

_____ Dimensions of structures as shown on plans.

_____ Slope stabilization complete.

_____ Tree Removal in conformance with approval.

_____ Elevation, colors, scenic requirements.

_____ Height as shown on plans.

_____ Other special conditions.

Comments:

11-25-96
need closure statement

Notes:

_____

_____

For additional notes see back. Released by: _____ Date _____

KLEINFELDER

94-140-15

October 25, 1994
File: 30-1057-38.002

RECEIVED
OCT 27 1994 BS
TAHOE REGIONAL
PLANNING AGENCY

Mr. Rob Palmer
Placer County Division of Environmental Health
P.O. Box Drawer CC
Tahoe City, CA 96145

SUBJECT: UST Closure Request, Coast Guard Lift Station
Tahoe City Public Utilities District
Tahoe City, California

Dear Rob:

This letter provides the analytical results for the soil and groundwater sample analyses from beneath the UST removed from the Coast Guard Lift Station. It also includes a formal request to allow the Tahoe City Public Utilities District (TCPUD) to backfill the underground storage tank (UST) excavation and proceed with the installation of the above-ground storage tank.

UST Removal and Sampling

On Thursday, September 20, TCPUD removed a 500 gallon diesel UST, used as an emergency back-up power source for the sewage lift station. During tank removal, a water line was broken. Both domestic water and storm water runoff water flooded the excavation. Based on discussions with you, Kleinfelder collected two samples of the water from the excavation, a composite soil sample from the excavated soil, and two soil samples from beneath the UST just above the water line.

Analyses were provided by Alpha Analytical (Alpha) of Sparks, Nevada, who is certified for the requested analyses by U.S. EPA and the California Department of Health Services (DHS). The analyses included Total Petroleum Hydrocarbons-Extractable (TPH-E), quantified as diesel-range and motor oil-range constituents, using modified EPA Method 8015, and for the gasoline-range constituents benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Method 8240/624.

The analytical results are attached, and show the following:

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KLEINFELDER 3189 Mill Street, Reno, NV 89502 (702) 323-7182

SAMPLE	LOCATION	DATE	DEPTH	TPH-E	B	T	E	X
CG-1	Below UST	9/21/94	3½'	57	ND	ND	ND	ND
CG-2	Excavated Soil	9/21/94	--	97	ND	ND	ND	ND
CG-3	UST (Water)	9/29/94	4'	3.68	ND	ND	ND	ND
CG-4*	UST (Water)	10/4/94	4'	0.98	--	--	--	--
CG-4	Below UST	10/12/94	3½'	29	--	--	--	--

ND = Not Detected; TPH-E reported in mg/kg for soil and mg/l for water.

* The designation GC-4 was inadvertently used twice. The date provides the distinction on the laboratory reports.

Analytical results and the chain-of-custody are attached to this letter.

Discussion of Analytical Results and Field Conditions

Based on the results reported by Alpha for the composite sample, the excavated soil was transported to the McKittrick Waste Treatment Site in McKittrick, Kern County, California, for treatment by bioremediation. Approximate volume was 10 cubic yards.

The initial soil sample (GC-1) analysis showed 57 mg/kg of total petroleum hydrocarbons in the range of motor oil (TPH-MO). Based on this result and because of the water in the excavation, the PCDEH requested a water sample be collected to assess the presence of hydrocarbons. This sample (CG-3) showed 3.68 mg/l of TPH-MO. Subsequently, storm water runoff entered the excavation, and Kleinfelder re-sampled the water. CG-4 of October 4, 1994 (one of the duplicate sample numbers) showed 0.98 mg/l of TPH with components in both the diesel and motor-oil ranges. Based on the water sample results, TCPUD pumped the water from the open excavation and re-sampled the soil at the excavation bottom (CG-4 of October 12, 1994). The sample result was 29 mg/kg of TPH-MO.

The analytical results indicated hydrocarbons predominantly in the motor oil-range, rather than the expected diesel-range, based on leakage from the UST. Hydrocarbons other than diesel-range very likely entered the excavation due to storm water runoff, which came from the adjacent paved roadway and from the overhanging shingled roof. Based on the analytical results and our field observations, we conclude the minor diesel-range components in the excavated soil represents minor overspill and that sufficient soil has been excavated from beneath the USTs. We further conclude that the concentrations of TPH-MO reported in the (GC-4 of October 4, 1994) water sample (0.98 mg/l) and final soil sample are likely from storm water runoffs and do not pose a significant threat to groundwater since the water was removed. Kleinfelder recommends the excavation be filled with material that is clean and appropriate for the intended future uses.

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All Rights Reserved

This letter requests your approval of and concurrence with Kleinfelder's conclusions and recommendations. We will call for your response.

Very truly yours,

KLEINFELDER, INC.

John R. Dyer, R.G.
Project Geologist

Wally Robison, R.E.A.
Senior Engineer

JRD:WR:rwk

cc: Jack Beckman, TCPUD
Lisa Dernbach, Lahontan Regional Water Quality Control Board
Brian Judge, Tahoe Regional Planning Agency

Attachments: Site Plan
Chain-of Custody
Laboratory Analytical Results

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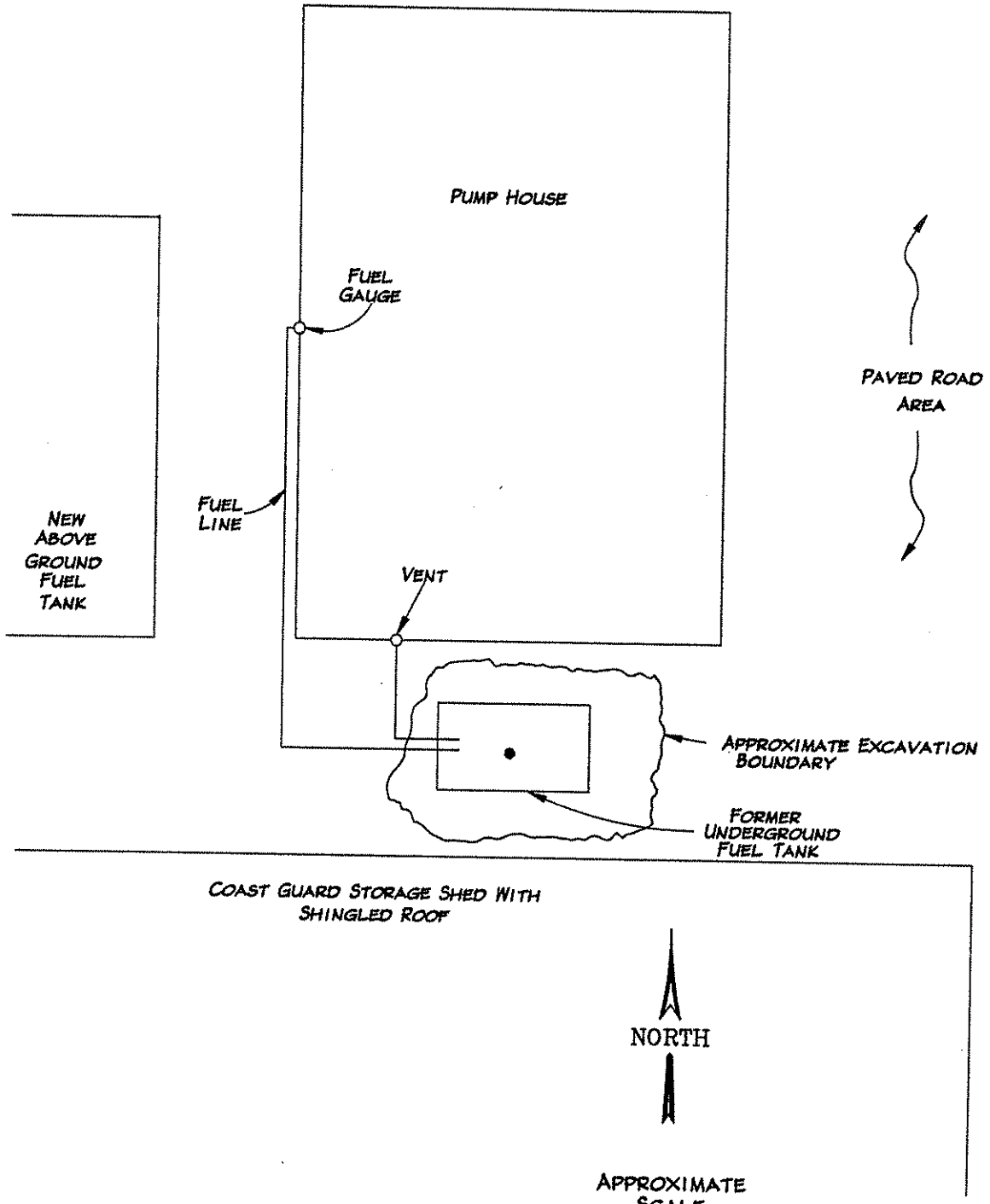
KLEINFELDER 3189 Mill Street, Reno, NV 89502 (702) 323-7182



EXPLANATION OF SYMBOLS

● APPROXIMATE SAMPLE LOCATION FOR CG-1, CG-2, CG-4 (10-4-94) AND CG-4 (10-12-94)

DRAWING: 105738C

KLEINFELDER

DATE: OCTOBER, 1994

PROJECT NO. 30-1057-38.002

SITE PLAN

TAHOE CITY PUBLIC UTILITY DISTRICT
U.S. COAST GUARD LIFT STATION
TAHOE CITY, CALIFORNIA

PLATE 1

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

Continued:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit	
CG-2 /KLF092194-04	TPH (Diesel)	44	6.0	mg/Kg**
	TPH (Motor Oil)*	53	6.0	mg/Kg**
	Benzene	ND	5.0	ug/Kg
	Toluene	ND	5.0	ug/Kg
	Total Xylenes	ND	5.0	ug/Kg
	Ethylbenzene	ND	5.0	ug/Kg
BW-2 /KLF092194-05	TPH (Diesel)	250	20	mg/Kg**
	TPH (Motor Oil)*	79	20	mg/Kg**
	Benzene	ND	5.0	ug/Kg
	Toluene	ND	5.0	ug/Kg
	Total Xylenes	ND	5.0	ug/Kg
	Ethylbenzene	ND	5.0	ug/Kg
MCK-2 /KLF092194-06	TPH (Diesel)	27	4.0	mg/Kg**
	TPH (Motor Oil)*	39	4.0	mg/Kg**
	Benzene	ND	5.0	ug/Kg
	Toluene	ND	5.0	ug/Kg
	Total Xylenes	ND	5.0	ug/Kg
	Ethylbenzene	ND	5.0	ug/Kg
M-2 /KLF092194-07	TPH (Diesel)	69	6.0	mg/Kg**
	TPH (Motor Oil)*	33	6.0	mg/Kg**
	Benzene	ND	5.0	ug/Kg
	Toluene	ND	5.0	ug/Kg
	Total Xylenes	ND	5.0	ug/Kg
	Ethylbenzene	ND	5.0	ug/Kg

* - Although its components eluted in the range of motor oil, the identified compounds were not similar to the hydrocarbons found in diesel fuels or lubricating oils.

** - Detection limit was increased due to the amount of petroleum hydrocarbons present in the sample.

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

ND - Not Detected

Approved By: Roger L. Scholl Date: 9/22/94
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

Kleinfelder, Inc
3189 Mill Street
Reno, NV 89502

Proj#: 30-1057-38.002
Phone: 323-7182
Attn: John Dyer

Sampled: 09/21/94 Received: 09/26/94 Analyzed: 09/26-27/94

Matrix: [X] Soil [ ] Water [ ] Waste

Analysis Requested: TPH (Diesel) - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
TPH (Motor Oil) - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTXE - Benzene,Toluene,Xylenes,Ethylbenzene

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191
BTXE - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
CG-1 /KLF092694-02	TPH (Diesel)	ND	2.0 mg/Kg*
	TPH (Motor Oil)	57	2.0 mg/Kg*
	Benzene	ND	5.0 ug/Kg
	Toluene	ND	5.0 ug/Kg
	Total Xylenes	ND	5.0 ug/Kg
	Ethylbenzene	ND	5.0 ug/Kg

** - Detection limit was increased due to the amount of petroleum hydrocarbons present in the sample.

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

ND - Not Detected

Approved By: Roger L. Scholl Date: 9/27/94
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

Kleinfelder, Inc
3189 Mill Street
Reno, NV 89502

Proj#:
Phone: 323-7182
Attn: John Dyer

Sampled: 09/29/94 Received: 09/29/94 Analyzed: 09/30/94

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
BTXE - Benzene,Toluene,Xylenes,Ethylbenzene

Methodology: TPH - Modified 8015/DHS LUFT Manual\BLS-191
BTXE - EPA Method 624/8240

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
CG-3 /KLF092994-01	TPH (Diesel)	0.58	0.050 mg/L
	TPH (Motor Oil)	3.1	0.050 mg/L
	Benzene	ND	1.0 ug/L
	Toluene	ND	1.0 ug/L
	Total Xylenes	ND	1.0 ug/L
	Ethylbenzene	ND	1.0 ug/L
BW-4 /KLF092994-02	TPH (Diesel)	0.51	0.050 mg/L
	TPH (Motor Oil)	1.3	0.050 mg/L
	Benzene	ND	1.0 ug/L
	Toluene	ND	1.0 ug/L
	Total Xylenes	ND	1.0 ug/L
	Ethylbenzene	ND	1.0 ug/L

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

ND - Not Detected

Approved By: Roger L. Scholl Date: 9/30/94
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

Kleinfelder, Inc
3189 Mill Street
Reno, NV 89502

Proj#:
Phone: 323-7182
Attn: John Dyer

Sampled: 10/04/94 Received: 10/04/94 Analyzed: 10/05/94

Matrix: [ ] Soil [X] Water [ ] Waste

Analysis Requested: TPH (Diesel) - Total Petroleum Hydrocarbons Extractable Quantitated as Diesel
TPH (Motor Oil) - Total Petroleum Hydrocarbons Extractable Quantitated as Diesel

Methodology: TPH (Diesel) - Modified 8015/DHS LUFT Manual
TPH (Motor Oil) - Modified 8015/DHS LUFT Manual

Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
CG-4 /KLF100494-01	TPH (Diesel)	0.21	0.050 mg/L
	TPH (Motor Oil)	0.77	0.050 mg/L

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

ND - Not Detected

Approved by: Roger L. Scholl Date: 10/5/94
Roger L. Scholl, Ph.D.
Laboratory Director

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, Nevada 89431
(702) 355-1044
FAX: 702-355-0406
1-800-283-1183

Boise, Idaho
(208) 336-4145

Las Vegas, Nevada
(702) 386-6747

ANALYTICAL REPORT

Kleinfelder, Inc
3189 Mill Street
Reno, NV 89502

Proj#: 30-1057-38.002
Phone: 323-7182
Attn: John Dyer

Sampled: 10/12/94 Received: 10/12/94 Analyzed: 10/13/94

Matrix: [X] Soil [ ] Water [ ] Waste

Analysis Requested: TPH (Diesel) - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel
TPH (Motor Oil) - Total Petroleum Hydrocarbons-Extractable Quantitated As Diesel

Methodology: TPH - Modified 8015/DHS LUFT Manual/BLS-191

TPH/BTXE Results:

Client ID/ Lab ID	Parameter	Concentration	Detection Limit
CG-4 /KLF101294-03	TPH (Diesel)	ND	1.0 mg/Kg
	TPH (Motor Oil)	29	1.0 mg/Kg

Note: Hydrocarbons outside the range of diesel may have varying recoveries.

ND - Not Detected

Approved By: Roger L. Scholl Date: 10/17/94
Roger L. Scholl, Ph.D.
Laboratory Director

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Appendix M

TRPA Final BMP Inspection Letter

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TAHOE REGIONAL PLANNING AGENCY

128 Market Street
Stateline, Nevada
www.trpa.org

P.O. Box 5310
Stateline, Nevada 89449

(775) 588-4547
Fax (775) 588-4527
Email: trpa@trpa.org

December 6, 2007

Roy S. Clark
Environmental Protection Specialist
2000 Embarcadero, Suite 200
Oakland, CA 94606

FINAL INSPECTION, PUBLIC SERVICE, PLACER COUNTY, 2500 LAKE FOREST ROAD, APN 094-140-15, TRPA FILE #20021687.

Dear Mr. Clark:

On December 03, 2007, Tahoe Regional Planning Agency (TRPA) staff inspected the above-referenced project and found it to be in substantial compliance with the required TRPA Best Management Practices (BMP) and the conditions of the permit. This project is now considered to be complete.

Thank you for your cooperation. Should you have any questions, you may contact me at (775) 589-5281, Monday through Friday, 8:00 a.m. to 5:00 p.m.

Sincerely,

Ethan Casaday

Ethan Casaday
Associate Environmental Specialist
Environmental Compliance Team

INTRODUCTION

The United States Coast Guard maintains a station at Lake Tahoe located 1.5 miles northeast of Tahoe City at 2500 Lake Forest Road on Placer County APN 094-140-01. As part of several projects completed over the years by the USCG, as well as the recent fencing and pavement overlay project, the Tahoe Regional Planning Agency (TRPA) has conditioned the USCG with several BMP requirements. The proposed project is to install Best Management Practices (BMPs) per the TRPA requirements of Permit No. 200896. Also included with this project is the banking of 1,336 SF that became available from coverage removals since the last verified land coverage.

PARCEL HISTORY & COVERAGE ANALYSIS

TRPA has confirmed that the last known verified coverage calculations were included with permit number 19891085, which was for the installation of a boatlift on an existing pier. Since that time the US Coast Guard has applied for several other permits. The table below lists the permits in the TRPA database that have been applied for since that time.

DATE	PERMIT NO.	TYPE/STATUS
1989	19891085	Boat Lift
1994	19940108	Tank Removal Application. Withdrawn.
1994	19940844	Tank Removal and Replacement. Completed.
1998	19980062	Temporary Use Permit for Weather Station.
2000	20000896	Pier Replacement. Completed.
2001	20010585	Public Service Application for TRPA Installation of Air Quality Monitoring Equipment. Withdrawn
2002	20021687	Public Service Application for Fence Repairs/Replacement. Complete.
2002	20021777	Withdrawn.

As TRPA has stated the last verified coverage was included in the 19891085 permit, the following coverage table uses those numbers as a baseline. Since the time of the above mentioned permit, the US Coast Guard has made several onsite improvements which have not been verified by TRPA. These improvements include both the addition and removal of coverage to the parcel. Improvements that provided additional coverage to the parcel total 4,303 SF, these include:

- Extension of Boat Garage, 90 SF
- Hot Tub/ Hypothermia Chamber, 322 SF
- Tank Behind Pump Station, 234 SF
- Gravel Parking Area, 3,657 SF

Improvements that provided a reduction in coverage to the parcel total 5,639, these include:

- Drive is 16' wide vice 22' wide (inside fenced area), 1,650 SF
- Old Gravel Parking Area, 880 SF
- Paved Area by Pump Station, 224 SF
- Drive is 16' wide vice 22' wide (outside fenced area), 1,950 SF
- Area Retired with Mulch, 935 SF

Item	Area (s.f.)	Date of Installation/Removal	Purpose
Extension of Boat Garage	90	Approximately –2000	Storage
Hot Tub/ Hypothermia Chamber	322	Mid – 90's	Hypothermia Chamber
Tank Behind Pump Station	234	Unknown	Public Utility Department Property; Diesel fuel for station emergency power
Gravel Parking Area	3,657	Unknown	Parking and Boat Storage
AC Pavement inside fenced area	-1,650	Incorrect on 1989 coverage analysis	Note that trenches will be replaced with TRPA approved plants
Gravel Parking Area	-880	Unknown	Unknown
AC by Pump Station	-224	Unknown	Unknown
AC outside fenced area	-1,950	Incorrect on 1989 coverage analysis	Note that trenches will be replaced with TRPA approved plants
Area retired with mulch	-935	TBD- this project	Relocating shed and locker

The following table illustrates the coverage as verified by TRPA in 1989 with permit 19891085 and lists the above mentioned improvements. The table illustrates that with the improvements to the property, the existing coverage is now 1,136 SF less than 1989 existing coverage. With this project the applicant intends to bank 1,136 SF of coverage in Class 1b.

US COAST GUARD LAKE TAHOE STATION COVERAGE ANALYSIS	
Lot Area: 97, 375 SF TRPA verified land Class: 1B - Mb (Marsh) Allowable Coverage (1%): 974 SF	
COVERAGE PER TRPA PERMIT 19891085	
Paved Driveway & Parking	23,173
Gravel Walkways & Parking	1,104
Access Walkway to Pier	102
Buildings	7,135
TOTAL	31,514
COVERAGE REMOVALS	
Drive is 16' wide vice 22' wide (inside fenced area)	1,650
Old Gravel Parking Area	880
Paved Area by Pump Station	224
Drive is 16' wide vice 22' wide (outside fenced area)	1,950
Area Retired with Mulch	935
TOTAL	5,639
COVERAGE ADDITIONS	
Extension of Boat Garage	90
Hot Tub/ Hypothermia Chamber	322
Tank Behind Pump Station	234
Gravel Parking Area	3,657
TOTAL	4,303
EXISTING COVERAGE	
August 1989 Verified Coverage	31,514
Coverage Removals	-5,639
Coverage Additions	4303
TOTAL	30,178
BANKED COVERAGE	
Verified Coverage	31,514
Existing Coverage	30,178
TOTAL	1,336

PERMANENT BEST MANAGEMENT PRACTICES

The proposed project is a BMP project that will address several concerns that TRPA has identified on the project site. Specific requirements for the treatment of water in the area have been required by TRPA in a letter from Birgit Widegren dated 5/29/03 (attached). The selection and design of BMPs for this project meet these requirements.

JENSON PRECAST SAND OIL SEPARATOR

Currently, the Station Lake Tahoe storm water runoff drains directly to Lake Tahoe. To provide storm water collection and treatment AEC has designed a storm water collection system for all paved areas in which all runoff will be collected via curbs and drop-inlets and then piped to a sand oil separator prior to discharge to Lake Tahoe. Currently the site has approximately 12,500 sq. ft. of paved surfaces equating to an estimated treatment volume of 1,050 cubic feet (cf). This estimated volume will require the construction of a sand-oil separator Jenson Precast model number JP-1200EE-TP.

REMOVAL OF EXISTING STRAW BALES

As part of the BMP project design and construction, the contractor will be required to remove all existing straw bales and disposed of properly, per TRPA requirements.

PAVING

Any areas where equipment storage and/or vehicle parking shall occur will be paved as part of the project.

ROCK

A 2 to 3 inch deep layer of clean drain rock sized 1-1.5 inches in diameter will be spread under all raised decks. It is estimated that a total of 4.5 cubic yards of drain rock will be required to achieve 3 inches of depth spread under the five (5) existing raised deck areas. Please refer to the site plans for specifications.

DRIP LINE PROTECTION

All building drip lines will be well vegetated with native and/or adapted species in order to dissipate the energy of runoff and prevent erosion, OR a 2 to 3 inch deep layer of clean drain rock sized 1-1.5 inch diameter, 18 inch wide by the length of all drip lines, needs to be spread under all drip lines to protect the soil. As part of the design, it is estimated that 500 linear feet (lf) of drip line trench will be required under existing roof eaves. Please refer to the site plans for specifications.

TEMPORARY CONSTRUCTION BEST MANAGEMENT PRACTICES

STAGING AREA

A construction staging area is proposed for all assembly and disassembly of construction equipment. This area will also be utilized as a delivery location for construction materials.

SEDIMENT PROTECTION FENCING

Sediment protection fencing shall consist of filter fabric fencing in unpaved areas and gravel bag dikes or straw bale dikes (the Contractor may use either type, as appropriate) in paved areas. Sediment protection fencing intercepts and slows the flow of sediment laden sheet flow runoff by reducing the velocity of sheet flows and retaining the sediment behind the barrier. Sediment protection fencing should be installed below the toe of exposed and erodible areas, beneath flat areas which have been disturbed and are subject to sheet and rill erosion, and around temporary stockpile and material processing areas. This may consist of placing filter fabric dikes around stockpiles and/or covering with plastic sheeting.

VEGETATIVE PROTECTION FENCING

Protection of plants and trees in areas subject to land disturbing activities is beneficial and shall be attempted whenever possible. Existing vegetation serves as an effective form of erosion and sediment control and provides watershed protection, landscape beautification, dust control, pollution control, noise reduction, and shade cover. Vegetative protection fencing shall be provided by the Contractor. Areas not to be disturbed must be clearly marked with fencing at all times and communicated to all contractors. Vegetative protection fencing consists of 4' brightly colored synthetic mesh fence with steel fence support posts 10' apart.

INDIVIDUAL TREE PROTECTION

Protection of individual trees located close to construction activity shall consist of the 2"x6'x6' lumber tied tightly to the tree with poly rope. Gaps between lumber will be an 8" maximum. Individual tree protection shall protect 50% of circumference on side facing construction activity. Any damage to the area must be repaired immediately in accordance with specifications as shown on the plans.

TRPA FINDINGS

The following Public Service Project Required Findings apply to the proposed project. The findings are listed in plain text and the rationales for making the findings are written in bold text below each finding.

6.3.A Findings Necessary To Approve Any Project: To approve any project, TRPA must find, in accordance with Sections 6.1 and 6.2, that:

(1) The project is consistent with, and will not adversely affect implementation of the Regional Plan, including all applicable Goals and Policies, plan area statements and maps, the Code and other TRPA plans and programs.

The nature of the proposed project as a BMP project complies with current planning standards for the area.

(2) The project will not cause the environmental threshold carrying capacities thresholds to be exceeded; and

The project is designed to increase compliance with environmental thresholds and thus will attain a positive result.

(3) Wherever federal, state or local air and water quality standards applicable for the region, whichever are strictest, must be attained and maintained pursuant to Article V(d) of the Tahoe Regional Planning Compact, the project meets or exceeds such standards.

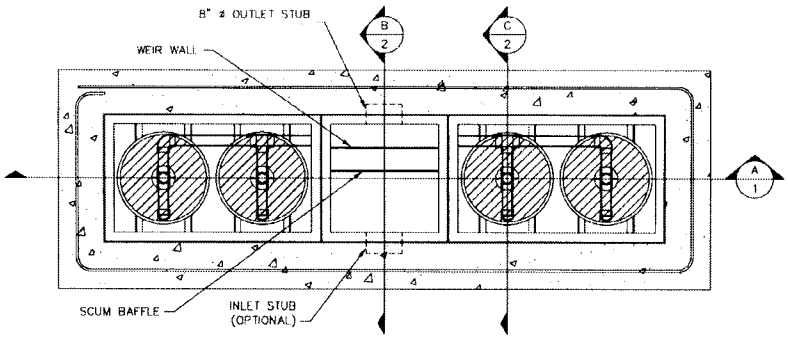
The proposed project does not include any components that relate to air quality standards in the region. The post project condition will remain the same as the pre project condition and air quality will not be affected.

25.5.A Runoff Water: Runoff water from impervious surfaces shall meet the discharge standards of Chapter 81 and shall be controlled as follows:

(1) Infiltration Requirements: Except as provided in section 25.7, infiltration facilities to discharge runoff to groundwater shall be required. Infiltration facilities shall be designed to accommodate the volume from a twenty year, one hour storm. An average intensity of 1 inch per hour can be used for this calculation. Infiltration facilities shall be designed utilizing the methodology set forth in the BMP Handbook. The bottom of infiltration trenches or dry wells shall be a minimum of one foot above the seasonal high water table. If TRPA finds that the runoff from impervious surfaces from a twenty year, one hour storm will infiltrate naturally on the parcel, TRPA may waive the requirement to install infiltration facilities.

The proposed project includes BMPs designed to treat stormwater and will meet the requirements set forth above. Please see the BMP section of this document for additional information on the proposed BMPs.

CatchBasin StormFilter



4-CART. CATCHBASIN – PLAN VIEW 1/1
SCALE: N.T.S.

Overview

The CatchBasin StormFilter™ (CBSF) consists of a multi-chamber steel, concrete, or plastic catch basin unit that can contain up to four StormFilter cartridges. The steel CBSF is offered both as a standard and as a deep unit.

The CBSF is installed flush with the finished grade and is applicable for both constrained lot and retrofit applications. It can also be fitted with an inlet pipe for roof leaders or similar applications.

The CBSF unit treats peak water quality design flows up to 0.13 cfs, coupled with an internal weir overflow capacity of 1.0 cfs for the standard and deep steel and concrete units. Plastic CBSF units have an internal weir overflow capacity of 0.5 cfs.

Design Operation

The CBSF is installed as the primary receiver of runoff, similar to a standard, grated catch basin. The steel and concrete CBSF units each have an H-20 rated, traffic-bearing lid that allows the filter to be installed in parking lots, and for all practical purposes, take up no land area. Plastic CBSF units can be used in landscaped areas and for other non-traffic bearing applications.

The CBSF consists of a sumped inlet chamber and a cartridge chamber(s). Runoff enters the sumped inlet chamber either by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit. The inlet chamber is equipped with an internal baffle, which traps debris and floating oil and grease, and an overflow weir. While in the inlet chamber, heavier solids are allowed to settle into the deep sump, while lighter solids and soluble pollutants are directed under the baffle and into the cartridge chamber through a port between the baffle and the overflow weir. Once in the cartridge chamber, polluted water ponds and percolates horizontally through the media in the filter cartridges. Treated water collects in the cartridge's center tube from where it is directed by an under-drain manifold to the outlet pipe on the downstream side of the overflow weir and discharged.

When flows into the CBSF exceed the water quality design value, excess water spills over the overflow weir, bypassing the cartridge bay, and discharges to the outlet pipe.

Applications

The CBSF is particularly useful where small flows are being treated or for sites that are flat and have little available hydraulic head to spare. The unit is ideal for applications in which standard catch basins are to be used. Both water quality and catchment issues can be resolved with the use of the CBSF.

Retro-Fit Applications

The retro-fit market has many possible applications for the CBSF. The CBSF can be installed by replacing an existing catch basin without having to "chase the grade," thus reducing the high cost of re-piping the storm system.

Special Considerations

When designing the CBSF into your system, you should consider the following:

- Additional information on the non-traffic bearing plastic CBSF units is available from the Stormwater Management Engineering Department.
- Standing water in the inlet bay may lead to standing water in the inlet pipe.
- If an inlet pipe is used, a deep unit is recommended in order to minimize the effect of standing water in the upstream system.
- The base of the CBSF should always be set level.

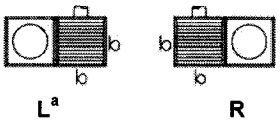
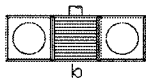
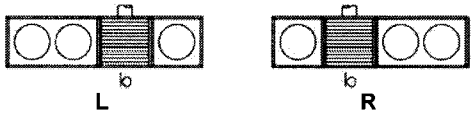
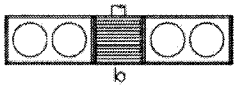
Sizing the CatchBasin StormFilter

To determine the size of your CatchBasin StormFilter:

1. Determine the number of cartridges required to treat your water quality flow rate. See "Determining the number of StormFilter cartridges" for instructions on how to calculate this value.
2. Determine the type of material that you want to use: steel, concrete, or plastic. Refer to Table 3 and corresponding footnotes to determine the configurations offered for each material.
3. Locate the number of required cartridges in the CBSF configuration options table below.
4. Use the corresponding StormFilter model number, dimensions, and configuration option for your CBSF size.

   Important: Be sure to specify standard or deep unit.

Table 3. CatchBasin StormFilter configuration options [a, d]

StormFilter Model	Number of Cartridges	Outside Dimensions	Approximate Weight (lbs) Standard / Deep	Configuration Options [b, c]
CBSF1 [a]	1	L,R 4'9" x 2'5"	650 / 775	 L[a] R
CBSF2 [a, d]	2	7'1" x 2'5"	950 / 1150	
CBSF3	3	L,R 8'10" x 2'5"	1250 / 1500	 L R
CBSF4	4	10'8" x 2'5"	1550 / 1850	

[a] Concrete catch basin units are available in the CBSF1-L configuration only; plastic catch basin units are available with 1 or 2 cartridges only; steel catch basin units are available in all configurations. If another configuration or more information is needed, contact the Stormwater Management Engineering Department.

[b] The "b" symbol on the configuration drawings denotes possible inlet pipe locations. Inlet pipes are recommended on deep units only. The inlet pipe can only be attached to the grated chamber.

[c] Inlet pipes installed lower than 1 foot below the grade (standard units; 2', deep units) will be partially to completely submerged by the permanent pool in the inlet chamber.

[d] 2-cartridge catch basin units can be designed with a left or right configuration if needed. Contact the Stormwater Management Engineering Department for details.

Sizing example for the CatchBasin StormFilter:

1. Assume that three cartridges are required for your site.
2. Assume that you want a deep, steel CatchBasin StormFilter.
3. Assume that the two-cartridge cartridge bay must be on the right side.

Answer: Using the CatchBasin StormFilter configuration options table, for a 3-cartridge, deep, steel CBSF with the two-cartridge cartridge bay on the right side, your CBSF size will be model **CBSF3-R, Deep**, with 8'10" x 2'5" outside dimensions.

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Appendix N

Mitigation and Monitoring Checklist

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Coast Guard Station Lake Tahoe Year-Round Mooring Project
Proposed Action: Dredging at Existing Pier
Mitigation, Monitoring, and Reporting Program

Mitigation Measures (MMs)						
Resource Area	**MM # and Title**	**Subtask**	**Actions**	**Timeframe**	**Responsible Party**	**Date Completed**
Aesthetics, Scenic Resources, and Community Design	**MM AES-1, Mitigation of Additional Visible Mass**	1	Per the requirements of the Lake Tahoe Shoreline Plan, each square foot of visible mass above an elevation of 6,226 feet, Lake Tahoe Datum (LTD), added by the Project will be mitigated at a ratio of 1:2.0. Mitigation will be accomplished by planting additional native landscaping to screen the view of existing Coast Guard Station structures from Lake Tahoe. Per TRPA guidelines, screening would first be added within the shorezone, and once no additional mitigation in the shorezone is practicable, then screening would be added to the upland area between the Station structures and the lakeshore. The new landscaping will be located so as to preserve the Coast Guard's visibility of the lake from the Station (for operational and safety purposes), meet requirements for fire protection and defensible space, and avoid disturbance of existing native vegetation.	Prior to construction	Coast Guard/ Landscaping Contractor	
		2	The Coast Guard will prepare and implement a *Scenic Resources Mitigation Plan* that will include landscaping plans specifying the location, type, and quantity of the new screening plantings. The landscape plan will utilize native plant species recommended in the *Home Landscaping Guide for Lake Tahoe and Vicinity* (University of Nevada Cooperative Extension 2006) to reduce the need for irrigation and fertilizer.	Prior to construction	Coast Guard/ Environmental Consultant	
		3	The *Scenic Resources Mitigation Plan* would be subject to review and approval by TRPA.	Prior to construction	TRPA	
		4	Survivorship and growth of the new landscaping will be monitored quarterly for the first year, while the plants are establishing, and then annually for an additional 4 years,	After construction (for 5 years)	Coast Guard/ Environmental Consultant	
		5	Corrective actions (e.g., replacement of dead plants) would be taken as needed based on the monitoring results	After construction (if required)	Coast Guard/ Environmental Consultant	
		6	A Scenic Mitigation Monitoring Report describing the monitoring results and any corrective actions taken or proposed will be submitted to TRPA annually during the 5-year monitoring period.	After construction (for 5 years)	Coast Guard/ Environmental Consultant	
		7	Achievement of the 1:2.0~~1.5~~ screening criteria will be subject to TRPA verification at the end of the monitoring period.	At end of 5-year monitoring period	TRPA	
Biological Resources	**MM BIO-1, Prime Fish Habitat (PFH) Mitigation and Monitoring**	1	Removal or displacement of PFH resulting from the proposed Project will be mitigated as required by TRPA. The following mitigation and monitoring protocol will be implemented: In consultation with TRPA, an area within the nearshore zone (i.e., between a lake-bottom elevation of 6,193 and 6,223 ft, LTD) at the Station will be designated for placing new feed and cover habitat to replace that which will be removed or displaced by the Project. Areas of the lakebed that currently have substrate types that are not considered PFH (e.g., lacustrine clay deposits) but which are adjacent to the PFH remaining on site after Project construction would be prioritized for habitat enhancement in order to provide habitat continuity. Littoral processes, human disturbance factors, and potential drought-induced water level fluctuations will also be considered when choosing the location of the replacement habitat to increase the likelihood that it will remain functional habitat over the long term.	Prior to construction	Coast Guard/ Environmental Consultant/ TRPA	
		2	In accordance with TRPA requirements, the area of PFH permanently removed or displaced due to implementation of the proposed Project will be replaced at a ratio of 1:1.5 to ensure no net loss of habitat. To accomplish the required mitigation, 2,843 square feet of substrate similar to that currently present in the affected PFH (i.e., cobble and small boulders) will be placed in the area designated for habitat creation. The replacement habitat will be designed to provide equal or greater function and value as the PFH removed or displaced by the proposed Project.	During construction	Dredging contractor	
		3	To the extent practicable, cobble, boulders, and large woody debris removed during the dredging would be recovered, separated from finer sediments, and used to create the replacement habitat. If additional material is required, it will be washed and free of invasive species or other deleterious materials.	During construction	Dredging contractor	
		4	As applicable, the CG will obtain approval from the USACE under Clean Water Act Section 404 for the placement of additional fill in a water of the U.S.	Prior to construction	Coast Guard	
		5	The new substrate will be placed within the designated area in an appropriate manner that minimizes lake bottom disturbance and turbidity (e.g., lowered by excavator, cargo net, or similar equipment and/or placed by hand) and replicates the characteristics of naturally-occurring habitat.	During construction	Dredging contractor	

		7	An inspection will be conducted just after placement of the replacement substrate and then annually for 3 years thereafter to determine the effectiveness of the mitigation. The inspections will be performed by a qualified fisheries biologist, who will conduct a dive survey to determine whether the condition of the replaced substrate is suitable for providing equal or greater habitat function and value as the PFH removed or displaced by the Projec (e.g., in place and not excessively silted over or infested with invasive aquatic organisms). The biologist will also observe whether fish and/or benthic prey organisms are present and utilizing the created habitat.	After construction (for 3 years)	Coast Guard/ Environmental Consultant	
		8	If the Project biologist determines during the annual inspection that the restored substrate is not meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, then the Coast Guard would implement corrective actions, which may include removing silt or invasive organisms, installing additional replacement substrate, or undertaking other actions agreed upon by TRPA.	After construction (if required)	Coast Guard/ Environmental Consultant	
		9	A *PFH Mitigation Monitoring Report* will be prepared annually for 3 years after Project completion and submitted to the TRPA, U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW). The report will include photographs of the restored habitat, a description of observations made during the monitoring, a determination of the replaced habitat's effectiveness in meeting the goal of providing equal or greater habitat function and value as the PFH removed or displaced by the Project, and a description of any corrective actions taken or proposed.	After construction (for 3 years)	Coast Guard/ Environmental Consultant	
		10	Achievement of the goals of providing replacement habitat at 1:1.5 ratio that provides equal or greater habitat function and value as the PFH removed or displaced by the Project would be subject to verification by TRPA, in consultation with USFWS and CDFW.	At end of 3-year monitoring period	TRPA	

Coast Guard Station Lake Tahoe Year-Round Mooring Project
Proposed Action: Dredging at Existing Pier
Mitigation, Monitoring, and Reporting Program

Best Management Practices (BMPs)					
BMP #	**Subtask**	**Actions**	**Timeframe**	**Responsible Party***	**Date Completed**
BMP C1-1	1	The results of the U.S. Coast Guard Station Lake Tahoe Sampling and Analysis Report (AECOM Technical Services 2016) will be used by the contractor to guide the dredging operations and to determine the location for disposal of dredged sediments. Sediments would be handled in accordance with applicable regulations and disposed of at a properly licensed facility.	Prior to and during construction	Dredging Contractor	
BMP C1-2	1	The contractor will be required to document whether there are any subsurface utilities in the area of excavation. This can be accomplished by: 1) contacting all utilities that provide service in the area, documenting these contacts; 2) contacting Underground Service Alert, documenting this contact; or, 3) some other equivalent affirmative action to determine whether there are subsurface utilities in the area of construction.	Prior to construction.	Dredging Contractor	
	2	If subsurface utilities are identified, the contractor would provide a utility avoidance plan before dredging starts.	Prior to construction (if required)	Dredging Contractor	
BMP C1-3	1	The disturbance area will be limited to the minimum required to complete the Project. To the extent practicable, dredging will be kept to the minimum area necessary to achieve the target channel width, depth, and gradient, and overdepth dredging will be minimized	During construction	Dredging Contractor	
		A final bathymetric survey will be completed that describes the actual final elevations within and dimensions of the dredging prism and the volume of material removed from the dredged area.	Within 1 week after construction	Surveying Contractor	
	2	The final bathymetric survey report will be provided to the USACE, LRWQCB, and TRPA.	Within 1 month after construction	Coast Guard	
BMP C1-4	1	To avoid the spread of turbidity and the sedimentation of surrounding sensitive habitats, a turbidity curtain will be installed around the dredging area that is sufficiently strong and durable to ensure integrity will be maintained under potential wind and wave actions. The bottom of the turbidity curtain will be securely anchored to the lakebed, and the top will include a floating boom with adequate freeboard to contain turbid waters in high wave and wind conditions. A double turbidity curtain may be used if required by the TRPA Compliance Inspector. Per TRPA *BMP Handbook* guidelines (TRPA 2014), the turbidity curtain will be installed at least 10 feet from work activities to prevent equipment from damaging the curtain.	Prior to construction	Dredging Contractor	
	2	Filter fabric will be placed under the conveyor belts, and fiber rolls will be installed along both sides of the belts to control the spread of sediment.	Prior to construction	Dredging Contractor	
	3	Prior to daily dredging activities, the turbidity barriers will be checked to ensure proper installation and functionality. This will include checking that the base of the turbidity curtain is securely anchored, that there are no gaps in the floating boom or fiber rolls, and that all turbidity barriers are in good condition. Needed repairs or replacements will be performed before dredging for that day begins.	Daily during construction	Dredging Contractor	
	4	The turbidity curtain would be removed only when construction is completed and turbidity levels return to natural levels.	After construction	Dredging Contractor	
BMP C1-5	--	Dredging operations will cease immediately if inclement weather or high wave and/or wind action threatens to cause turbidity to spread beyond the turbidity-curtained area. Dredging would only resume once weather conditions improve. The dredging contractor will be required to prepare a dredging and discharge mitigation plan prior to the start of project-related dredging activities. The plan will include specific actions that the dredging contractor will be required to take immediate action to ensure that turbidity outside the curtained area is kept to a minimum at all times, including during inclement weather, to the extent that this can be done safely.	Prior to and during construction	Dredging Contractor	

BMP C1-6	--	The contractor will ensure that the operator of dredge is familiar with and skilled in using operational controls for minimizing turbidity, including minimizing bucket speed, avoiding jerking the bucket, deliberate placement of material on the conveyor, and avoiding smoothing the bottom at the end of dredging.	Prior and during construction	Dredging Contractor	
BMP C1-7	1	A Spill Prevention and Response Plan will be prepared.	Prior to construction	Coast Guard/Environmental Consultant	
	2	Petroleum products and other hazardous materials will be kept in non-leaking containers stored within secondary containment on an impermeable surface (on either the work barge or the upland staging area) and covered in a manner that will prevent stormwater from contacting the container	During construction	Dredging Contractor	
	3	Material Safety Data Sheets (MSDSs) for hazardous materials used during construction and operations will be available on site to provide information on storage, disposal, protective equipment, and spill-handling procedures.	During construction	Dredging Contractor	
	4	If a spill occurs, it will be contained and cleaned up immediately to the extent that this can be accomplished safely.	During construction	Dredging Contractor	
	5	A supply of suitable spill control and cleanup materials, such as absorbent booms and pads, will be available on site for prompt cleanup of spills.	During construction	Dredging Contractor	
	6	Coatings for new structures will be applied in advance and not over the lake. Application of paints, sealers, and coatings over water will be limited to minor touch up that must be done after structures are constructed and in place.	During construction	Dredging Contractor	
BMP C1-8	1	Construction equipment will be kept in good repair and will be inspected (prior to construction) and monitored (during construction) for leaks and invasive species and removed from service for maintenance or cleaning if necessary to prevent water quality or invasive species impacts	Prior and during construction	Dredging Contractor	
	2	Any mechanical equipment that will be submersed in Lake Tahoe during dredging will be steam cleaned and inspected for leaks prior to use.	Prior to construction	Dredging Contractor	
BMP C1-9	1	Handling and dewatering of dredged materials over the lake will occur only within the areas confined by turbidity barriers to prevent spillage of dredged materials and decant water outside of that area	During construction	Dredging Contractor	
	2	Any dredged material spilled onto the ground or pavement (during truck loading, etc.) will be cleaned up in a manner that minimizes discharges to storm drains or the lake.	During construction	Dredging Contractor	
	3	Temporary filter inserts will be installed in storm drains in the Station parking lot to further avoid potential discharges to the stormwater system or lake during dredged material transfer and loading	Prior to construction	Dredging Contractor	
	4	The dredged materials will be transported off site in lined trucks to avoid discharges during transportation.	During construction	Dredging Contractor	
BMP C1-10	1	Staging and use of construction equipment and materials will be limited to paved upland areas and areas contained by turbidity barriers.	During construction	Dredging Contractor	
	2	Materials subject to wind or stormwater displacement will be secured.	During construction	Dredging Contractor	
	3	Upland staging areas will be centralized and delineated with construction boundary fencing as needed to minimize impacts to soil and vegetation.	Prior to construction	Dredging Contractor	
	4	The stands for the conveyor system will also be placed in a manner that minimizes disturbance of soil and vegetation, to the extent practicable.	During construction	Dredging Contractor	
BMP C1-11	1	A *Water Qualtiy Monitoring Plan* will be prepared.	Prior to construction	Coast Guard/Environmental Consultant or Dredging Contractor	
	2	Continuous visual inspection will be conducted to check that the turbidity curtain is functioning properly and that the dredging equipment is in good working order. If a turbidity plume or petroleum product sheen is detected outside the turbidity-curtained area, work will be suspended and a discharge mitigation plan (to be prepared by the contractor) will be implemented.	Prior to and during construction	Environmental Consultant or Dredging Contractor	
	3	At least once every 2 hours, the turbidity level will be measured at a point no more than 5 feet outside the turbidity-curtained area. If turbidity levels 5 feet outside the curtain exceed 1 nephelometric turbidity units (NTUs) or more than 10% of the natural concentration of the levels in the lake then in evidence (i.e., due to wind, wave, storm or other conditions), whichever is greater, actions will be taken to reduce turbidity from the work activity to below the required limits as required in the contractor's discharge mitigation plan.	During construction	Environmental Consultant or Dredging Contractor	

	4	Lake water samples will be collected weekly at a point no more than 5 feet outside the turbidity-curtained area and analyzed for total nitrogen (TN) and total phosphorus (TP). If levels exceed the LRWQCB's water quality objectives for these constituents (0.15 milligrams per liter [mg/L] TN or 0.008 mg/L TP) or background concentrations, whichever is greater, corrective actions, such as use of a double turbidity curtain, would be taken to reduce these levels to below the required limits. Additional parameters may be added to the monitoring program if the need is indicated by the results of the pre-construction sediment analysis.	During construction	Environmental Consultant or Dredging Contractor	
	5	A daily written record will be kept documenting inspections, water sampling, exceedances (if any), and corrective actions (if any).	During construction	Environmental Consultant or Dredging Contractor	
	6	The water quality monitoring record will be provided to the LRWQCB and TRPA at the end of construction, or as otherwise required.	Within 1 month after construction	Coast Guard	
BMP C1-12	--	No chitosan or other flocculants will be used within the lake to reduce turbidity.	During construction	Dredging Contractor	
BMP C1-13	--	Construction crew members will keep the work area free from trash or litter. Waste material from the site will be transported off site and disposed of in accordance with federal, state, and local regulations.	During construction	Dredging Contractor	
BMP C1-14	1	Work will be conducted between the hours of 8:00 am and 6:30 pm, in accordance with TRPA's construction noise guidelines.	During construction	Dredging Contractor	
	2	Construction activities will be limited to daytime hours to avoid the use of bright lights at night that could affect the behavior of fish and other aquatic organisms and/or cause visual impacts	During construction	Dredging Contractor	
BMP C1-15	1	To reduce noise impacts, a vibratory hammer will be used as the preferred method to drive piles for the Project unless an impact hammer is required due to substrate type. The construction contractor will be required to attempt to drive the pile using a vibratory hammer until refusal first, and then an impact hammer would be used.	During construction	Dredging Contractor	
	2	If the use of an impact hammer is required, a wooden cushion block would be used to muffle sound from the hammer strike.	During construction	Dredging Contractor	
	3	Use of pre-drilling or jetting will be limited to situations where these techniques are required for proper pile installation and/or to minimize environmental impacts.	During construction	Dredging Contractor	
	4	The construction contractor will follow Occupational Safety and Health Administration and California Division of Occupational Safety and Health requirements for occupational noise exposure and the provision of hearing protection to construction workers during pile driving, drilling, and other noise-producing activities.	During construction	Dredging Contractor	
BMP C1-16	--	In-water work will only occur during the non-spawning season (between October 1st and May 1st) unless written authorization is obtained from the California Department of Fish and Wildlife (CDFW) and TRPA to dredge outside of those dates.	During construction	Dredging Contractor	
BMP C1-17	1	Should construction activities occur during nesting bird season (February through August), a qualified biologist would perform a nesting bird survey, covering all areas within 100 feet of proposed construction activities and upland staging areas, within 14 days prior to the start of construction. The survey will be conducted by a qualified biologist.	Prior to construction (if required)	Coast Guard/Environmental Consultant	
	2	If nests are discovered, an appropriate non-disturbance buffer zone would be established around the nesting site. A qualified biologist would monitor active nests to determine when the young have fledged and are feeding on their own. The Project biologist would consult the CDFW for clearance before construction activities may resume within the non-disturbance buffer	Prior to and during construction (if required)	Coast Guard/Environmental Consultant	
BMP C1-18	1	To avoid potential adverse effects on Tahoe yellow cress, a pre-construction survey will be conducted to confirm that no Tahoe yellow cress is present within the Project Area. The survey will be conducted by a qualified biologist familiar with the vegetation of the Lake Tahoe region. The survey will take place during the Tahoe yellow cress flowering season (June 15 to September 30) prior to start of construction and will follow the survey protocol from Appendix N of the *Conservation Strategy for Tahoe Yellow Cress* (Pavlik et al. 2002). All un-submerged areas of the shorezone within the Station property will be surveyed.	Prior to construction	Coast Guard/Environmental Consultant	
	2	If Tahoe yellow cress is observed, then the plants will be marked and fenced for avoidance, and construction personnel will be required to avoid disturbing the plants.	Prior to construction (if required)	Coast Guard/Environmental Consultant	

	3	Results of the survey will be provided to the USFWS, CDFW, and TRPA prior to the start of construction, and these agencies would be consulted regarding suitable impact avoidance measures if Tahoe yellow cress is found.	Prior to construction	Coast Guard/Environmental Consultant	
BMP C1-19	1	During construction, the contractor will minimize idling time to a maximum of 5 minutes for all diesel powered equipment.	During construction	Dredging Contractor	
	2	Signs will be posted in the designated queuing areas of the construction site to remind equipment operators of the idling restriction.	Prior to construction	Dredging Contractor	
	3	Idling of construction-related equipment and vehicles will be discouraged within 1,000 feet of sensitive receptors.	During construction	Dredging Contractor	
	4	All construction equipment will be equipped with properly operating mufflers and engine shrouds, in accordance with manufacturers' specifications	During construction	Dredging Contractor	
BMP C1-20	1	The contractor will utilize existing power sources (e.g., power poles) or clean fuel (e.g., gasoline, biodiesel, or natural gas) generators for temporary power rather than diesel power generators	During construction	Dredging Contractor	
	2	Per state law, portable generators or other portable equipment with an engine of 50 horsepower or greater will be required to have either California statewide portable equipment registration (issued by the California Air Resources Board) or an individual permit issued by the Placer County Air Pollution Control District.	Prior to construction	Dredging Contractor	
BMP C1-21	1	In the unlikely event that buried cultural resources are discovered during Project activities, ground-disturbing activities would cease within a 30-foot radius of the find and the Coast Guard would consult a qualified archaeologist for recommended procedures.	During construction (if required)	Dredging Contractor/ Coast Guard	
	2	Any necessary investigation and treatment will be completed before work continues in the vicinity of the find.	During construction (if required)	Coast Guard/Environmental Consultant	
	3	If the find is related to tribal cultural resources, the Tribal Historic Preservation Officer for the Washoe Tribe of Nevada and California will be contacted and invited to consult with the Project archaeologist and to monitor investigation and treatment.	During construction (if required)	Coast Guard/Environmental Consultant	
	4	If human remains are discovered, ground-disturbing work would stop immediately and the County Coroner would be notified. If the remains are Native American, the Coroner would notify the Native American Heritage Commission, which would contact the most likely descendents for consultation on treatment of the burial site.	During construction (if required)	Coast Guard/Environmental Consultant	
	5	TRPA will also be notified in writing if cultural resources are discovered in the Project Area.	During construction	Coast Guard/Environmental Consultant	
BMP C1-22	1	New structures will utilize materials and colors that blend with the natural environment rather than contrast with it, and the use of reflective materials will be avoided to the extent practicable	During construction	Dredging Contractor	
BMP C1-23	1	A Traffic Management Plan will be prepared addressing Project construction traffic, parking, emergency access, truck haul routes, truck turning movements, specific hours of construction, traffic control signage, and potential bicycle and pedestrian traffic conflicts.	Prior to construction	Coast Guard/Environmental Consultant	
	2	The Traffic Management Plan will be submitted to, and subject to approval by, TRPA.	Prior to construction	Coast Guard	
	3	The Traffic Management Plan will be implemented.	During construction	Dredging Contractor	
BMP C1-24	1	The Coast Guard will inform the dredging contractor of all Project BMPs and the specific conditions of Project permits and approvals.	Prior to construction	Coast Guard	
	2	The Coast Guard will be responsible for maintaining compliance with the Project BMPs and specific conditions of Project permis and approvals.	During construction	Coast Guard	
	3	A Worker Environmental Awareness Program will be mandated for personnel involved in construction activities. Training will include the importance of the aquatic environment to special-status species and the environmental protection measures that are being implemented to avoid and minimize adverse environmental impacts.	Prior to construction	Coast Guard/Environmental Consultant	

* The Coast Guard will have oversight of all BMPs and will be responsible for providing them to the contractor, etc., and maintaining their compliance.