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.gov

STAFF REPORT

Date: January 13, 2022

To: TRPA Hearings Officer

From: TRPA Staff

Subject Bock Land Capability Challenge; 1105 Tiller Drive, Washoe County, NV; APN 130-211-11, TRPA File number LCAP2021-0257

Staff Recommendation:
Staff recommends the TRPA Hearings Officer approve this land capability challenge which would reduce land capability of Class 4 and increase Class 6, as well as change Class 1B to Class 6 due to lack of seasonal high water table for the lower portion of the property. This change is itemized on the table on Page 3 and depicted on a map included in Attachment C.

Required Motion:
In order to approve the proposed land capability challenge, the Hearings Officer must make the following motion, based on the staff report:

1) A motion to approve the proposed land capability challenge.

Staff recommends that the Hearings Officer take the following actions, based on this staff report.

Background:
The parcel being challenged is mapped as land capability Class 6. The Soil Conservation Service Soil Survey of Tahoe Basin Area, California-Nevada (Rogers, 1974) identifies the site having Inville stony coarse sandy loam, 2 to 9% slopes (IsC). The Invile soil type is derived from mixed andesitic and granitic parent material that was deposited as glacial outwash, debris flows and alluvium. The Inville soil is deep (no bedrock within 60 inches of the surface) and considered well drained due to sandy loam textures and minor degree of accumulated clay in the subsoil. The vicinity of the parcel has a geomorphic mapping of E-2 for Depositional Lands, outwash, till and lake deposits (low hazard lands). The subject parcel has a surveyed size of 36,472 square feet (0.845-acre).

A June 18, 1998 Land Capability Verification (LCV) compiled by TRPA staff indicated the site as Class 1B, Class 4 and Class 6 (Attachment C). In particular, the LCV changed the land capability from Class 6 to Class 1B for much of the lower terrace due to its proximity to Mill Creek (50 to 100 feet offsite) and Class 6 to Class 4 for the natural escarpment (which has steeper slopes).

A detailed soil investigation was conducted for this land capability challenge by Sid Davis (Davis2 Consulting Earth Scientists), on August 04, 2021. A land capability challenge (LCAP2021-0257) was filed with TRPA on August 16, 2021. On August 22, 2021, TRPA contractor Phil Scoles, Terra Science, Inc., conducted a site visit with Gary Midkiff (applicant's planning consultant) and examined soil conditions in three recently dug backhoe-dug pits located in the upper, center and lower portions of the parcel. The TRPA contractor's observations of textures, matrix colors, ped structures, horizon depths, and gravel volume generally matched the soil consultant's findings (Appendix D). The contractor also conducted a walking tour of the remaining portion of the property, with particular attention to the lower terrace that had been labeled as SEZ in the 1998 LCV.

The TRPA contractor hand-augered to 55 inches to verify lack of seasonal high-water table for the lowest portion of the property. The TRPA contractor agreed with the soil consultant that the lower terrace lacks SEZ soil and vegetation conditions.

Findings:
The subject property consists of a south by southeast-sloping lake terrace and alluvial terrace that is naturally truncated by Mill Creek (50 to 100 feet southeast of subject parcel). The northern (upper) part contains a single-family residence with attached garage, driveway, decks, and patio. The remainder of the parcel is undeveloped, with landscaping adjacent to the residence, and defensible space to the perimeter. The parcel lacks any rock outcrops and surface stones. The natural escarpment between the lake terrace (upper) and alluvial terrace (lower) appears relatively unaltered, except for vegetation management. The parcel has an overstory of Jeffrey pine trees and white fir, and understory of scattered greenleaf manzanita, Sierra currant, Oregon grape, bracken fern, lupine, Baltic rush, and thin duff layer composed of conifer needles. In contrast, offsite SEZ associated with Mill Creek supports white fir, willow, Sierra currant, wild rose, Baltic rush, grasses, and forbs. The Mill Creek SEZ is situated entirely offsite and sustained by runoff, stormwater, and groundwater.

For the field investigation, the applicant's consulting soil scientist described three backhoe-dug pits. The backhoe pits were situated on the upper terrace, lower terrace and the natural escarpment between the terraces. The TRPA contractor hand-augered to 55 inches in the southwest portion of the property and verified similar conditions as the lower backhoe-dug pit. Overall, the soil consultant documented deep soils across the entire parcel and an absence of seasonal high-water table or other root-restricting layers. In particular, the upper terrace has a deep, loamy coarse sand topsoil that is underlain by more loamy coarse sand to a depth of 32 inches. The soil becomes gravelly and less loamy to a depth of 60 inches or more. Such soils lack any in-situ development, such as clay accumulation (argillic horizon) or iron accumulation (cambic horizon). The upper terrace has 6 to 13% slopes. This upper terrace does not match the SCS-mapped Inville series, and it is sufficiently dissimilar to the Elmira and Gefo series (which have more in-situ development), that it is an unnamed inclusion (designated as 'XXX'). In accordance with Table 4 of Land-Capability Classification of Lake Tahoe Basin, California-Nevada (Bailey, R.G.,1974), this unnamed soil (XXX) qualifies as Class 6 for slopes 0 to 16%.

In contrast, the soils on the natural escarpment and lower terrace show a slight clay and iron accumulation in the subsoil (cambic horizon); however, the overall soil textures are mostly loamy coarse sand. The escarpment soil has 15 to 35% stones in the substratum, while the lower terrace does not. The lack of stoniness in the lower terrace reflects the ancient flood deposition of Mill Creek (consisting most of just sand textures). There are no indications of seasonal high-water table, such as redoximorphic soft masses (mottles) or depleted matrix, in the escarpment or lower terrace soils. The escarpment and lower terrace soils differ from the SCS-mapped Inville series due to their andesitic parent material, gravel composition, and minimal in-situ soil development. Thus, these are unnamed inclusions (XXX). The natural escarpment has 16 to 28% slopes, while the lower terrace has 2 to 16% slopes. In accordance with Table 4 of Land-Capability Classification of Lake Tahoe Basin, California-Nevada (Bailey, R.G.,1974), the unnamed escarpment soils (XXX) qualifies as Class 4 for slopes 16 to 30%, and the lower terrace soils (also XXX) qualify as Class 6 for slopes 0 to 16%. The table below summarizes the changes in land capability from the 1998 TRPA land capability verification to the 2021 land capability challenge, as concluded by this document.

Land Capability District	Slope Class (Range)	1998 TRPA LCV Area (sq. ft.)	2021 Land Cap. Challenge Area (sq. ft.)	Net Change Total Area (sq. ft.)
Class 1B (SEZ)	Any Slope	12,499	0	-12,499
Class 4 (IsD)	9 to 15%	12,648	0	-12,648
Class 4 (XXX)	16 to 30%	0	7,858	+7,858
Class 6 (IsC)	2 to 9%	11,325		-11,325
Class 6 (XXX)	0 to 16%	0	28,614	+28,614
Total Parcel Area		**36,472**	**36,472**	**0**

Contact Information:

This staff report was jointly prepared by TRPA contractor Phil Scoles (Terra Science, Inc.) and TRPA Senior Planner, Julie Roll. If you have questions on this Hearings Officer item, please contact Julie Roll at 775-589-5247 or jroll@trpa.gov.

Attachments:

A. Vicinity map and TRPA land capability map
B. Site Photographs (August 22, 2021)
C. June 18, 1998 LCV and January 2022 land capability challenge recommendation map
D. Soil consultant's land capability report (November 03, 2021)

BAILEY LAND CAPABILITY CHALLENGE FINDINGS

Site Information	
Assessor's Parcel No. (APN):	130-221-11
TRPA File No. / Submittal Date:	LCAP2021-0257 / August 16, 2021
Owner or Applicant:	Catherine J. Bock; Post Office Box 5203; Incline Village, NV. 89450
Site Address:	1105 Tiller Drive, Incline Village, NV 89450; 39.235938° N, -119.933273° W

Environmental Setting	
Bailey Soil Mapping Unit / Hydrologic Soil Group (HSG) / Land Class / Geomorphic Hazard Unit	Inville stony coarse sandy loam, 2 to 9% slopes (IsC, HSG-B) / E-2 Depositional lands, outwash, till and lake deposits (low hazard lands as per 1974 Bailey Land Capability Report)
Landform and Soil Parent Material	Lake terrace and alluvial terrace having mixed andesitic and granodiorite parent material.
Slopes and Aspect	2 to 28% slopes / slopes to south by southeast.
Elevation and Datum	6274 to 6294 feet (Lake Tahoe datum, Welsh-Hagen Associates, August, 2020)
Rock Outcrops and Surface Configuration	None.
SEZ and Hydrology Source	None onsite, but Mill Creek located 50 to 100 feet to southeast (dominated by white fir, willow, wild rose, and sustained by runoff and groundwater).
Vegetation	Jeffrey pine, white fir. Understory includes, currant, manzanita, Oregon grape, bracken fern, lupine, Baltic rush and forbs/grass.
Ground Cover Condition	Fair (understory vegetation 5 to 10%, thin duff layer)
Site Features	Residence with attached garage, driveway, decks, and patio. Large backyard with minimal understory growth.

Field Investigation and Procedures	
Consultant and Address	Sid Davis, Davis2 Consulting Earth Scientists; Post Office Box 734, Georgetown, CA 95634 (530) 559-1405; sid@davis2consult.com
TRPA Contractor and Address	Phil Scoles (TRPA subcontractor) Post Office Box 2100; Portland, OR 97208-2100
TRPA Contractor Field Dates	August 22, 2021.
SEZ Mapping / NRCS Hydric Soil	Yes (from 1998 LCV); no hydric soil mapping.
Number of Soil Pits or Auger Holes and Description Depth	Three backhoe pits excavated to 60+ inches. TRPA contractor observed all three backhoe pits.

Additional or Repetitive TRPA Sample Locations	One hand-augered hole to verify lack of seasonal high water table in lower portion of property.
Areas Not Examined	Residence, driveway, decks, and patio to shoreline.

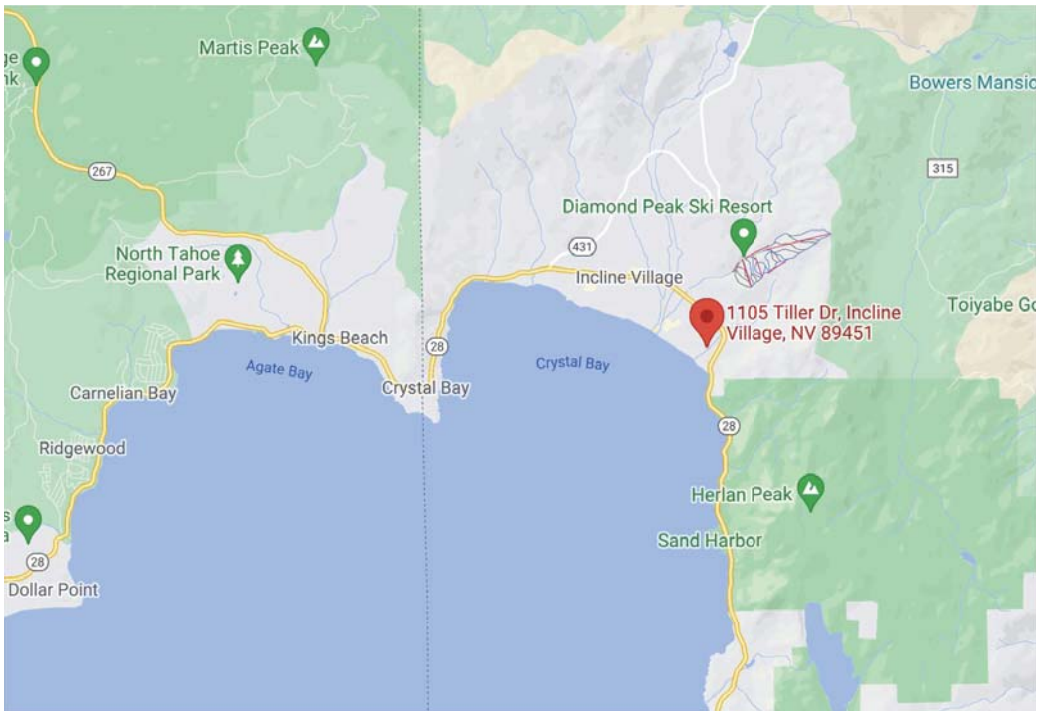
TRPA Findings	
2006 Soil Survey Map Unit[1]	Inville gravelly coarse sandy loam, 2 to 9% slopes (map unit 7141, Class 6).
Consultant Soil Mapping Determination and Rationale	Soil consultant used 3 backhoe pits to determine unnamed soils (XXX) occur across entire site. The field observations indicate the soils are somewhat excessively drained (no seasonal high water table, hence no SEZ), and lack other types of restricting layers. The soils differ from the SCS-mapped Inville series due to andesitic parent material and less in-situ soil development. The upper and lower terraces have slopes 0 to 16%, while the natural escarpment has slopes 16 to 28%.
Slope Determination	2 to 28% (slopes to south by southeast) for XXX soils across entire parcel.
TRPA Conclusion(s)	Decrease in Class 4 (XXX) for 16 to 30% slopes; and increase of Class 6 soil (XXX) for 0 to 16% slopes. Area previously labeled by LCV as Class 1B lacks evidence of seasonal high waters, so such land qualifies as Class 6.
Applicable Area	Entire site (see map, Attachment C, January, 2022).

[1] TRPA currently relies upon the Soil Survey of Tahoe Basin, California-Nevada (Rogers and Soil Conservation Service, 1974), which the Bailey Land Capability system is predicated upon. The 2006 soil survey update has not yet been formally adopted by TRPA for use with land capability matters.

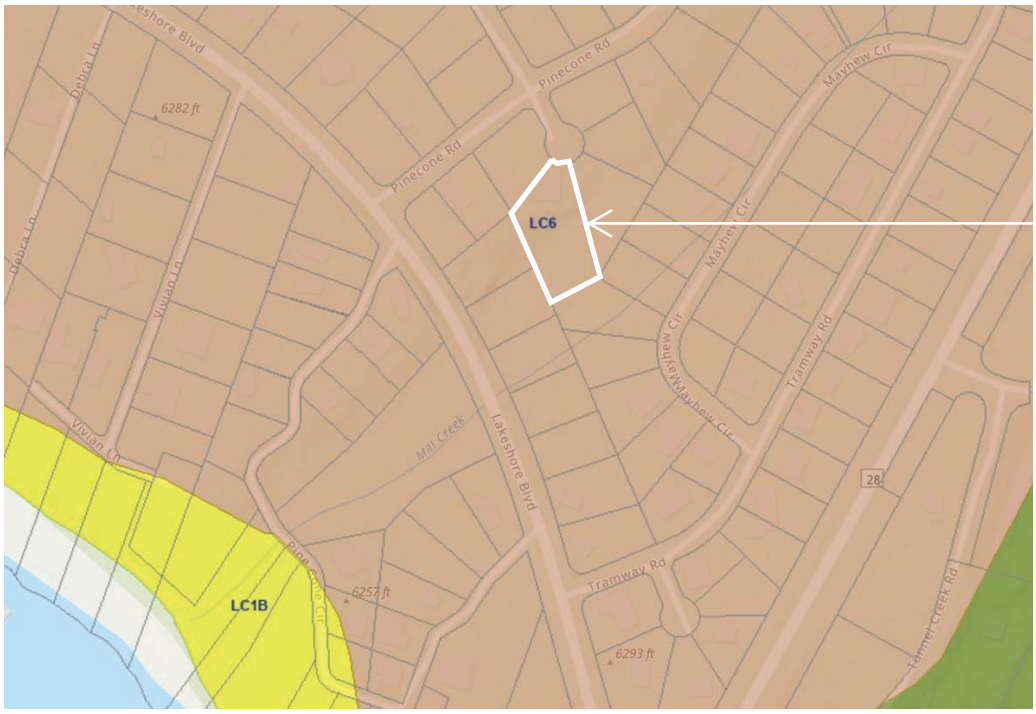
Attachment A

Vicinity map and TRPA land capability map

VICINITY MAP (no scale)



TRPA LAND CAPABILITY MAP



CATHERINE J.
BOCK PARCEL
APN 130-211-11
1105 TILLER DR.

LAND CAPABILITY
Class 1b (Yellow)
Class 2 (Olive)
Class 6 (Tan)

Attachment B

Site Photographs (August 22, 2021)

TAHOE REGIONAL PLANNING AGENCY

Mail
PO Box 5310
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Location
128 Market Street
Stateline, NV 89449

Contact
Phone: 775-588-4547
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1105 TILLER DRIVE (CATHERINE J. BOCK PARCEL) PHOTOGRAPHS (APN 130-211-11)

Photo 1 – View northwest from southeast property corner. Residence located in north part of somewhat pie-shaped parcel and atop lake terrace. Foreground and center part of backyard consist of gently sloping alluvial terrace – likely formed when ancient lake level receded. The understory is mostly cleared and may have been historically graded smooth (no indication of fill material).

Photo 2 – View southeast across backyard (house patio at far left). The slope between the lake terrace left foreground) and alluvial terrace (center and background) has 16 to 28% slopes. The land capability challenge relied on historical contours and ignored minor terracing in foreground.

	
Photo 3 – Soil profile for north portion of property (aka lake terrace landform). Uppermost layers (16 inches thick) consist of dark brown loamy coarse sand. The subsoil, from 16 to 32 inches below the surface, is also loamy coarse sand, that shows little in-situ soil formation. The substratum below 32 inches (parent material) is gravelly sand. This soil is similar to Gefo and Elmira series in the 1974 soil survey; however, it shows less in-situ soil development. As per Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning (Rbt. Bailey, 1974), this unnamed soil (XXX) qualifies as Class 6 (for 0 to 16% slopes).	Photo 4 – View southwest toward Pit #3, situated on lake terrace (same topographic setting as existing residence). This terrace is approximately 12 feet higher than the alluvial terrace that comprises most of the backyard. Site-specific soil conditions, and soil profiles were described by Davis2 Consulting Earth Scientists in August, 2021.

Photo 5 – Soil profile for escarpment below the lake terrace and above the alluvial terrace landform. The uppermost layers (19 inches thick) consists of dark brown gravelly loamy coarse sand. The subsoil, from 19 to 42 inches below the surface, is a sandy loam, that shows a slightly increase of illuviated iron (slightly redder tones), but not appreciable amounts of clay. The substratum below 42 inches (parent material) is a stony-gravelly sand. This soil is similar to Gefo and Elmira series in the 1974 soil survey; however, it has andesitic parent material and the substratum is more stony. As per Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning (Rbt. Bailey, 1974), this unnamed soil (XXX) qualifies as Class 4 (for 16 to 30% slopes).

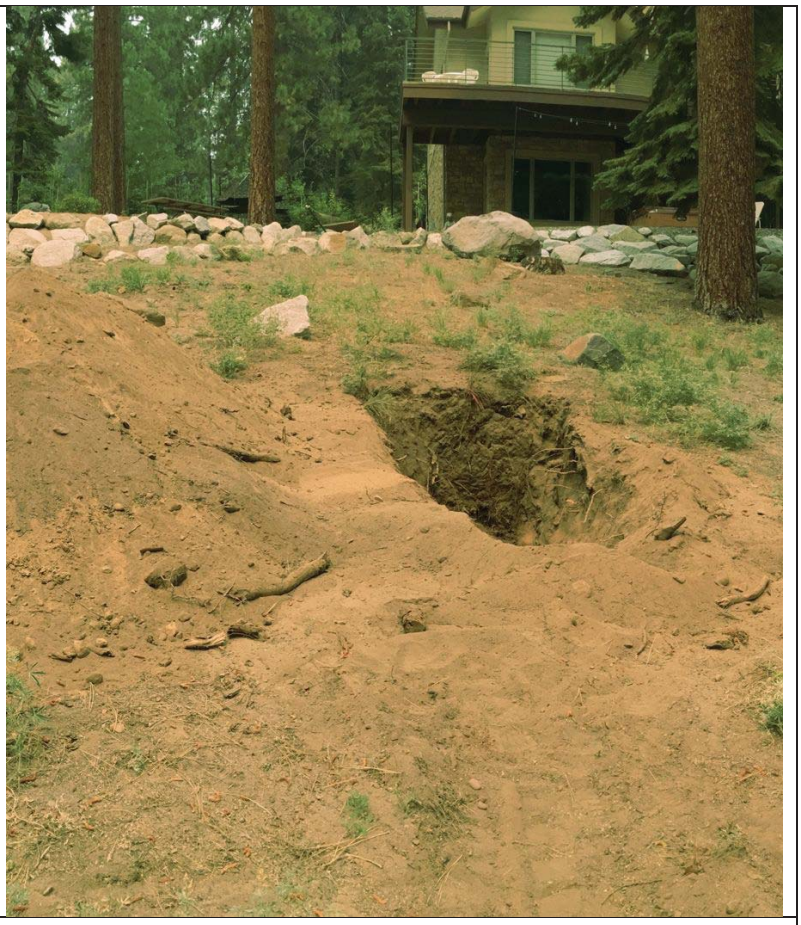


Photo 6 – View north at the transitional slope (aka natural escarpment) between upper lake terrace (older) and the alluvial terrace (opposite direction of photo). This soil at Pit #2 is deep and lacks any restricting layers, such as a fragipan or silica-cemented layer. Furthermore, no indication of seasonal groundwater was observed, such as redoximorphic features (iron staining, depleted matrix, pore linings). The slope of the escarpment ranges from 16 to 28%.

Photo 7 – Soil profile for the lower terrace (south and lowest part of parcel). The uppermost layers (16 inches thick) consists of dark brown sandy loam. The subsoil, from 16 to 30 inches below the surface, is a loamy coarse sand, that shows a slightly increase of illuviated iron (redder hue), but not appreciable amounts of clay. The substratum below 30 inches (parent material) is also loamy coarse sand. This soil is similar to Gefo and Elmira series in the 1974 soil survey; however, it has andesitic parent material. As per Land-Capability Classification of the Lake Tahoe Basin, California-Nevada, A Guide for Planning (Rbt. Bailey, 1974), this unnamed soil (XXX) qualifies as Class 6 (for 0 to 16% slopes).

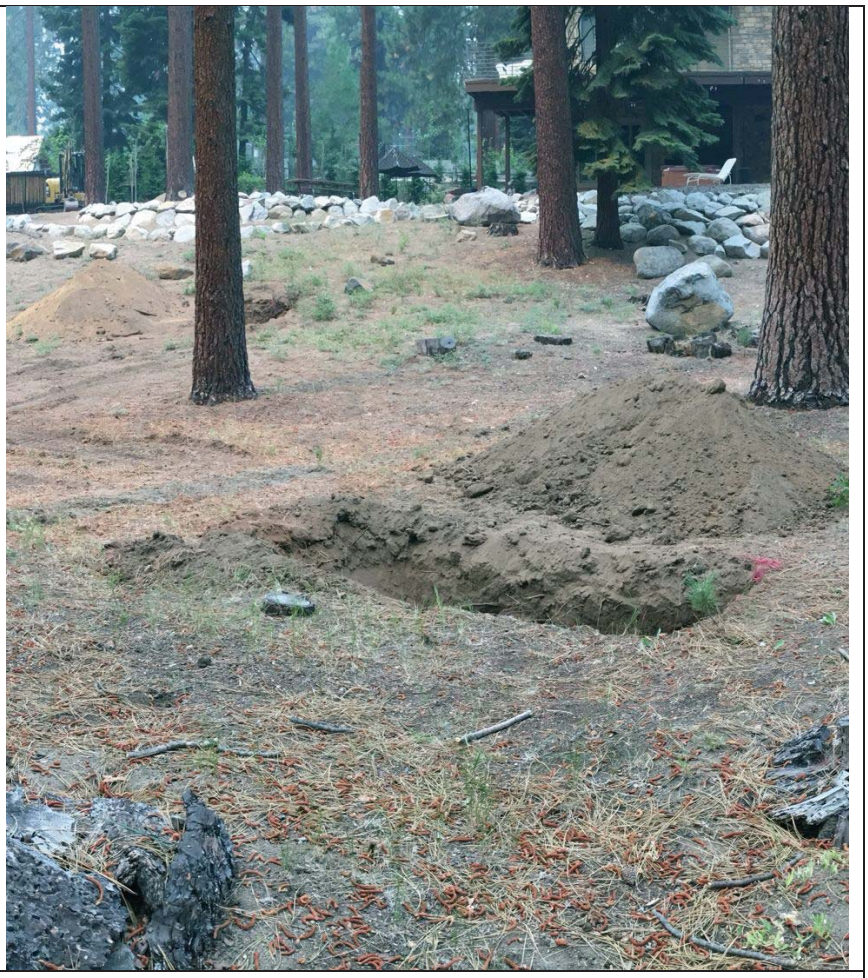


Photo 8 – View northwest toward Pit #1, situated on the alluvial terrace landform. This terrace slopes very gently to the south (2 to 16%). Like the soils on the lake terrace and escarpment, the alluvial terrace soils are deep and lack any restricting layers, such as a fragipan or silica-cemented layer. Furthermore, no indication of seasonal groundwater was observed, such as redoximorphic features (iron staining, depleted matrix, pore linings). The lack of such features is essential to the conclusion that this terrace is not, nor historically SEZ. That is, the alluvial sediments were natural flood sediments, but such area did not have a seasonal high water table.

Photo 9 – View southwest toward offsite Stream Environment Zone (SEZ). Subject parcel is topographically higher and lacks SEZ plant composition; whereas, offsite SEZ (50 to 100 feet beyond fence) is dominated by willow, mountain alder, wild rose, Sierra currant, bluegrass, and Baltic rush. The onsite understory is mostly cleared, but there are small pockets of currant, bracken fern, greenleaf manzanita and lupine (all non-SEZ).

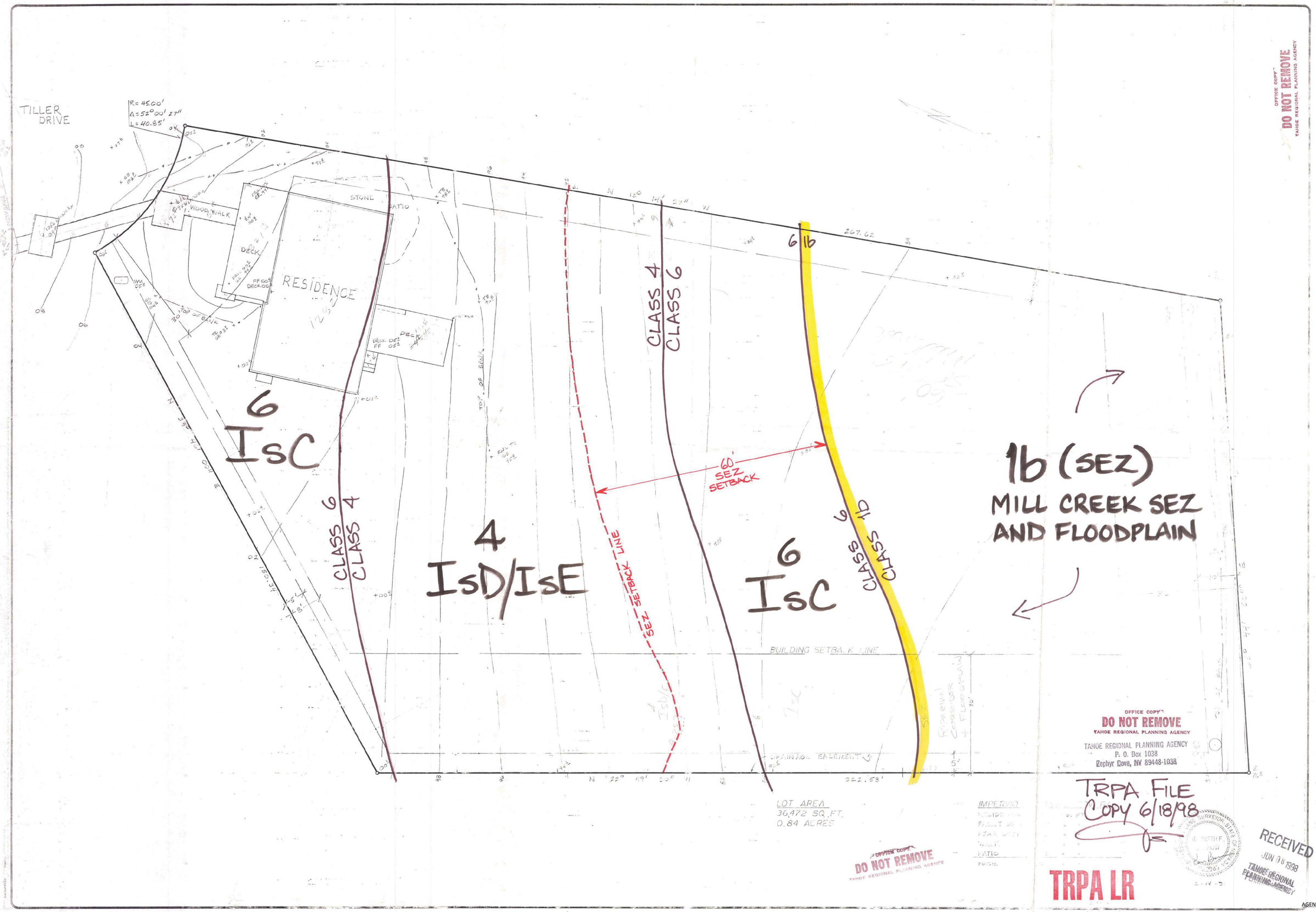
Photo 10 – View northeast from opposite position as Photo 9. This vicinity was labeled SEZ under a Land Capability Verification; however, it is dominated by large Jeffrey pines, with scattered non-SEZ shrubs in the understory. The hand-augered hole to the left of the orange field bag found deep, non-mottled and sandy soils. Also lacking any restricting layer, this soil qualifies as Class 6 (0 to 16% slopes), as per Table 4 of Bailey land capability classification system.

Photo 11 – View of sewer manhole located within an easement along the south property line. The sewer is set within an excavated ditch. The bottom of the ditch is about 2 feet lower than alluvial terrace described in Davis2 Consulting Earth Scientists report. The ditch was created from upland and it lacks any seasonal flow, as evident by accumulated tree needles (no scouring). It is possible the 1998 LCV interpreted the ditch as a natural feature, but the more detailed investigation for this land capability challenge found only well drained to somewhat excessively drained soils onsite.

Photo 12 – View northeast from east property line. This vicinity is dominated by white fir, Sierra currant and bracken fern – all non-SEZ species. The photo shows a narrow feature that could have historically been an overflow channel or scour channel created by Mill Creek. The feature lacks any indication of flow or seasonal high water table, so it was not considered an SEZ. Instead, the feature naturally contains accumulated branches and tree needles (normal upland forest litter/ground cover).

Attachment C

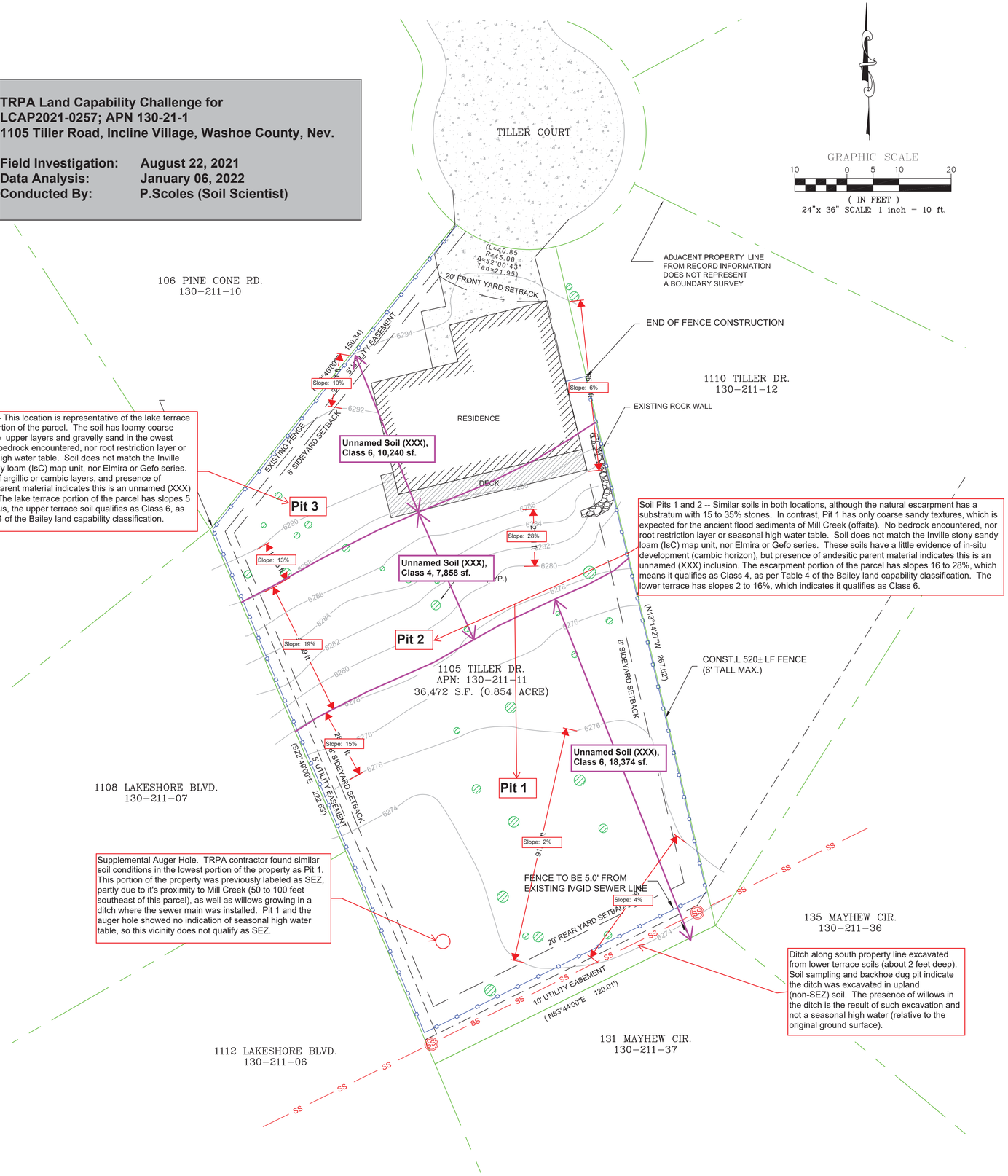
June 18, 1998 LCV and January 2022 land capability challenge recommendation map



AGENDA ITEM NO. V.A.

TRPA Land Capability Challenge for
LCAP2021-0257; APN 130-21-1
1105 Tiller Road, Incline Village, Washoe County, Nev.

Field Investigation: August 22, 2021
Data Analysis: January 06, 2022
Conducted By: P.Scoles (Soil Scientist)

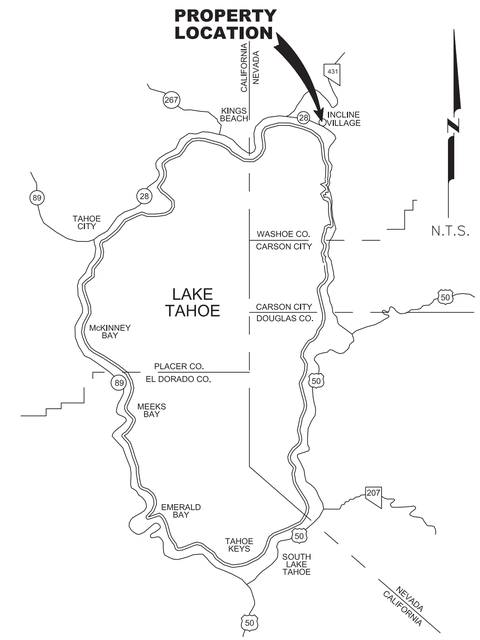


Soil Pit 3 -- This location is representative of the lake terrace (upper) portion of the parcel. The soil has loamy coarse sand in the upper layers and gravelly sand in the owest layer. No bedrock encountered, nor root restriction layer or seasonal high water table. Soil does not match the Inville stony sandy loam (IsC) map unit, nor Elmira or Gefo series. The lack of argillic or cambic layers, and presence of andesitic parent material indicates this is an unnamed (XXX) inclusion. The lake terrace portion of the parcel has slopes 5 to 10%; thus, the upper terrace soil qualifies as Class 6, as per Table 4 of the Bailey land capability classification.

Soil Pits 1 and 2 -- Similar soils in both locations, although the natural escarpment has a substratum with 15 to 35% stones. In contrast, Pit 1 has only coarse sandy textures, which is expected for the ancient flood sediments of Mill Creek (offsite). No bedrock encountered, nor root restriction layer or seasonal high water table. Soil does not match the Inville stony sandy loam (IsC) map unit, nor Elmira or Gefo series. These soils have a little evidence of in-situ development (cambic horizon), but presence of andesitic parent material indicates this is an unnamed (XXX) inclusion. The escarpment portion of the parcel has slopes 16 to 28%, which means it qualifies as Class 4, as per Table 4 of the Bailey land capability classification. The lower terrace has slopes 2 to 16%, which indicates it qualifies as Class 6.

Supplemental Auger Hole. TRPA contractor found similar soil conditions in the lowest portion of the property as Pit 1. This portion of the property was previously labeled as SEZ, partly due to it's proximity to Mill Creek (50 to 100 feet southeast of this parcel), as well as willows growing in a ditch where the sewer main was installed. Pit 1 and the auger hole showed no indication of seasonal high water table, so this vicinity does not qualify as SEZ.

Ditch along south property line excavated from lower terrace soils (about 2 feet deep). Soil sampling and backhoe dug pit indicate the ditch was excavated in upland (non-SEZ) soil. The presence of willows in the ditch is the result of such excavation and not a seasonal high water (relative to the original ground surface).



LAKE TAHOE AREA MAP
NOT TO SCALE

LEGEND:

- PROPOSED FENCE
- PROPERTY LINE OF RECORD
- EXISTING BUILDING
- EXISTING ASPHALT / CONCRETE
- EXISTING DECKS AND SHED
- EXISTING TREE (DIAMETER SCALE APPROXIMATE)
- SS — EXISTING IVGID SEWER LINE

SURVEY NOTES:

1. COORDINATE SYSTEM IS ASSUMED; BASIS OF BEARINGS ARE PER THE MILL CREEK ESTATES SUBDIVISION TRACT MAP #670, BEING A PORTION OF NE 1/4 OF THE SW 1/4 OF SECTION 23, T.16N., R.18.E., M.D.M., OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA.
2. VERTICAL DATUM IS BASED ON USGS INFORMATION (NAVD88).
3. TOPOGRAPHY IS SHOWN AT A 2 FOOT CONTOUR INTERVAL.

SETBACK NOTES:
1. PROPERTY IS ZONED MDS (MEDIUM DENSITY SUBURBAN), MINIMUM LOT AREA OF 12,000 SF WITH SETBACKS OF 20 FT FRONT, 20 FT REAR AND 8 FT SIDES.

Important Notation: TRPA Contractor modified Welsh-Hagen Associates AutoCAD file by turning off unrelated layers, changing line colors, and turning off text associated with the 1996 LCV designations. No modification to contour lines, structures, fences, trees, or other surveyed features.

1105 TILLER DR.
APN: 130-211-11
WASHOE COUNTY NEVADA

BOCK TRUST, CATHERINE J.
PO BOX 5203
INCLINE VILLAGE NV. 89450

WELSH HAGEN ASSOCIATES
ENGINEERING · PLANNING · SURVEYING
250 S. ROCK BLVD
Reno, Nevada 89511
(775) 853-7776
www.welshhagen.com

Revisions:

TRPA SUBMITTAL

STAMP:
PROFESSIONAL ENGINEER DAVID L. HAGEN No. 16460 Exp: 6/30/21 CIVIL STATE OF NEVADA
7/26/2021

Sheet Title:
AS-BUILT TOPO & FENCE SITE PLAN

Project:	1105 TILLER
Drawn By:	BAMF
Checked By:	DLH
Sheet Size:	24"x36"
Scale:	AS NOTED
Date:	AUG. 2020

Sheet Number: 1 OF 1

AGENDA ITEM NO. V.A

Attachment D

Soil consultant’s land capability report (November 03, 2021)

DAVIS²
CONSULTING EARTH SCIENTISTS
P.0. Box 734 · Georgetown, CA 95634 · Tel. (530) 559-1405; davis2consulting@sbcglobal.net

Land Capability Challenge
Catherine Bock Parcel
1105 Tiller Drive, Incline Village, Washoe County, Nevada
(APN 130-211-11)

November 3, 2021

INTRODUCTION

A soil investigation was conducted on the parcel on August 4, 2021. The objective of the study was to identify soils and other features and relate them to Land Capability, which is administered by the Tahoe Regional Planning Agency (TRPA) for the purpose impervious coverage regulation, by Chapter 30 of the Code of Ordinances.

The parcel supports an existing single-family residential dwelling on 0.84 acres of land, located at 1105 Tiller Court, Incline Village, Washoe County, Nevada. This work is advanced at the request of Ms. Catherine Bock.

Soil information contained in this report is for the strict use of land capability and it should not be used for building foundation design, slope stability, hazard waste assessment or seismic analyses.

ENVIRONMENTAL SETTING

The site is located at 1105 Tiller Court, Incline Village, Nevada. Vegetation consists of Jeffrey pine, a clear understory with patchy lupine. Slopes range between 3 and 20 percent on an easterly aspect. There are no stream environment zones (SEZ) influencing this parcel.

Soils are shown on TRPA map sheet H-4 as IsC (Inville coarse sandy loam 2 to 9 percent slopes). Geology (Mathews, 1968) is characterized as Rl (Recent lake beds). Bailey's (1974) geomorphic analysis shows the parcel within E_2 (Outwash, till and lake deposits).

METHODOLOGY

The parcel was surveyed as well as areas nearby. Sites considered representative of the landforms were chosen and excavations were placed to open and examine the soil profile in detail. Standards of the National Cooperative Soil Survey were used to describe and interpret soil physical properties. Information gathered at the site was compared to the *Soil Survey of the Lake Tahoe Basin, California-Nevada* (Rogers et al, 1974) and to the *Land-Capability Classification of the Lake Tahoe Basin, California-Nevada* (Bailey, 1974) for proper placement in the appropriate land capability class. A detailed topographic base map supplied by Welsh Hagen Associates. was available in the field for ground control and slope analysis. Information pertaining to land capability districts is shown on the base map.

FINDINGS

Soils are found to be very deep, Excessively drained, members of Hydrologic Soil Group A. Three excavations examined were all similar with respect to soil depth and texture with an intervening steeper slope that separates two terrace treads. Soils on the lower tread (Stop 1) can be characterized having a mixed topsoil consisting of dark brown loamy sand immediately above a crotovina-laced transitional (AB horizon) top soil approximately 16 inches thick, over dark yellowish brown cambic (structural Bw) loamy coarse sand subsoil to 64 inches depth. Mature Jeffrey pine occupy this surface and roots explore the soil profile to more than 60 inches. Hydrophytic vegetation is devoid of the area as well as any wetness indicators (redoximorphic features) that might be associated with wetness. A TRPA verification showing this area mapped as 1b (flood plain) is not substantiated by flood plain overlays (Figure 1).

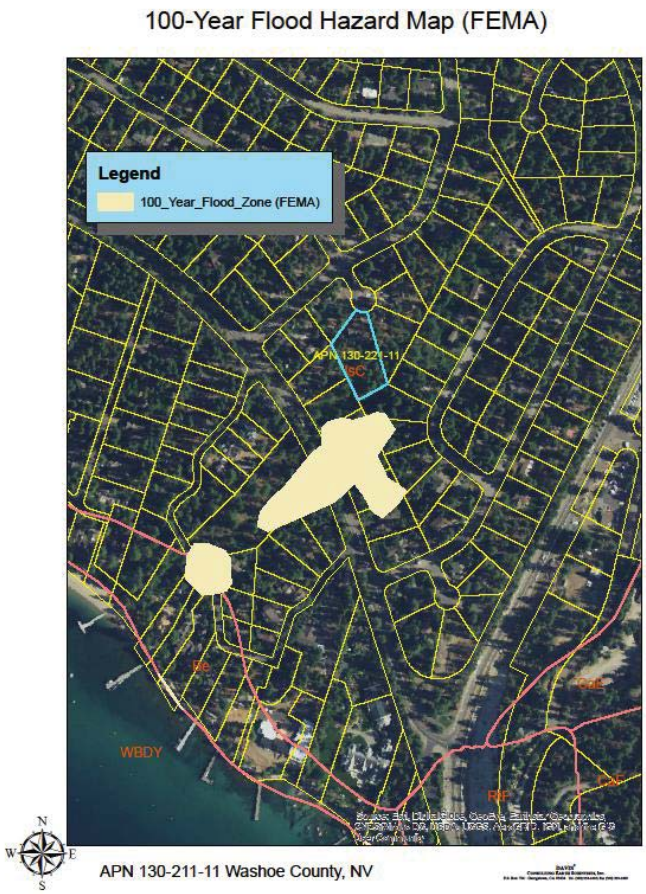


Figure 1- Flood plain in relation to subject parcel.

Soils on the intervening slope (Stop 2) display very dark brown gravelly loamy coarse sand topsoil approximately 19 inches thick over strong brown stony sandy loam or loamy coarse sand to a depth of 68 inches. These soils display less than 35 percent coarse fragment and have a sandy control section (10-40 inches).

Soils on the upper terrace (Stop 3) display dark brown loamy coarse sand topsoil about 16 inches thick over dark yellowish brown loamy coarse sand sediments to greater than 60 inches depth. These are all similar in that they are other than skeletal (< 35 percent coarse fragments by volume) in the control section.

Soils found across the site are other than the Inville series (IsC) shown on the TRPA map sheet because they lack high amounts of gravel and stone along with an absence of argillic subsoil horizonation. Each of the three soils examined are members of Hydrologic Soil Group A. Soils found are unnamed in the Lake Tahoe basin Soil Survey and are rated as "XXX". As such they are evaluated according to the criteria found on Page 20 of the Bailey (1974) report, *Table 4 – Basis of capability classification of Lake Tahoe basin lands*.

CONCLUSIONS AND RECOMMENDATIONS

Soils found are unnamed (XXX) and place in Land Capability Class 6 where slope measure less than 16 percent and Class 4 where slopes measure between 16 and 30 percent. Class 6 (32,608 SF) receives 30 percent allowable coverage and Class 4 (3,864 SF) receives 20 percent allowable coverage.

There is no SEZ or Class 1b area on the parcel and the mapped flood plain is well offsite to the south (Figure 1).

Please refer to the following soil profile descriptions that support the findings and the attached map showing the spatial distribution of the appropriate land capability classes on the parcel.

Respectfully submitted,

Sidney W. Davis,
CPSS /SC No. 1031

Representative Soil Profile Descriptions
Stop No. 1

Oi Conifer needles and duff.

A1 1 – 8 inches, dark brown (10YR 3/3) moist; sandy loam; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; less than ten percent gravel; clear smooth boundary.

AB 8 – 16 inches, dark brown (10YR 3/3) moist; coarse sandy loam; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many fine medium and coarse roots; many very fine and fine interstitial pores; less than ten percent gravel; gradual smooth boundary.

Bw1 16 – 30 inches, dark brown (10YR 3/3) moist; loamy coarse sand; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; many fine medium coarse roots; many very fine and fine interstitial pores; less than ten percent gravel; clear smooth boundary.

Bw2 30 – 64 inches, dark yellowish brown (10YR 3/4) moist; loamy coarse sand; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine medium and few coarse roots; many very fine and fine interstitial pores; less than ten percent gravel.

Notes: Crotovina in AB. Burrows filled with granitic coarse sand. Mature trees estimated at >200 years old.

Soil Series: Unnamed (XXX)
Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts
Soil Drainage Class: Somewhat Excessive
Hydrologic Soil Group: A

Figure 2- Stop 1 soil profile.

Figure 3- Landscape at Stop 1.

Stop No. 2

Oi Conifer needles and duff.

A1 1 – 5 inches, very dark grayish brown (10YR 3/2) moist; gravelly loamy coarse sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; twenty percent gravel; clear smooth boundary.

A2 5 – 10 inches, very dark grayish brown (10YR 3/2) moist; gravelly loamy coarse sand; strong fine medium coarse structure; soft, loose, nonsticky and nonplastic; many fine medium roots; many very fine interstitial pores; twenty percent gravel; clear smooth boundary.

A3 10 – 19 inches, dark brown (10YR 3/3) moist; loamy coarse sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine interstitial pores; ten percent gravel; gradual smooth boundary.

Bw1 19 – 33 inches, dark brown (7.5YR 3/3) moist; sandy loam; moderate medium subangular blocky structure; soft, loose, nonsticky and nonplastic; many fine medium and coarse roots; many very fine interstitial pores; ten percent gravel; gradual smooth boundary.

Bw2 33 – 42 inches, dark brown (7.5YR 3/4) moist; stony loamy sand; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; common fine medium and few coarse roots; many very fine interstitial pores; fifteen percent gravel; clear smooth boundary.

Bw3 42 – 68 inches, brown (7.5YR 4/3) moist; stony loamy sand; single grain; soft, loose, nonsticky and nonplastic; common fine medium roots; many very fine interstitial pores; fifteen percent gravel.

Soil Series: Unnamed (XXX)
Soil Classification: Sandy, mixed, frigid, Humic Dystroxerepts
Soil Drainage Class: Somewhat Excessive
Hydrologic Soil Group: A

Figure 4 - Stop 2 soil profile.

Figure 5 - Intervening slope landscape.

Stop No. 3

A1 0 – 7 inches, very dark brown (10YR 3/2) moist; loamy coarse sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; common fine roots; many very fine and fine pores; clear smooth boundary.

A2 7 – 16 inches, dark brown (10YR 3/3) moist; loamy coarse sand; moderate fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine and fine pores; gradual smooth boundary.

C1 16 – 32 inches, dark yellowish brown (10YR 3/4) moist; loamy coarse sand, moderate fine granular structure; soft, loose, nonsticky and nonplastic; many fine medium coarse roots; many very fine and fine pores; gradual smooth boundary.

C2 32 – 60 inches, yellowish brown (10YR 5/4) moist; gravelly sand; single grain; soft, loose, nonsticky and nonplastic; common fine and few coarse roots; many very fine and fine pores; fifteen percent gravel.

Notes: Surface compacted by traffic.

Soil Series: Unnamed (XXX)
Soil Classification: Sandy, mixed, frigid, Typic Xerosamments
Soil Drainage Class: Somewhat Excessive
Hydrologic Soil Group: A

Figure 6 - Stop 3, upper terrace. **Figure 7 - Upper terrace landscape.**