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STAFF REPORT

Date: September 7, 2023

To: TRPA Hearings Officer

From: TRPA Staff

Subject: Postmistress Properties LLC Land Capability Challenge,
1949 Glenbrook Inn Road, Glenbrook, Douglas County, NV;
Portion of APN 1418-10-802-010; TRPA File No.: LCAP2022-0779

Proposed Action:

Hearings Officer review and approve the proposed Land Capability Challenge.

Staff Recommendation:

Staff recommends the TRPA Hearings Officer approve this land capability challenge which would change the land capability that reduces Class 1B (SEZ) and increases Class 4 (XXX, Slopes 16 to 30%), and Class 6 (XXX, Slopes 0 to 16%).

Background:

The subject study area is shown as Class 5, on TRPA Land Capability Overlay Maps (aka Bailey Land Capability maps, Attachment A). These maps do not identify any Stream Environment Zone (SEZ); however, the Glenbrook Creek corridor and associated wet meadow are mapped immediately to the north and east. The Soil Conservation Service Soil Survey of Tahoe Basin Area, California-Nevada (Rogers, 1974) places the entire study area within the Jabu coarse sandy loam mapping unit (JaC, 0 to 9% slopes). Jabu soils formed in glacial outwash that may have been reworked as a lake terrace and have a less permeable lacustrine layer deeper in the profile. The soil textures are generally coarse sandy loam and the subsoil has small accumulation of clay (argillic horizon) and a weak fragipan below 40 inches of the surface. The fragipan may perch infiltrated water for several weeks in spring or soon after snowmelt. While containing gravel, this soil does not have outcrops or surface stones. The vicinity of this 1.08-acre study area has a geomorphic mapping of E-2 for Depositional lands: Outwash, till, and lake deposits (low hazard lands).

TRPA conducted a land capability verification (LCV) on January 21, 2020 (LCAP2019-0276). The LCV refined the boundaries of Stream Environment Zone (SEZ, Class 1B) and determined a larger area of Class 6 land based on slope. At the direction of the owner's planning consultant (Karin Hoida, Basin Strategies Planning & Consulting), a land capability challenge was filed on November 22, 2022 (LCAP2022-0779). The field work for the land capability challenge was conducted by consulting soil scientist Roger Poff (Attachment D). TRPA's contractor (Terra Science/Phil Scoles) conducted a walking tour of the study area on July 24, 2023; however,

previous field investigation occurred on October 15, 2019 with Mr. Poff. In particular, the TRPA contractor examined the same soil pits and auger holes established by Mr. Poff and verified the consultant's field findings. TRPA contractor Marchel Munnecke examined the soil pits on November 12, 2020 and also concurred with consultant's field findings.

Findings:

The study area composes the northwest portion of APN 1418-10-802-010, a large and irregular shaped parcel locally designated as Shakespeare Ranch. The study area includes two residences with landscaping on the west side (facing Glenbrook Inn Road). The area east of the residences is open space that contains a mixture of trees, shrubs, mulched land, and vegetated SEZ. Forest fuels treatment in 2020 removed many of the fire hazard trees and understory debris. The study area consists of a gently to moderately sloping lake terrace that descending down to the Glenbrook Creek and associated riparian corridor. Slopes range from 8 to 20%. The study area is bounded by narrow, paved roads to the east and west, and another residence to the south. Overall, the study area does not appear to have cut-and-fill terracing associated with the former lumber mill in this vicinity.

For the field investigation, the applicant's consulting soil scientist described four backhoe pits, which were located mostly in the center of the study area (where high capability land occurs). The backhoe pits are representative of an older alluvial terrace, which has silt loam, loam to heavy sandy clay loam soils. The soils are moderately well drained to well drained, which Hydrologic Soil Group B (HSG-B). This soil formed in sediment deposited when Lake Tahoe water levels was higher in prehistoric times.

Specifically, the soils on the upper terrace (backhoe pits 1 and 4) are deep, moderately to well drained that formed in silty to loamy parent material (HSG-B), possibly deltaic deposits from Glenbrook Creek, when lake levels were significantly higher. Remnants of similar deltaic deposits occur in the Glenwood vicinity, but much of the original deposit has eroded when water levels receded to current lake shoreline. This terrace soil has a natural accumulation of clay in the subsoil (argillic horizon), which typically forms over 10,000 to 20,000 years. The subsoil, as explained in the R.J. Poff soil report, the unnamed soil is dissimilar from the Gefo soil series due to insufficient sand and gravels, as well as having more soil development (i.e. argillic horizon). The unnamed soil is also dissimilar to the mapped Jabu soil series, since it lacks a fragipan (root restrictive layer). The somewhat-related Jabu moderately fine subsoil variant (JgC) has different subsoil conditions (hence, unlike the unnamed soil). About 14% of the study area has unnamed soil on slopes 0 to 16%, while 9% of the study area has the unnamed soil on slopes 16 to 30%.

The north-center, east and west portions of the study area consist of somewhat poorly to poorly drained soils sustained by seasonal high-water table. These soils have slopes from 8% to 20% (north and northwest aspect). These soils have a very dark grayish brown loam topsoil that is underlain by dark gray coarse sandy loam. While such soil has evidence of reducing conditions (depleted matrix), it also has some root penetration below 30 inches (suggesting fluctuating water table). This soil mostly resembles the Loamy Alluvial (Lo) map unit in the 1974 soil survey, which encompasses contemporary and relict alluvial deposits (excluding glacial

outwash). This soil has some steeper slopes supporting aspen, willow, mountain maple, cow parsnip and sedges. On flatter slopes (lower, closer to Glenbrook Creek), the soil supports more willows, sedges, aspen saplings, fennel, and species associated with Type 2: Wet marsh and Wet mesic meadow vegetation. The Lo soil qualifies for Class 1B and composes 77% of the study area. See Attachment B for site photographs.

The soils across the lower elevations of the study area are consistent with the Loamy Alluvial (Lo) soil type described in the 1974 soil survey. The unnamed soils (occurring on middle and upper elevations of the study area) were examined and compared to both 1974 and 2006 soil surveys but did not match any of the mapped soil types. In accordance with Table 4 of Land-Capability Classification of Lake Tahoe Basin, California-Nevada (Bailey, R.G.,1974), the unnamed soils (designated XXX) qualify as Class 4 for slopes 16 to 30 and Class 6 for slopes 0 to 16%. The table below summarizes the changes in land capability and allowable land coverage as concluded by this land capability challenge.

| Land Capability District, Slope Range | 2020 TRPA Land Capability Verific.; Area (sq. ft.) | 2023 Land Capability Challenge; Area (sq. ft.) | Net Change (sq. ft.) |
|--|---|---|-----------------------------|
| Class 1b, Loamy Alluvial (SEZ) | 41,243* | 36,238 | -5,005 |
| Class 4 (XXX), 16-30% sl. | 0 | 4,087 | +4,087 |
| Class 6 (XXX), 0-16% sl. | 5,847* | 6,765 | +918 |
| Total Study Area | 47,090** | 47,090** | |

* TRPA land capability map shows entire study as Jabu coarse sandy loam mapping unit (JaC, 0 to 9% slopes); however, January 21, 2020 LCV superseded such mapping (itemized in table).

** Study area is portion of APN 1418-10-802-010. Study area and land capability class square footage calculated by Turner & Associates, Inc. (February 22, 2022).

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 Maps.
- B. Site Photographs (July 24, 2023)
- C. 2020 LCV Map and 2023 Land Capability Challenge Site Plan
- D. Applicant’s Soil Consultant Land Capability Soil Report

BAILEY LAND CAPABILITY CHALLENGE FINDINGS

| Site Information | |
|---|--|
| Assessor's Parcel Numbers: (APN) | Portion of 1418-10-802-010 (47,090 sf., 1.08 acres) |
| TRPA File No. / Submittal Date: | LCAP2022-0779 / November 22, 2022 |
| Owner or Applicant: | Postmistress Properties LLC (Larry Ruvo); 8400 S. Jones Boulevard, Las Vegas, NV 89139 |
| Address: | 1949 Glenbrook Inn Road, Glenbrook; Douglas County, NV |

| Environmental Setting | |
|---|---|
| Bailey Soil Mapping Unit¹ / Hydrologic Soil Group (HSG) / Land Class / Geomorphic Hazard Unit | From 2020 LCV: Jabu coarse sandy loam, 0 to 9% slopes (JaC, Class 5). This map units is HSG-B / E-2 Depositional lands: Outwash, till, and lake deposits (low hazard lands). |
| Soil Parent Material | Lake terrace alluvium and sediments. |
| Slopes and Aspect | 10 to 16% for upper elevations (Class 6), which dips to the north and northwest. 16 to 20% for backslope (Class 4). Slopes typically less than 8 to 20% for SEZ. |
| Elevation and Datum | 6235 to 6258 ft. elev. (from Turner & Associates, Inc. topography survey, February 22, 2022). |
| Rock Outcrops and Surface Configuration | No outcrops of bedrock. No surface stones. |
| SEZ and Hydrology Source | Yes, north portion of study area, which extends downslope to Glenbrook Creek. SEZ within study area sustained by groundwater. SEZ supports aspen, willows, horsetail, cow parsnip, grasses and forbs. |
| Vegetation | Quaking aspen, mountain maple, currant, Oregon grape, grasses, forbs, plus landscaping (ornamental shrubs, lawn, etc.). Forest fuels reduction in 2020. |
| Ground Cover Condition | Good (herbaceous/shrubs 40 to 60%, mulch 40 to 60%); typically, less than 10% bare ground. |
| Site Features | Residences, garage, driveway, pathways, decks, landscaping and open space. |

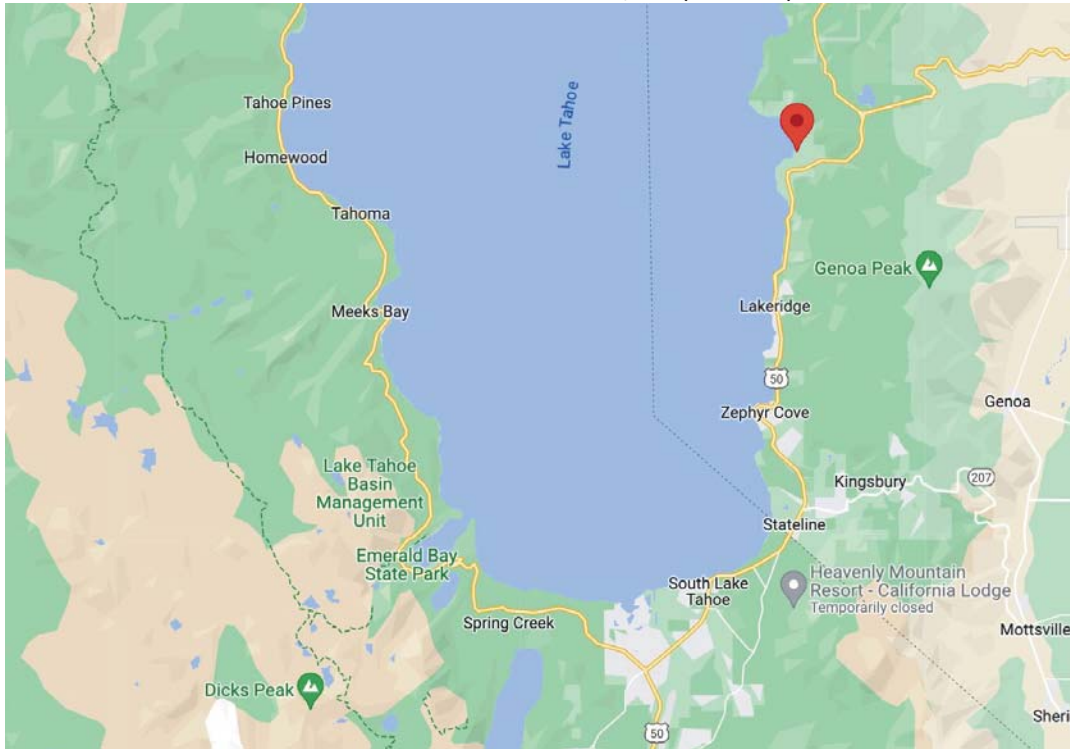
¹ TRPA currently relies upon the Soil Survey of Tahoe Basin, California-Nevada (Rogers and Soil Conservation Service, 1974), which the Bailey Land Capability system is predicated upon.

| Field Investigation and Procedures | |
|---|---|
| Consultant and Address | Roger Poff, R.J. Poff & Associates; Post Office Box 2073, Nevada City, CA 95959 (530) 559-9669; roger_poff@icloud.com |
| Consultant Field Date | November 12, 2020, and October 15, 2019. |
| SEZ Mapping / NRCS Hydric Soil | Prior mapping of SEZ and 2006 soil survey update identifies hydric soil in north part of study area. |
| Number of Soil Pits or Auger Holes and Description Depth | 4 backhoe-dug pits and 1 hand-dug pit dug to 60+ inches, plus 4 hand auger holes to 40 in. (2 visits). |
| Additional or Repetitive TRPA Sample Locations | TRPA contractor Phil Scoles examined same hand-dug pit and auger holes on October 15, 2019. TRPA contractor Marchel Munnecke examined same backhoe pits on November 12, 2020. |
| Areas Not Examined | Residences, garage, decks, driveway and landscaping. |

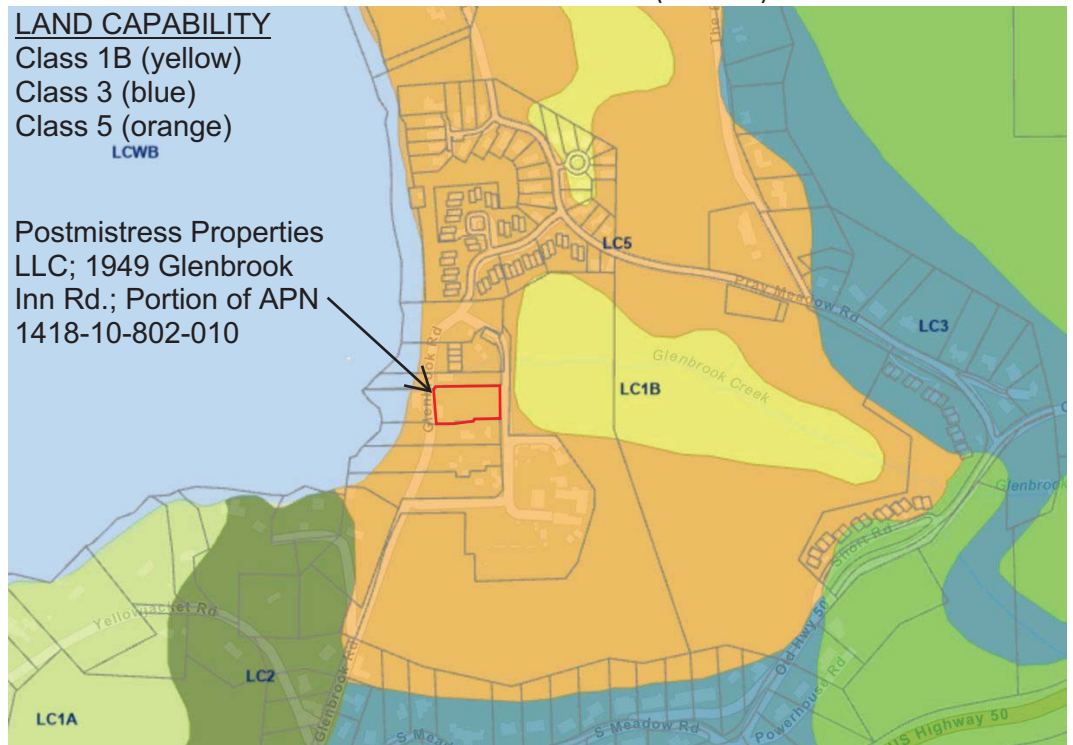
| TRPA Findings | |
|--|---|
| 2006 Soil Survey Map Unit | North part: Oxiquic Cryorthents-Aquic Xerorthents-Tahoe complex, 0 to 15% slopes (map unit 9011). This map unit would qualify as Class 1B. South part: Kingsbeach stony sandy loam, 2 to 15% slopes (map unit 7161). This map unit would qualify as Class 6. |
| Consultant Soil Mapping Determination and Rationale | Upper terrace soil (XXX, Class 6) is deep, loam to heavy sandy loam, but dissimilar to Gefo series (more sandy and gravelly). Backslope terrace soil (XXX, Class 4) is deep, silt loam to light sandy clay loam, but lacks root restricting layer of the mapped Jabu soil. The lower backslope and footslope in the study area is somewhat to poorly drained loam that resembles the Loamy Alluvial (Lo) soil map unit (SEZ, Class 1B. Additional detail in staff report narrative and soil consultant's report (Attachment D). |
| Slope Determination | 0 to 16% for Class 6; 16 to 30% for Class 4; any slope for SEZ (Class 1B). |
| TRPA Conclusion(s) | Approximately 77% of the study area qualifies as Class 1B due to seasonal high water table and presence of SEZ plant community. The middle and upper elevations of the study area consist of moderate to well drained loam to heavy sandy clay loam soils (an upland version of the Lo soil). This unnamed soil is HSG B, Class 4 for 16 to 30% slopes, and HSG-B, Class 6 for 0-16% slopes. |
| Applicable Area | Selected study area, 47,090 sq. ft. (1.08 acres – See map (Attachment C, March 14, 2022) |

Attachment A
Vicinity Map and TRPA Land Capability Maps

VICINITY MAP – GLENBROOK, NV (no scale)



TRPA LAND CAPABILITY MAP (no scale)



Attachment B
Site Photographs (July 24, 2023)



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PO Box 5310
Stateline, NV 89449-5310

Location

128 Market Street
Stateline, NV 89449

Contact

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1949 Glenbrook Inn Rd, Glenbrook, Nevl. (Postmistress Properties LLC Parcel; LCAP2022-0779



Photo 1 – View upslope (south) at upper portion of study area where high capability soils occur. Vegetation is quaking aspen, mountain maple and forbs/grasses. Steeper area in foreground has 16 to 20% slopes and qualifies for Class 4. Less steep land in background (10 to 16% slopes) qualifies for Class 6. Field study conducted in Oct. 2019 and Nov. 2020 by R.J. Poff & Associates, and observed by TRPA contractors.



Photo 2 – View east and northeast at southwest portion of study area, which supports mixture of mountain maple and quaking aspen. Soils in this vicinity are moderately to well drained, and have dark surface horizon indicative of organic matter accumulation. Soils at rated as HSB-B and Class 6 (0-16% slopes). Existing residence beyond left edge of photograph.



Photo 3 – View to south at southeast portion of study area. This vicinity of the study area consists of Stream Environment Zone (SEZ), which extends from the top of slope (background) to Glenbrook Creek (behind photographer). SEZ land (Class 1B) composes 77% of the study area, while remainder of land is Class 4 and Class 6. Vegetation in this vicinity was thinned for forest fuels reduction in 2020.



Photo 4 – View to southwest at south-center portion of study area at interface of Class 6 soils (left side of photo) and Class 4 soils (right side). The soils in this vicinity are deep, have non-gravelly loamy to sandy clay loam textures. This landform is a relict alluvial terrace and likely formed from deltaic sediments when prehistoric lake levels submerged this land. Foreground has burn pile from forest fuels reduction.

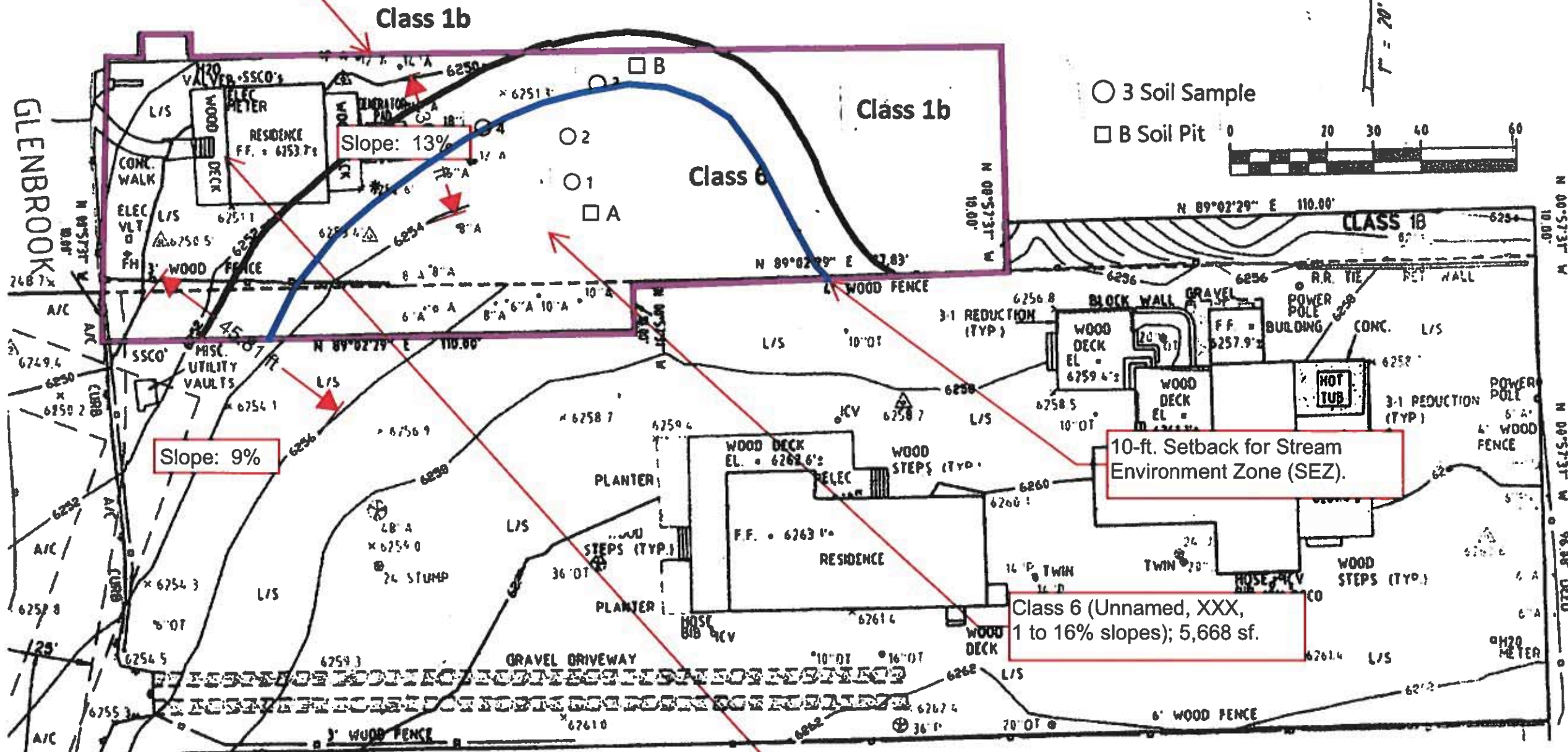
Attachment C
2020 LCV Map and 2023 Land Capability Challenge Site Plan

Land Capability Verification
 1949 Glenbrook Inn Road, APN 1418-10-802-010
 R. J. Poff & Associates October 21, 2019

TRPA Land Capability Verification
 for APN 1418-10-802-010. LCAP2019-0276
 1949 Glenbrook Inn Road;
 Glenbrook, Douglas County, Nev.

Field Visit: Oct. 15, 2019
 Office Determination: Nov. 04, 2019
 Conducted By: P.Scoles

STUDY AREA



Slope: 9%

Slope: 13%

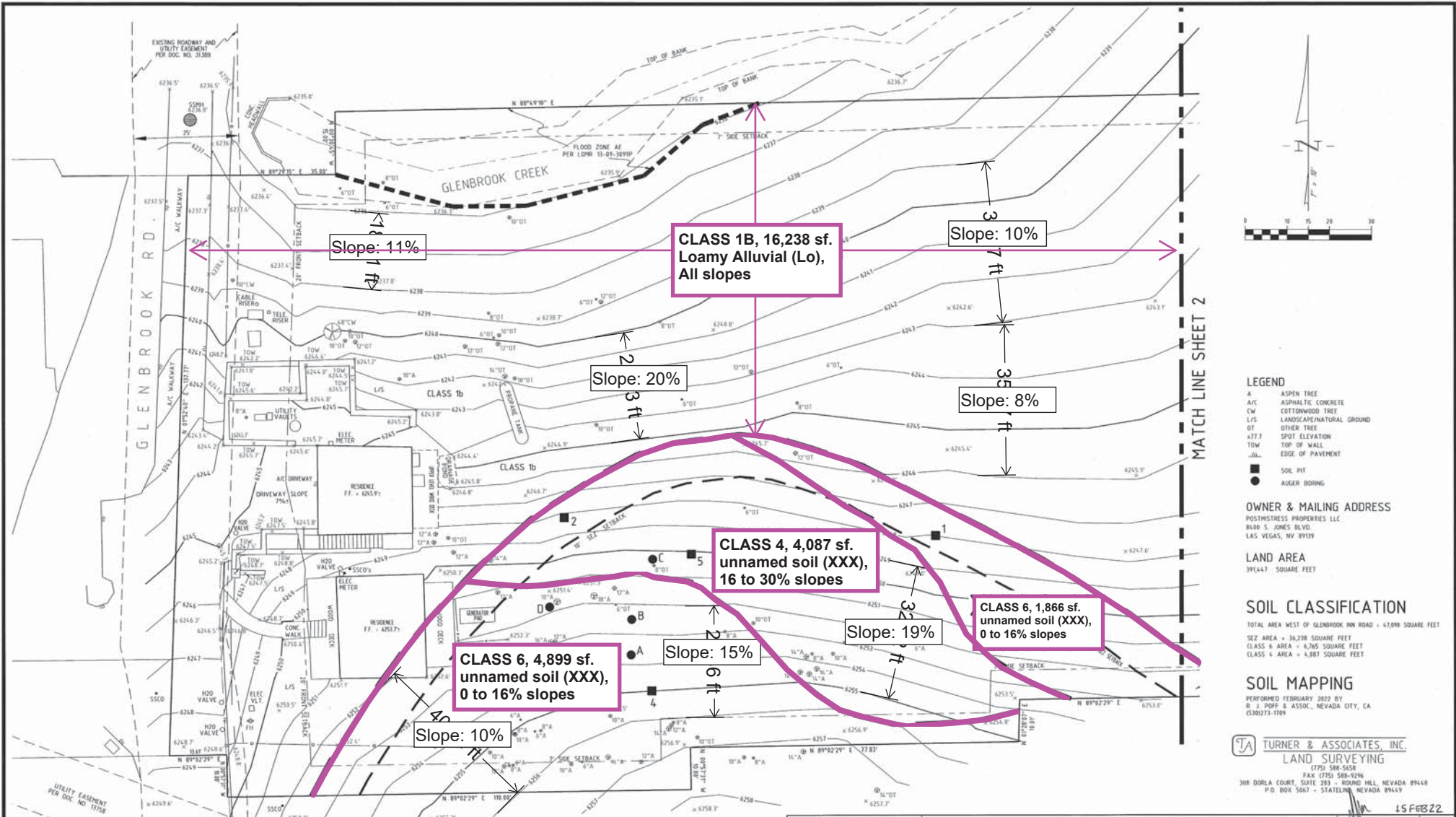
10-ft. Setback for Stream Environment Zone (SEZ).

Class 6 (Unnamed, XXX, 1 to 16% slopes); 5,668 sf.

IMPORTANT NOTE:
 Study area (magenta line) limited to vicinity of Postmistress House, which has frontage on Glenbrook Road (private street). The study area is a small part of a large parcel that is known as Shakespeare Ranch. The acreages shown on this diagram apply only to the study area.

Class 1B (Stream Envir. Zone, SEZ, any slope); West part = 2,762 sf.; East part = 1,861 sf. (extends further east of study area).

DETERMINATION
[Signature]
 EXECUTIVE DIRECTOR / DESIGNEE 11/5/19
 DATE
 TAHOE REGIONAL PLANNING AGENCY



- LEGEND**
- A ASPEN TREE
 - A/C ASPHALTIC CONCRETE
 - CW COTTONWOOD TREE
 - L/S LANDSCAPE/NATURAL GROUND
 - OT OTHER TREE
 - ▽77.7 SPOT ELEVATION
 - T/W TOP OF WALL
 - EDGE OF PAVEMENT
 - SOIL PIT
 - AUGER BORING

OWNER & MAILING ADDRESS
 POSTIMSTRESS PROPERTIES LLC
 8800 S. JONES BLVD.
 LAS VEGAS, NV 89139

LAND AREA
 391447 SQUARE FEET

SOIL CLASSIFICATION
 TOTAL AREA WEST OF GLENBROOK INN ROAD = 47,099 SQUARE FEET
 SEZ AREA = 36,298 SQUARE FEET
 CLASS 6 AREA = 4,765 SQUARE FEET
 CLASS 4 AREA = 4,087 SQUARE FEET

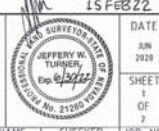
SOIL MAPPING
 PERFORMED FEBRUARY 2022 BY
 R. J. POFF & ASSOC., NEVADA CITY, CA
 (530)273-1099

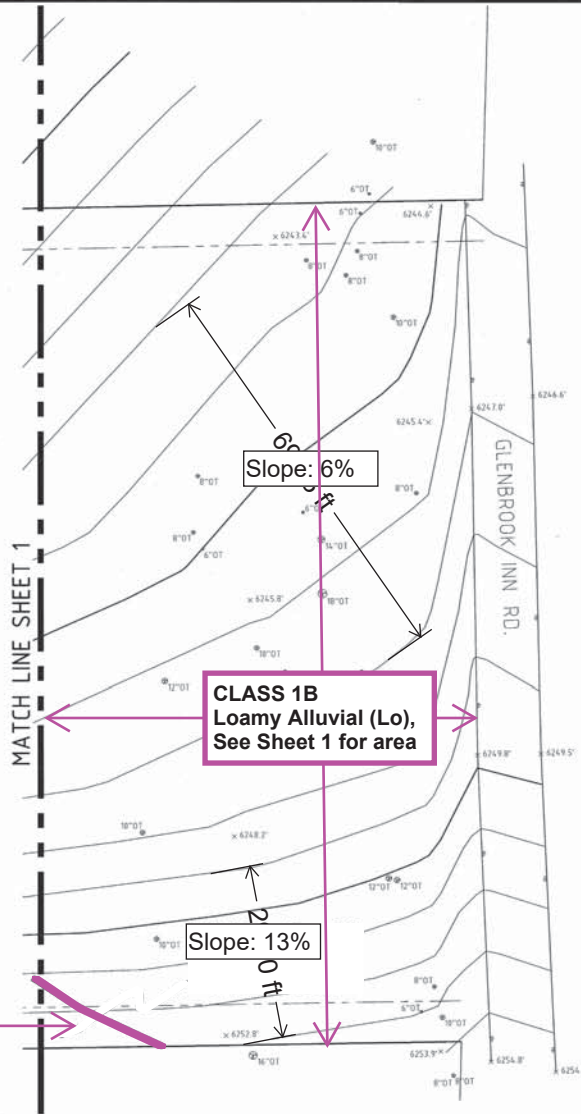
TURNER & ASSOCIATES, INC.
 LAND SURVEYING
 (775) 588-5458
 FAX (775) 588-9296
 308 DORLA COURT, SUITE 203 - ROUND HILL, NEVADA 89448
 P.O. BOX 5687 - STATALEIN, NEVADA 89449

**TRPA Land Capability Challenge for LCAP2022-0779;
 Portion of APN 1418-10-802-010; 1949 Glenbrook Inn Road
 Glenbrook, Douglas County, Nev.**

Field Investigation: Oct. 15, 2019 and Nov. 12, 2020
Data Analysis: July 26, 2023
Conducted By: P.Scoles (Soil Scientist)

| | | | | | |
|-------------------|-----------------------|---|--|-----------------|--|
| BENCH MARK | | TOPOGRAPHIC SURVEY | | DATE | |
| NUMBER | | POR. OF PARCEL PER DOC. NO. 2018-920173 | | JUN 2020 | |
| ELEVATION | 6223.24' | APN 1418-10-802-010, 1949 GLENBROOK INN RD. | | SHEET 1 OF 2 | |
| DATUM | BUREAU OF RECLAMATION | DOUGLAS CO., NV | | JOB NO. 20071 | |
| DESCRIPTION | LAKE TAHOE ON 17AUG16 | SCALE | | DRAWN FILE NAME | |
| REVISION NO. | DATE | DESCRIPTION | | CHECKED | |
| 2 | MAY 2021 | SOIL CLASS SLOPE ANALYSIS | | SW JMT | |
| 3 | FEB 2022 | MAPPING EDITS FOR SOIL REPORT BY OTHERS | | SW JMT | |





LEGEND

| | |
|-------|--------------------------|
| A | ASPEN TREE |
| A/C | ASPHALTIC CONCRETE |
| CW | COTTONWOOD TREE |
| L/S | LANDSCAPE/NATURAL GROUND |
| OT | OTHER TREE |
| +77.7 | SPOT ELEVATION |
| TOW | TOP OF WALL |
| --- | EDGE OF PAVEMENT |
| ■ | SOIL PIT |
| ● | AUGER BORING |

OWNER & MAILING ADDRESS
 POSTMESSHOP PROPERTIES LLC
 8400 S. JONES BLVD.
 LAS VEGAS, NV 89139

LAND AREA
 391,447 SQUARE FEET

SOIL MAPPING
 PERFORMED FEBRUARY 2022 BY
 R. J. POFF & ASSOC., NEVADA CITY, CA
 0300073-1028

**TRPA Land Capability Challenge for LCAP2022-0779;
 Portion of APN 1418-10-802-010; 1949 Glenbrook Inn Road
 Glenbrook, Douglas County, Nev.**

Field Investigation: Oct. 15, 2019 and Nov. 12, 2020
Data Analysis: July 26, 2023
Conducted By: P.Scoles (Soil Scientist)

NOTES

- SETBACKS SHOWN HEREON WERE PROVIDED BY BASIN STRATEGIES.
- THE PROPERTY LINE INFORMATION SHOWN HEREON IS FROM RECORD DATA AND DOES NOT REPRESENT A BOUNDARY SURVEY.
- THIS SURVEY HAS BEEN PREPARED WITH THE USE OF A TITLE REPORT PREPARED BY FIRST CENTENNIAL COMPANY OF NEVADA, NO. 225699-C1 DATED FEBRUARY 6, 2017.
- TURNER AND ASSOCIATES INC. ASSURES NO RESPONSIBILITY FOR ANY EASEMENTS WHICH MAY AFFECT THIS PROPERTY.
- PROPERTY OWNER AND/OR DESIGNER MUST VERIFY BUILDING SETBACKS AND ANY OTHER BUILDING RESTRICTIONS BEFORE ANY DESIGN OR CONSTRUCTION.
- ONLY VISIBLE UTILITIES AND FEATURES HAVE BEEN LOCATED.
- THIS DRAWING OR MAP IS THE PROPERTY OF TURNER & ASSOCIATES INC., AND MAY NOT BE USED OR REPRODUCED WITHOUT THE CONSENT OF TURNER & ASSOCIATES INC.

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 P.O. BOX 5267 - STATELINE, NEVADA 89449

| | | | | | | | | | |
|-------------------|-----------------------|---|-------|---------------|-------------|--------------|----------|----------------------|-------------|
| BENCH MARK | | TOPOGRAPHIC SURVEY | | | | | | DATE | |
| NUMBER | | POR. OF PARCEL PER DOC. NO. 2018-920173 | | | | | | JUN 2020 | |
| ELEVATION | 6223.24' | APN 1418-10-802-010, 1949 GLENBROOK INN RD. | | | | | | SHEET 2 OF 2 | |
| DATUM | BUREAU OF RECLAMATION | DOUGLAS CO., NV | | | | | | JOB NO. 20071 | |
| DESCRIPTION | | LAKE TAHOE ON 17AUG16 | SCALE | HORIZ. 1"=10' | VERT. 1"=1' | FIELD SW - # | DRAWN SW | FILE NAME 20071-20w0 | CHECKED JMT |
| REVISION NO. | DATE | DESCRIPTION | | | | | | | |
| 2 | MAY 2021 | SOIL CLASS SLOPE ANALYSIS | | | | | | | |
| 3 | FEB 2022 | MAPPING EDITS FOR SOIL REPORT BY OTHERS | | | | | | | |
| | | | | | | | BY SW | CHKD JMT | |

Attachment D
Applicant's Soil Consultant Land Capability Soil Report

Soil Capability Report for 1949 Glenbrook Inn Road, Glenbrook, NV (a portion of APN: 1418-10-802-010), 47,090 Square Ft.

Introduction

This report provides soil mapping and an analysis of soils in support of a TRPA Land Capability Challenge (LCC). The parcel is owned by the Postmistress Properties LLC, 8400 S. Jones Blvd, Las Vegas, NV 89139. Mr. Larry Ruvo requested the soil evaluation and subsequent land capability challenge.

This parcel is the portion of APN 1418-10-802-010 that is bordered on the west by Glenbrook Road, on the east by Glenbrook Inn Road, on the north by Glenbrook Creek, and on the south by APN 1418-10-702-010. The parcel includes a residence, a small lawn, and a detached garage. The parcel is undeveloped east of the residence, where the vegetation is maple, aspen, and introduced species on the upland, and riparian vegetation in the SEZ. Elevation ranges from 6,236 to 6,258 feet (Lake Tahoe datum). Turner & Associates, Stateline, NV, prepared the topographic base map for the parcel, conducted a detailed slope analysis for the soil mapping, surveyed the location of the flagged SEZ boundary, and calculated the areas of capability classes.

Summary of the Proposed Action

The parcel is currently verified by TRPA as SEZ (Class 1b) and an unnamed soil (XXX 0-16 percent slope) that does not match any soils identified in the 1974 Soil Survey (Rogers, 1974). We found the SEZ and the unnamed soil (XXX 0-16 percent slope), and also identified an unnamed soil (XXX 16-30 percent slope). The proposed changes are shown on Appendix 1, sheets 1 and 2, and in Table 1. below.

| Land Capability Class | Soil Type | Current Area (sq. ft.) | Proposed Area (sq. ft.) | Difference (sq. ft.) |
|-----------------------|-------------|------------------------|-------------------------|----------------------|
| Class 1b | Lo, SEZ | 41,243 | 36,238 | (5,005) |
| Class 4 | XXX, 16-30% | 0 | 4,087 | 4,087 |
| Class 6 | XXX, 0-16% | 5,847 | 6,765 | 918 |
| Total | | 47,090 | 47,090 | 0 |

Table 1. Summary of Proposed Changes to Land Capability Class

Background

We conducted a Land Capability Verification (LCV) on the parcel in October, 2019. At that time the SEZ boundary was at the south property line of the parcel. This was because the parcel had not been examined under other LCCs made on the Shakespeare Ranch. Under the LCV the SEZ boundary was moved to the north, but not as far north and east as under this proposed

LCC. There are a couple of reasons for this. First, the only action allowed under a LCV is moving an existing soil boundary; new delineations cannot be created. This prevented recognizing the slopes greater than 16 percent that were not SEZ. Second, much of the parcel was covered with extremely dense vegetation and downfall in 2019. In 2020 the parcel was cleared for fire protection. Clearing the parcel allowed the SEZ boundary to be located accurately, and also allowed access for a backhoe to excavate soil pits. See Appendix 4, page 5 and page 1 for photos of before and after conditions.

Methodology

Soils were verified by observations at four backhoe pits, one hand-dug pit with auger boring, and four auger borings. This includes two pits and four auger borings we made for the Land Capability Verification of the parcel in 2019. Turner & Associates conducted a detailed slope analysis to assist in delineating the two slope phases of the XXX soil. The SEZ boundary was located using auger borings to observe the depth to redoximorphic features and flagged-in. This flagged SEZ boundary was then surveyed by Turner & Associates.

Soil profile descriptions were on made on November 12, 2020 from two backhoe pits and one hand-dug pit with an auger boring. TRPA land capability contractor Marchel Munneke examined the sample sites at this time.

The soil profile descriptions (including those from the 2019 LCV) are in Appendix 3. Photos of the soil pits and sites are in Appendix 4. The location of the soil pits is indicated on the parcel map (Appendix 1) by a black square and number, and auger borings by a black circle and letter.

Field equipment used included tools normally used to observe and describe soils, such as a shovel, soil auger, trowel, knife, pruning shears, sieves, Munsell soil color charts, pH kit, hand lens, water bottle, measuring tape, compass, camera, and clinometer.

The soil profiles were described following the standards in Schoeneberger et al. (2012). The described soils were compared to the soils listed in the Soil Survey of the Tahoe Basin Area, California and Nevada (Rogers, 1974), and to the soils in the 2006 NRCS soil survey update (Soil Survey Staff, 2006). The comparison with the 2006 soil survey update was for informational purposes only, since TRPA does not use this soil survey to determine land capability class.

The methods used to describe the soil and site are consistent with the detail typical of an Order 1 Soil Survey (USDA Soil Science Division Staff, 2018).

Site Characteristics

Geomorphology

The study area is mapped within geomorphic unit E2 (Outwash, till, and lake deposits) in the Land-Capability Classification of the Lake Tahoe Basin, California-Nevada (Bailey, 1974). The parcel contains mixed alluvium, which is consistent with geomorphic unit E2. Unit E2 is in Group

III, Low hazard lands, which implies low erosion potential. However, the scale of the Bailey geomorphic mapping does not capture site-specific details.

Vegetation

There is a small lawn area adjacent to the residence. The vegetation in the SEZ area behind the residence is dominantly willow, willow and aspen sprouts, skunk cabbage, *Carex* spp., and assorted weeds. The upland area behind the residence is aspen and maple sprouts, assorted weeds, with scattered riparian forbs on the lower slope near the SEZ. When the site was first examined in October 2019, the vegetation was extremely dense, with heavy downfall and thick understory vegetation. The site was cleared in 2020, and when evaluated in October 2020 was much more open and accessible, making it possible to locate subtle changes in slope and to precisely locate the SEZ boundary.

Ground Cover, Surface Hydrology, and Erosion Hazard

The upland area has a ground cover of 1 to 3 inches of duff and litter. Infiltration is rapid and there is no evidence of runoff and erosion. The SEZ area—some of which is in the floodplain of Glenbrook Creek—has moderate Infiltration, and has 2 inches of well-decomposed surface duff. It has no evidence of erosion or surface scour.

Improvements and Modifications

A residence with a small lawn and a detached garage are on the west side of the parcel facing Glenbrook Road. The site is undeveloped behind the residence and east to Glenbrook Inn Road.

Findings and Analysis

The boundaries of the soils we observed are shown in Appendix 1, Sheets 1 and 2.

Soils

The Loamy alluvial land (Lo) that we mapped on the northern portion of the parcel fits within the map unit description for Loamy alluvial land in the 1974 soil survey. It qualifies as SEZ because it has two key indicators of SEZ (primary riparian vegetation, near surface groundwater) and three secondary indicators of SEZ (secondary riparian vegetation, groundwater between 20 and 40 inches, and alluvial soil Lo).

The unnamed (XXX) soil we mapped, however, does qualify as SEZ and does not fit within the descriptions for any named soils included in the 1974 soil survey. The XXX soil we mapped has loamy soil textures, is deep (40 to 60 inches), and is moderately-well to well drained. Near the boundary with the SEZ, the XXX soil has textures that become more clayey with depth.

Of the soils mapped the 1974 soil survey, the soil most similar to the XXX soil we mapped is the Gefo series, which occurs on alluvial fans, outwash terraces, and floodplains. The Gefo soil has gravelly soil textures, is very deep (greater than 60 inches), and is somewhat excessively drained. The Gefo soil is also limited to slope classes 2 to 9 percent, and 9 to 20 percent.

The 2006 survey update (Soil Survey Staff, 2006) has most of the parcel mapped as 9011 Oxaquic Cryorthents-Aquic Xerorthents-Tahoe complex, 0 to 15 percent slopes (9011), with Kingsbeach stony sandy loam, 2 to 15 percent slopes (7161) mapped along the south boundary of the parcel. The 2006 soil survey update is not an Order 1 Soil Survey intended for use at the parcel scale, and this comparison with the 2006 soil survey update is for informational purposes only, since TRPA does not use this soil survey to determine land capability. Allowing for scale differences, our findings are in general agreement with the 2006 soil survey update.

Determination of Hydrologic Group and Subsurface Hydrology

The unnamed XXX soil observed on this parcel is in Hydrologic Group B because it is a deep, well to moderately well-drained, moderately fine to moderately coarse-textured soil that has moderately slow to moderately rapid permeability, a moderate rate of water transmission, and a moderate rate of infiltration when thoroughly wetted (Rogers, 1974).

The XXX soil lacks restricting layers to a depth of greater than 40 inches, as observed by root penetration in the soil pits, and by the absence of redoximorphic features to a depth greater than 40 inches.¹ (See Appendix 3, pages 1 through 5.)

Determination of Land Capability Class for Soil XXX

The land capability for unnamed soil XXX was determined using the criteria in Table 4 of Land-Capability Classification of the Lake Tahoe Basin, California-Nevada (Bailey 1974). Unnamed soil XXX, 0 to 16 percent slopes, qualifies as Land Capability Class 6 because it occurs on slopes of 0 to 16 percent, has a slight relative erosion potential, a low to moderately low runoff potential, and a low disturbance hazard, and is in Hydrologic Soil Group B. Unnamed soil XXX, 16 to 30 percent slopes, qualifies as Land Capability Class 4 because it occurs on slopes of 16 to 30 percent.

Conclusions and Recommendations²

We found that the parcel includes an area that meets the criteria for SEZ (Land Capability Class 1b) and delineated its extent. We also found two soils that do not meet the criteria for SEZ, and that do not fit within the descriptions for any soils mapped in the 1974 soil survey (Rogers, 1974). We mapped these soils as XXX, 0 to 16 percent slopes (Land Capability Class 6), and XXX, 16 to 30 percent slopes (Land Capability Class 4).

We recommend the land capability classes for the parcel be changed to those listed in Table 1 and delineated in Appendix 1, sheets 1 and 2.

¹ An exception is the soil at Pit 2, which is not typical of XXX but was intentionally located near the SEZ boundary to verify the SEZ boundary location.

² A draft of this report was reviewed on March 13, 2022 by TRPA land capability contractor Marchel Munnecke (Pyramid Botanical Consultants). Where appropriate, her suggestions have been incorporated into this final report.



Respectfully submitted,

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List of Appendices

- Appendix 1 Proposed Land Capability Map, Sheets 1 and 2*
- Appendix 2 Current TRPA Land Capability (Verified LCV Map)*
- Appendix 3 Soil Profile Descriptions and Field Stops*
- Appendix 4 Photos*

Appendix 3 – Soil Descriptions

Soils were described in November 2020 at two backhoe pits and one hand-dug pit with auger boring. Also included are additional descriptions from backhoe pits and auger borings made for a Land Capability Verification conducted on the parcel in October of 2019. These recent observations were field-verified by a TRPA representative. Backhoe pit locations are shown on Appendix 1 as a black square and number; auger boring locations are shown as a black circle and letter.

Backhoe Pit #1

Described by Roger Poff on November 12, 2020 from a backhoe pit. Pit was observed by Marchel Munneke on November 12, 2020.

On a 13 percent convex/convex, north-northwest facing slope. This is a deep, well-drained soil developed in ancient terrace or beach sediments. Site has been recently cleared for fire protection. Vegetation is dominantly aspen sprouts. A photo of the pit is in Appendix 4, page 1.

At the time of description the soil was dry to 56 inches, then moist to 66 inches.

Oi—0 to 1 inches; fresh leaf litter; abrupt smooth boundary.

A—1 to 14 inches; 10YR 4/2 silt loam, 10YR 2/2 moist; weak coarse granular breaking to moderate medium and fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; common coarse, and many fine and very fine roots; strongly hydrophobic; 15% fine gravels; 2% medium gravels; pH 7.0; clear smooth boundary.

AB—14 to 30 inches; 10YR 4/3 loam, 10YR 3/2 moist; moderate medium and fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; few coarse, and common medium and fine roots; 20% fine gravels; 5% medium gravels; pH 7.0; gradual smooth boundary.

Bw1—30 to 45 inches; 10YR 4/3 loam, 10YR 3/2 moist; weak medium and fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; common fine and few very fine roots; 15% fine gravels; 10% medium gravels; pH 6.5; gradual smooth boundary.

Bw2—45 to 56 inches; 10YR 4/3 heavy sandy loam, 10YR 3/2 moist; weak fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; few

medium and fine roots; 10% fine gravels; 20% medium gravels; pH 6.0;
abrupt smooth boundary

CB—56 to 66 inches; 10YR 5/3 heavy sandy loam, 10YR 3/3 moist; very weak fine granular structure; slightly hard, friable, slightly sticky, slightly plastic; very few, very fine, redox concentrations (7.5YR 5/6 moist) in pores; very few very fine roots; 15% fine gravels; 15% medium gravels; pH 6.0.

Backhoe Pit #2

Described by Roger Poff on November 12, 2020 from a backhoe pit. The soil pit was observed by Marchel Munneke on November 12, 2020. This pit was intentionally located near the SEZ boundary to verify the location of the delineation. This soil is not necessarily representative of the delineation as a whole.

On a convex/convex, 18 percent north-facing slope. This is a deep, somewhat poorly drained soil developed in ancient terrace or beach sediments. The slight surface disturbance is estimated to be no more than 4 to 6 inches deep. Vegetation is aspen and maple sprouts and scattered riparian forbs.

A photo of the pit is in Appendix 4, page 2. When described, the soil was dry to 26 inches, slightly moist from 26 to 36 inches, and wet from 36 to 60 inches.

Oi—0 to 3 inches; fresh leaf litter; abrupt smooth boundary.

A1—3 to 11 inches; 10YR 3/2 silt loam, 10YR 2/2 moist; moderate medium breaking to strong fine and medium granular structure; soft, very friable, slightly sticky, plastic; very many very fine, fine, and medium roots, and common coarse and very coarse roots; strongly hydrophobic; 2% fine and 3% medium gravels; pH 7.0; gradual smooth boundary.

A2—11 to 26 inches; 10YR 4/2 light clay loam, 10YR 2/2 moist; moderate medium and coarse granular structure; slightly hard, friable, sticky, plastic; common fine and medium, and few coarse and very coarse roots; 3% fine and 10% medium gravels; pH 7.0; abrupt smooth boundary.

Bw—26 to 36 inches; 10YR 5/3 light sandy clay loam, 10YR 3/3 moist; weak fine and medium granular structure; slightly hard, firm, sticky, plastic; few fine and very fine roots; few fine 10YR 5/6 (6/6 dry) and 7.5YR 5/6 (4/6 dry) redox concentrations in pore linings; 3% fine and 20% medium gravels; pH 6.5; clear wavy boundary.

Cg1—36 to 48 inches; variegated 60% 5YR 5/6 and 40% 2.5Y 7/4 heavy silty clay loam, 5YR 4/6 and 2.5Y 5/4 moist; massive; hard, firm, very sticky, very plastic; very few fine roots; no fine gravels; pH 6.0; diffuse smooth boundary.

Cg2—48 to 60 inches; variegated 30% 5YR 5/6 and 70% 2.5Y 7/2 heavy silty clay loam, 5YR 4/6 and 5Y 5/2 moist; massive; hard, firm, very sticky, very plastic; very few fine roots; no fine gravels; pH 6.0.

Hand Dug Soil Pit with Auger Boring #3

Described by Roger Poff on November 12, 2020 from a hand-dug soil pit plus an auger boring to 42 inches (saturated soil did not allow excavation). This soil is representative of soils in the SEZ. This soil is located on a nearly level portion of the SEZ. The site had been recently cleared, piled, and burned for fire protection. Vegetation is dominantly willow and willow and aspen sprouts, skunk cabbage, carex, and assorted weeds. A photo of the soil and landscape is in Appendix 4, page 3.

Oi—0 to 2 inches; raw, fresh leaf litter; abrupt smooth boundary.

A—2 to 9 inches; 2.5Y 3/2 loam, 5Y 2.5/2 moist; moderate fine granular structure; soft, very friable, slightly sticky, slightly plastic; very many medium, fine, and very fine roots, and few coarse roots; 2% fine gravels; moderately hydrophobic; pH 6.0; gradual smooth boundary.

Cg1—9 to 16 inches; 5Y 3/2 gritty loam, N 2/0 moist; very weak medium granular structure; soft, very friable, slightly sticky, slightly plastic; common fine and medium, and few coarse roots; 5% fine gravels; moderately hydrophobic; pH 6.0; gradual smooth boundary.

Cg2—16 to 42 inches; 2.5Y 4/2 gritty loam, N 2/0 moist; massive; no roots; no fine gravels; pH 7.5; free water at 16 inches.

Backhoe Pit #4

Soil notes were made from backhoe pits #4 and #5 by Roger Poff on October 15, 2019. Phil Scoles, TRPA soils contractor, reviewed the open pits on October 15, 2019. The following notes were made prior to clearing the site for fire protection. Only selected horizon features were described. Soil Pit #4 is on a 10 to 13 percent convex/convex, north-facing slope. This is a deep, well-drained soil developed in ancient terrace or beach sediments. Vegetation is closed canopy maple (overstory and understory) with scattered old aspen. The duff and litter is

very thick, and includes many dead limbs and branches (see site photo on page 5 of Appendix 4). The understory is scattered Oregon Grape, but no meadow or wetland species. Slight surface disturbance from the historic mill site is estimated to be no more than 4 to 6 inches. Soil was very dry throughout at the time of description. A photo of the pit is in Appendix 4, page 4.

A—0 to 20 inches; 10YR 4/2 loam, 10YR 2/2 moist; moderate medium and fine granular structure; common medium and coarse, and many medium, fine and very fine roots; <5% fine gravels; gradual smooth boundary.

AB—20 to 32 inches; 10YR 4/3 heavy sandy loam, 10YR 3/2 moist; weak, fine and very fine granular structure; common medium and coarse, and many fine and very fine roots; <15% fine gravels; abrupt wavy boundary.

C1—32 to 54 inches; 10YR 6/4) heavy sandy loam, 10YR 5/4 moist; few, medium, distinct redox concentrations (7.5YR 4/6 moist); massive; common fine, medium, and coarse roots; clear wavy boundary.

C2—54 to 62 inches; 10YR 6/4 light sandy loam, 10YR 5/4 moist; common, distinct redox concentrations (7.5YR 4/6 moist), and common, faint redox depletions (10YR 5/3 moist); massive; few medium and fine roots; 10% fine gravels.

Note: The few redox concentrations in the C1 horizon occupy <1% of the horizon. There are no redox depletions in this horizon and the concentrations are interpreted as relic weathering features. The seasonal water table is below 60 inches at this pit location.

Backhoe Pit #5

Surface conditions and vegetation are similar to those described for Pit #4. When described, the soil was very dry to 58 inches, then moist to 64 inches. This moderately well-drained soil has a thicker A horizon, darker surface colors, and more pronounced redox features below 40 inches than Soil Pit #4. These changes in soil properties are typical of soils located closer to the Class 1b boundary. A photo of the pit is in Appendix 4, page 5.

A—0 to 20 inches; 10YR 3/2 loam, 10YR 2/1 moist; moderate and strong medium and fine granular structure; very many coarse, medium, fine, and very fine roots; gradual smooth boundary.

AB—20 to 40 inches; 10YR 4/2 heavy sandy loam, 10YR 2/2 moist; moderate very fine granular structure; few coarse, and common fine and medium roots; abrupt wavy boundary.

C1—40 to 58 inches; 2.5Y 7/4 sandy loam, 10YR 6/4 moist; common, distinct (2.5Y 5/4 moist) redox depletions, common, distinct (7.5YR 4/6 moist) redox concentrations, and few, prominent (5YR 4/6 moist) redox concentrations along root channels; massive; few fine and very fine roots; 15-20% fine gravels and <1.5 inch pebbles; clear smooth boundary.

C2—58 to 64 inches; 10YR 6/4 heavy sandy loam, 10YR 5/4 moist; common, faint (10YR 6/4 moist) redox depletions, and common, distinct (10YR 5/6 moist) redox concentrations; few, prominent (5YR 4/4 moist) redox concentrations along root channels; massive; no roots; no fine gravels.

Note: Redox concentrations at 40 inches implies the upper limit of seasonal water table; however chroma 4 matrix suggests the frequency of such water table is less than 5 out 10 years. Location does not qualify as SEZ due to lack of primary indicators and lack of three secondary indicators. The seasonal high water table at this pit location is at or below 40 inches.

Hand-Dug Holes with Auger Borings

The following hand-dug pits with auger borings were made on September 27, 2019. They provided additional support in locating the soil boundaries.

Stop A Dug to 16 inches then augered to 72 inches. 0-30 inches 10YR 4/2 (dry), 10YR 3/2 (moist), heavy sandy loam. A few pebbles. A few, prominent 5YR 5/6 redox concentrations from 42-46 inches, but no redox features from 46 to 70 inches.

Stop B Dug to 16 inches then augered to refusal by roots at 20 inches. 10YR 4/2 (dry), 10YR 3/2 (moist); an occasional glass shard and old can at surface; no redox features within the upper 20 inches.

Stop C Dug to 16 inches then augered to refusal at 30 inches. 10YR 3/2 (dry), 10YR 2/2 (moist), heavy sandy loam, not gravelly; slight stone line at 16 inches; no redox features within the upper 30 inches.

Stop D Dug to 18 inches then augered to refusal at 34 inches. 0-28 inches 10YR 3/2 (dry), 10YR 2/2 (moist) sandy loam; slightly stony at 28 inches. At 32 inches is coarse sandy loam, 10YR 5/2 (dry), 10YR 4/2 (moist), a little more gritty than other borings; no redox features to 34 inches. Less than 6 inches of surface disturbance or fill.



Soil Pit 1 Profile, XXX 0-16 percent slope



Soil Pit 1 Site, XXX 0-16 percent slope



Soil Pit 2 Profile, XXX 16-30 percent slope



Soil Pit 2 Redox Features, XXX 16-30 percent slope



Soil Pit 3 Profile, SEZ (Lo)



Soil Pit 3 Site, SEZ (Lo)



Soil Pit 4 Profile, XXX 0-16 percent slope



Soil Pit 4 Site, XXX 0-16 percent slope



Soil Pit 5 Profile, XXX 16-30 percent slope



Soil Pit 5 Site, XXX 16-30 percent slope