Water Quality Inspection Report

Inspection Details

Name and Location of Facility Inspected

East Branch South Fork Eel River Watershed
Former Tooby Ranch properties
Humboldt County APNs
223-074-006, 223-074-004,
223-074-009 (Property)

Water Board Regulatory ID numbers

Tobias Hafenecker-Dodge
WDID: 1B16290CHUM

Kenneth Bullock

Inspection Date/ Inspection Time

April 10, 2018 / All day

Names & Titles of On-Site Representatives and Consenting Parties and Contact Information

Tobias Hafenecker-Dodge
Contact: (415) 583-3555
lastresortsvip@gmail.com

Steve Dodge, Neighbor
Contact: (707) 498-9433
staff.milewide@gmail.com

Kelsey McDonald, Hohman & Associates Forestry Consultants
Contact: (707) 768-3743
kmcdonald@hohmanandassociates.com

Property Owners & Mailing Address

Tobias Hafenecker-Dodge
APN: 223-074-004, 223-074-009

Address: 60 Rausch Street #208
San Francisco, CA, 94103

Notified of Inspection?

Yes

Kenneth Bullock
APN: 223-074-006

Address: PO Box 940
Redway, CA, 95560

Notified of Inspection?

Yes

WQ Inspector Name(s) & Title(s)

Brian Fuller - Engineering Geologist (EG), North Coast Regional Water Quality Control Board (Regional Water Board)
Adona White - PE, Water Resource Control Engineer (WRCE)Regional Water Board

Attending Agency Representatives

Kalyn Bocast - Environmental Scientist, Ca. Department of Fish and Wildlife (DFW)
Payman Alemi - WRCE, DIV (Division of Water Rights)
Steve Cannata - Humboldt County Planning and Building Department
Brad Padilla - Watershed Enforcement Team Warden, DFW

California Integrated Water Quality System (CIWQS) Place ID Numbers: 823853 and 826001

Weather at the Time of the Inspection

Light rain in the morning and then sunny in the afternoon.

Facility Receiving Water Names

Buck Mountain Creek, Panther Canyon, and Bear Canyon, all tributaries to South Fork Eel River.

Prepared By: Brian Fuller, on June 28, 2018

Reviewed By: Diana Henrioulle, P.E., on July 5, 2018

Attachments:

Figure 1 — Property Map
Appendix A — Existing Pond Assessment, Lindberg Geologic Consulting, November 7, 2017
Appendix B — Selected Photographs

I. Watershed information

The Property is located in the Benbow Hydrologic Subarea of the South Fork Eel River Hydrologic Area in the Eel River Hydrologic Unit.

Beneficial Uses for 111.32 Benbow Hydrologic Subarea

- *Existing:* Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Groundwater Recharge (GWR), Freshwater Replenishment (FRSH), Navigation (NAV), Water Contact Recreation (REC1), Non-Contact Water Recreation (REC2), Commercial or Sport Fishing (COMM), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN) and
- *Potential:* Industrial Process Supply (PRO), Hydropower Generation (POW), Aquaculture (AQUA)

Section 303(d) Listings

The South Fork Eel River Watershed is listed on the Clean Water Act section 303(d) List due to impairment and/or threat of impairment to water quality by sediment and temperature.

TMDL Development

The United States Environmental Protection Agency adopted a TMDL for sediment and temperature in the South Fork Eel River on December 16, 1999.

TMDL Implementation

As part of the Regional Water Board's efforts to control sediment waste discharges and restore sediment impaired water bodies, the Board adopted the *Total Maximum Daily Load Implementation Policy Statement for Sediment Impaired Receiving Waters in the North Coast Region*, also known as the Sediment TMDL Implementation Policy, on November 29, 2004, through Resolution R1-2004-0087. The Sediment TMDL Implementation Policy directs the Executive Officer to use "all available authorities, including existing regulatory standards and permitting and enforcement tools, to more

effectively and efficaciously pursue compliance with sediment-related standards by all discharges of sediment waste." The goals of the policy are to control sediment waste discharges to impaired water bodies so that the TMDLs are met, sediment water quality objectives are attained, and beneficial uses are no longer adversely affected by sediment.

The Eel River temperature TMDLs assigned temperature load allocations corresponding to solar radiation loads that occur when riparian vegetation is at full potential growth conditions. With the goal of establishing actions that achieve those TMDL load allocations, the Basin Plan *Action Plan to Address Elevated Water Temperatures in the Eel River Watershed* identifies implementation actions. On non-federal lands, parties conducting activities associated with agriculture that discharge waste or have the potential to discharge waste shall implement riparian management measures that meet the riparian shade load allocations (shade consistent with full potential vegetation conditions) and water quality standards.

II. Threatened and Endangered Species

California Department of Fish and Wildlife's CNDDB Tool in Bios lists the Threatened and Endangered Species for the Garberville area as:

- Federally Threatened:
  - Coho salmon - Southern Oregon / Northern California ESU,
  - Chinook salmon - California Coastal ESU,
  - Steelhead - Northern California DPS
- State Endangered:
  - Bald eagle
- State Candidate Threatened:
  - Foothill yellow-legged frog

III. Property ownership and regulatory background

The Property comprises three parcels, subdivided from the Tooby Ranch. The subdivision of Tooby Ranch was subject to continuing legal issues/proceedings for several years following a lawsuit filed by Humboldt County in 2002 regarding compliance with the Williamson Act, applicable County guidelines, and an agricultural preserve contract between the County and former owner Arthur Tooby.

June 11, 2002, #1 Tooby RD LLC., (Tobias Hafenecker-Dodge) purchased parcel 223-074-004 from Buck Mountain Ranch LP (Robert C. McKee)

October 19, 2007, #3 Tooby RD LLC., (Tobias Hafenecker-Dodge) purchased parcel 223-074-009 from Harris Land & Cattle LLC., (Journey Aquarian).

May 13, 2015, Kenneth Bullock purchased parcel 223-074-006 from Scott Doyle.

June 21, 2016, Regional Water Board sent Kenneth Bullock an enrollment enforcement letter directing him to enroll parcel 223-074-006 under Order No. R1-2015-0023.

June 22, 2016, Tobias Hafenecker-Dodge enrolled parcels 223-074-004 and 223-074-009 as a Tier 2 site under Order No. R1-2015-0023.

May 3, 2018, CDFW issued Notice of Violation of Fish and Game Code Sections 1602, 5650, and 5652 to Kenneth Bullock for violations associated with the pond enlargement on APN 223-074-006.

June 5, 2018 Tobias Hafenecker-Dodge submitted his 2017 Annual Monitoring Report, as required under Order No. R1-2015-0023. Mr. Hafenecker-Dodge also submitted portions of a Water Resource Protection Plan for his two enrolled parcels.

IV. Purpose of inspection

Regional Water Board staff participated in this inspection in response to an invitation from staff of CDFW. On an earlier site visit, CDFW staff had identified water quality concerns associated with site development and use for cannabis cultivation. Features of particular concern included a large, recently-constructed pond and recently graded/disturbed areas with cannabis cultivation operations.

I. Meeting at Alderpoint Road

On the inspection day, Regional Water Board and CDFW staff met Property owners Tobias Hafenecker-Dodge and Steve Dodge, and their consultant, Kelsey McDonald, at the intersection of Little Buck Mountain and Alderpoint Roads. While we waited for Humboldt County representative Steve Cannata to arrive, I showed the landowners an aerial image with overlain parcel boundaries and asked them to identify their respective properties on the map. Mr. Hafenecker-Dodge showed me where his property was on the map and identified the location of a pond (Enlarged Pond). He explained that there had previously been a smaller pond that was fed by a spring and approximately five years earlier, the spring shifted location and began running down a road which initiated a landslide nearly impacting a greenhouse. Mr. Hafenecker-Dodge explained that he hired someone to enlarge the pond at this site to recapture the spring. I asked Mr. Hafenecker-Dodge who built the Enlarged Pond and when. Mr. Hafenecker-Dodge told us that Brett Gratzel built the pond in 2015; Regional Water Board staff understand that Mr. Gratzel is an unlicensed earthwork contractor. Note that there is no record of any permit/order sought or issued for the instream work associated with the pond construction. I also asked Mr. Hafenecker-Dodge if he had any engineering designs or drawings related to the construction of the Enlarged Pond, and he said he did not.

II. Enlarged Pond Report

Kelsey McDonald, gave me a November 7, 2017, report (Appendix A) prepared by Lindberg Geologic Consulting, entitled Engineering-Geologic R-2 Soils Exploration Report (Report) The Report includes a statement indicating that it had been commissioned by Mr. Hafenecker-Dodge to "characterize the apparent adequacy of the construction" of the Enlarged Pond.

The Report includes a statement that the Enlarged Pond "is not acceptably constructed", and is not "a preferred design." The report recommends increasing the size of the outboard fill face to achieve a standard 2:1 slope, with two-foot key-in, adding two twelve-inch diameter outflow pipes in such a way as to maintain twelve inches of freeboard above the top of the pipe, and controlling the outflow discharge with Tees on the pipe and rock to slow the water "to a point in a native stream with effective erosion control." The Report indicates that these recommendations are based on assumptions about the subsurface that could have only been tested during the initial earthwork. I note that the Report does not indicate that Lindberg staff observed any fill material slope failures during the October 2017 field exploration to develop the Report.

III. Aerial imagery

- Based on review of Google Earth imagery, a landslide occurred ~350 feet west of the Pond sometime between September 2011 and August 2012. In both the September 2011 and August 2012 images, a road is visible along the head scarp of the landslide leading to a cannabis cultivation site ~200 feet away. Note that staff did not visit this cultivation site during the April 10, 2018, inspection.

- In May 2014 Google Earth imagery, a pond with ~1,300 square feet (0.03 acre) surface area is visible near the southwest portion of the existing 0.80-acre pond.

- A greenhouse first appeared at the site 1 location in 2006. The greenhouse was increased in size in between September 2011 and August 2012 and again between 2014 and 2016.

- The Enlarged Pond is first visible in NAIP 2016 imagery (dated May 28, 2016).

IV. Inspection Observations

Site 1

We accessed the Property via a shared-use dirt road from the north and drove to an area, identified as Site 1 in *Figure 1*, near the boundary between parcels 223-074-004 and 223-074-006 with a generator building, two-story house, the Enlarged Pond, and a greenhouse (Glass House).

Enlarged Pond

Ms. White and Mr. Alemi each walked the perimeter of the Enlarged Pond *(photo 1)* on top of the dam buttress with a handheld GPS unit. I measured the area encompassed by their walks using Google Earth's measure tool, getting a result of 35,000 square feet (0.80 acre). When asked, Mr. Hafenecker Dodge said the pond was 18' deep. I walked along the perimeter as well and observed nearly continuous tension cracks on the downslope, northwest buttress and patches on the out-slope face where earthen material had been slumping off *(photo 2)*. The water level in the pond had reached less than twelve inches from the downstream buttress crest along much of its length *(photo 3)*. The pond's outflow is directed over an area of the out-slope face covered with cobbles and small boulders *(photo 4)* and then into an unarmored Class III tributary to Panther Canyon *(photos 4 and 5)*. West of the of the pond's outflow, and closer to the pre-enlarged pond location, there is an incised channel with no current contributing drainage area *(photo 6)*. It should be noted that the Lindberg Report did not describe the cracked sloughing face, suggesting that the erosion occurred after his October 2017 assessment and prior to our inspection.

Glass House

We observed a road heading north from the east side of the Enlarged Pond which then continued west over the Class III watercourse (impacted by the Enlarged Pond) and toward a nursery greenhouse (Glass House) as well as the large-scale landslide. Beyond the watercourse crossing, an inside ditch along the road conveys road and landing drainage to a discharge point where water flows down the slope toward the landslide and the associated Class II watercourse. We observed uncontained potting soil on the flat immediately adjacent to the inside ditch.

The Glass House is 300 feet northwest of the Enlarged Pond on a graded flat (Mr. Hafenecker-Dodge said it was a former log landing). The Glass House sits between the Class II watercourse associated with the landslide (to the south) and a Class III watercourse to the north, which flows to the Class III watercourse that is impacted by the Enlarged Pond; below the confluence of the two Class IIIs they form a Class II watercourse. The graded flat encroaches on segments of the Class III and the Class II watercourses; the toe of the earthen fill is located at the head of the Class III watercourse and erosion and runoff from the north side of the graded flat. We observed evidence of recent soil disturbance with heavy equipment around the edge of the flat, with fill pushed about 10 feet out from the former edge.

The road to the Glass House is not visible in 2014 NAIP imagery. The road lacks adequate best management practices (BMPs) including appropriate drainage structures and adequate surfacing for winter use. We observed evidence that stormwater runoff flows over the road *(photo 7),* eroding the road surface and transporting the eroded sediment to the Class III watercourse that captures outflows from the Enlarged Pond *(photos 4, 5 and 8)*. The road crosses the watercourse—routing the watercourse through a 36" diameter corrugated plastic culvert—near the south side of the Glass House. Wetland vegetation is evident both upstream and downstream of the culvert. The culvert is not installed at grade, and the outlet is perched above the channel. Downstream of the road crossing, we observed fine sediment deposits in the

watercourse, most likely associated with the road surface erosion *(photo 8)*. We observed two scour holes in the watercourse indicating impacts to channel stability, likely resulting from increases in water discharge and sediment deposition and scour from the culvert.

The Glass House roof and building pad have created an impervious surface. Concentrated water from around the building enters a pipe and drains to the Class III watercourse. In addition to the road runoff, rainwater flowing over potting soils piled on the southeast side of the Glass House *(photo 9)*, enters the Class III watercourse via the pipe. On the northwest side of the Glass House, water runs off the roof, over spent potting soils and then towards the watercourses *(photos 10 and 11)*. We also observed cultivation waste, including plastic irrigation, netting, fans, black-out tarps, root-balls and plant stalks stockpiled along the narrow perimeter of the graded flat, beyond the building, and over the edge of the flat. These items are not adequately contained to prevent them from entering or being transported into surface waters.

Generator Building

The generator building is located on the west side of the road accessing Site 1 from the north, 200 feet east of the Enlarged Pond. The building has no roof and we observed ponded water in the building, with a rainbow sheen, likely from spilled/leaked petroleum products. Additionally, nearby we observed various large uncovered generators.

Site 2

We walked south from Site 1 along a dirt road and arrived at a cut/ fill earthen pad with five rows of hoop houses on the east side of the road *(photos 13 and 14)*; this flat, as well as a pond proposed for enlargement, southeast of the road (Proposed Pond 1), and a proposed new cultivation area southwest of the road (Proposed Cultivation 1) are identified as Site 2 in *Figure 1*.

Surface Water

The road lacks adequate drainage structures/features, and we observed water running down its surface. Near the northern side of the cultivation flat, we observed a plugged culvert where surface water crosses the road *(photos 13 and 14)*; the water is pooled upstream from the road *(photo 15)*, meanders across a flat area adjacent to—yet hydrologically disconnected from—the cultivation flat *(photo 17).* Below the cultivation flat, the low gradient surface waters spread out amongst wetland vegetation on the hillslope east of the flat. This hillslope dips east towards tributaries to Buck Mountain Creek.

Cut/fill earthen pad

Below the road, we observed a graded cut/fill earthen pad in a concave area. The fill material at the eastern edge of the flat partially covered burnt trees *(photo 18),* suggesting the flat had been expanded since a recent fire. Additionally, the only vegetation on the fill material appears to be less than one year old. We observed tension cracks on the top of the fill face *(photo 19)* and gullying in the fill material *(photo 20)*.

Proposed Cultivation 1
We crossed the road southeast of the cut/fill pad, and walked 100 feet into a northeasterly dipping meadow which Mr. Hafenecker-Dodge told us he proposed to develop as a future cultivation site *(photo 21)*. We observed hydrophytic plant species and advised Mr. Hafenecker-Dodge to get a wetland delineation if he intended to develop the area.

Proposed Pond 1
We returned northwest along the road and walked 100 feet west, uphill among trees to an existing pond which Mr. Hafenecker-Dodge told us he proposes to expand *(photo 22)*. We observed potential wetland features in this location, and advised Mr. Hafenecker-Dodge to get a wetland delineation if he intended to develop the area.

Road south of Site 2
We continued southeast down the road. Five hundred feet from Proposed Cultivation 1, the road begins trending north-south and we observed an in-board ditch *(photo 23)*, which receives the road runoff as well as diverted spring flow from the west before flowing over a driveway *(photo 24)* and eventually into a gully incising six feet deep and 10 – 15 feet wide with the banks slumping into the gully in blocks *(photo 25)*. The gully continues downslope for at least 350 feet to a lower road crossing.

Site 3 (Shady Grove)
We continued following the road after it switched back north. Five hundred feet north of the driveway depicted in photo *24*, we entered a side road to the northwest *(photo 26)* which leads to a group of three structures that appeared to have been previously used for indoor cannabis cultivation. This area (identified as the shady grove) is downhill and directly east of Site 2. There are two distinct watercourses running through the area heading east towards Buck Mountain Creek. Flows from the southern of the two watercourses enter an excavated trench with electrical conduit, running along the western portion of the site, then continue down a trench bordering one of the structures *(photo 27)* and then spread over and cross the road we followed to access the site *(photo 28).* Where the water has spread over developed surfaces, we observed wetland vegetation. We observed a mound of potting soils with perlite, as well as plastic and cultivation waste, encroaching into the northern of the two watercourses *(photo 29).* Mr. Hafenecker-Dodge told us that the soil has been here for several years.

Site 4
We left Site 3 along the road exiting the area to the south and continued southeast along the main road, arriving at an incised gully *(photo 30)* which is downstream from the watercourse on the road south of Site 2 *(photo 25).* We then walked west, passing through a meadow area south of the gully, and observed small cabins on top of a watercourse, and garbage sitting on the sides of the cabins *(photo 31)*. Uphill to the west of the cabins, we observed a pond *(photo 32)*.

Site 5
We then walked back to Site 1, where Mr. Hafenecker-Dodge showed me an erosion control plan prepared by Manhard Consulting (*Erosion Plan*) containing property maps and map points along the main roads across the property. We then drove north onto parcel 223-074-009 and stopped at a clearing/earthen pad with cannabis cultivation infrastructure *(photos 33-35)*. Using Google Earth, I determined that the distance between the edge of the parking area depicted in photos 33 and 34 and the headwaters to Panther Canyon is 140 feet. We observed cultivation waste including potting soil, root balls and stalks, and plastic on the fill slope beyond the edge of the flat area.

We drove northeast to the main road and continued northwest along the main road, stopping at 6 culvert crossings, numbered 49 through 54 in the Erosion Plan. The proposed culvert replacements per the Erosion Plan appear to be appropriate for conveying water across the road, but the Erosion Plan does not adequately address stormwater flowing over the road-surface *(photo 36)*. Additionally, there is a buried 12-inch culvert—between points 50 and 51—not addressed in the Erosion Plan; this feature may cause or result in erosion and adverse impacts to water quality and should be incorporated into the Erosion Plan.

Site 6
We drove northwest along the main road and arrived at a house-type structure. We walked from the house to another proposed pond site (Proposed Pond 2), where we again observed wetland-indicating vegetation. Again, we advised Mr. Hafenecker-Dodge to first get a wetland delineation if he intended to develop the area. *(photo 37)*.

Site 7
We continued walking north along the main road. At map point 56 in the Erosion Plan, a steep road segment drains to an inboard-ditch, which discharges into a watercourse. Farther north along the road, at map point 58, we observed a watercourse not identified in the Erosion Plan. At this map point, the cut face upslope of the road is slumping, and we observed water weeping onto the road-surface *(photo 38)*. I walked upslope from the road over apparent earthflow deposits and observed a small watercourse which infiltrates into the earthflow deposit. From this location, the water weeping onto the road flows into an inboard ditch *(photo 39)* and pools in the parking area next to the Site 7 cultivation area.

Site 8
We then drove south, returning to parcel APN: 223-074-004, and drove to another cultivation site on a clearing/pad with cleared oak trees *(photo 41).* Some of the cleared trees had been placed in a swale upslope of a pond east of the cultivation area. I climbed through the cut trees and slash and could not identify a watercourse bed or bank.

Site 9
We then drove north along the road we had used to initially access the Property and stopped at a clearing on parcel 223-074-009 where Mr. Hafenecker-Dodge proposed to

develop a new cultivation area south of the road *(photo 42)*. I identified two watercourses bounding the proposed cultivation area—one of them depicted in photo 43—and advised Mr. Hafenecker-Dodge that the proposed site would not meet stream buffer width requirements, however I agreed with Mr. Hafenecker-Dodge that a location on the north side of the road would be far enough from the watercourses to meet stream buffer requirements.

V. Documents provided to staff on June 5, 2018

- ***waterboard map of mazari.pdf***
  This map appears to be a page from a set of drawings, no date or author is indicated.

- ***ECP - Hafenecker-Dodge Tobias Ownership Road Points.pdf***
  This document appears similar to the Erosion Plan compiled by Manhard which I reviewed during the inspection, however this document has no date or author.

- ***water board wrrp 2018 copy.numbers***
  I was unable to open this file.

- ***DOD.GACA-AllMaps.pdf***
  Maps of property prepared by Manhard with no date.

- ***Existing R1 Enrollees New Annual Reporting Form (Fillable)1.25.2018.pdf***
  Annual Reporting Form required under Order No. 2015-0023.

- ***Hafenecker-Dodge Tobias_Resto.pdf***
  Document prepared for the Humboldt County Streamside Management Area Ordinance, in regard to an application for Commercial Cannabis, by Mike Atkins, RPF #2613. Document is not signed or dated.

VI. Summary of Site Relative to Standard Conditions

1. **Site maintenance, erosion control and drainage features:**
   At a minimum, roads throughout the Property require maintenance. Some may need to be reshaped or upgraded *(photos 7, 13, 15, 23, 24, 25, 26, 28, 30, 36, 38, 39).*

2. **Stream crossing maintenance:**
   The Erosion Plan presented during the inspection identified approximately 100 points requiring work on the subject and neighboring properties, mostly inadequate stream crossings.

3. **Riparian and wetland protection and management:**

Enlarged Pond at Site 1, has impounded a spring, potentially dewatered a watercourse *(photo 6)*, filled a watercourse *(photo 4)* and discharged a large amount of fine sediment downstream in the same watercourse *(photo 8)*. Watercourses are diverted around or flow under structures at Sites 2 and 4 *(photos 27 and 31)*.

4. **Spoils management:**
   Stockpiled potting soils at Site 1 Glass House are entering and positioned where they can enter a watercourse *(photos 9 – 11).* Potting soils fill a watercourse at Site 3 (Shady Grove) *(photo 29)*.

5. **Water storage and use:**
   The Enlarged Pond is on-stream and at risk of failing.

6. **Irrigation runoff:**
   We observed no issues involving irrigation runoff.

7. **Fertilizers and soil amendments:**
   Soil amendments improperly disposed of (see Standard Condition 4 above).

8. **Pesticides and herbicides:**
   We observed no pesticide or herbicides onsite.

9. **Petroleum products and other chemicals:**
   The generator building has no roof, and ponded rainwater in the building is likely to transport spilled/leaked hydrocarbons, outside of building, and into locations where they could enter or be transported into receiving waters *(photo 12).*

10. **Cultivation-related wastes:**
    In addition to improperly stockpiled spent potting soils (see Standard Condition 4 above), we observed cultivation waste at Sites 5 and 8 *(photos 35 and 41)* in or where it could enter or be transported into receiving waters.

11. **Refuse and human waste:**
    Chemical toilets were appropriately accessible throughout the Property *(photo 24)*.

VII. Summary of violations.

- Dredge and fill within waters of the state watercourse associated with work at Enlarged Pond in 2015 (Water Code, Clean Water Act)

- Conditions on the property violate Basin Plan Action Plan for Logging, Construction, and Related Activities Prohibitions 1 and 2.

- Failure to comply with the requirement of R1-2015-0023; the WRPP was required to be developed within 180 days of enrollment. A complete WRPP was not available either onsite or after the inspection. A treatment schedule is a required component.

VIII. Summary of recommendations:

- The Enlarged Pond was constructed without required permits and resulted in a feature that has the potential to harmfully impact water quality; the outboard face of the pond berm is too steep, and the spillway allows water to flow over the berm crest and erode the face. This increases the risk that the pond berm will fail which would transport waste to tributaries of Panther Canyon *(Appendix A).*

  We recommend that the Discharger retain a licensed Civil Engineer to develop a restoration plan for the area of the pond enlargement, including:
  - A description of how long-term impacts from erosion and sedimentation sources will be abated (e.g., re-grading and reengineering, graveling or paving road surface, etc.), as well as a proposal to restore beneficial uses of any waters of the state that were adversely impacted by the unauthorized activities;

  - A proposal to provide compensatory mitigation to compensate for any temporal and/or permanent impacts to wetlands and other waters of the state that resulted from unauthorized activities on the Property. Compensatory mitigation should comply with the State's No Net Loss Policy. The proposal should (1) describe existing site conditions at the proposed mitigation site; (2) describe implementation methods used to provide compensatory mitigation; (3) include monitoring that will be implemented and performance criteria that will be used to evaluate the success of the compensatory mitigation; and (4) include an implementation schedule;

  - Best management practices to be applied to all current and planned work associated with construction activities on the Property impacting, or having the potential to impact, South Fork Eel and unnamed tributaries thereto. The plan should contain, at a minimum, design specifications for roads, any water crossing, in-stream structure and for riparian and aquatic habitat restoration, surface drainage controls, erosion and sedimentation controls, an implementation schedule, a monitoring and reporting plan, and success criteria for restoration and compensatory mitigation;

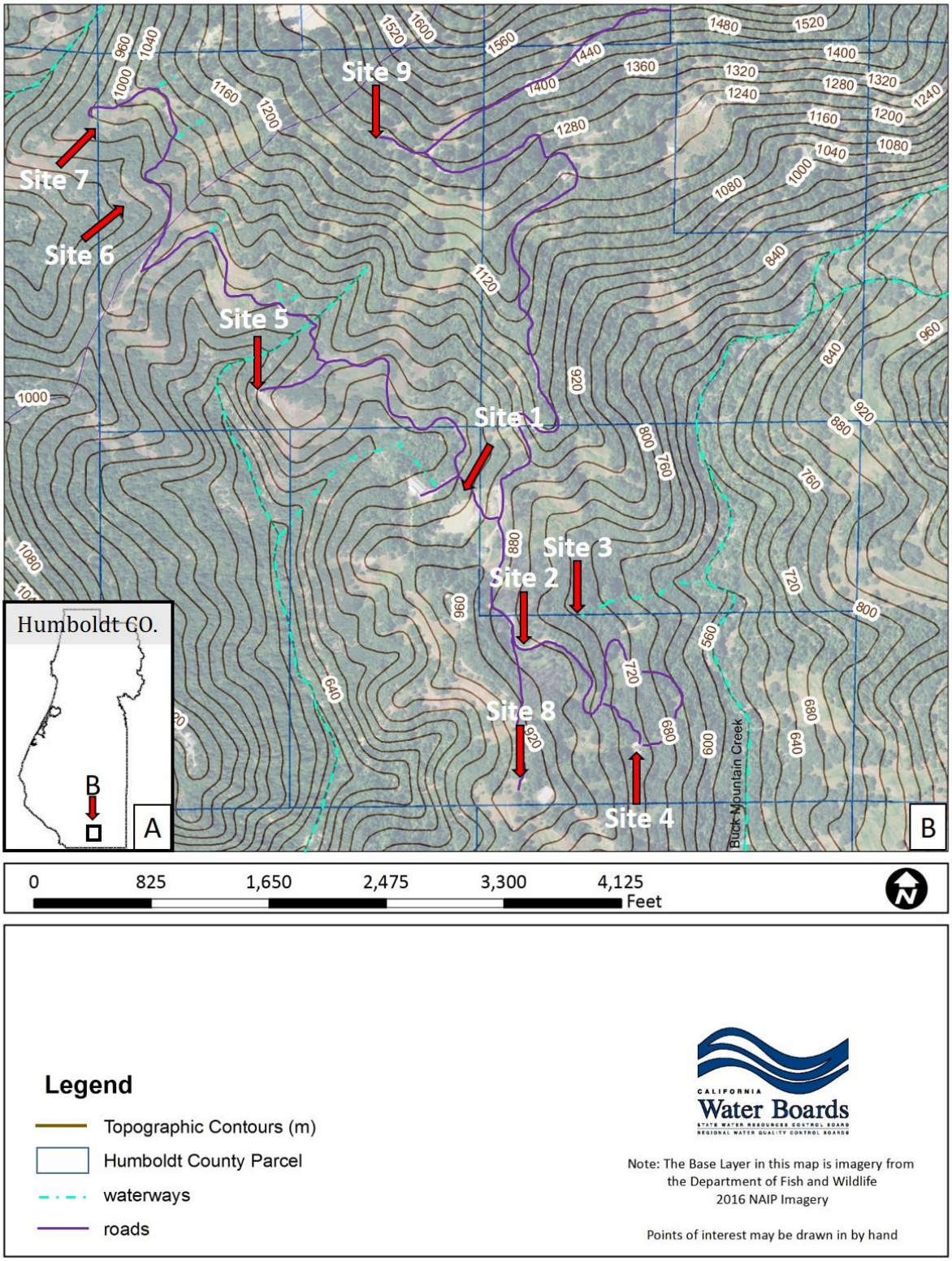
  - An implementation schedule that includes a time schedule for submitting permit applications to all applicable local, state, and federal agencies necessary;

- The plan should be submitted to the Regional Water Quality Control Board plan **within 45 days**.

- WRPP documents submitted on June 5, 2018 identify some work needed to bring the Property into compliance with standard conditions, however the documents do not provide a plan nor a timeline for doing this work.

  We recommend that the Discharger retain a licensed professional to develop a plan and timeline that addresses all of the issues in this report in addition to the Enlarged Pond. Submit to the Regional Water Board **within 45 days.**

Figure 1 — Property Map



LINDBERG GEOLOGIC CONSULTING
David N. Lindberg, Certified Engineering Geologist

ENGINEERING-GEOLOGIC R-2 SOILS EXPLORATION REPORT

Existing Pond Assessment, Tooby Ranch
Humboldt County, California

Assessor's Parcel Number: 223-074-004

Prepared for:
Mr. Tobias Dodge

David N. Lindberg, CEG 1895, Exp. 02/28/2018

November 7, 2017

Post Office Box 306 Cutten, California 95534 (707) 442-6000

LGC Project No. 0256.00

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Contents:

LINDBERG GEOLOGIC CONSULTING
707-442-6000

ENGINEERING-GEOLOGIC R-2 SOILS EXPLORATION REPORT
Existing Pond Assessment
Tobias Dodge, APN: 223-074-004
Tooby Ranch, Garberville, Humboldt County, California

1.0 INTRODUCTION
1.1 Site and Project Description

Presented in this report are the results of a site-specific, engineering-geologic soils reconnaissance conducted by Lindberg Geologic Consulting (LGC) on the Tooby Ranch near Garberville, California (Figure 1). Our explorations were limited to the location of an existing pond on Humboldt County Assessor's parcel 223-074-004 (Figure 2).

The existing pond observed on the parcel was constructed at a formerly-vacant site at the head of a small Class-III ephemeral watercourse. Runoff from this pond drains to the Class-III stream and thence, Panther Canyon Creek to the east Branch South Fork Eel River. Dimensions were estimated in the field to be approximately 290 by 140 feet. Capacity is estimated at 2.7 million gallons, according to the client. Located in the north eastern part of the parcel, the existing pond was reportedly constructed during July 2015, and was completed and filled at the time of our site explorations on October 16, 2017. Our area of exploration was limited to the pond area (Figures 1 and 3). This pond is accessed by an existing driveway. Overflow is discharged over the top of the pond berm dam through a rock-lined spillway.

Parcel 223-074-004 has an assessed lot size of 160 acres, and is located in a portion of the south half of Section 29, T4S, R4E. Latitude and longitude of the centroid of this parcel are 40.0804° and -123.7565°, respectively, per the Humboldt County WebGIS. This existing pond is located at approximately 40.08348° and -123.75792° (Figures 1 and 3).

Elevations on the subject parcel range from approximately 550 feet in the southwestern corner at Panther Canyon Creek, to 922 feet at the highest point of the parcel. Elevation of the existing pond is estimated to be approximately 880 feet (Figure 1). The subject parcel is situated on a generally southerly-trending spur ridge between Buck Mountain Creek and panther Canyon Creek (Figure 1), and is approximately 2.0 miles southeast of Garberville. Water is supplied by rainfall runoff and pre-existing springs. Ingress to the existing pond is via existing graveled ranch roads. To the best of our knowledge no new grading is proposed on the parcel at this time.

Included in this report are brief assessments of the site geology, subsurface soil conditions, and potential geologic hazards associated with the existing pond site. Recommendations are provided as necessary where appropriate, to mitigate potential negative effects of geologic hazards on this pond. Recommendations are provided for buttressing, overflow piping, and drainage and erosion control, for the pond.

LGC understands that the property owners require engineering-geologic review of the existing pond site for permitting purposes. The existing pond is used for agricultural water storage for cannabis cultivation. A Certified Engineering Geologist from our office examined the existing and potential pond sites on October 16, 2017.

1.2 Scope of Work

LGC was retained to observe and characterize the apparent adequacy of the construction of the subject pond. We were subsequently requested to provide recommendations for buttressing and a new overflow for the pond. As part of our scope we assessed potential geologic hazards, and prepared this brief engineering geologic soils report. The specific scope of this investigation included the following:

- Review pertinent published geologic maps and reports of this area.
- Conduct a reconnaissance field exploration program of the pond site.
- Prepare this engineering-geologic soils report to provide an assessment of stability.
- Provide earthwork and drainage recommendations for the owner and contractors.

Excluded from our scope of work were any other proposed or existing site developments, any environmental assessment for the presence or absence of any hazardous waste, toxic, or corrosive materials. Although we assessed subsurface conditions in this investigation, we conducted no laboratory testing of any samples for the presence of hazardous material(s).

1.3 Limitations

This report has been prepared for the exclusive use of Mr. Tobias Dodge, his contractors and subcontractors, and appropriate public authorities, for specific application to the pond site described on this parcel. We have endeavored to perform our services within the engineering-geologic standard of care common to the local area at the time this work was performed. LGC makes no other warranty, express or implied.

Analyses and recommendations contained in this report are based on data obtained from existing maps and reports, field observations and limited subsurface explorations. Methods indicate subsurface conditions only at locations explored, only at the time any excavations or borings were opened, and only to the depths penetrated. Soil observations and sampling cannot always be relied on to accurately reflect stratigraphic or lithologic variations that commonly exist between sampling locations, nor do they necessarily represent conditions at any other time.

Recommendations included in this report are based, in part, on assumptions about subsurface conditions that may only be tested during earthwork. Accordingly, the validity of our recommendations is contingent upon how they are applied in the field during construction. Experienced engineers and equipment operators should be retained where necessary and

appropriate to provide a complete professional service. LGC cannot assume responsibility or liability for the adequacy of our recommendations when they are applied in the field unless we are retained to observe those phases of the construction work applicable to our recommendations (e.g., earthworks). We are available to discuss the extent that such observations may be necessary to provide assurance of the validity of our recommendations.

Do not apply any of this report's conclusions or recommendations if the nature, design, or location of the pond is changed. If changes are contemplated, LGC should be contacted and consulted to review the impact of the changes on the applicability of the recommendations in this report. Note that LGC is not responsible for any claims, damages, or liability associated with any other party's interpretation of the subsurface data or reuse of this report for other projects or at other locations without our express written authorization. There is no warranty, express or implied.

2.0 FIELD EXPLORATION AND LABORATORY TESTING

2.1 Field Exploration Program

In-situ soil conditions were assessed during a site visit on October 16, 2017. Our explorations utilized observation of existing cut slopes, and the materials in the fill prisms of the pond, to assess the in-situ soil profiles. Soil stratigraphy was observed and interpreted in the field and in general accordance with ASTM standards.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Topography and Site Conditions

On this subject parcel, the existing pond is located on sloping ground with a generally westerly aspect. Maximum slope gradients are approximately 15 to 30 percent at the existing pond site, becoming steeper (30% – 50%) on the west. Steeper-, and gentler-gradient slopes exist in the vicinity, but are generally well-separated from the existing pond location. Slopes prior to grading are estimated to have been 30 percent, or more, in the area of the pond berm dam.

The U.S. Geologic Survey (USGS 1970) 7.5-minute topographic "Garberville, Calif." quadrangle indicates that this subject parcel is situated at elevations ranging between approximately 550 to nearly 925 feet above mean sea-level (NAD83) with slopes greater than 30 to greater than 50 percent across large portions of this parcel. Surrounding the existing pond, the slopes to the north, east and south, rise at 30 to 50 percent. Based on review of satellite imagery back to November 20, 2004, some of the "undisturbed" slopes in the vicinity of this pond appear to have been altered by past grading, thus the topography of the ground where the pond berm dam was constructed is obscure. Native slopes in the immediate vicinity of the pond appeared generally-stable in their present condition.

The parcel is located in the Coast Ranges Geologic Province and is underlain by late Pleistocene to middle Miocene marine and nonmarine overlap deposits. McLaughlin and Others (2000) designate these overlap deposits as QTw, and describe them as follows:

"Thin-bedded to massive, weakly lithified siltstone, fine- to medium-grained sandstone, silty to diatomaceous mudstone and locally soft, scaly mudstone. Locally includes lenses of pebble to boulder conglomerate, carbonate concretions, abundant molluscan fossils, woody debris, and horizons of rhyolitic volcanic ash that are greater than 1 meter thick in some areas. Includes the Wildcat Group (Ogle, 1953), the Bear River beds (Haller, 1980), and related outlier Neogene deposits isolated along faults near Briceland, Garberville, Benbow, Piercy, Bridgeville and northeast of Weott. Unit also includes minor fault-bounded blocks along or near the coast between Bear River and the Mattole River that are incorporated into mélange of the Coastal terrane; the Neogene Falor Formation northeast of Eureka (Manning and Ogle, 1950); and equivalent deposits in the offshore area deposited in shelf, slope, and slope basin settings."

3.2 Geologic Setting

The subject parcel is located north of the East Branch South Fork Eel River, approximately two miles northeast of Benbow. This pond drains to an ephemeral tributary of Panther Canyon Creek (Figure 1). Based on our field review of this pond site, satellite imagery, and published geologic maps (McLaughlin and Others, 2000), we find the project site is underlain by sandstone and siltstone of the overlap deposits, likely a distal exposure of the Wildcat Group.

At this existing pond site, the observable subgrade appeared to consist of medium dense to dense silty fine sandstone and siltstone. At the pond location, native topsoil and some portion of the upper native soil profile had been stripped by prior site grading activities. Undisturbed native soil below the existing ground surface at this site appeared suitable as subgrade bearing material for the existing pond. Soil profiles appeared to become more dense with depth.

3.3 Seismicity

The subject property is located within California's Northern Coast Ranges Geomorphic Province (CGS, 2002), a seismically active region in which large earthquakes are expected to occur during the assumed economic life span (50 years) of the site developments (Heaton and Kanamori, 1984). The Northern San Andreas fault, which comes ashore at Shelter Cove, approximately 16 miles to the west-southwest, is the nearest active fault, as defined by the State of California. The Northern San Andreas fault is a northwest-striking, near-vertical, right-lateral strike slip fault. The upper-bound earthquake considered likely to occur on the Northern San Andreas fault has an estimated maximum moment magnitude (Mw) of 7.9 (Petersen et al., 1996).

Based on the record of historical earthquakes (approximately 150 years), faults within the North American plate boundary zone and internally-deforming, subducting Gorda and Juan de Fuca

plates have produced numerous small-magnitude and several moderate to large (i.e. magnitude 6.0 or greater) earthquakes affecting the local area. The Cascadia subduction zone (CSZ) is located approximately 15 miles west of the subject parcel and is estimated to be capable of producing earthquakes of magnitude 9.0 when its entire length ruptures from Cape Mendocino to Vancouver Island in British Columbia (Satake, et al, 2003). Several active regional seismic sources in addition to the CSZ, and the Northern San Andreas fault, are proximal to the project site and have the potential to produce strong ground motions. These seismic sources include:

- Mendocino fault offshore: a high-angle, east-west trending, right-lateral strike-slip fault between the Gorda plate and Pacific plate approximately 17 miles to the southwest.
- Faults within the internally-deforming Gorda and Juan de Fuca plates consisting of high-angle, northeast-trending, left-lateral, strike-slip faults.

3.4 Subsurface Conditions and Description of the Site Soils

Subsurface data obtained during our site exploration of the subject property, indicate soils within at least the upper eight to nine feet of the soil profile to consist of silty fine sand (SM), and weakly-indurated sandstone and siltstone. Native topsoil was disturbed or removed by prior grading activities. Native soils below the existing ground surface appeared medium dense to dense in the soil profiles observed in local excavations. Based on field observations of the soil conditions, site soils do not appear to be subject to high groundwater conditions; no soil mottling or free groundwater was encountered. These existing parcels drain to the Mattole River, approximately one-half mile to the west-southwest. Late in the dry season (October), there was no groundwater observed on or near the pond site.

Native sandy and silty soil materials we observed continued to the maximum depths exposed are estimated to be dense and friable. Soil structure within the upper nine feet is weakly developed. Materials below six feet are interpreted to grade to more-dense sandstone and siltstone bedrock, with relatively-intact bedrock at some depth below the surface (bgs).

3.5 Groundwater Conditions

Late in the dry season, groundwater was not encountered in our explorations. No perched water was observed. Soil mottling, considered indicative of seasonally-saturated or high groundwater conditions, was likewise not observed. It is unlikely that groundwater will rise to within five feet of the ground surface except perhaps briefly in winter during more-intense storm events.

4.0 GEOLOGIC AND SOIL HAZARDS

Potential geologic and soil hazards associated with the region and the proposed project at this site include seismic ground shaking, surface fault rupture, liquefaction and related phenomena, settlement, slope instability, flooding and high groundwater, and swelling or shrinking soils. Brief assessments of these potential hazards are presented below.

4.1 Seismic Ground Shaking

As noted in Section 3.3, the project site is situated within a seismically active area proximal to multiple seismic sources capable of generating moderate to strong ground motions. Given the presence of significant regional active faults within and offshore of northern California, there is high likelihood that the project site will experience strong ground shaking during the economic life span of this pond (50 years).

Site-specific seismic Spectral Response Accelerations are presented in Table 1, below, in accordance with 2016 California Building Code (CBC 2016) requirements, and were obtained from the USGS. The on-line USGS ground motion parameter calculator provides spectral acceleration values (S_s and S_1) based on the site specific geographic coordinates, the latest available seismic database maintained by the USGS, the site classification, site coefficients, and adjusted maximum considered earthquake values (F_a, F_v, SM_s and SM_1).

Based on the site conditions and assumptions of the soils and geologic materials within 100 feet of the ground surface, we conservatively classify the site as Site Class D consisting of a "Stiff soil" profile (Section 1613.3.2, 2016 CBC). The parameters in Table 1 below are based on this classification and were determined using the 2010 ASCE Standard 7 (w/March 2013 errata), minimum design loads for buildings and other structures (USGS, 2016).

Table 1. Spectral Response Accelerations; APN 223-074-004

Site Information	Latitude / Longitude*	40.0804° / -123.7565°
	Occupancy Risk Category (2016 CBC, Sect. 1604.5)	II
	Seismic Design Category (2016 CBC, Sect. 1613.3.5)	D
	Site Class (2016 CBC, Sect. 1613.3.2)	D
Spectral Acceleration	S_s (Site Class C)	1.973
	S_1 (Site Class C)	0.800
Site Coefficients	F_a / F_v	1.0 / 1.5
Response Accelerations	S_{MS}	1.973
	S_{M1}	1.200
	S_{DS}	1.315
	S_{D1}	0.800

* Coordinates for the Parcel Centroid per Humboldt County WebGIS.

4.2 Surface Fault Rupture

The Coastal Belt thrust lies to the west of the property (McLaughlin, et al., 2000), and the Garberville-Briceland fault (CDMG, 1983) is to the southwest. These are ancient inactive faults, and are therefore not zoned as "active faults" by the California Geologic Survey. The subject parcel is not located within an Alquist-Priolo earthquake fault zone where the State of California anticipates potential surface rupture. Based on the distance to the nearest active fault trace, the potential for surface fault rupture on the subject property is low.

4.3 Liquefaction

Liquefaction is a loss of soil strength that results in fluid mobility through the soil. Liquefaction typically occurs when uniformly-sized, loose, saturated sands or silts that are subjected to strong shaking in areas where the groundwater is less than 50 feet below ground surface. In addition to the necessary soil and groundwater conditions, the ground acceleration must be high enough, and the duration of the shaking must be sufficient, for liquefaction to occur.

According to Special Publication 115, Map S-1 (CDMG, 1995), the project site is not located within an area of recognized liquefaction potential. Based on the lack of saturated, loose, poorly-graded sand or silt in the soil profile, the potential for liquefaction to occur at this site is considered low. Site-specific quantitative evaluation of liquefaction potential was not performed.

4.4 Settlement

The shallow bearing soils at this pond site, below the existing stripped ground surface, are silty fine sand with minor clay. By our observation, the existing pond berm dam exhibited no apparent settlement issues. The pond berm dam fill had experienced no fill material slope failures at the time of our site observations in October 2017. Through the past two winter wet seasons, this pond berm dam appeared to have performed acceptably.

4.5 Landsliding

Landslide mapping has been published by the CDMG for all of the Garberville Quadrangle, (Spittler, 1984) however; the landslide inventory mapping, and other geologic mapping (e.g., McLaughlin, 2000); show no areas of potential instability, and no earthflow landsliding at the location of the existing pond sites. A landslide is mapped on the neighboring parcel to the northeast, on the other side of the ridge from this pond. Site-specific exploration of this pond revealed no associated areas of instability. Satellite imagery indicated that a recent slope failure, apparently an earthflow, recently occurred approximately 350 feet west of this pond.

4.6 Flooding and Groundwater

4.6.1 Flooding

The subject site is located on high ground above Panther Canyon Creek and other watercourses in the vicinity. Potential for flooding to affect this existing pond site is minimal.

4.6.2 Groundwater

In our opinion, based on our field exploration and professional experience, seasonally high groundwater conditions have little potential to occur at this site. During our field investigation, our observation of the lack of free groundwater or soil mottling, indicates groundwater is unlikely to rise to within five feet of the ground surface during the winter wet season. Shallow groundwater conditions appear unlikely to have an adverse effect on the performance of the existing pond, provided our recommendations are adhered to.

4.7 Soil Swelling or Shrinkage Potential

At this pond site, bearing soils consist of silty fine sand with minor clay. Soils contained few fragments of other lithologies. Soils were dry on the surface and moist within one foot of existing grade in October. Soils appeared relatively well-drained by secondary tubular and fracture porosity.

The presence of clay makes these soils subject to significant shrink-swell potential associated with cyclic seasonal wetting and desiccation. Site soils do not appear likely to desiccate seasonally to a depth sufficient to affect a typical foundation system built according to current building codes. The pond will also prevent desiccation and subsequent shrinkage of the soils. The shrink-swell hazard to the pond berm dam is low.

5.0 CONCLUSIONS AND DISCUSSION

1) Slope instability, a primary potential geologic hazard on the subject parcel, does not appear to be a significant hazard to the pond in its present location.

2) This pond is underlain by dense soils at depth. These materials appeared to be a suitably-firm subgrade in which to embed compacted fill for a pond berm dam.

3) Late in the dry season, our field explorations found no free groundwater, or evidence suggestive of seasonally-high groundwater at this existing pond location. Perched groundwater was not observed. Nor was soil mottling indicative of seasonal high groundwater conditions observed. The site soils appear relatively well drained and permeable. Potential for groundwater to rise to problematic shallow depths is low. We were informed that there were a couple of small springs at the pond site prior to development; we understand these are now in the pond.

4) The nearest faults to the site are the inactive Coastal Belt thrust, and the Garberville-Briceland fault to the east. The State of California does not consider these faults active. The active San Andreas fault is approximately 16 miles from the subject property. Due to the fact that there are no recognized active faults on or near the property, the risk of fault surface rupture at the site may be characterized as low.

5) Strong seismic ground shaking, however, will occur during the economic life of any developments on the subject property. Risks associated with strong ground motions are typical of the region and as such, these risks, as mitigated by prudent, code-compliant design and construction are assumed by owners and developers in the area. The existing pond construction was not observed while in-progress.

6) Overflow is via a rock-lined spillway approximately 30 feet in width, and 1-foot lower than the dam crest. Overflow travels down the face of the pond berm dam in a rock-lined swale

to the Class-III watercourse below. Even qualitatively, we cannot estimate if this pond will resist deformation during strong seismic shaking. Having had no involvement in the design or construction of the pond, we can not provide a quantitative seismic stability evaluation.

6) For the native silty fine sand with clay, a presumptive load-bearing value of 1,500 pounds per square foot (psf) for vertical foundation pressure would be used for design. For lateral bearing use 100 psf per foot of embedment below grade. For lateral sliding resistance, use a cohesion factor of 130 psf, multiplied by the contact area.

7) The undisturbed native soils at a depth of two feet below the surface appear suitable to support earthen fills designed and constructed in accordance with the current building code requirements.

8) In our professional opinion and provided our recommendations are adhered to, this pond is not expected contribute to, nor be subject to, any site-specific geologic hazards. In our opinion, the existing pond appeared marginally well-constructed, but its stability is debatable.

We understand from our on-site observations that this pond is not lined. As discussed, the existing pond appeared to be built to an acceptable standard, but we were not present to observe the site prior to construction, and we did not observe any of the earthworks during construction operations. Therefore, we have no knowledge of how the earth fills were placed or of how the ground was prepared to receive the fill.

It is our opinion, based on observation of the appearance, that the existing pond is not acceptably constructed. The outboard face of the pond berm dam is steeper than the two horizontal to one vertical (2 to 1) slope typically recommended for such structures. A spillway of the type apparently constructed on this pond is not an optimal, nor a preferred design. An overflow pipe (or pipes) with at least 12-inches of freeboard above the pipe is preferable.

6.0 RECOMMENDATIONS

6.1 Slope Setback Considerations

We recommend a minimum construction setback of eight (8) feet from slopes steeper than 30 percent. If any other pond sites are proposed for elsewhere on the property, those sites should be reviewed and setbacks should be established separately from the nearest grade breaks to slopes greater than 30 percent. At minimum, we recommend that space always be allowed to permit access by a typical "bobcat" type tractor around and across pond berm dams, and any ascending and descending slopes, to provide access for repairs should problems occur.

6.2 Site Preparation

To construct a new pond, one would typically remove all existing sod, topsoil, sidecast fill, imported gravel or road base, rubble, and any other debris encountered at or below the ground surface from areas of the pond footprint, and from an area eight feet (minimum) beyond the perimeter. Any stumps left from tree removal or historic logging would also be removed. Excavated sod and topsoil would be stockpiled for later use as landscaping fill material. Road base or imported gravel (if any) would also often be stockpiled for subsequent incorporation in the pond berm structural fill.

Earthwork, including but not limited to, site clearing, grubbing and stripping should be conducted during dry weather conditions; generally May through September. Failure to comply with this recommendation can result in detrimental erosion or sedimentation. Erosion and sediment control recommendations are provided later in this report.

6.3 Temporary Excavations

Temporary construction slopes are not anticipated for this project. However, if any temporary construction slopes are proposed, they should be designed and excavated in strict compliance with applicable safety regulations including the OSHA Excavation and Trench Safety Standards. All construction equipment, building materials, excavated soil, vehicular traffic, and other similar loads should never be allowed near the top of any unshored or unbraced excavations. Where the stability of adjoining buildings, walls, pavements, or any other similar improvements may be endangered by excavation operations, support systems such as shoring, bracing, or underpinning may be necessary and should be provided to provide structural stability and to protect any personnel working in the excavation.

Since excavation operations are dependent on construction methods and scheduling, the owner and contractor shall be solely responsible for the design, installation, maintenance, and performance of all shoring, bracing, underpinning, and other similar systems. Under no circumstances should any comments provided herein be inferred to mean that LGC is assuming any responsibility for temporary excavations or the safety thereof. LGC does not assume any responsibility for the design, installation, maintenance, and performance of any shoring, bracing, underpinning, or other similar systems unless they are designed specifically for the work at this site by a licensed professional from this office.

6.4 Cut and Fill Slopes

Pond excavations create short cut and fill slopes. Cut slopes are recommended to be no steeper than 1:1 (H:V) under the liner of a lined pond. Cut slopes exposed to water or air should not exceed 2:1. Fill slopes of compacted soils should be no steeper than 2:1 on the outside face of the pond berm dam, and not more than 3:1 inside the pond. Unrestrained ancillary cut and/or fill slopes (if any) with heights in excess of four feet should be no steeper than two to one, horizontal

to vertical (2:1, H:V). Pond grading should be designed by an experienced civil engineer, and constructed in accordance with the County grading ordinance and current CBC requirements.

This pond, although apparently not constructed to a rigorous standard, is not expected to have a negative impact on the stability of the adjacent slopes, or to impact watercourses, provided our recommendations are adhered to. We recommend two, 12-inch diameter (minimum) galvanized, corrugated metal CMP), overflow pipes, with at least 12 inches of freeboard above the top of pipe, should be constructed at this pond to control discharge of overflow. Continue the CMP down the face of the pond berm dam to an outlet point in the native stream course with effective erosion control at the outlet of the overflow discharge pipes. Tees at the ends of the pipes armored by rock slope protection such as "Light" or "Backing/Facing" RSP per Caltrans.

6.5 Structural Fills

A pond berm dam structural fill should be constructed as a controlled and compacted engineered fill. Structural fill should be free of organic materials and may be composed of low plasticity clay, sand, or well graded gravel. Native soils below the topsoil appeared suitable for use as general engineered fill for the pond berm provided they were moisture conditioned, free of organic or deleterious materials, and particles larger than approximately 3-inches in diameter.

Imported fill material is anticipated to be required to achieve acceptable finished grades on this pond site; possibly sufficient material sources may be available on the property, but we have not evaluated any. If additional fills are used, there are native site soils which may be suitable for such use. Pond berm dam fills should consist of select, non-expansive engineered fill. The material for select, engineered fill should be free of organic material and particles larger than approximately 3-inches in diameter, and should meet the following minimum criteria:

- Plasticity Index: 15 or less,
- Liquid Limit: 35 or less,
- Percent Passing #200 sieve: 10 to 40%,
- Maximum Particle Size: 3 inches

Avoid fill placement on sloping ground. Pond berm dam fills should be place on level, suitably prepared subgrade surfaces and keyed into the native subgrade. Pond berm dam fills should be compacted mechanically as described below to minimize the potential for settlement.

Structural fills such as pond berm dam fills should be placed on level, benched, suitably prepared subgrade surfaces and should be compacted mechanically to minimize potential settlement and seepage. Approved fill material should be placed in loose lifts no more than 8 inches thick, uniform moisture content at or near optimum, and compacted mechanically.

Structural fill used to construct the pond berm dam, should be subject to compaction testing and inspection during construction. It is prudent to monitor the suitability of such fill materials as placed, and to assure compliance with the recommended compaction standards. Structural fills should be compacted as specified in the "Compaction Standard" section following below.

6.6 Compaction Standard

Fill for the pond berm dams should be compacted mechanically to 90 percent relative compaction so that no construction consolidation or settlement will occur. Vibratory mechanical compactors should be employed to achieve the recommended compaction. Within small shallow excavations such as around pipes, it is recommended that vibrating plate compactors (e.g., "wacker packers") be used. If no other compaction is performed, fill materials should be compacted to be firm and unyielding under a loaded 10-yard dump truck, at minimum.

For granular fill material such as sand and gravel, smooth-drum vibratory compactors should be used. Flooding of granular material should never be employed to consolidate backfill in trenches or other excavations.

It is recommended that structural fill and backfill material be compacted in accordance with the specifications listed in Table 2 below. A qualified person should be present to observe fill placement and assess the field density throughout each lift to verify that the specified compaction is being achieved by the contractor.

TABLE 2 – STRUCTURAL FILL PLACEMENT SPECIFICATIONS

Fill Placement Location	Compaction Recommendation	Moisture Content (Percent Optimum)
Structural fill and Pond Berm fills.	90 percent	-1 to +3 percent
Utility trenches within building and driveway/parking areas	90 percent	-1 to +3 percent
Landscape and grass areas	Compact such that no settlement will occur	-1 to +3 percent

6.7 Pond Berm Dam Enhancement Design Criteria

For the existing pond, we recommend placement of fill on the outboard side to bring the slope to 2:1. The toe of the added fill should be keyed into the slope a minimum of 24-inches below the topsoil and root zone. Added fill may be soils placed, compacted and tested as described above, or using facing class RSP (per Caltrans) as a buttress fill. For the pond berm enhancement, excavate and stockpile existing topsoils for later reuse as landscape fill. Stockpile native mineral soil below the topsoil and root zone for later use as structural fill. Excavate a level bench, at least two feet into firm, undisturbed native soil materials. Construct the bench to accommodate the length and width of the buttress fill along the length of the pond berm dam base. Continue the

embedment to the end of the berm at the hillside abutments. Use stepped excavations to embed the abutments of the buttress into the adjacent hill slopes.

We recommend that the base of the pond berm dam excavation be observed and approved by a qualified professional prior to the placement of any fill. Fill should be placed with a moisture content at or near optimum, and compacted mechanically to 90 percent relative compaction, with sufficient observation and testing to ensure conformance with our compactions. Continue the buttress fill to the top of the existing pond berm dam. Construct the berm with a crest width of at least 8 feet for access with a mini-excavator or small backhoe, for potential future maintenance and repair needs. Surface the pond berm dam crest with at least 6 inches of Class-2 aggregate base (or equivalent) for such vehicular access.

Securely anchor the CMP overflow pipes to the face of the pond berm dam. Place securely-anchored "Tees" at the outlet end of the overflow pipes to slow the velocity of the discharge. Armor the outlet of the overflow pipe with Light RSP boulders (per Caltrans), and fill the interstices with coarse gravel to limit the potential for erosion. For further erosion control, line the drainage way (an unclassified drainage) below the outlet pipe with Light RSP and coarse gravel, and continue for at least 20 feet downhill below the outlet. The drainage way should be wide enough to contain the maximum potential outflow from the pond; we estimate that the existing depth and width of the native watercourse will be sufficient.

All bare soil areas around the rebuilt pond berm dam should be treated to control erosion. Generalized erosion control measures for the project site are listed in Section 6.9 below. Around the pond, we recommend that all exposed soils in the pond berm dam face, and all cut slopes, and any other bare soil areas be seeded with native grasses and covered with straw erosion control blankets. Anchor the straw erosion control blankets securely to the bare soil cut and fill slopes. Following the recommendations of the manufacturer, install silt fencing, securely anchored, at the toe of the pond berm dam. If compacted earth is used to buttress the existing pond berm dam fill, we recommend that fiber rolls (straw wattles), be placed contour-parallel at the approximate midpoint of the pond berm dam face slope.

6.8 Drainage

Grading performed should be conducted to create surface gradients adequate to provide for positive drainage by sheet flow. We recommend that flat areas around the pond be surfaced with an eight inch thick layer of Class-2 aggregate base (or equivalent), compacted to provide a firm wearing surface for the personnel and equipment that may potentially operate on the periphery of the pond, or on the pond berm dam.

Landscaping design, grading and construction should be such that no water is allowed to pond onsite, or to migrate beneath any structural fills. Runoff from the site should be controlled and

discharged such that no erosion, sedimentation or discharge of turbid water to perennial streams will occur. Storm water runoff should be controlled with the installation of rock-lined channel drainage ways, and discharged at suitable outlet points, armored with small boulders, cobbles and coarse gravel, such that no erosion, sedimentation, or ponding will occur.

6.9 Erosion and Sediment Control Recommendations

Wet weather conditions can occur at any time at the subject property but are "a given" from Mid-October through early April. Storm water erosion and pollution prevention measures should be initiated concurrently with any ground disturbance, and completed prior to the winter rains.

Except in an emergency, we recommend always avoiding wet-season earthwork and grading. To the extent feasible for this project, Humboldt County Erosion Control Standards should be incorporated into the project design and strictly adhered to during construction; a current edition may be obtainable from the Building Department. We specifically recommend the following erosion and sedimentation control measures:

- Prevent discharge of suspended sediment; contain sediment on the site.
- Following earthwork, cover disturbed soils above the waterline with stockpiled topsoil.
- Re-vegetate disturbed soils and replaced topsoil concurrently with earthwork.
- Seed, and mulch exposed flat soil areas with straw at minimum to protect against erosion.
- "Punch" straw into the soil to minimize the potential for wind to blow the straw away.
- Exposed sloping ground, especially fill slopes, will not be protected adequately with only straw mulch and should have straw mats (with seed), straw wattles, and silt fencing.
- Seed mulched soils immediately; water through the dry season as necessary to establish grass for erosion protection.
- Install silt fence at the toes of all fill slopes and at the base of the pond berm dam.
- Install a rock energy dissipation structure at the outlet point of the pond overflow.
- Direct overflow toward the unclassified drainage below the pond.
- Cover all temporary soil stockpiles with plastic sheeting (6 mil min.) and anchor securely to prevent wind disturbance.
- Drive no vehicles on the native site soils when they are wet; at minimum use six inches of compacted, crushed rock or road base gravel to pave driveways, parking areas, and other areas accessed by vehicles during wet weather.
- Repair improperly functioning erosion control measures immediately when necessary.
- Monitor site conditions (before and after runoff-generating rainfall events to verify proper functioning of erosion control measures, and to repair them when/if necessary.

6.10 Additional Services

6.10.1 Review of Grading and Drainage Plans

The conclusions and recommendations provided in this report are based on the assumption that soil conditions encountered during grading will be essentially as exposed during our evaluation, and that the general nature of the grading and use of the property will be as described above. We recommend that final drafts of grading plans be reviewed by this office prior to implementation.

6.10.2 Observation and Testing

To assure conformance with the specific recommendations contained within this report, and to assure that the assumptions made in the preparation of this report are valid, LGC should be retained to review any new design plans. We should also review and provide written approval of the exposed subgrade prior to placement of the pond berm dam structural fill. Sufficient testing and observation should be performed during construction to ensure that the compaction standards specified above are adhered to.

7.0 REFERENCES

CBC [California Building Code], 2016, California Code of Regulations, Title 24, Part 2, Volume 2. California Building Standards Commission.

CDMG, 1995, Planning Scenario in Humboldt and Del Norte Counties, California, for a Great Earthquake on the Cascadia Subduction Zone, Special Publication 115.

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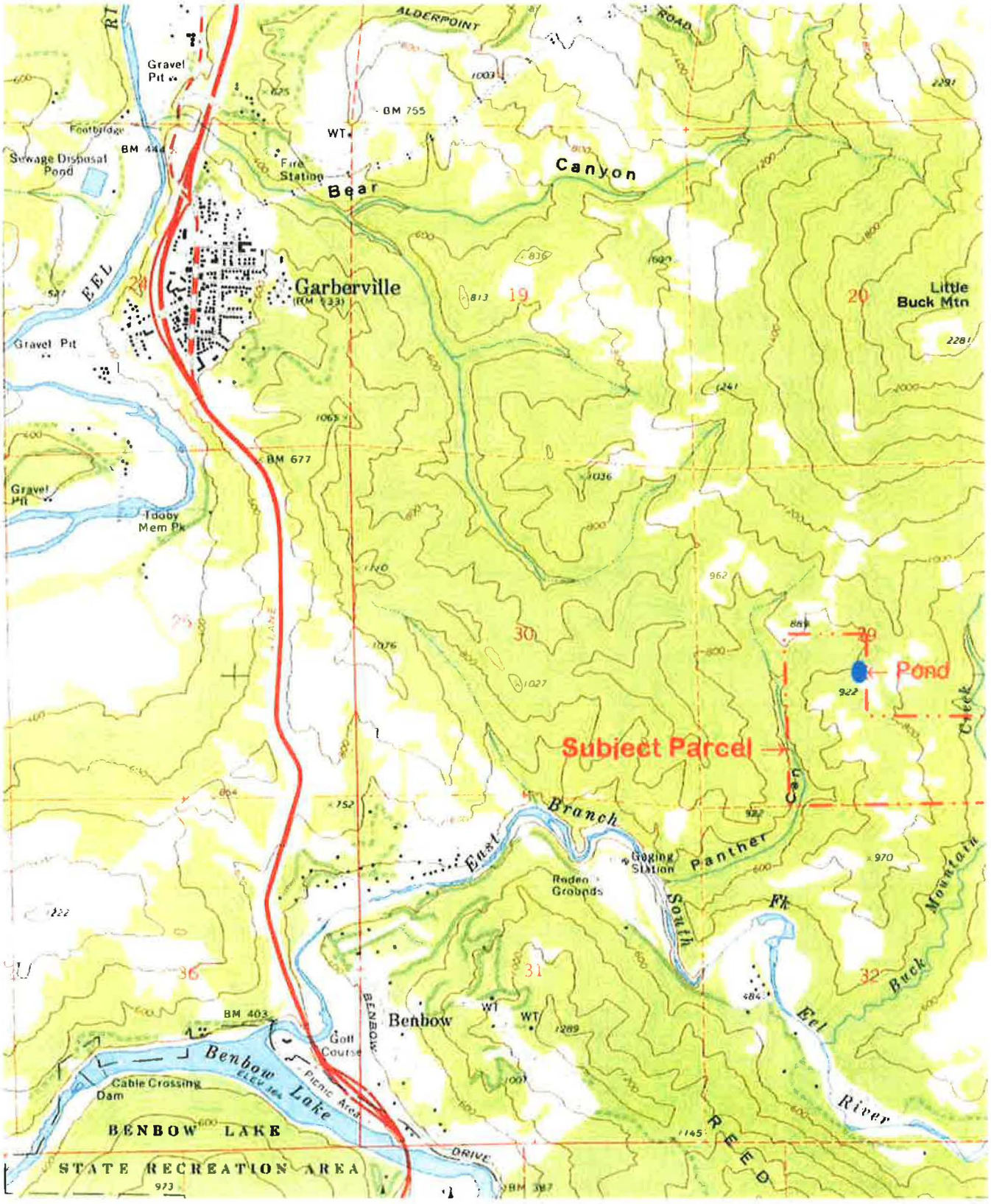
8.0 LIST OF FIGURES

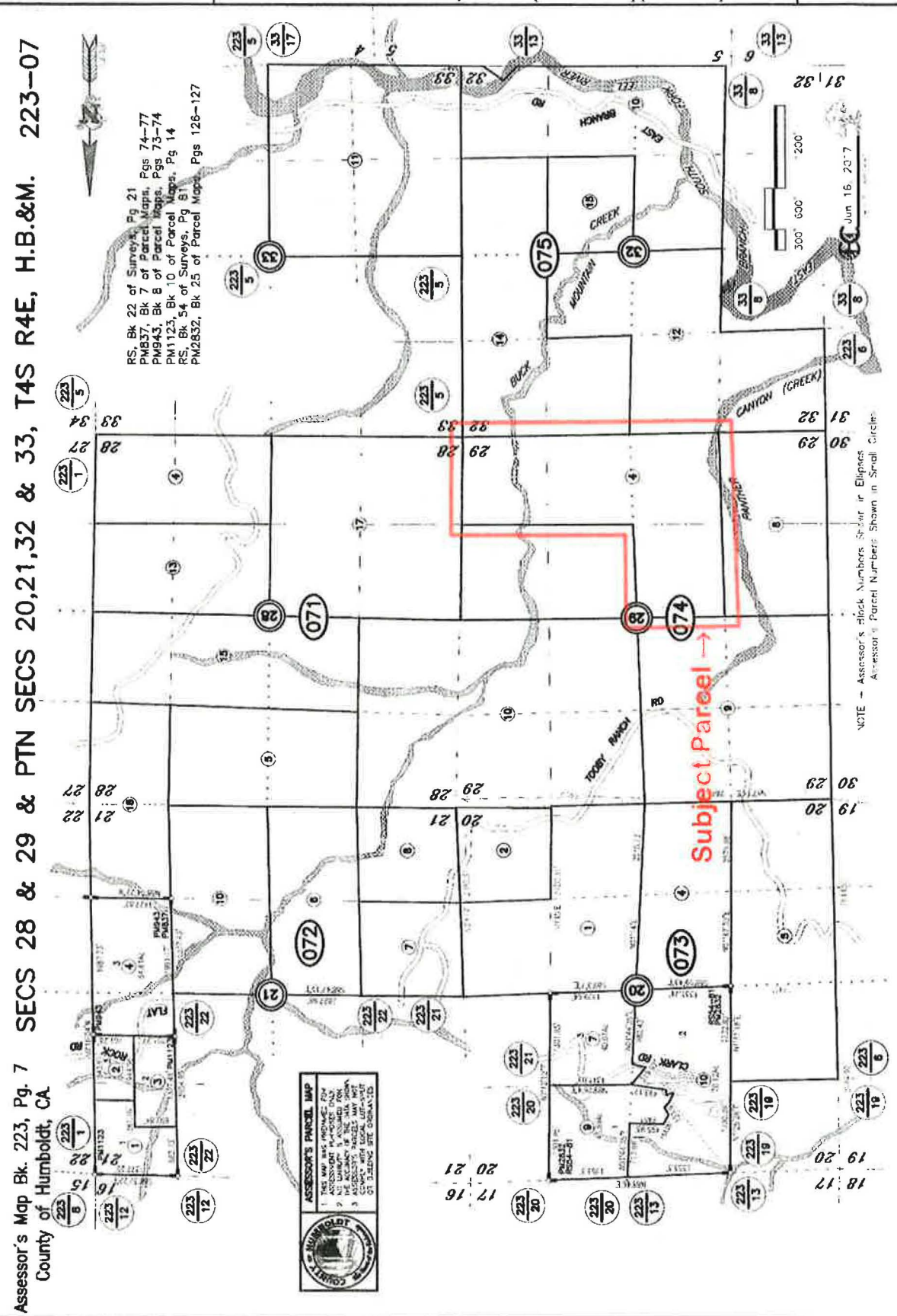
Figure 1: Topographic Property Location Map
Figure 2: Annotated Assessor's Parcel Map
Figure 3: Satellite Image Pond Site

Lindberg Geologic Consulting	Engineering-Geologic R-2 Soils Exploration Report	Figure 1
Post Office Box 306	Pond Assessment, Tooby Ranch, Garberville, Humboldt County	November 7, 2017
Cutten, CA 95534	APN 223-074-004, Mr. Tobias Dodge, Client	Project 0256.00
(707) 442-6000	Topographic Property Location Map (All Locations Approximate)	1 inch ≅ 2,100 feet

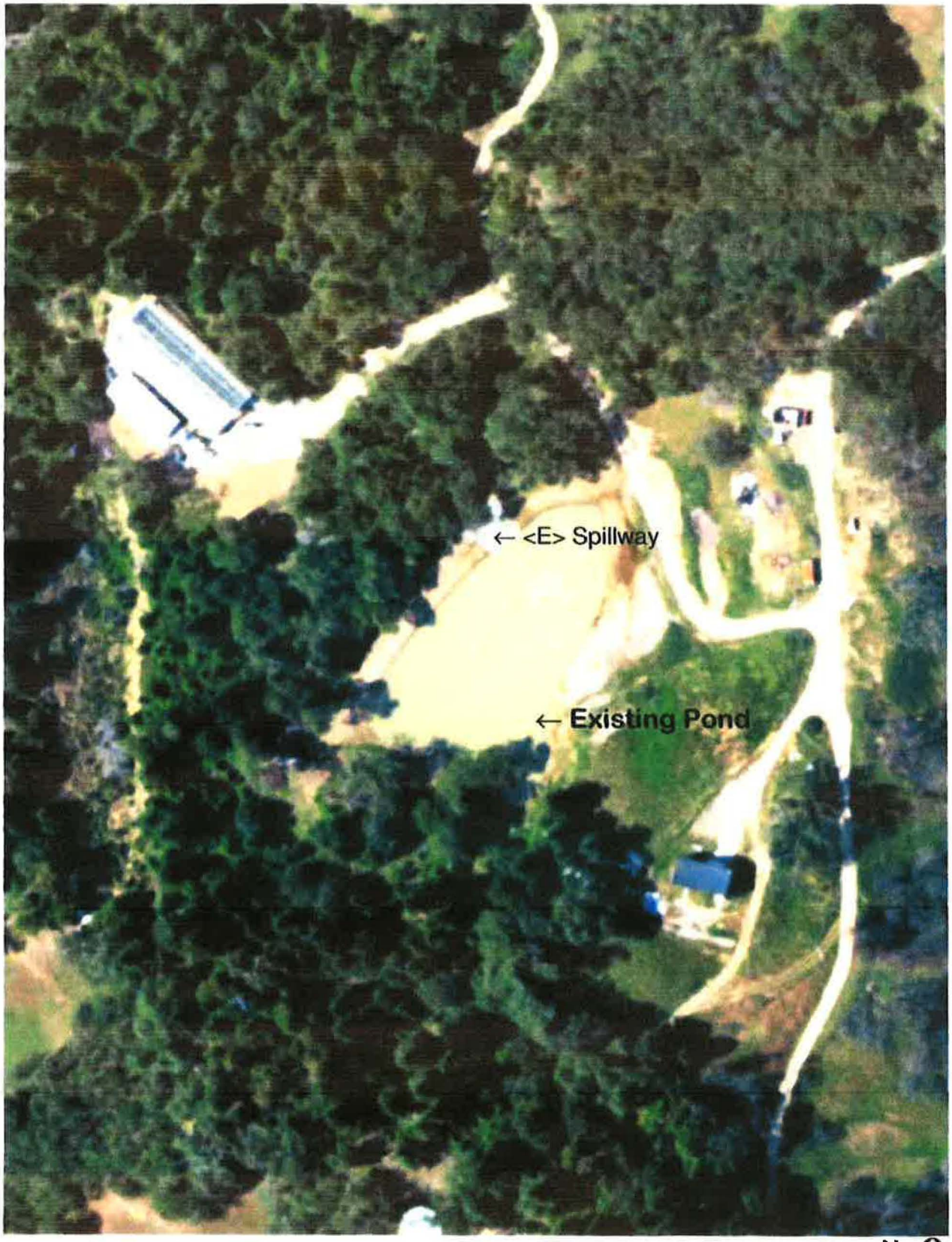


Modified from: USGS "Garberville, Calif.", 7.5' Quadrangle Map, 1970. N ≅

Lindberg Geologic Consulting	Engineering-Geologic R-2 Soils Exploration Report	Figure 2
Post Office Box 306	Pond Assessment, Tooby Ranch, Garberville, Humboldt County	November 7, 2017
Cutten, CA 95534	APN 223-074-004, Mr. Tobias Dodge, Client	Project 0256.00
(707) 442-6000	Assessor's Parcel Map 223-07 (Locations Approximate)	Scale as Shown



Lindberg Geologic Consulting	Engineering-Geologic R-2 Soils Exploration Report	Figure 3
Post Office Box 306	Pond Assessment, Tooby Ranch, Garberville, Humboldt County	November 7, 2017
Cutten, CA 95534	APN 223-074-004, Mr. Tobias Dodge, Client	Project 0256.00
(707) 442-6000	Satellite Image of Existing Pond Site (Locations Approximate)	1 inch ≅ 125 feet



Modified from: Humboldt County WebGIS imagery, 2017. N ≅

Appendix B

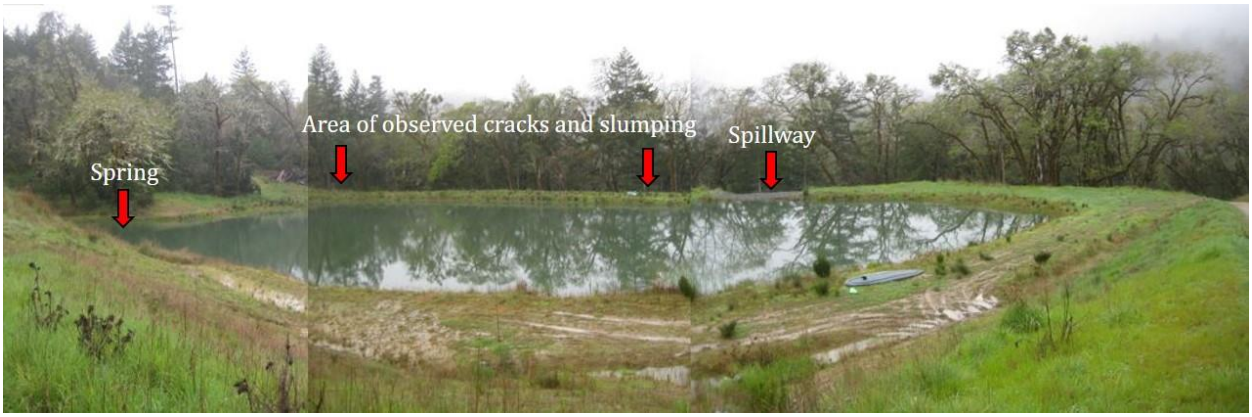


Photo 1. Pond overview looking northwest.

Photo 2. Cracks and slumping on outslope face of the northwest pond buttress, southwest of the spillway.

Photo 3. Picture showing water level in pond near dam crest.

Photo 4. Looking northwest from top of spillway.

Photo 5. Pond spillway, taken from road leading to Site 1 greenhouse (Glass House).

Photo 6. Incised channel west of dam spillway. Picture taken from dam crest looking northwest. Site 1 Glass House is in the center, background of the image.

Photo 7. Water flowing over road-surface on road leading to Site 1 Glass House.

Photo 8. Water course capturing pond outflow and Site 1 Glass House runoff. Looking north from road leading to Site 1 Glass House.

Photo 9. Southeast side of Site 1 Glass House. Potting soils, identified by the white speckles of perlite, have been disposed of outside of greenhouse. Stormwater runs over soils to a trench in the background of the image and then through a pipe that discharges to waterway shown in photo 8.

Photo 10. Northwest of Site 1 greenhouse. Water runs off roof, over disposed potting soils and then toward watercourses.

Photo 11. Partially covered potting soils on the northwest side of Site 1 Glass House.

Photo 12. Generator building with no roof. Rainwater covered the floor of the building and is able to transport spilled hydrocarbons, identified by colorful sheen on water surface, outside of building.

Photo 13. Looking southeast towards site 2.

Photo 14. Looking southeast towards site 2.

Photo 15. Site 2 upstream of plugged culvert road crossing. Note pooled water.

Photo 16. Site 2 road at plugged culvert crossing.

Photo 17. Site 2 downstream of plugged road crossing.

Photo 18. Site 2, sediment piled against burnt tree is evidence of recent expansion of fill pad.

Photo 19. Site 2, tension cracks on east face of recently expanded fill pad.

Photo 20. Site 2, water flowing in gully on east side of recently expanded fill pad.

Photo 21. Wetland indicators at proposed grow site south side of Site 2.

Photo 22. Proposed pond expansion west side of Site 2.

Photo 23. Road south of Site 2, spring flow runs into ditch.

Photo 24. Road south of Site 2, water from ditch, flows over road-surface.

Photo 25. Road runoff and spring water is concentrated in incised gully.

Photo 26. Water flowing over road leading to Site 3.

Photo 27. Water course directed along the side of building.

Photo 28. Site 3, Water flowing over road surface.

Photo 29. Several cubic yards of potting soil disposed of in watercourse.

Photo 30. East of site 4, incised gully at culvert outlet.

Photo 31. Site 4, water flowing past and underneath sheds.

Photo 32. Site 4, pond.

Photo 33. Site 5 looking south.

Photo 34. Site 5 looking southwest.

Photo 35. Site 5, note improperly disposed of cultivation waste.

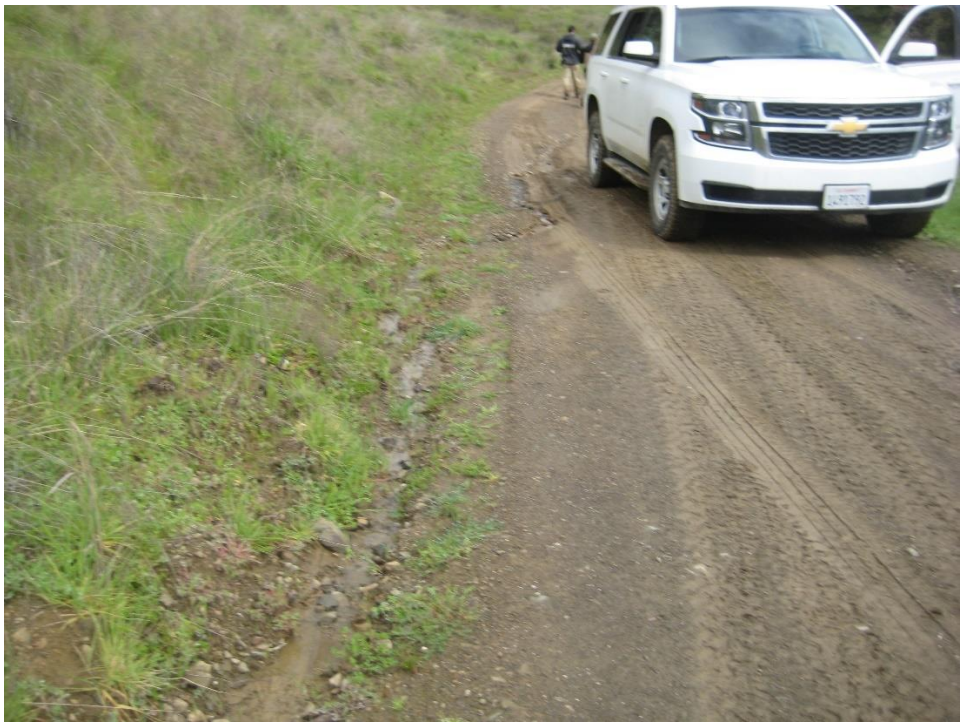


Photo 36. Water flowing from trench, over road-surface between Sites 5 and 6.

Photo 37. Site 6, proposed pond location 2. Note juncus, a wetland identifier is in the middle of image.

Photo 38. Road leading to Site 7, water seeping out of cutbank onto road.

Photo 39. Road leading to Site 7, water running down inboard trench.

Photo 40. Site 7 cultivation area.

Photo 41. Site 8 note plastic netting disposed of at side of road

Photo 42. Site 9, area to the left of the road is Proposed Cultivation 2.

Photo 43. Site 9 watercourse within 50 feet of Proposed Cultivation 2.