MINUTES OF REGULAR MEETING OF
THE BOARD OF TRUSTEES OF
DOUGLAS COUNTY LAKE TAHOE SEWER AUTHORITY
November 15, 2023

CALL TO ORDER:

A Meeting of the Board of Trustees of the Douglas County Lake Tahoe Sewer Authority (DCLTSA) was duly convened at 9:30 a.m. on Wednesday, November 15, 2023, at the Wastewater Treatment Plant, Stateline, Douglas County, Nevada.

ROLL CALL:

Present were Trustees John McLaughlin, Jodie Nelson and Andy Huckbody.

RECOGNITION OF OTHERS IN ATTENDANCE:

Also present were Authority Manager Rob Hopkins, Authority Controller Paula East-Janicki, Authority Accountant Ying Johnson, Authority Engineer, Rob Anderson, and the Authority's legal counsel, Jim Cavilia. Representatives of the Elk Point Sanitation District (EPSD), Bradley Oneto and Ann Harry were present. Also, in attendance via audio internet connection by which they could hear everyone at the meeting, and everyone could hear them, were Tiffany Williams and Chris McCarthy of Eide Bailly, the Authority auditor.

PUBLIC COMMENT:

Mr. Oneto of EPSD addressed the Board about the fact that EPSD was recently notified by Douglas County that the EPSD does not have a quorum of eligible board members based on the residency of the existing Board members. Mr. Oneto indicated that the Douglas County Commission was scheduled at an upcoming meeting to consider various options for the continued operation of EPSD. Ms. Harry, as the only currently qualified member of the EPSD Board, added that there are currently about thirty individuals that are eligible to serve on the EPSD Board and that she was confident that a sufficient number of people would be willing to serve so that the County Commission will be able to simply appoint qualified board members. Ms. Harry stated that prior to this issue of board member eligibility being raised, EPSD had been proceeding with the steps necessary to takeover full responsibility for the EPSD sewer collection system.

Chairman McLaughlin opened the floor to any additional public comment regarding the matter. There was no additional public comment.

MINUTES OF PRIOR MEETING:

It was moved by Trustee Nelson, seconded by Trustee Huckbody and carried unanimously (3-0) that the minutes of the Meeting of the Board of Trustees of DCLTSA, dated October 18, 2023, be approved as presented.

Presentation of Audited Financial Statement for Fiscal Year 2022-2023 by auditing firm, Eide Bailly.

Authority Controller, Paula East-Janicki, introduced Tiffany Williams of Eide Bailly to the Board for the purpose of presenting the recently completed 2022-2023 audited Financial Statement of the Authority. Ms. Williams thanked Ms. East-Janicki and proceeded to walk the Board through the Financial Statement dated June 30, 2023, a copy of which had been provided to each of the Trustees.

Going through the Financial Statement, Ms. Williams pointed out recent changes to accounting standards and disclosure requirements. Ms. Williams reported that the Authority had no misstatements or errors. She complimented Ms. East-Janicki on her accounting work on behalf of the Authority and reported that the auditor has issued an unmodified, clean opinion. Ms. Williams then pointed out various, specific matters described in the Financial Statement.

In response to an inquiry from Trustee Nelson about "consolidated taxes" described in the Financial Statement as nonoperating revenue, Ms. East-Janicki described that this is an amount received annually by the Authority from the State of Nevada.

In response to a question from Trustee Huckbody, Ms. Williams explained that the auditor does not generally provide recommendations with regard to the requisite amount of reserve funds, but that if reserve funds appeared to be too low it would be noted.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

Following the comments of the Trustees, **it was moved by Trustee Nelson, seconded by Trustee Huckbody and unanimously approved (4-0) that the audited Financial Statement, as presented, be approved.**

MANAGER'S REPORT:

A. General Status Report

Mr. Hopkins presented the Board with a written summary of various general matters related to the Authority and briefly summarized some items in the written report. The written report is incorporated in these minutes by this reference.

Mr. Hopkins reported that the Authority's Discharge Monitoring Reports (DMRs) for the third quarter were submitted to and approved by the Nevada Division of Environmental Protection (NDEP).

With regard to the Export Force Main Replacement Project, Mr. Hopkins indicated that meetings have recently taken place to develop the scope of Phase 2 of the project. Mr. Hopkins stated that the project involves the replacement of approximately 3,800 lineal feet of pipeline and that the Authority was seeking approval to relocate a portion of the line located in a marshy area of United

States Forest Service (USFS) property. Mr. Hopkins reported that HDR was currently working on preliminary designs for the project with the hope that the design and permitting can be completed in the current fiscal year, with the work to be completed by the end of the construction season in 2024.

Mr. Hopkins reported that the Authority's IT specialist, Eric Heffernon, had recently completed the migration of Authority data to a new server and the update of Windows software.

Mr. Hopkins indicated that staff has completed research on various types of flow meters for the Mixed Liquor Return pump at the plant and that having better data with regard to flow will allow the plant to be operated at maximum efficiency.

Mr. Hopkins stated that paving work at the Authority's main pump station was recently completed and that the new emergency backup generator at the pump station should be in place and operational in the near future.

With regard to access to the Beach Pump Station, Mr. Hopkins reported that a meeting recently took place with USFS officials and representatives of the Nevada Tahoe Conservation District (NTCD). Discussions are ongoing about the proposed future access and Mr. Hopkins indicated that the Authority engineer would have additional information on the subject.

Responding to an inquiry from Trustee Huckbody, Mr. Hopkins indicated that it had been approximately eight years since NDEP's last inspection of the Authority's plant and that there is not a set schedule for such inspections, but they generally take place every seven to ten years.

Trustee Nelson questioned Mr. Hopkins about how the Export Force Main Replacement Project was being designed and planned. Mr. Hopkins indicated that the project was being designed by HDR, which has a historical knowledge of the Authority and its facilities. Mr. Hopkins explained that the hope would be to proceed with a Construction Manager at Risk to complete the project, which provides for some flexibility along the way. Finally, Mr. Hopkins indicated his hope was that the project can be completed for approximately $6 million.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

ENGINEER'S REPORT

A. General Projects Status Report

In addition to his participation in the Manager's Report, Authority Engineer, Rob Anderson, presented correspondence dated November 14, 2023, briefly summarizing various issues that R.O. Anderson Engineering has been involved with on behalf of the Authority. The November 14, 2023, correspondence is incorporated in these minutes by this reference.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

B. Discussion and Update of Proposed Modifications to USFS Special Use Permit for Beach Pump Station and Request for Financial Participation in USFS's Burke Creek Rabe Meadow Riparian Restoration Project.

Mr. Anderson explained that the USFS officials have recently indicated that maintaining the Authority's existing access will not be feasible going forward based upon a very conservative flood analysis and that the USFS is seeking the Authority's financial participation in the project. Mr. Anderson expressed his disagreement with the USFS opinion. Mr. Anderson reported that the USFS would like to relocate the Authority's access to the north and have the authority participate in the cost of this relocation.

Mr. Anderson presented the Trustees with two alternatives for responding to the USFS. The first alternative is to insist on retaining the existing access, contributing to some of the USFS costs and agreeing to maintain the drainage improvements necessary to prevent flooding.

The second alternative would be to agree to the USFS recommendation of relocating the access and agreeing to contribute approximately $72,000 to the site circulation improvements. Mr. Anderson explained that the first alternative that would maintain the existing access preferred by the Authority would likely require a greater financial contribution from the Authority.

After indicating that the Authority could live with either alternative, Mr. Hopkins expressed his strong preference for maintaining the existing access and that he had serious concerns about the Authority accepting responsibility for road improvement in the new location being recommended by the USFS.

Following a discussion among the Trustees about the possible responses to the USFS and NTDC, Mr. Anderson explained that the USFS has historically been a good partner with the Authority on this matter and others. Mr. Hopkins reiterated his preference for maintaining the existing access and that accordingly, his recommendation was that the Board adopt Mr. Anderson's first alternative.

Following the recommendation from Mr. Hopkins and some additional discussion among the Trustees, **it was moved by Trustee Huckbody and seconded by Trustee Nelson that the first alternative outlined by Mr. Anderson, with a financial contribution of $160,000.00 be approved and communicated to the USFS an NTCD.** Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment. **The motion carried unanimously (3-0).**

AUTHORITY CONTROLLER'S REPORT:

A. General Status Report

The Authority Controller, Paula East-Janicki, provided the Board with a budget to actual spreadsheet and reported that operating expenses are approximately 3.9% under budget through September. Ms. East-Janicki also stated that the Authority's cost of electricity has been very high.

Ms. East-Janicki reported that the salary study being conducted on the Authority's behalf has been completed and that Ms. East-Janicki was in the process of integrating new salaries into the Authority budget. Ms. East-Janicki stated that the study would be presented to the Board in January and that it shows Authority salaries, on average, are approximately 7% lower than similar positions at similar agencies.

Ms. East-Janicki stated that the Authority's accounts receivable show a credit balance. Ms. East-Janicki indicated that flows to the plant continue to be high and are currently up approximately 11.9% over last year.

Based on the Authority's completed audit, KGID will have a credit of $81,518, RHGID will have a credit of $23,711 and Tahoe Douglas (TDD) will have a credit of $10,716. In response to a question Trustee Nelson, Ms. East-Janicki indicated that the contributing districts had been notified of their respective credits.

Trustee Nelson also inquired about certain erosion control costs that have been incurred and not budgeted for. Mr. Hopkins indicated that these costs were necessary for work done in and about the plant reservoir to reduce the accumulation of material in the reservoir. Also Mr. Hopkins indicated that there were some unbudgeted costs incurred in an effort to extend the life of the carbon media in the plant odor control system.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

B. Investment Report

Ms. East-Janicki had a written summary of the Authority's investments available and indicated that the Authority has approximately $16.6 currently invested in the Local Government Investment Pool (LGIP) and laddered certificates of deposit (CDs). Ms. East-Janicki reported that two CDs recently matured and were reinvested at 5.35% and 5.45% per year. Ms. East-Janicki also reported that the LGIP is currently paying interest of 4.95% per year.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

APPROVAL OF CLAIMS:

The claims along with the Authority's check register were provided to the Board.

The claims were signed off on by Chairman McLaughlin.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

Reports/updates from Board of Trustees concerning the areas or districts they represent

Trustee Huckbody reported that it appears the Nevada Department of Transportation (NDOT) will not be reducing the number of lanes on Highway 50 and that this is good news for the residents of TDD. Chairman McLaughlin agreed that this was a good decision and that this will hopefully resolve the matter for an extended period of time.

Trustee Huckbody reported that TDD was working with NV Energy on efforts to relocate some power lines underground. Trustee Huckbody also indicated that TDD was transitioning some of the District's reserve funds to CDs as long as five years.

Trustee Nelson reported that KGID's new building was progressing with an anticipated opening date in January. Trustee Nelson also stated that KGID held a planning meeting to discuss the possibility of KGID merging with the Oliver Park General Improvement District. Trustee Nelson indicated that the KGID board recently refused to approve future engineering costs to study stormwater issues within KGID.

Trustee McLaughlin reported that over the next couple of years Harvey's and the Golden Nugget are both planning significant improvements to their facilities that may result in many guestrooms being out of service for a period of time. Trustee McLaughlin indicated that this may reduce sewage flows to the plant in the next couple of years, but in the long run it will be very good for the area.

Chairman McLaughlin opened the floor to public comment regarding the matter. There was no public comment.

PUBLIC COMMENT:

There was no public comment.

ADJOURNMENT:

There being no further business, the meeting was adjourned at 10:55 a.m.

APPROVED

Meeting Date: November 15th, 2023

DOUGLAS COUNTY LAKE TAHOE SEWER AUTHORITY
Staff Report

Subject / Title:

Authority Manager's Monthly Report – November 2023
A. General Status Report

Staff Recommendation:

None. This is an informational item only.

Discussion/Report:

This item serves to afford the Authority General Manager the opportunity to update the DCLTSA Board of Trustees on select activities over the previous month(s).

1. The DCLTSA Treatment Plant Discharge Monitoring Report for the third quarter 0f 2023 has been submitted to and passed by both the Nevada Division of Environmental Protection and the Environmental Protection Agency.

2. Preliminary meetings have been held to develop the scope of and prepare for the start-up of the DCLTSA Export Force Main Replacement Phase 2 project. The project will be constructed using the same Construction Manager at Risk (CMAR) model which DCLTSA successfully used for the recently completed 9.5-million-dollar Treatment Plant Upgrades Project. A basic outline of the anticipated project is as follows:

   a. Project Concept:

      The project considers replacement of approximately 3,800 LF of the existing 16-inch spiral-welded steel force main from STA 51+50 on Terrace View in KGID, where Phase 1 ended in 2020, to STA 89+02, near air-relief valve #6, on DCLTSA maps. We would like to replace the existing pipe, which ranges from C-400 to C-250 with more robust cement mortar lined, cement mortar encased welded steel pipe, rated at C-400 for the entire run, if financially possible, subject to the recommendations of the design engineer, of course.

   b. Construction Conditions:

   c. DCLTSA wishes to do a parallel pipeline next to the existing so that we do not have to rely on our emergency storage reservoir for temporary impoundment of our treated effluent. The Nevada Division of Environmental Protection has previously indicated that our reservoir will

not likely be approved for planned storage of effluent pursuant to this project without the reservoir being upgraded with an HDPE liner. This requirement would change the scale and scope of the project, possibly making considerable changes to the overall cost of the project.

d. Construction should be much more efficient for Phase 2, as 100 percent of the construction will be done within our existing dirt road / easement with the U.S. Forest Service, and will encounter no conflicts with other utilities, require no traffic control, no replacement of asphalt, and the work may be performed from both ends of the pipeline, working toward the middle, shortening the construction timeline if desired.

e. Timeline:

Design and permitting are hoping to be completed in the current FY 2023-2024, with construction completed by the close of construction season on or around October 15, 2024, if possible.
We would like to pre-purchase pipe if practical to secure as low a unit cost as possible. If the above timeline is too optimistic, we would consider construction in the summer / fall of 2025.

3. DCLTSA I.T. / SCADA Specialist Heffernon has completed computer server migration and Windows software updates on all DCLTSA computer server infrastructure.

4. Staff have completed research on several types of flowmeters which we are considering installing to measure Mixed Liquor Return (MLR) pump flow rates. Recent experience with degraded MLR pump performance due to worn bearings and seals has shown us that having early warning of reduced MLR flow capacity will help us keep the plant operating at maximum treatment efficiency.

5. Paving work at the Main Pump Station has been completed (photos attached). The new Emergency Backup Generator is expected to be set on its pad in the next several days, with wiring and testing to take place likely after the Thanksgiving holiday.

6. A follow-up meeting with the U.S. Forest Service to review proposed plans to improve / relocate the southern access easement to the Beach Pump Station have been recently conducted. The outcome of the meeting appears to reflect modeling condition changes, unanticipated by DCLTSA, to the hydraulic analysis of various flood event impacts on the two easement alignment configurations, ruling out the use of the existing easement alignment. DCLTSA Engineer R.O. Anderson will provide a detailed summary of the meeting in his attached report.



New MPS pavement, looking east toward Fire Station.



New pavement looking west, showing new generator pad.

R O Anderson

November 14, 2023

Via Email

Board of Directors
DOUGLAS COUNTY LAKE TAHOE SEWER AUTHORITY
P.O. Box 578
Zephyr Cove, NV 89448

Authority Engineer's Monthly Report – November 2023

Dear Members of the Board:

The following report presents a summary of activities undertaken on behalf of the Sewer Authority since our last meeting together on October 18, 2023. During this period, we provided general engineering support; however, the bulk of our energies during this period have been focused on evaluating documentation prepared and provided by USFS relative to access and circulation improvements at the Beach Pump Station. The following paragraphs and included attachments summarize the background information. At the end of this report, we have provided two alternative recommendations for the Board's consideration.

Beach Pump Station: Alternate Access and Site Circulation Improvements: With my report last month, Mr. Hopkins and I confirmed that representatives of USFS Lake Tahoe Basin Management Unit (LTBMU) had presented a summary letter from the Forest Supervisor, Mr. Erick Walker, that acknowledged the Board's earlier decision and strong preference to retain the existing access road from Beach Club Drive to the site of the Beach Pump Station. A copy of Mr. Walker's letter is attached. In his letter, Mr. Walker states that since receiving that correspondence, their design consultant, Nevada Tahoe Conservation District (NTCD) had undertaken and completed a hydraulic (floodplain) analysis of DCLTSA's preferred alternative. His letter indicates that the results of that analysis "*...reveal that raising the road in place and adding culverts result in additional flood risks to the Tahoe Beach Club during flood recurrence intervals less than the 100-year flood. The LTBMU believes that increasing flooding to adjacent developed property eliminates this option for viability. In contrast, relocating the road upstream does not increase the flood risk to the Tahoe Beach Club and decreases the flood risk to the existing pump station.*" A copy of the NTCD's hydraulic analysis and their map of the two alternatives is also attached for your review and consideration.

On November 6, 2023, Mr. Hopkins and I participated in a conference call with representatives of LTBMU and NTCD to review the hydraulic analysis, discuss their basis and conclusions that the Board's preferred alternative is no longer viable, and to review DCLTSA's proposed site circulation improvements to facilitate future

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construction equipment and emergency vehicle access to the site of the Beach Pump Station.

As shown on NTCDs Access Alternative sketch, both the Downstream Crossing Alternative and the Upstream Crossing Alternative contemplate the installation of four box culverts. However, the provided hydraulic analysis does not list what sizes these proposed culverts are, nor does it provide design elevations, or area topography from which an independent party might be able to critically review the technical analysis presented in their report. During our meeting on November 6th, when we pressed them about the lack of these fundamental and foundational details being provided with the analysis, we finally came to understand that the reason that information is not presented is that it is irrelevant as the direction from LTBMU was to assume that the proposed box culverts were blocked by vegetation or even beaver dams. On behalf of the Board, I raised the concern that the directive from the supervisors at LTBMU to change the design standard represented a wholesale change from our prior discussions where we came to understand that their hydraulic design criteria was to pass the runoff from a 100-year recurrence interval storm event. Mr. Michael Gabor, Engineering Manager for LTBMU, confirmed to us that it was in fact a stricter design standard but that they felt justified due to the presence of beaver in the area and the potential that the new culverts could be completely choked by either vegetation or beavers.

The predictable result of this change in design criteria – assuming a complete blockage within the watercourse of Burke Creek - on the Downstream Crossing Alternative is to raise the base flood elevation to a height that flood waters would be routed to the south through the site of Tahoe Beach Club or to the north through the site of Beach Pump Station. Applying the same criteria to the Upstream Crossing Alternative, due to the relative topography at that location, is to cause the excess runoff to be routed to the north, away from Tahoe Beach Club property and around the site of the Beach Pump Station – see Figure 6 of NTCD's hydraulic analysis.

During the meeting we reviewed the proposed site circulation improvements needed at the Beach Pump Station to afford construction and emergency vehicles to reasonably circulate around the site. There was some discussion about the need for full vehicular circulation around the pump station but in the end almost everyone on the call concurred that the proposed circulation improvements were reasonable and necessary. All parties on the call concurred that it would be most appropriate and efficient for USFS, through its consultant, to process the remaining environmental processes for the proposed site improvements through the state (TRPA) and federal agencies to obtain authorizations and permits to construct these improvements.

We also discussed at some length the representation that LTBMUs funding for the project is insufficient. From the comments made to Mr. Hopkins and me during the meeting, they estimate that they are short about $160,000. They asked again about the willingness of the Board to make a capital contribution to the construction

budget for the project. With the addition of the site circulation improvements in the project's budget, all parties anticipated that the amount of shortfall will increase. Representatives of NTCD agreed to update their construction cost estimates and provide it to us for review in advance of the Board's meeting. Yesterday afternoon, Ms. Meghan Kelly of NTCD provided the attached spreadsheet summarizing their estimate of construction cost inclusive of the site circulation improvements. As you will see, the site circulation improvements have been estimated at $71,250 (Items 12 & 13 on the attached estimate).

Given this information and summary provided above, subject to any supplemental information that may come up during our discussion, we recommend the Board consider the merits of two Alternative approaches as follows:

1. Retain the Existing Access Road Alignment (Downstream Crossing Alternative) with New Culverts (but without the flood control levee); DCLTSA accepts responsibility for maintaining the culverts; DCLTSA make a one-time capital contribution (~$160,000) to the project's construction costs inclusive of site circulation improvements at the Beach Pump Station. The one-time capital contribution is provided directly to USFS-LTBMU upon award of the construction contract, and issuance of the updated SUP for DCLTSA that defines any limitations on maintenance activities for the road or future box culverts.
    a. Identified Advantages:
        i. The existing access road provides a location that is expected to prove invaluable during construction or maintenance of the Sewer Authority's existing Edgewood Interceptor.
        ii. The existing road represents the shortest distance for snow removal and other access and maintenance operations.
        iii. The existing road alignment is included within DCLTSA's current USFS Special Use Permit.
        iv. DCLTSA personnel have a demonstrated commitment to maintaining their facilities.
    b. Identified Disadvantages:
        i. It's a significant capital cost contribution.
        ii. It's contrary to the preferred direction of USFS-LTBMU.
        iii. There is some prospective liability to DCLTSA if the culverts are not maintained and future flooding is attributed to poor maintenance.
        iv. The terms of the updated SUP must be definitive on the limitations on maintenance activities if any (e.g., removal of beaver dam if needed).
        v. If agreement can't be reached, potentially delays their project.

2. Agree to abandon Existing Access Road Alignment upon completion of construction of the Upper Crossing Alternative as planned by USFS; DCLTSA accepts no responsibility for culvert maintenance; DCLTSA makes a one-time capital contribution (~$72,500) to the project's construction costs inclusive of site circulation improvements at the Beach Pump Station.

a. Identified Advantages:
    i. The one-time capital contribution is commensurate with the estimated construction costs for the site circulation improvements at the Beach Pump Station.
    ii. It's consistent with USFS-LTBMU's preferred direction for the project, and arguably would not delay their project.
    iii. Any liability for future flooding attributable either to design or maintenance is the responsibility of USFS-LTBMU.
b. Identified Disadvantages:
    i. Results in DCLTSA to be responsible for a greater length of road maintenance and snow removal.

I will be present at the Board meeting and available then to review this information in greater detail, as well as address any specific questions or concerns Board members might have relative to these subjects. Thank you for your continued confidence and the opportunity to provide these services.

Yours faithfully,

R.O. ANDERSON ENGINEERING, INC.

Robert O. Anderson, PE, WRS, CFM
Principal Engineer

Attachments

cc: Jim Cavilia, Esq.
Paula East-Janicki
Rob Hopkins

USDA United States Department of Agriculture | Forest Service | Lake Tahoe Basin Management Unit | 35 College Drive
South Lake Tahoe, CA 96150
530-543-2600
TDD: 530-543-0956

File Code: 1560
Date: October 5, 2023

Rob Hopkins
Douglas County Lake Tahoe Sewer Authority General Manager
PO Box 1160
Zephyr Cove, NV 89448

Dear Mr. Hopkins:

Thank you for engaging with the Forest Service Lake Tahoe Basin Management Unit (LTBMU) Staff and our partner the Nevada Tahoe Conservation District (NTCD) on the Burke Creek Rabe Meadow Riparian Restoration Project regarding access to the existing sewer pump station at Nevada Beach. During our in person meeting on June 14, 2023, NTCD presented two concept-level designs for a new road and creek crossing accessing the pump station from the Tahoe Beach Club.

On August 7, 2023, you sent an email expressing that keeping the road in the current location is the Sewer Authority's preferred access to the pump station. As the project design engineers, NTCD advanced design of Douglas County Lake Tahoe Sewer Authority's (DCLTSA) preferred alternative and completed additional hydraulic modeling. The results from the modeling, detailed in the attached memorandum, reveal that raising the road in place and adding culverts would result in additional flood risks to the Tahoe Beach Club during flood recurrence intervals less than the 100-year flood. The LTBMU believes that increasing flooding to adjacent developed property eliminates this option from viability. In contrast, relocating the road upstream does not increase the flood risk to the Tahoe Beach Club and decreases the flood risk to the existing pump station.

In summary, the LTBMU recommends that the road is located upstream from the existing road location to reduce flooding risks to both the DCSLTA pump station and the Tahoe Beach Club. We request a response from the DCLTSA in the next 2 weeks regarding realignment of the road to the upstream location based on these findings. Please contact Theresa Cody, Watershed Program Manager, if you have any questions at (530) 545-2057 or theresa.cody@usda.gov.

Sincerely,

ERICK J. WALKER
Forest Supervisor

Enclosures: Memo, Design and Hydraulic Analysis; Alternatives Map

cc: Rob Anderson, Meghan Kelly, Michael Gabor, Randy Striplin, Theresa Cody

DCLTSA Nevada Beach Lift Station Proposed Access Alternatives Design and Hydraulic Analysis for the Burke Creek Rabe Meadow Riparian Restoration Project

BY: MEGHAN KELLY, P.E. AND PATRICK JOHNSON, NEVADA TAHOE CONSERVATION DISTRICT

DATE: 9/20/2023

INTRODUCTION

One of the goals of the Burke Creek Rabe Meadow Riparian Restoration Project (BCRMRRP) is to alleviate flood risk at the Douglas County Lake Tahoe Sewer Authority (DCLTSA) lift station at Nevada Beach. The project proposes to do this by increasing floodplain capacity, relocating the existing alignment of Burke Creek away from the station and along a more direct route to Lake Tahoe and by altering the access road to the station so it will not be inundated during major flood events.

Based on previous discussions in May and June of 2023, two potential alignments for the access road to the station were identified for further development and analysis. The Nevada Tahoe Conservation District has conducted additional hydraulic and design analysis on these two alignments, the results of which are presented in this document.

PROPOSED ACTIONS AND ROAD ALIGNMENT ALTERNATIVES

Proposed Floodplain Expansion and Creek Realignment (Both Alternatives)

Regardless of the proposed road alignment to the sewer station, the BCRMRRP will improve drainage and conveyance at the DCLTSA lift station through floodplain expansion and creek realignment. The floodplain of Burke Creek was significantly reduced in the 20th century due to development in the watershed, including at the creek's historic outlet. The project proposes an expanded floodplain along the USFS's boundary with the Tahoe Beach Club through which Burke Creek will run. This will significantly increase floodplain capacity, reduce the distance floodwaters must travel to reach Lake Tahoe and increase the distance between the sewer lift station and the creek. The project also proposes maintaining the existing channel and floodplain northwest of the lift station to provide a secondary outlet to Lake Tahoe for the Burke Creek watershed. All of these proposed actions will help reduce flood risk at the station.

Proposed Access Alternative #1- Raised Road Along Existing Alignment

This alternative proposes raising the road onto a berm that would follow the existing alignment that the current road follows from the Tahoe Beach Club to the lift station. This berm would be 350 LF long, 36" to 48" high and would have box culverts below it that would be sized for flows based on a 1% annual recurrence flow event. Because of the location's proximity to Lake Tahoe, invert elevations of these culverts would need to be above the high-water elevation of Lake Tahoe (6229.1') so that inundation of infrastructure and floodplain capacity loss does not occur during periods of high water. Based on this, four box culverts with a vertical capacity of 2 feet and a horizontal capacity of 10 feet would be proposed below the road. The floodplain adjacent to the berm would be about 3 feet below the adjacent grade on the road at the Tahoe Beach Club.

This alternative would also require a flood protection levee that would protect the DCLTSA lift station from backwatering on the upstream side of the berm and culverts. This levee would need to be around 130 feet in length and would tie the road berm into the upland area southeast of the lift station. FEMA has design standards that levees are required to meet for inclusion on Flood Insurance Rate Maps[1]. While the proposed levee may not necessarily be required to meet these standards if the lift station does not require flood insurance, these guidelines still provide a useful guide to additional design requirements that this levee may need to meet to provide a factor of safety to prevent catastrophic flooding at the station. These design requirements include: 3 to 4 feet of freeboard above the base flood elevation on the levee, an erosion analysis, a settlement analysis, an embankment protection analysis and the submittal of an operation and maintenance plan to FEMA.

Proposed Access Alternative #2- Upstream Crossing of Creek and New Road Through Forest

This alternative proposes relocating the road about 250 feet to the east. The riparian corridor at this location is much narrower and therefore a smaller road embankment will be required to cross it. Under this alternative the road will cross the riparian area on an 80 LF berm that is 42" to 48" high. This berm would also need four box culverts with a vertical capacity of 2 feet and a horizontal capacity of 10 feet to convey 1% annual recurrent flows below the road. After crossing the riparian area this alignment would then follow a 350 LF road through the upland forested area to the station. This alternative would not require a flood protection levee since backwatering behind the culverts at the riparian crossing would not be adjacent to the lift station. The floodplain adjacent to the berm would be about 4.25 feet below the adjacent grade on the road at the Tahoe Beach Club.

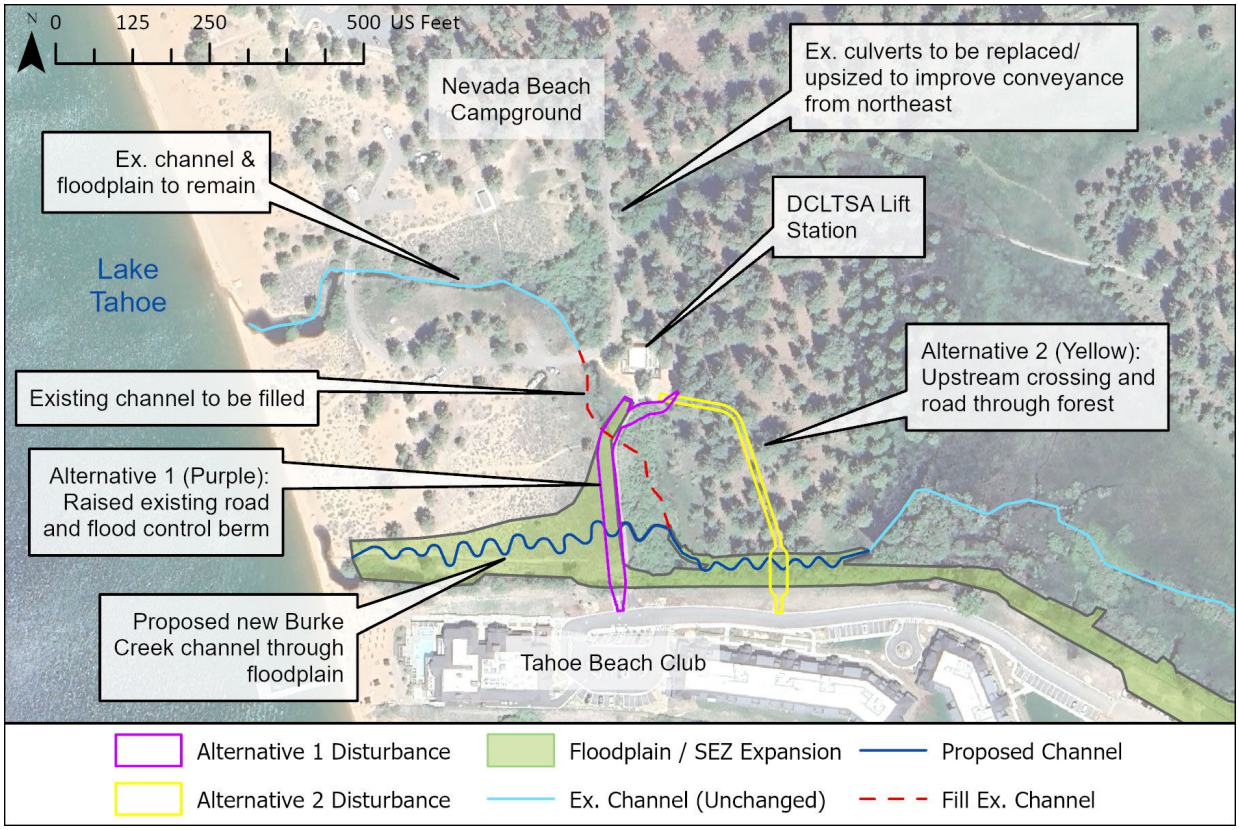


Figure 1: Proposed conveyance improvements in the vicinity of the DCLTSA Nevada Beach lift station and proposed alternatives. See Appendix 1 for site plans of alternatives.

Hydraulic modeling of the existing conditions and proposed alternatives was conducted with HEC-RAS 2D using the 100-year flows that were determined during previous modeling work for the BCRMRRP[2]. Previous flood events in the project area, such as the one that occurred in March of 2023 showed that snow and ice can significantly alter the hydraulics of Burke Creek. There is also a risk in a flood event that debris flows and objects from upstream in the watershed could affect flood conveyance. For example, Rabe Meadow has numerous large diameter trees, and a fallen tree could be carried by floodwaters during a storm and block downstream culverts. As well, the neighborhoods adjacent to Rabe Meadow could be a source of debris and materials that could block culverts. To account for these risks, hydraulic models for each alternative were also run with blocked culverts to model where flooding may occur in the event of a loss in conveyance capacity.

Existing Conditions Model

The existing condition model was run using existing terrain and drainage infrastructure to show baseline flooding conditions in the project area. Proposed improvements should show an improvement over these baseline conditions at the lift station to accomplish project goals.

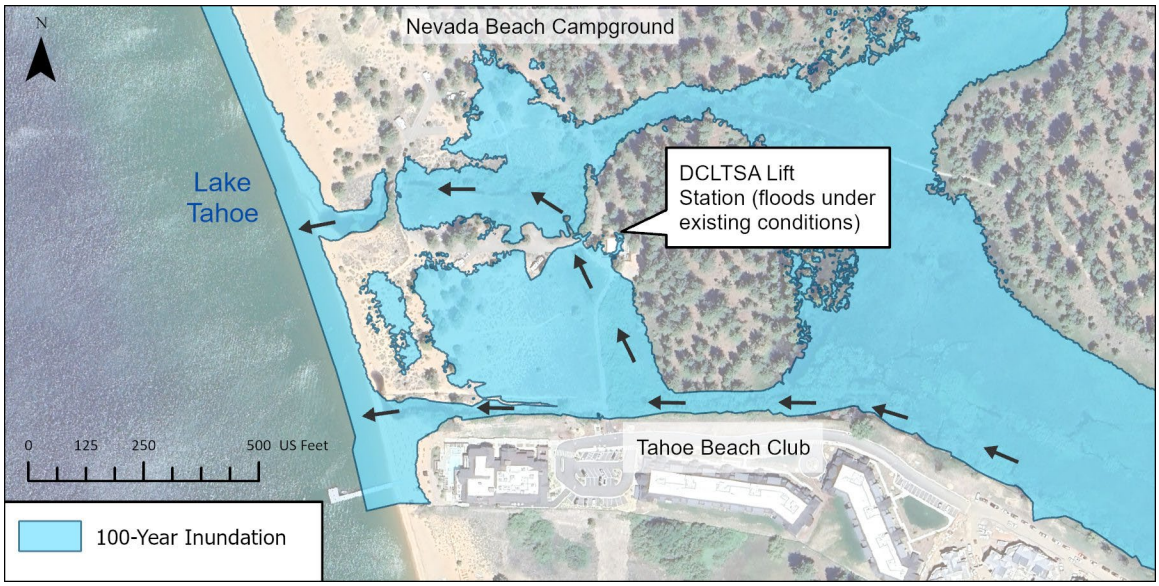


Figure 2: Existing 100-Year inundation shows flooding at the DCLTSA Nevada Beach lift station.

Alternative 1 modeling (raised road along existing alignment)

Initially, a model of alternative 1 was run without a levee protecting the station to confirm the need for it. Even with full capacity in the culverts, flooding at the station got worse over existing conditions, thus confirming the need for the flood protection levee. Next, a model of alternative 1 was run with the flood control levee in place at the same elevation as the road and culverts working at full capacity. This resulted in an improvement at the station over baseline conditions. Then, the model was rerun but with blocked culverts. In this model the floodwaters overtopped the road, created additional flooding at the lift station, and also created flooding at the Tahoe Beach Club. Finally, a model of alternative 1 was run with the flood control levee in place at an elevation 1 foot higher than the road and blocked culverts. While the flooding was reduced at the lift station, the floodwaters overtopped the road, and also created significant additional flooding at the Beach Club.

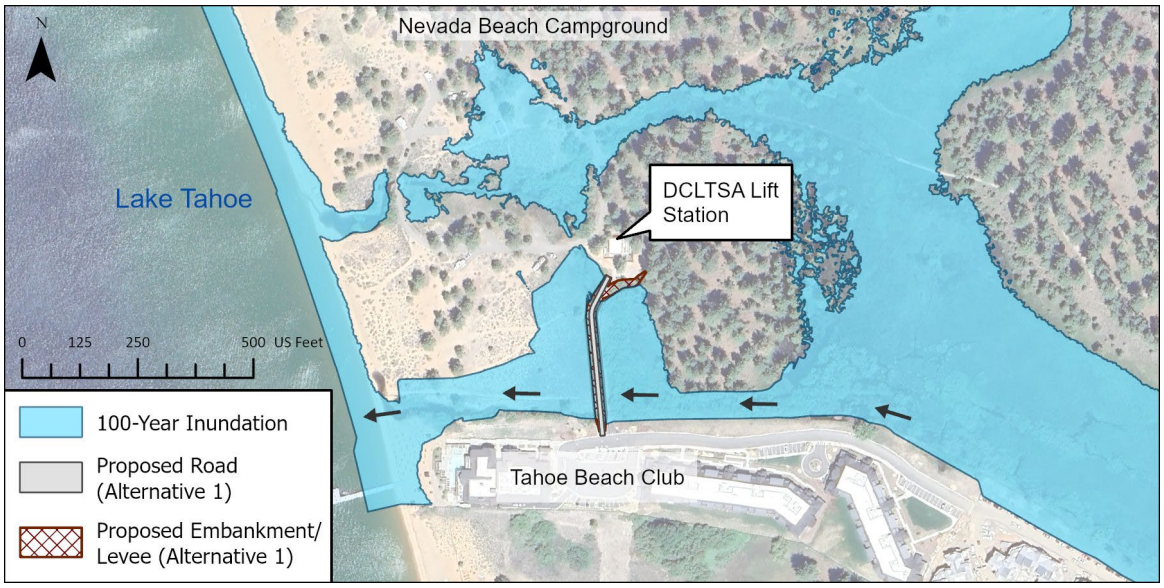


Figure 3: Proposed 100-Year inundation for Alternative 1 with working culverts shows decreased flooding at the lift station.

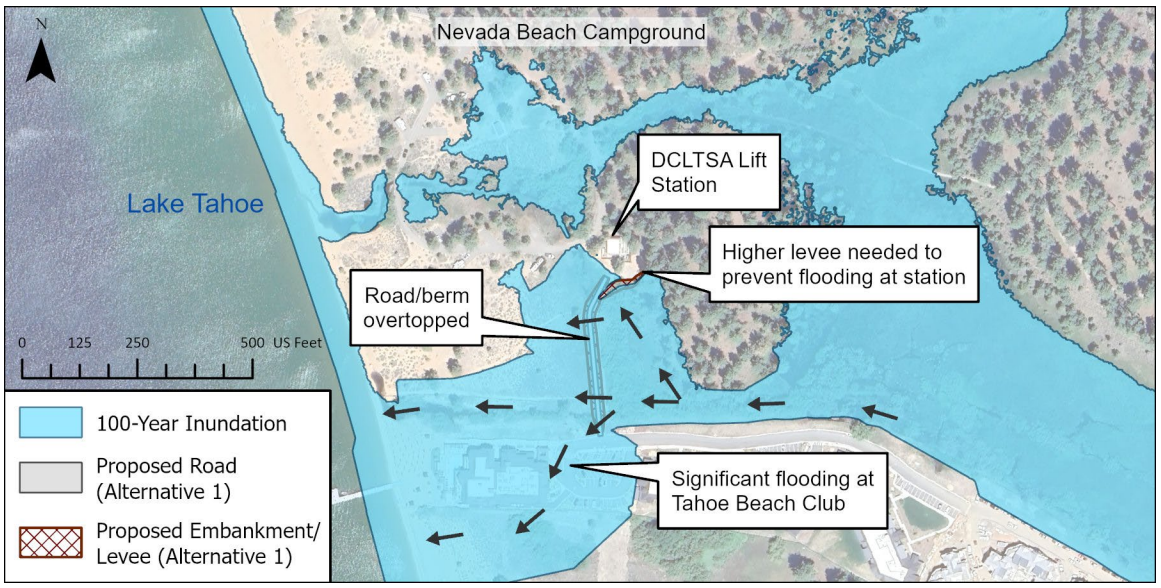


Figure 4: Proposed 100-Year inundation for Alternative 1 with blocked culverts shows there is a risk of significant flooding issues if culvert capacity is reduced.

Alternative 2 modeling (upstream access road)

A model of alternative 2 was run with full capacity in the culverts. Flooding at the station got better over existing conditions and appeared to be about the same at the lift station as those shown in the alternative 1 model with undisrupted culverts. Next, a model of alternative 2 was run with blocked culverts. Flooding at the station got better over existing conditions and floodwaters did not overtop the road. Instead, backwatering occurred into Rabe Meadow and floodwaters then traveled through the northern secondary outlet from Rabe Meadow to Lake Tahoe.

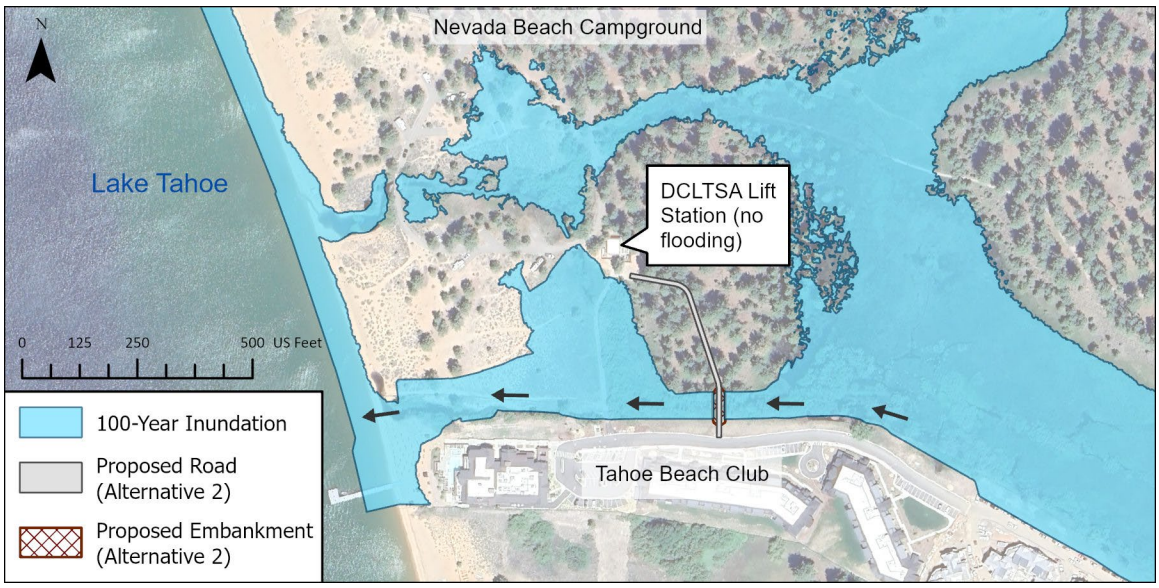


Figure 5: Proposed 100-Year inundation for Alternative 2 with working culverts shows decreased flooding at the lift station.

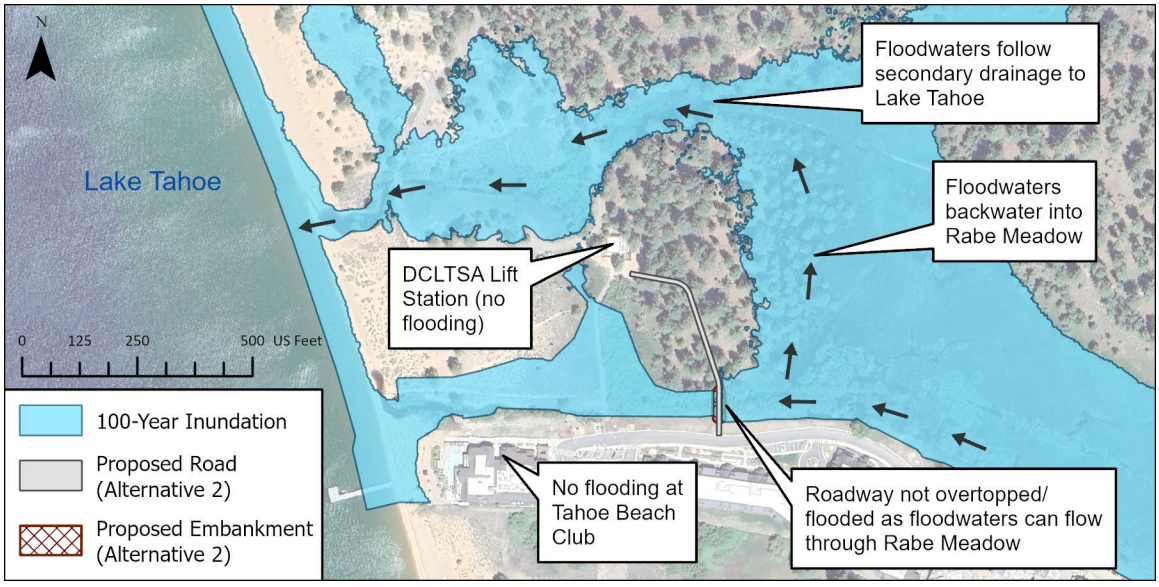


Figure 6: Proposed 100-Year inundation for Alternative 2 with blocked culverts still shows decreased flooding at the lift station, as floodwaters backwater into Rabe Meadow and are conveyed through the secondary outlet from the meadow to Lake Tahoe.

DISCUSSION

While both proposed alternatives reduce flooding at the DCLTSA lift station under ideal high-flow conditions, a loss in capacity of the culverts at the downstream crossing will still cause significant flooding of the Tahoe Beach Club and/or the DCLTSA lift station. As well, a loss in capacity of the culverts may cause the road to be overtopped. In contrast, the upstream alternative reduces flooding at the DCLTSA lift station, does not increase flooding at the Tahoe Beach Club and does not result in the road being overtopped, both under ideal high-flow conditions and under conditions where culverts lose conveyance capacity.

Design constraints at the existing road make it very challenging to find a way to mitigate flood risks along the existing access road alignment. The upstream crossing provides more design flexibility as it is both horizontally and vertically further from Lake Tahoe, further from the lift station and has a greater elevation difference between the proposed floodplain and the Tahoe Beach Club. Because of this, the roadway berm can be at an elevation that is lower than the Tahoe Beach Club but also high enough to allow backwatered flooding to flow into Rabe Meadow and then to Lake Tahoe through the northern secondary outlet. While additional culvert capacity could be added at either of the alternatives, added culverts could still be blocked by debris, especially considering that design constraints limit their vertical height capacity to two feet or less.

While the hydraulic analysis examined flooding in the event of a 100-year flood, it must also be recognized that the flood concerns relating to blocked culverts could also show up during lower flow events. At the annual snowmelt flow of 2 CFS[2], the limited upstream ponding capacity of alternative 1 could lead to the accumulation of enough water to overtop the berm in less than 24 hours if the culverts became blocked. Several issues could cause capacity to be lost in these culverts, even at lower flows. For example, snow removal from the access road will likely lead to some snow being pushed into the floodplain, potentially blocking the culverts at times. As well, because of the proliferation of beaver in Lake Tahoe, including at present in Burke Creek, there could be ongoing issues with beaver attempting to dam culverts. While both issues will be addressed as part of ongoing maintenance of the culverts, resilient infrastructure that does not necessarily need immediate attention to any issues that come up is best suited to prevent flooding issues in the project area, and in this regard the upstream alternative is superior.

In addition to the reduced flood risk, several additional beneficial features of the upstream crossing were identified during the design analysis. The existing sewer main that runs from the Tahoe Beach Club to the DCLTSA lift station runs about 15 to 20 feet below the existing riparian floodplain, and it is understood that excavation may be required at a future point to reach this line, either in the event of an emergency or when the line reaches its lifetime and needs to be replaced. The trench excavation width required[3] to reach this depth in saturated riparian soils would require the downstream road berm to be removed during excavation to reach the line. The upstream crossing would not need to be removed, and also would provide a good location to install a cofferdam (essentially blocking the culverts) to dewater the riparian area away from the sewer line during excavation.

A final beneficial feature of the upstream alignment that was identified is that the road grade in the upland area on the north side of the creek could potentially be built up as a small berm to provide slightly more flood protection to the lift station. While the 100-year flood model does not suggest there is a risk of flooding through this area, even larger events such as a 500-year or 1000-year event potentially could cause floodwaters to go through this area. By having the road in this area slightly raised, the risk of this flooding could be reduced with a relatively small impact that conforms to the existing site topography.

CONCLUSION

Based on the hydraulic modeling and additional design analysis, the upstream crossing (alternative 2) is the significantly preferable alternative for providing access to the DCLTSA lift station. This alternative will reduce flooding of the DCLTSA lift station, is less likely to experience roadway flooding, will not increase flooding at the Tahoe Beach Club and provides better resilience than the downstream crossing (alternative 1), even in the event of culvert blockage.

REFERENCES/ENDNOTES

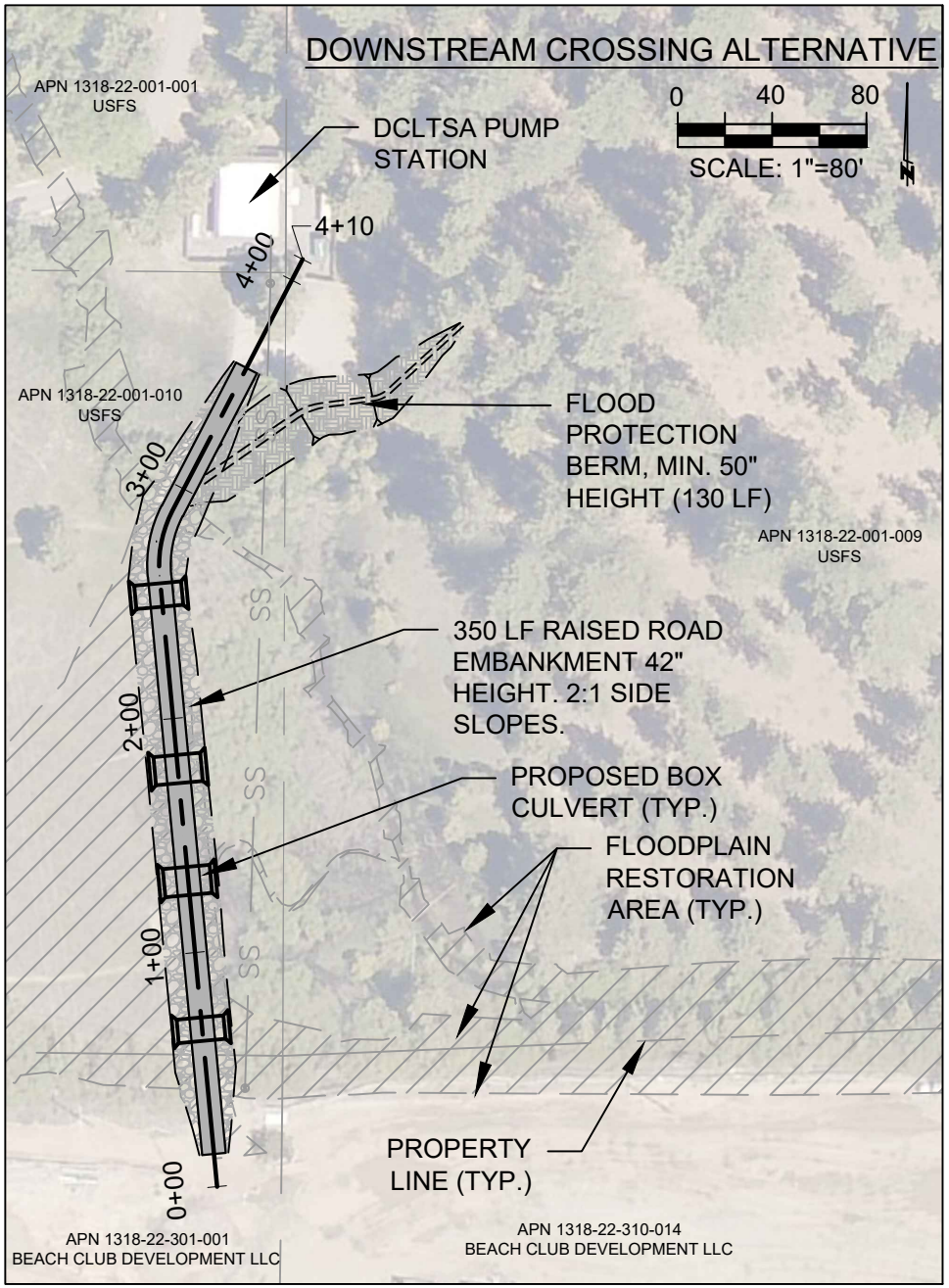
1) United States Department of Homeland Security, Federal Emergency Management Agency. "Meeting the Criteria for Accrediting Levee Systems on Flood Insurance Rate Maps". Available online at: https://www.fema.gov/sites/default/files/documents/fema_meeting-criteria-accrediting.pdf.

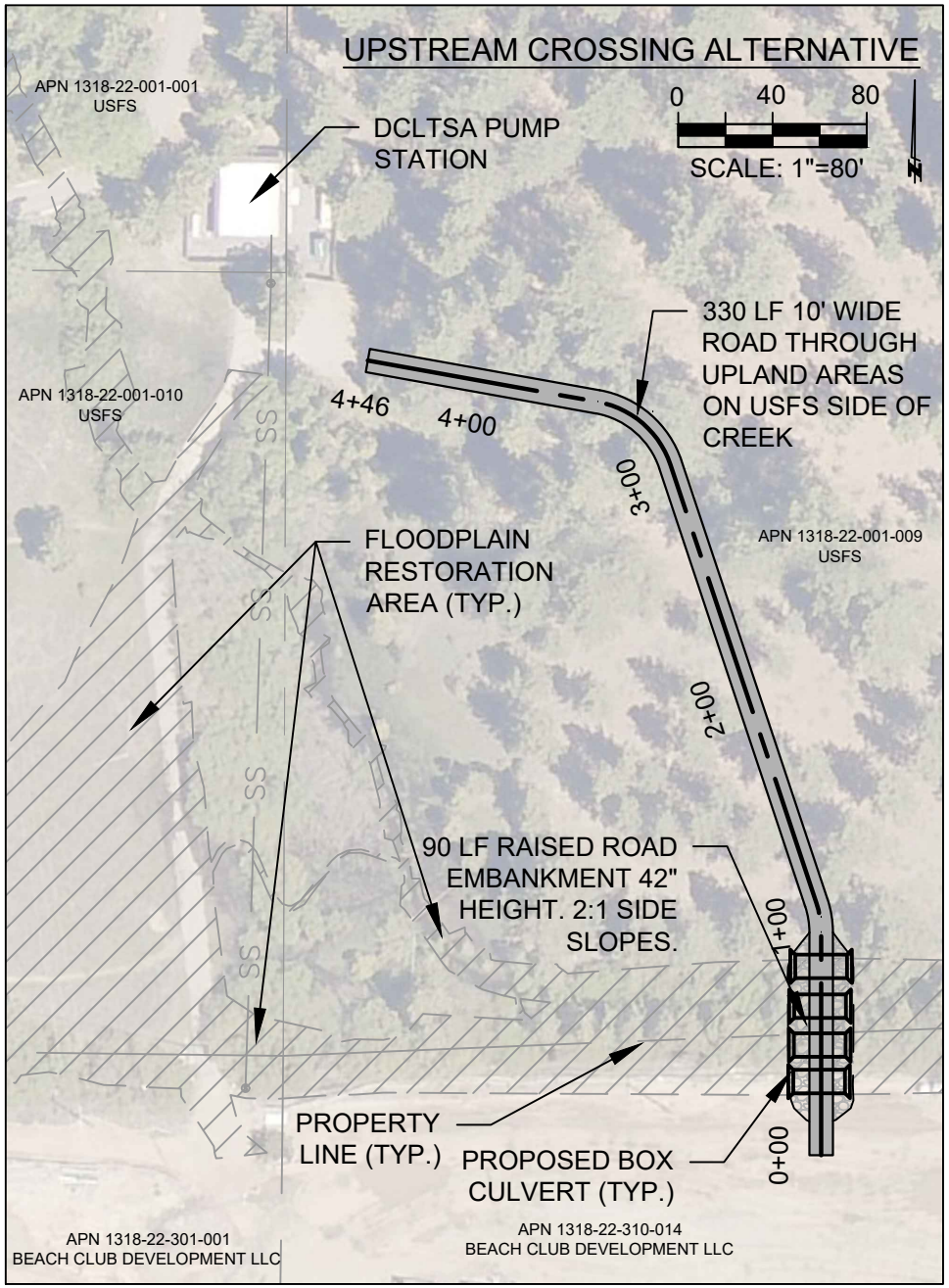
2) Meghan Kelly & Patrick Johnson, Nevada Tahoe Conservation District. "100-Year Flood Analysis- Burke Creek Rabe Meadow Riparian Restoration Project". April 6, 2023.

3) United States Department of Labor, Occupational Safety and Health Administration. "Trenching and Excavation Safety". Available online at: https://www.osha.gov/sites/default/files/publications/osha2226.pdf.

APPENDICES

Appendix 1: Site plans for proposed alternatives





SHEET 1 OF 1	Nevada Tahoe Conservation District	APPENDIX 1 PLAN VIEW DCLTSA ACCESS ALTERNATIVES NEVADA BEACH, USFS LTBMU, DOUGLAS COUNTY, NV	DRAWN: PJ, NTCD PREPARED: 6/12/2023 REVISED: 9/20/2023 SCALE: AS SHOWN PROJECT: BCRMRRP

COST ESTIMATE, SPLIT BY FUNDERS, WITH ROAD CROSSING

Burke Creek Rabe Meadow Riparian Restoration Project - Burke Creek and Kahle Ditch

Prepared By: Nevada Tahoe Conservation District

Date: November 13, 2023

Total Cost of Burke Creek Rabe Meadow Project	**$1,797,882.50**	
Total Construction Funding Available:	**$1,637,600.30**	
Total Shortfall with new access/paving	**$160,282.20**	
Cost of Sewer Plant Access Road	$387,700.00	
Additional Sewer Plant Paving/Improvements	$71,250.00	(paving and permanent BMPs)

Breakdown of Access Road and New Paving Costs

1	1	LS	Additional Permitting and Engineering	$50,000.00	$50,000
2	4500	SF	New Sewer Plant Access Road AC Pave	$12.00	$54,000
3	900	SF	New Sewer Plant Shoulder	$6.00	$5,400
4	100	CY	Fill to Raise Road	$40	$4,000
5	900	LF	Road BMPs	$5	$4,500
6	6	EA	Tree Removal	$800	$4,800
7	3	EA	Box Culverts and Foundations (Material and Delivery)	$35,000.00	$105,000
8	3	EA	Foundation Setting and Dewatering	$10,000.00	$30,000
9	3	EA	Culvert Installation	$10,000.00	$30,000
10	6	EA	Culvert Headwalls	$15,000.00	$90,000
11	400	SF	Rock Slope Protection	$25.00	$10,000
12	6900	SF	New Sewer Plant Paving (includes base)	$10.00	$69,000
13	900	LF	Sewer Plant Paving BMPs	$2.50	$2,250

CONTROLLER'S GENERAL STATUS REPORT

November 15, 2023

- The Budget to Actual spreadsheet in the Board packet that shows operating expenses through September were 3.91% under budget. Yay, us as last month we were more than 2% over. Electricity here at the plant is still high. Since lower flows are here now, I'm hoping it will smooth out.

- The salary study numbers are in. We're in the process of analyzing the budget to determine how best to implement it, if the Board adopts it. Kay Tilzer will present the findings and an implementation plan at the January 17 Board meeting.

- There is a credit balance on the Authority's Accounts Receivable because so many customers paid their bills ahead of time.

- Influent flows are still up 11.9% over those of last year, with the increases being spread fairly evenly between the districts.

- Now that the audit is complete and the expense adjustment for the last fiscal year is done, with the next quarter's bills to the participating districts, refunds will be credited as follows:

    - KGID - $81,518
    - TDD - $10,716
    - RHGID - $23,711.

These credits are due because actual flow percentages were lower than estimated for the budget year.

Investment Report

At the time of writing this report, the Authority's investments total more than $16.6 million. Since the last Board meeting 2 CDs matured at 4.05% and 2% and they were reinvested at 5.35% and 5.45% each for 2 years. 2 new CDs were purchase of $245,000 each were purchased for 9 months and 10 months at 5.45% each. Those were purchased with Construction Fund accounts and the shorter terms will ensure that the money is available in time for the export pipeline project. A list of current CDs is in the Board packet.

Additionally, $510,000 of Construction Fund money was invested in LGIP, which is liquid. In September, LGIP paid 4.8%, but October interest has not yet been distributed.

Claims and Check Register

The check register and wires since the last meeting are in the Board packet. If there are no questions, I will ask the Board Treasurer to sign them and return them to me for our records.