

MEMORANDUM

TO: Board of Trustees

THROUGH: Indra Winquest
District General Manager

FROM: Brad Underwood, P.E.
Director of Public Works

SUBJECT: Review, discuss, and possibly concur with IVGID Staff, Design and CMAR Team recommendation of a two-million-gallon pre-stressed concrete tank as the WRRF effluent storage facility.

DISTRICT STRATEGIC PLAN: Long Range Principle 5 – Assets and Infrastructure.

DATE: June 1, 2022

I. RECOMMENDATION

That the Board of Trustees makes a motion to concur with IVGID Staff, Design, and CMAR Team recommendation of a two million gallon (MG) pre-stressed concrete tank as the WRRF effluent storage facility.

II. DISTRICT STRATEGIC PLAN

Long Range Principle 5 – Assets and Infrastructure – The District will practice perpetual asset renewal, replacement, and improvement to provide safe and superior long term utility services and recreation venues, facilities and services.

- Maintain, renew, expand, and enhance District infrastructure to meet the capacity needs and desires of the community for future generations.
- Maintain, procure, and construct District assets to ensure safe and accessible operations for the public and the District's workforce.

III. BACKGROUND

Storage Facility Project Scope Change

In March 2022, the Board granted approval for IVGID staff to proceed with agreement amendments for Jacobs and Granite Construction to develop three alternative WRRF effluent storage options to 30% and return to the Board with a recommendation. An effluent storage facility is required to meet Nevada Division of Environmental Protection (NDEP) discharge permit requirements.

Prior to the amendments approved in March 2022, the original agreement with Jacobs was for design of a permanent HDPE liner in Pond 2; the Granite Construction agreement combined CMAR tasks for both the Pond 2 lining and the effluent export pipeline (EEP) replacement projects. The amendments and design scope revisions were required following the Nevada Division of Water Resources - Division of Dam Safety (DWR) notice that the Mill Creek Dam No. 2 (Pond 2) would be subject to full structural/hydrologic analyses and a Dam Application process. This process was deemed prohibitive with regard to the feasibility of the original Pond 2 design proposal and overall effluent pipeline construction schedule.

Therefore, IVGID staff, the Design and CMAR team determined the permanent effluent storage facility solution must be developed independently of the EEP to ensure compliance with NDEP discharge permit requirements. This memo specifically addresses the three alternatives investigated and final recommendation for a facility to meet the WRRF effluent storage needs.

Current Design Development

Since March 2022, the team of IVGID PW Staff, Granite Construction and Jacobs have collaborated on the proposed alternatives to investigate and progress the technical design, cost estimation, construction risks and regulatory aspects of the three alternatives. The efforts included a coordination meeting in April 2022 with Agency partners with both NDEP and DWR; during this meeting the Design team presented the design concepts enabling the Agencies to provide input on the suitability of the alternatives within their respective regulatory jurisdictions. The input provided has been incorporated to the current 30% designs. The following design alternatives for an emergency WRRF effluent storage facility were developed to the current 30% design stage:

- 1) HDPE Pond Liner to existing Pond 1, including proposed Mill Creek Dam No.1 (MCD1) improvements
- 2) 2MG Welded Steel Storage Tank, including MCD1 removal
- 3) 2MG Pre-stressed Concrete Tank, including MCD1 removal

Recommendation

IVGID staff recommends proceeding with the 2MG Pre-Stressed Concrete Tank.

This recommendation is based on the health and safety considerations, current and future WRRF operational flexibility, overall relative construction, and long-term maintenance costs.

Health and Safety - A fundamental aspect of the tank alternative selection is the removal of the existing Mill Creek Dam No. 1. A review of the original construction

documents for the dam indicates that the dam is not compliant with current standards and best practice for dam construction. As a result, the existing dam is categorized as High Risk by DWR; any failure of MCD1 under full capacity conditions has the potential for considerable and harmful impacts to downstream structures and public safety.

The removal of MCD1 to accommodate a storage tank eliminates all dam-related health and safety concerns; redesign and reconstruction of the dam, perimeter fencing, signage, etc. would minimize the risk profile, however, IVGID would still carry the liability associated with the dam and accountability to DWR would continue in perpetuity. It is the opinion of IVGID staff that the lined pond represents the largest health and safety risk and associated liability of the three considered options.

Operational Flexibility – A second storage tank intended primarily for emergency storage also allows for increased operational opportunities at the WRRF. The additional 2MG tank would provide immediate, in-line redundancy for the existing 0.5MG tank when maintenance/repair or inspections are due. The tank also increases potential site area available to expand WRRF treatment processes should a change in regulations require additional processes. Currently, there is limited land surrounding the WRRF suitable for development due to the sloping nature of the site. Replacing Pond 1 with a storage tank decreases the effluent storage area footprint and allows site grading with the potential to add level sections adjacent to the WRRF that could be utilized in the future for plant operations.

If Pond 1 is lined with HDPE, IVGID public works loses the current on-site option for decanting of the vacuum truck. This existing decant facility is regularly used in support of water and sewer distribution/collection system maintenance throughout the District. The lined pond option only effectively works in emergency scenarios as effluent discharged to the pond will require re-treatment thru the WRRF due to potential (external) contamination risk; if the pond were required to be used.

Construction Costs – The CMAR and engineering estimates for the three effluent storage options investigated are as follows:

Single Enclosed Tank Welded Steel	\$8.0 Million
Single Enclosed Tank Prestressed Concrete	\$6.8 Million
HDPE Liner	\$8.5 Million

These project cost estimates are in line with what was presented to the Board at the March 1, 2022 meeting. The significant project cost increase to the HDPE Liner option is primarily due to the anticipated need to reconstruct the dam. (The total amount budgeted for this project of \$4.55 million (FY21/22 and FY22/23) is not reflective of any cost estimates but an effort to build up the project fund balance).

These updated cost estimates have projected the lowest cost option is the pre-stressed concrete tank. Each estimate presented includes anticipated investigation, design, TRPA coverage costs, regulatory permitting and construction costs related to the proposed option.

The two tank options include equivalent design and construction elements; however, the primary cost difference results from the tank materials. The earthwork quantities and forecast construction durations are comparable as the same amount of site grading is required to accommodate construction of the actual tank.

The HDPE liner cost is greatly increased due to the regulatory requirements imposed by DWR that require significant investigation and analysis of the existing dam. A review of the original plans for MCD1 indicate that the design is not compliant with present day standards, therefore, in order to utilize the dam as an integral (structural) component of the HDPE liner system IVIGD must demonstrate compliance with current design standards as reflected in the current cost estimate. The figure above (\$6.1M) includes replacement of Mill Creek Dam No. 1 to incorporate a clay core and appropriate dam embankment reinforcements in addition to the construction and material costs for the HDPE liner itself.

Long term maintenance costs – IVGID staff, Designer and CMAR team weighed the expected long-term maintenance costs for each option.

The Pre-stressed concrete tank option is projected to have very limited maintenance costs. An advantage of concrete tanks is that no coatings are required after the initial concrete coating and curing. Inspections are required on three to five year intervals to ensure that the concrete surfacing is not deteriorating. No coatings or material replacements are typical for this type of tank in the first 20-30 years.

The Welded Steel tank option also requires regular inspections for both the structural elements (rafters, welds, panels, etc.) and the protective coatings on both interior and exterior surfaces. The cost of the ongoing maintenance costs will be similar to existing IVGID potable water storage tanks; these costs are generally not prohibitive if routine inspections are completed, however this maintenance cost does exceed that expected for the concrete tank.

The HDPE lining system will require full replacement after approximately 20 years. There will also be on-going maintenance and seasonal inspections to ensure the liner and/or perimeter fencing has not been damaged or compromised. Any observed damage will require remedial repairs to ensure competency of the liner.

IV. BID RESULTS

Not Applicable

V. FINANCIAL IMPACT AND BUDGET

The current agreement with Jacobs will need an amendment to incorporate the 100% design scope for the chosen effluent storage tank option. The scope and costs for the amendment will be presented at the June 29, 2022 Board meeting for approval.

Final costs for environmental permitting are not yet known. The current OPCC estimates include \$100,000 for environmental documentation and permitting to allow for various application, consultation, and subcontractor fees. IVGID Staff are currently engaging Exline Consulting to liaise with TRPA to determine the applicable land classifications for the subject area within Pond No. 1. Existing classifications indicate the Pond is a SEZ/Class 1a land capability; the current OPCC estimates include a budget number of \$40/square foot to indicate approximate total project costs if IVGID is required to mitigate the new storage facility as SEZ/1a coverage. However, a site meeting was held with IVGID, TRPA, and Exline to discuss the suitability of the existing land classifications and applicable permit application processes; a formal determination is still outstanding at this time.

The Board has thus far approved a total of \$4.55 million for the Effluent Pond/Storage project including \$1.55 million if the current year budget and \$3.0 million in the FY 2022/23 budget. As of May 1, 2022, approximately \$330,000 has been expended, and unexpended funds at year-end will be carried over to FY 2022/23.

With the current project cost estimate, the project budget will require additional funding prior to award of a construction contract.

IVGID staff are currently pursuing Federal 595 Program Funds through the Army Corps for this project. If Army Corps funding is granted, the funding model has a maximum contribution of 75% of total cost. Concurrently, Staff are pursuing funding through additional federal infrastructure funding programs.

Upon concurrence of the project approach by the Board, IVGID Staff will complete the necessary application documents needed by the Army Corps. If funding is authorized by the Army Corp a funding agreement will be brought before the Board for approval.

Prior to award of a construction contract, Staff will present to the Board a comprehensive funding plan, consistent with funding currently available as well as additional funding commitments secured in support of the this project.

VI. ALTERNATIVES

The alternatives are limited to the options presented herein. Existing IVGID facilities do not satisfy current NDEP discharge permit requirements for the WRRF effluent storage. Construction of either a storage tank or lining of the existing pond is necessary.

VII. BUSINESS IMPACT

This item is not a "rule" within the meaning of Nevada Revised Statutes, Chapter 237, and does not require a Business Impact Statement.

Attachments:

- Tech Memorandum: Pond 1 Effluent Storage Alternatives – Final Recommendation, by: Jacobs, dated: June 1, 2022
- 30% Design Exhibit – HDPE Liner
- 30% Design Exhibit – Enclosed Storage Tank
- Effluent Storage Comparison Table
- Effluent Storage 30% Schedule
- Effluent Storage 6/8 BOT Presentation
- DRAFT 30% Opinion of Probable Construction Costs (OPCC)
 - 2MG Pre-stressed Concrete Tank
 - 2MG Welded Steel Tank
 - HDPE liner and MCD1 dam replacement

Pond 1 Effluent Storage Alternatives – Final Recommendation

Date:	June 1, 2022	Jacobs
Project name:	IVGID Effluent Export Pond Lining	2525 Airpark Drive
Project no:	W8Y12900	Redding, CA 96001-2443
Attention:	Brad Underwood	United States
Company:	Incline Village General Improvement District:	T +1.530.243.5831
Prepared by:	Ashley Kellogg, PE	F +1.530.243.1654
Copies to:	Granite Construction	

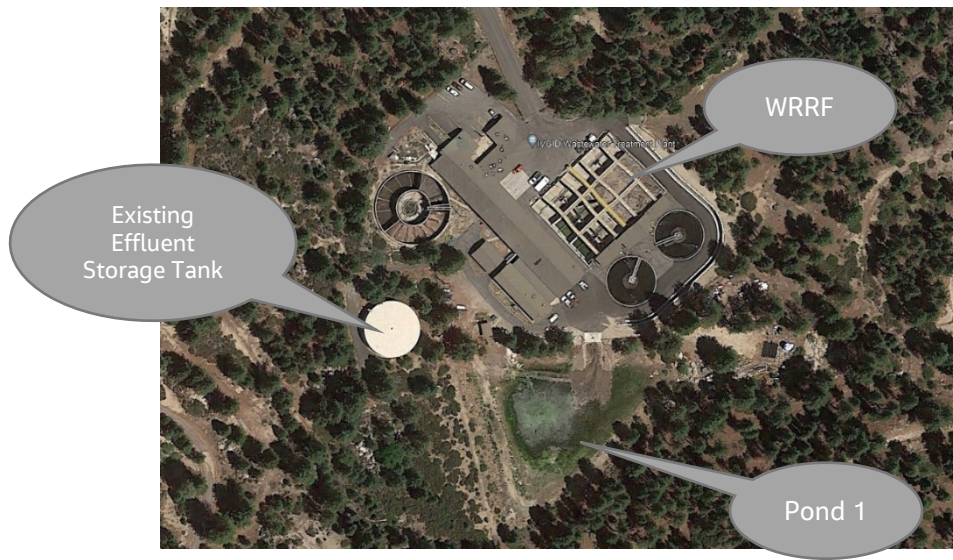
Introduction:

After thorough investigation of multiple alternatives, IVGID recommends a single enclosed tank made of prestressed concrete as the preferred effluent storage solution. The purpose of this memo is to provide the background, criteria, and summary of alternatives considered in supporting this recommendation.

Project Background:

Incline Village General Improvement District (IVGID) currently operates a Water Resource Reclamation Facility (WRRF) in Incline Village, Nevada. The facility includes two unlined reservoirs initially designed for effluent storage: Pond 1 located immediately adjacent to the WRRF and Pond 2 north of the facility and at a lower elevation. Pond 1 has an approximate existing storage capacity of 2 million gallons (MG), while Pond 2 is contained by Mill Creek No. 2 Dam and has an approximate existing storage capacity of 15 MG. IVGID's current operating permit prohibits use of an unlined pond for emergency effluent storage, therefore IVGID is pursuing a permanent effluent storage option to satisfy their operating permit requirements. The 60% design of a geomembrane lining system at Pond 2 was submitted to Nevada Department of Water Resources Division of Dam Safety for their review. The Division of Dam Safety team conferred with the State Engineer and then notified the Design team in December 2021 that the proposed permanent lining of Pond 2 requires formal submittal of an Application for Approval of Dam Plans (dam permit). A dam permit consists of structural, geotechnical, and hydraulic analyses of the existing dam in addition to improvements of the existing spillway to prevent overtopping of the dam in the event of a Probable Maximum Flood event. The dam permit application would require considerable engineering resources and, importantly, a significant time delay to the pond lining project (estimated >12 months).

Agreements between IVGID, Jacobs Engineering, and Granite Construction (CMAR), have been established to initiate review of options in and around Pond 1 for design and construction of the required permanent effluent storage improvements at the WRRF.



Effluent Storage Alternative Analysis:

The alternative analysis presented below is comprised of effluent storage management criteria, alternative development, initial alternative screening, and results.

Effluent Storage Management Criteria

Following are effluent storage criteria:

- Effluent storage capacity shall be a minimum of 2.0 MG to accommodate approximately 48 hours of average peak flow rates.
- The jurisdictional embankment (Mill Creek Dam No 1) must be considered, and NV DWR review will be required.
 - If removed, dam will be decommissioned per NAC 535.220
 - If remaining, would require an application for dam modification, including seepage, stability, and hydrology evaluations for review by NV DWR.
- Effluent must be plumbed to the existing pumping station (to pump effluent back to the WRRF headworks) or be conveyed to the export pipeline.
- Potential relocation of the existing decant facility within Pond 1 will be completed outside of this project.
- Effluent Storage must be in accordance with Nevada Division of Environmental Protection (NDEP) requirements.
- TRPA conditions of approval must be considered, including Coverage Fee.

Other factors considered for final alternative recommendation include the following:

- Initial Construction Cost
- Construction Schedule
- Lifetime Maintenance

- Constructability
- Funding
- Future Opportunities for plant expansion

Alternative Development:

Effluent storage alternatives were developed based on the criteria presented above and are described below. The initial alternatives considered with Mill Creek Dam No. 1 decommissioning were construction of a concrete basin with vertical walls, and construction of a single enclosed tank of either welded steel or prestressed concrete. Lining the Pond 1 basin with HDPE geomembrane similar to the originally proposed Pond 2 liner was also considered. The Pond 1 liner would have the same issues as Pond 2, requiring ongoing annual inspections and dam performance approvals by NV DWR, but the engineering requirements are much simpler compared to Pond 2 because of the smaller dam size and contributing watershed area. After initial consideration, the concrete basin with vertical walls was eliminated and the three remaining alternatives were advanced to 30% Design level for cost estimating.

In summary these include:

1. Single Enclosed Tank – Welded Steel
2. Single Enclosed Tank – Prestressed Concrete
3. HDPE Liner

Single Enclosed Tank –

Alternative site development around Pond 1 for both enclosed storage tank material options was considered to be the same. Advancement to 30% design included an effort to balance earthwork cut/fill on site to greatly reduce or eliminate soil export requirements. Further analysis determined existing WRRF access routes were unsuitable for the proposed storage tank construction; the need for an alternative construction access route off Sweetwater Road was identified. The design proceeded with optimized tank dimensions for 2 MG of storage. This included reducing the tank diameter to 99-feet and increasing the height accordingly. To support the more economical tank size, site grading was optimized with the minimum bottom of tank elevation set at 6466 feet and the maximum water elevation via gravity flow at 6479 feet. This design allows up to 0.85 MG of effluent storage without pumping. In order to utilize the full 2 MG of available storage in the tank, the existing 0.5 MG steel tank will be refurbished with a connection port and will be utilized as a 'wet well' in conjunction with a trailer mounted pump, currently owned by IVGID. This condition is anticipated during an emergency situation when storage capacity in excess to standard WRRF operations is required.

Installation of a single enclosed tank requires decommissioning of Mill Creek Dam No. 1. The excess material from the dam removal is proposed as fill material for construction of a suitable access road (18ft width) between the tank site and the existing access road that intersects Sweetwater Road. Additional excess material would be used to build-up the site east of the tank to be more or less at the existing plant elevation. An 15-foot-wide perimeter road would also be provided around the tank and staging/laydown areas for crane siting and tank erection.

Welded Steel Storage Tank Option

IVGID currently maintains an existing welded steel storage tank for effluent storage and is familiar with the construction and maintenance requirements of such a system. Resource Development Company of Reno, NV has provided the initial cost estimate for welded steel tank installation, with an assumed diameter of 99-feet and 39-foot height. The cost estimate includes using D100-21 Risk Category III and Seismic Use Group II design criteria. The tank would meet AWWA D100-21 standard requirements as well as Washoe County building requirements. The tank would include appurtenances, manways, ladders, handrails and surface preparation coating in accordance with AWWA D102 and NDEP requirements. Earthwork, site

preparation and construction of the perimeter and column foundations and below grade piping would be completed by Granite Construction.

Welded steel tanks require regular inspection and maintenance with costs that accumulate over the lifetime of the tank. The project estimate for the initial construction of the tank was the highest of the three alternatives, with the estimate for the tank alone exceeding that of the prestressed concrete tank by over \$1 Million.

Prestressed Concrete Storage Tank Option

Similar to the hydraulic requirements of a welded steel tank, it is anticipated that a prestressed concrete tank would be of similar dimensions and require equivalent earthwork and site preparation efforts prior to tank erection. Prestressing of the cast-on-site panels would occur after the installed panels have reached specified cure strengths. DN Tanks provided an initial cost estimate for a prestressed concrete tank with a 99-foot interior diameter and 35-foot height, which includes perimeter concrete foundation, floor, and precast dome roof. DN Tanks also reviewed the existing site and provided input on required staging and laydown areas that have been incorporated into the 30% design. As with the welded steel option, Granite Construction would complete necessary earthwork and site preparation.

Compared to the lifecycle of a welded steel tank, there are little to no repairs or maintenance required over the expected lifetime of a concrete tank. A prestressed concrete tank can be partially buried, which would allow for flexibility in earthwork balance if needed. Steel tanks need to be fully above grade and do not provide this flexibility. Various aesthetic options are available for the final exposed finish of the tank if desired. For a 2 MG tank with similar footprint, prestressed concrete is a more economical option both at initial construction and over the lifetime of the tank when compared to a steel tank.

HDPE Liner

NDEP requires geomembrane liner systems comply with Water Technical Sheet WTS-37; this guidance document mandates inclusion of a 60-mil primary liner and 40-mil secondary liner. HDPE is proposed for the geomembrane system with geonet installed between the primary and secondary liners as a leak detection system. The available storage volume with the pond preparation and assumed 3-feet of freeboard would be approximately 2.0 MG.

Preliminary pond grading with the inclusion of a 15-foot perimeter access road and pond lining details were presented to NV DWR and NDEP at an agency meeting on April 20, 2022. NDEP confirmed the design details would meet the requirements of WTS-37 and would be acceptable for the WRRF operating permit. However, NV DWR informed the design team that any liner anchorage into Mill Creek Dam No. 1 or other permanent impact would trigger a full analysis of dam performance and require a dam application for review by the agency. This would include geotechnical subsurface investigation of the current dam foundation and embankment condition and analyses of seepage, stability, and hydrology. Based on as-built information, the existing dam does not include a clay core or other standard condition to prevent seepage; this is assumed to be sub-standard and - due to the consequences of failure, downstream facilities, and dam size - classifies as a high hazard dam. Mill Creek Dam No. 1 was built prior to oversight by NV DWR and is unlikely to meet current design standards. NV DWR recommended dam decommissioning in lieu of a dam improvement project as removal of Mill Creek Dam No. 1 would eliminate the liability of a high hazard dam from IVGID and NV DWR's jurisdiction.

Although the initial investment in the liner system alone is much less than that of the tanks, the analysis, design and potential reconstruction of Mill Creek Dam No. 1 contributes to increased project schedule, risk profile, and overall cost. Additionally, the expected lifetime of the liner is significantly shorter than the storage tank alternatives. Therefore, full liner replacement costs should be assumed every 20-30 years during the operational life of the storage basin.

Alternative Analysis Results:

The alternatives, preliminary construction costs and considerations are summarized below.

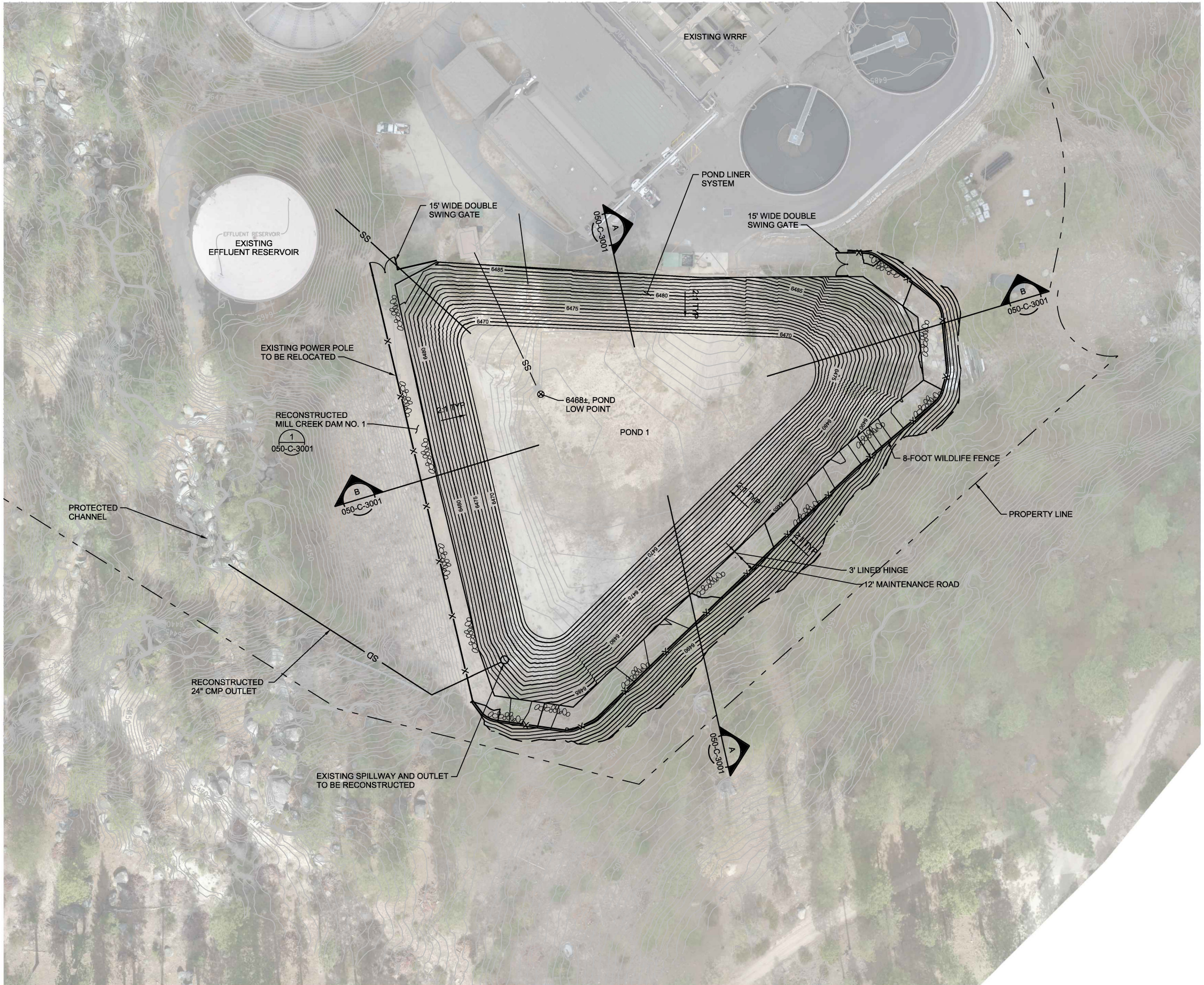
Alternative	Estimated Project Cost	Considerations
Single Enclosed Tank – Welded Steel	\$8.0 Million	<p>Tanks are enclosed and, therefore, allow for greater detention durations before conveying effluent to the export pipeline. Does not require pumping and retreatment through the WRRF.</p> <p>Proposed earthwork and tank size will allow for future expansion of the plant.</p> <p>IVGID is familiar with the maintenance and function of an enclosed tank for effluent storage.</p> <p>Initial cost and estimated lifetime maintenance cost is greater than the pre-stressed concrete alternative.</p> <p>Decommissioning of Mill Creek Dam No. 1 will remove IVGID liability of High Hazard dam.</p>
Single Enclosed Tank – Prestressed Concrete	\$6.8 Million	<p>Similar considerations for enclosure and grading as the steel tank.</p> <p>Lifetime maintenance costs forecast to be less than a welded steel tank. Minimal maintenance is required once installed.</p> <p>Tank can be buried to eliminate earthwork export volume or provide additional available site area for future WRRF expansion.</p> <p>Decommissioning of Mill Creek Dam No. 1 will remove IVGID liability of High Hazard dam.</p>
HDPE Liner	\$8.5 Million	<p>HDPE is widely used and is currently permitted by NDEP for effluent storage and initial liner installation cost is lowest.</p> <p>Minimal earthwork would be required to prepare existing basin for liner system and to provide target storage volume. However, Mill Creek Dam No. 1 will likely need to be removed and replaced with a dam meeting current design standard. This would require analysis of current conditions, design and reconstruction to meet current standards.</p> <p>Maintaining Mill Creek Dam No. 1 would require continual maintenance and annual inspections to maintain the high hazard dam.</p> <p>Pond 1 would be unavailable for decant facility use or future plan expansion due to lining material and area needed for the pond.</p> <p>Wildlife fence would be required to protect the HDPE liner.</p>

Alternative	Estimated Project Cost	Considerations
		Replacement of the entire liner system is assumed every 20-30 years.

Recommendations and Next Steps:

After consideration of the alternatives, IVGID staff finds an enclosed tank to be the most beneficial effluent storage option with regards to future plant expansion opportunities and elimination of the liability of Mill Creek Dam No. 1. An enclosed tank eliminates the need to retreat effluent after storage within the closed system. The CMAR team recommends advancing a final design package for a 2 MG prestressed concrete tank. Of the storage tank options, prestressed concrete has a lower initial investment and minimal maintenance cost over the lifetime of the tank, compared to welded steel which requires regular inspection and maintenance. The proposed removal of Mill Creek Dam No. 1 will eliminate the liability of a high hazard dam and the grading design will allow for future plant expansion with the proposed fill within Pond 1 and option to partially bury the tank. Various aesthetic treatment options are available to address visual impacts of the tank.

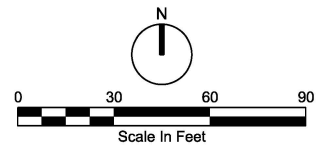
The CMAR Team is looking forward to advancing the effluent export storage project to final design and through construction to satisfy the operating permit requirements of the WRRF and provide opportunities for future plant improvements via the project.



PLAN
1"=30'

APPROXIMATE POND 1 EARTHWORK QUANTITIES		
EXCAVATION (CUT TO FILL)	600	CY
EXCAVATION (CUT TO EXPORT)	3000	CY
UNDERLINER MATERIAL (IMPORT TO FILL)	500	CY

APPROXIMATE MILL CREEK DAM NO. 1 QUANTITIES		
EXISTING EMBANKMENT REMOVAL	8,600	CY
OVER EXCAVATION TO BEDROCK	1,100	CY
CLAY CORE (IMPORT)	2,600	CY
SAND FILTER (IMPORT)	1,300	CY
DAM EMBANKMENT (CUT TO FILL)	5,800	CY



Jacobs
CIVIL

POND 1 GRADING PLAN
HDPE LINER OPTION

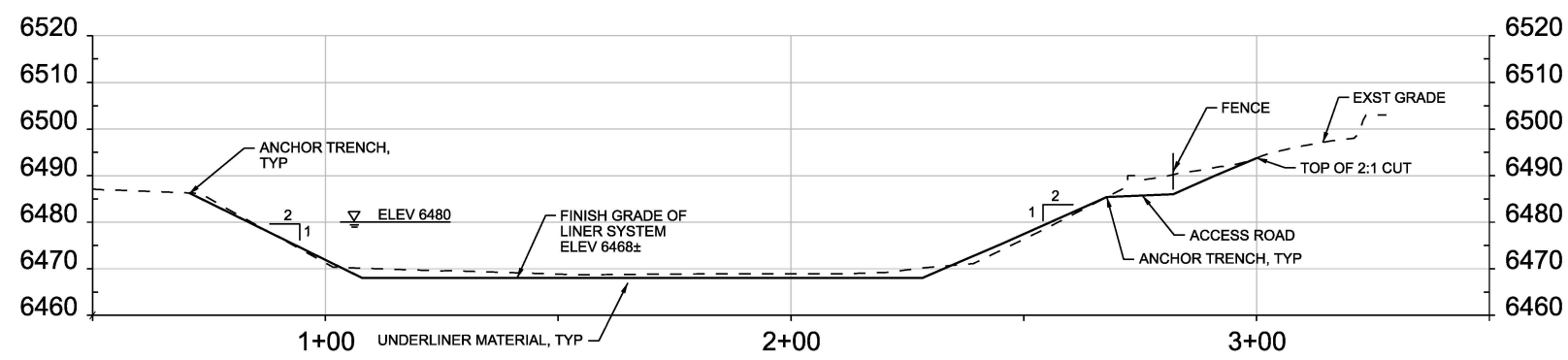
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60% DESIGN - NOT FOR CONSTRUCTION

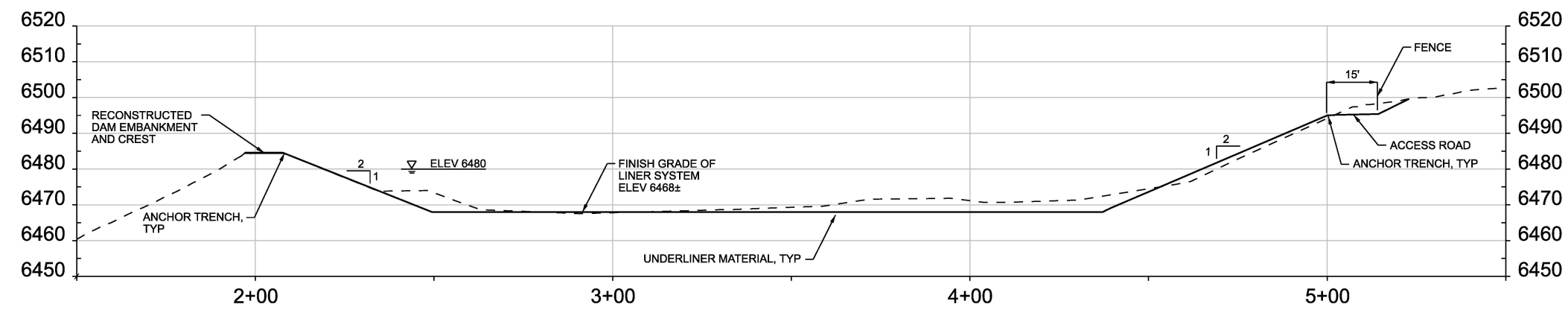
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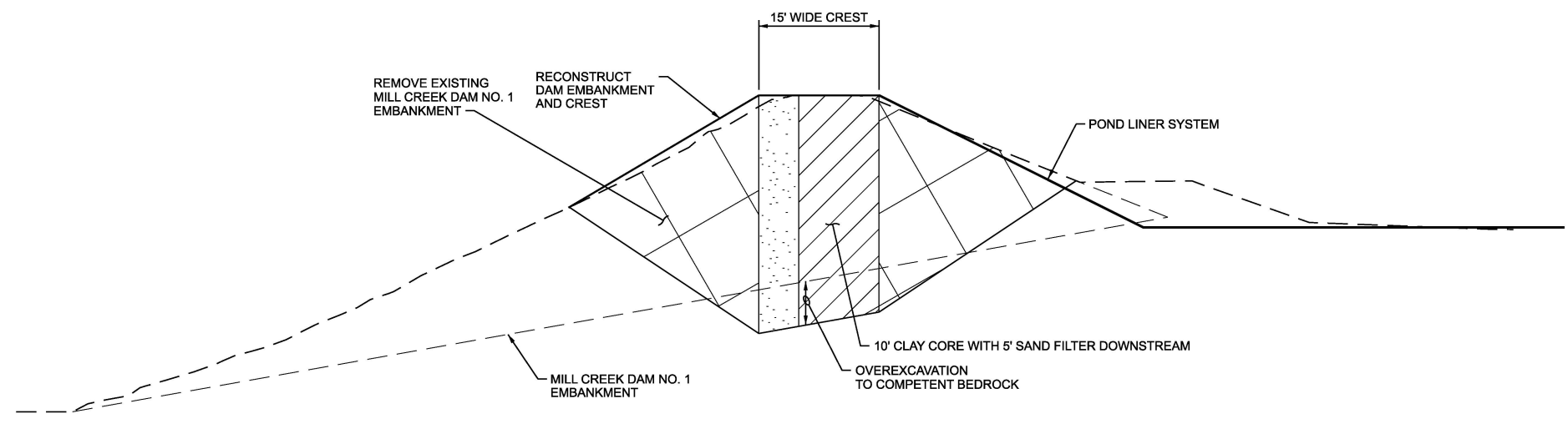
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A SECTION
1"=20'
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B SECTION
1"=20'
050-C-2002



1 DETAIL - MILL CREEK DAM NO. 1
NTS
050-C-2002



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POND I GRADING SECTION & DETAILS
HDPE LINER OPTION

VERIFY SCALE	
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DWG	050-C-3001
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REGISTERED PROFESSIONAL ENGINEER
 TRAVIS J. HOWARD
 CIVIL
 LICENSE NO. 021924
 STATE OF NEVADA
 NOT FOR CONSTRUCTION

NO.	DATE	DR	CHK	APVD	BY	APVD
		T HOWARD	J CHELONIS	B CHELONIS	A KELLOGG	

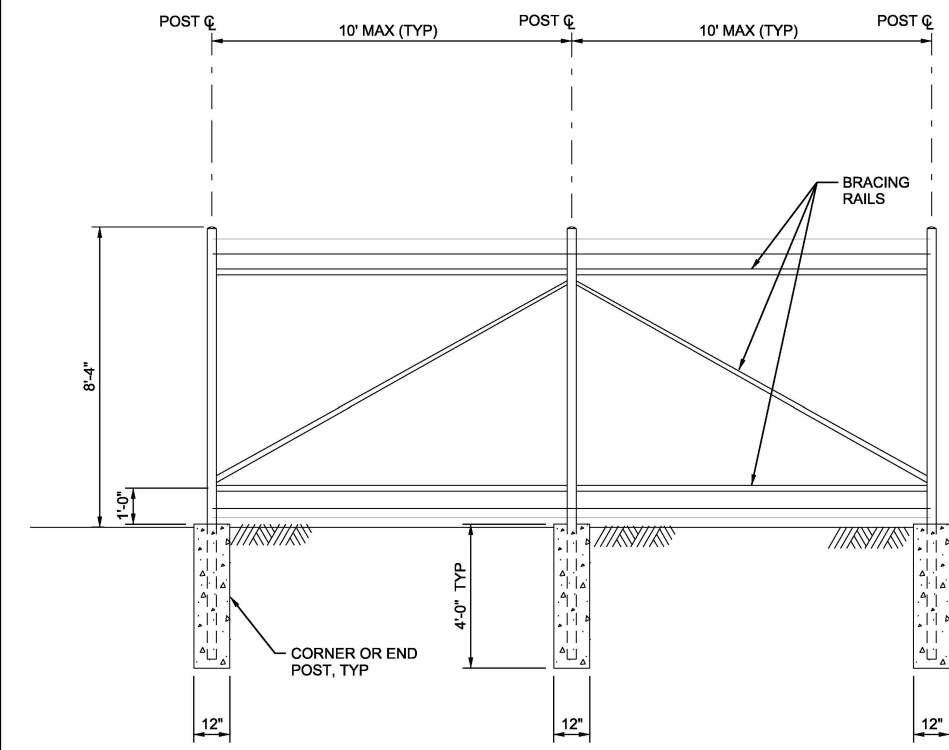
INCLINE VILLAGE
 GENERAL IMPROVEMENT DISTRICT
 ONE DISTRICT - ONE TEAM
 EFFLUENT EXPORT POND LINING PROJECT

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 WILDLIFE FENCE DETAIL

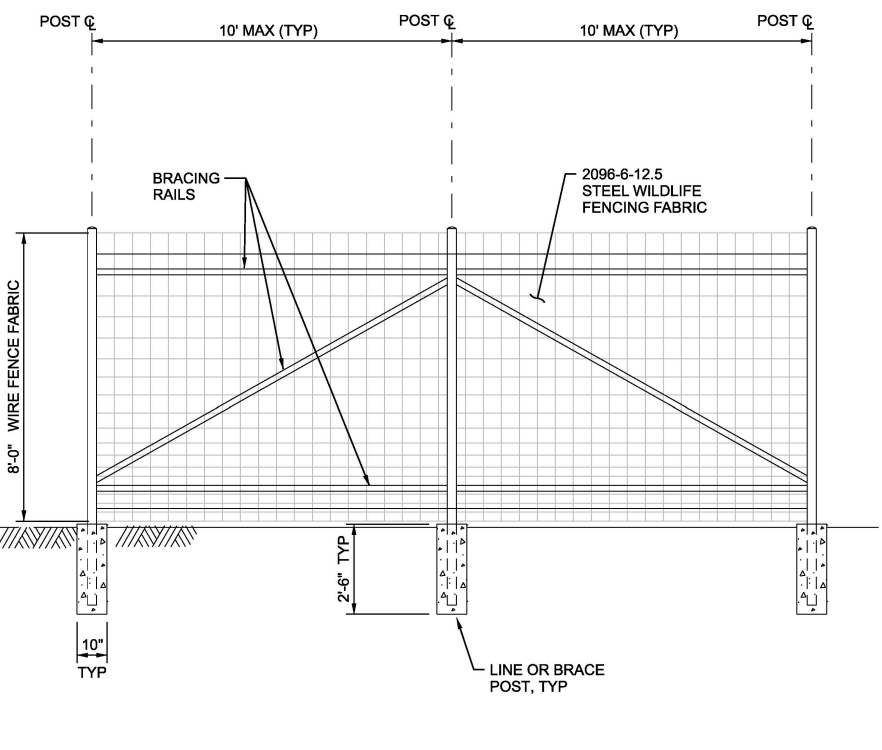
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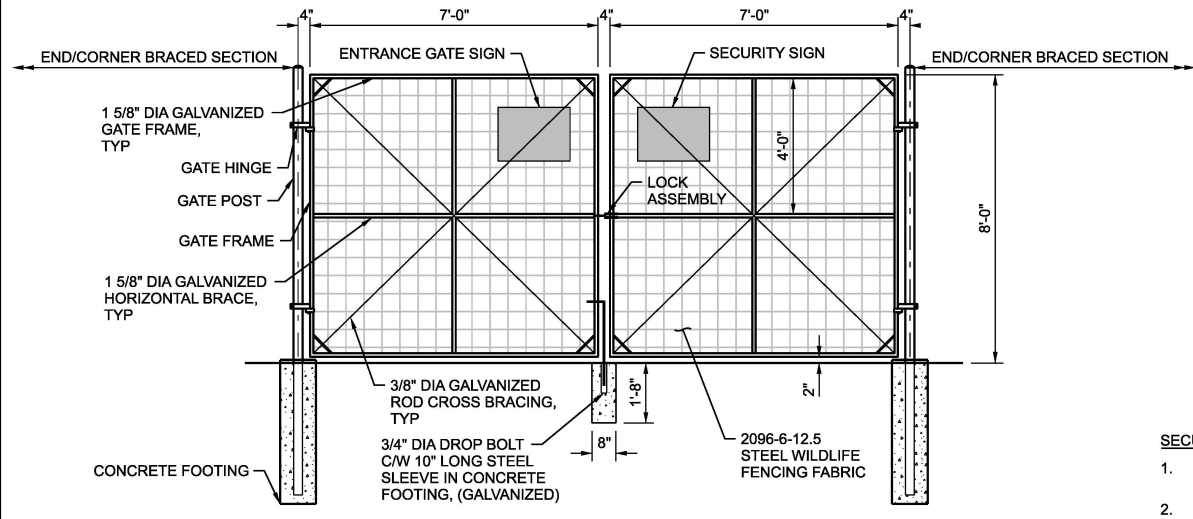
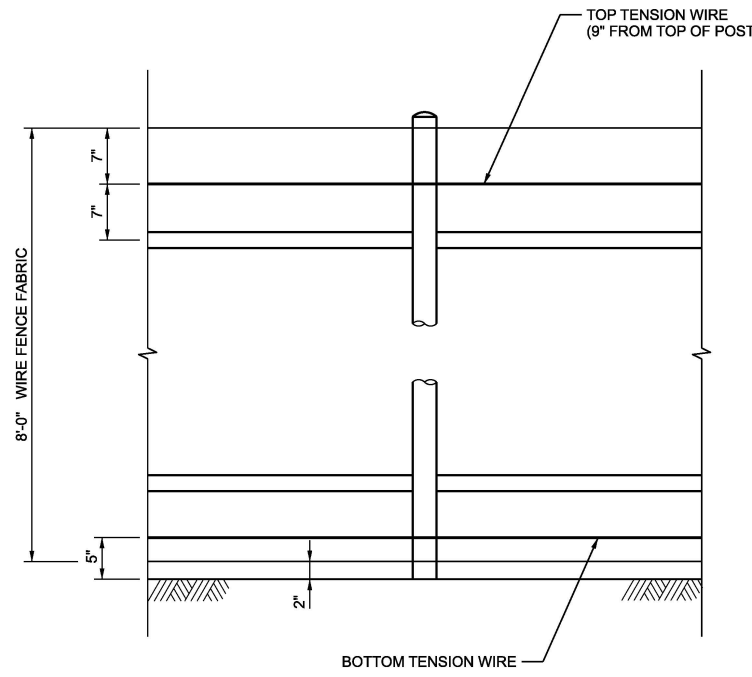
60% DESIGN - NOT FOR CONSTRUCTION



END/CORNER BRACED SECTION
 3/8"=1'-0"



LINE BRACE SECTION
 3/8"=1'-0"



15' WILDLIFE GATE
 3/8"=1'-0"



- SECURITY SIGNING**
- ATTACH 18" X 24" ALUMINUM SECURITY SIGNING TO WILDLIFE FENCE. MESSAGE: AS SHOWN.
 - SIGNING TO BE EVENLY SPACED AT INTERVALS NOT TO EXCEED 300-FOOT SPACING. SIGNING TO FACE AWAY FROM POND.
 - INSTALL SECURITY SIGN TO GATE.

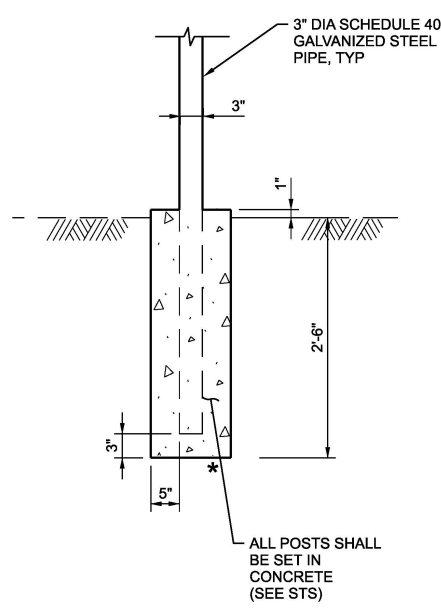
**INCLINE VILLAGE
 GENERAL IMPROVEMENTS DISTRICT**

POND 2

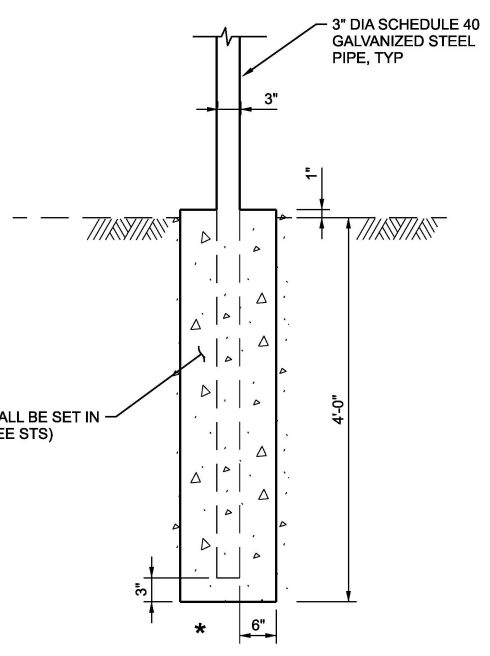
**EMERGENCY CONTACT:
 775-832-1203**

- ENTRANCE GATE SIGN**
- SECURE 18" X 24" ALUMINUM ENTRANCE GATE SIGN TO GATE. MESSAGE AS SHOWN.

8-FOOT WILDLIFE FENCE

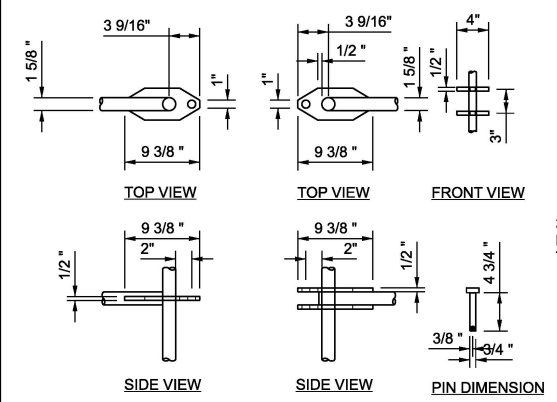


LINE & BRACE POSTS
 1"=1'-0"

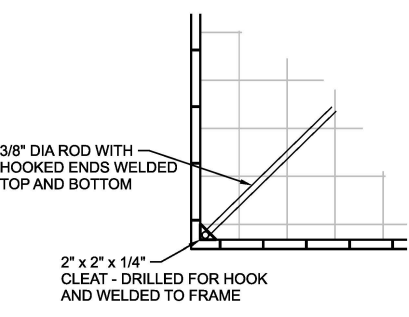


CORNER & END POSTS
 1"=1'-0"

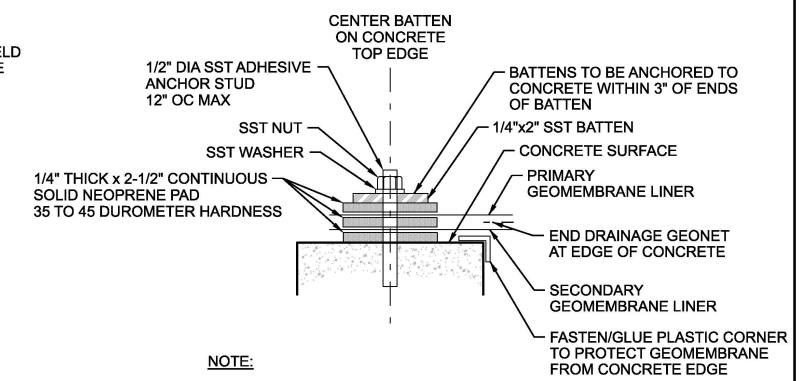
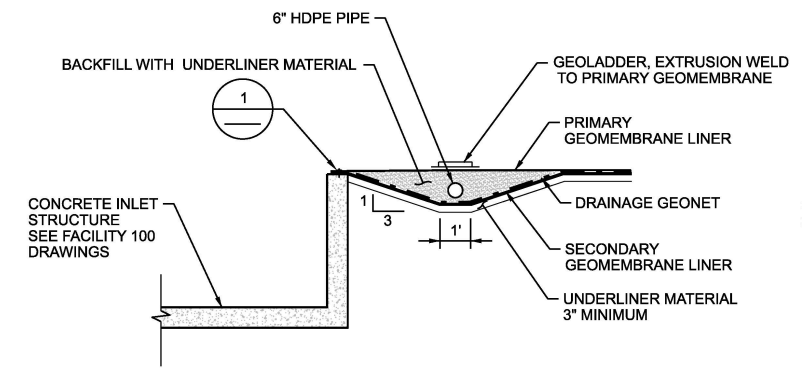
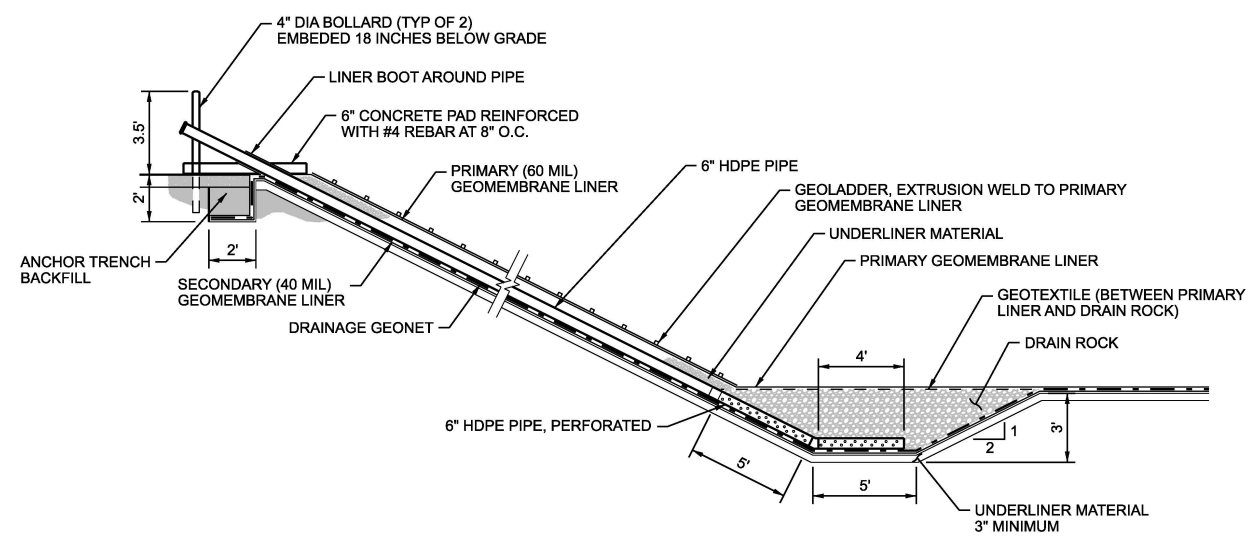
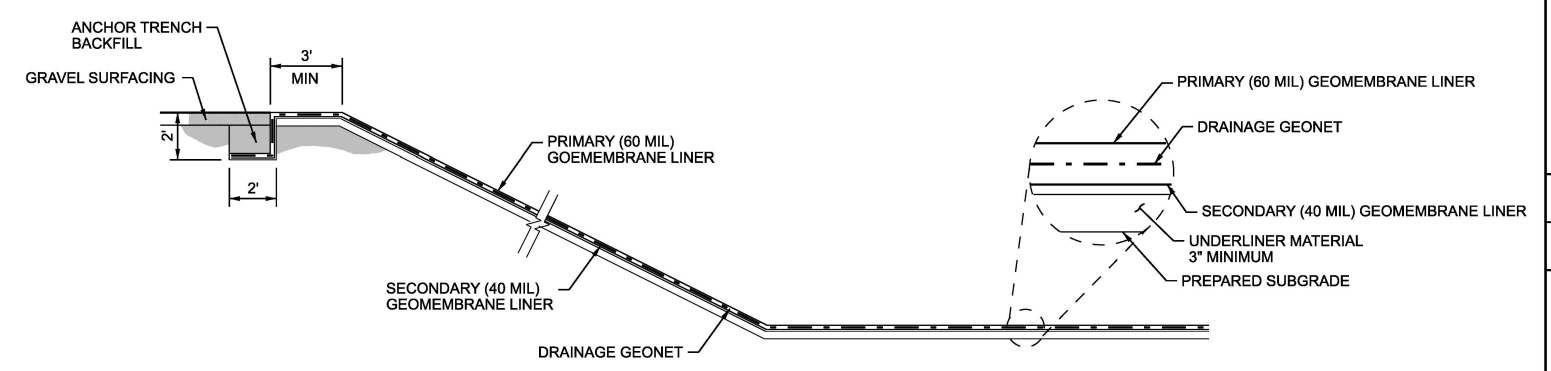
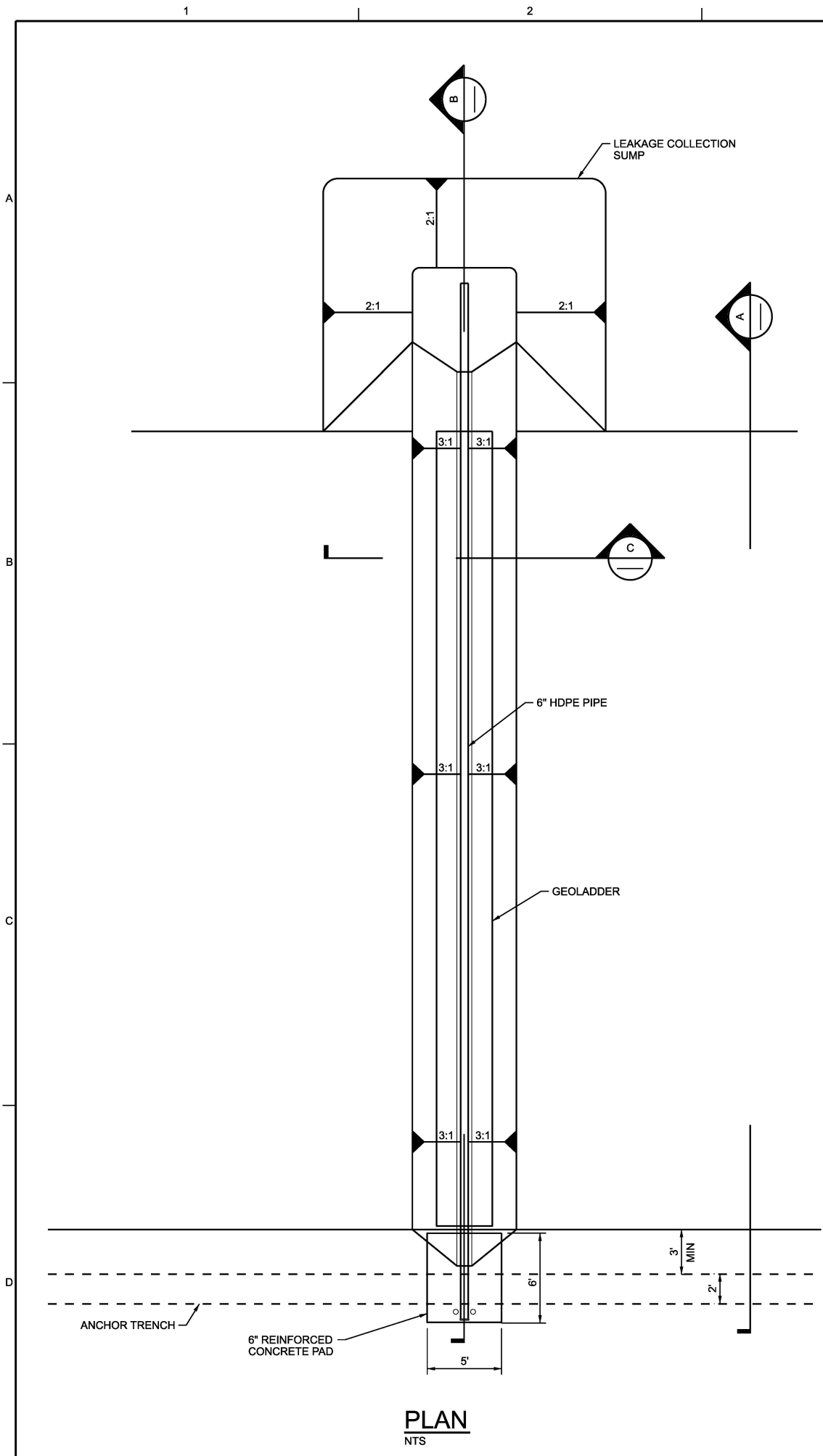
* OVERSIZED HOLES SHALL BE COMPLETELY BACKFILLED WITH CONCRETE OR WELL TAMPED GRAVEL AROUND CONCRETE FOOTING.



LOCK MECHANISM DETAIL
 1"=1'-0"



DIAGONAL BRACE CLEAT DETAIL
 1"=1'-0"



NOTE:
1. LIMIT COMPRESSION OF NEOPRENE PAD TO 10 - 15 PERCENT TOTAL THICKNESS.



Jacobs
CIVIL
POND 1
HDPE LINER DETAILS

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MAY 2022
PROJ	W8Y12900
DWG	050-C-5002
SHEET	109 of

60% DESIGN - NOT FOR CONSTRUCTION

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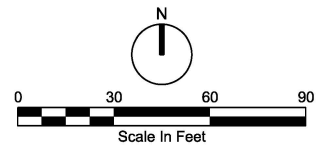


A
B
C
D

1 2 3 4 5 6

PLAN
1"=30'

APPROXIMATE EARTHWORK QUANTITIES		
EXCAVATION (CUT TO FILL)	8,860	CY
EXCAVATION (CUT TO EXPORT)	685	CY
AGGREGATE BASE (IMPORT TO FILL)	600	CY



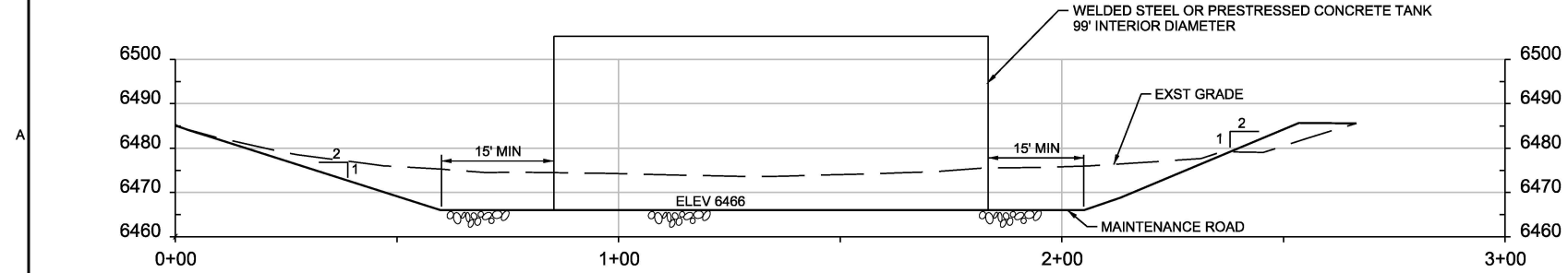
INCLINE VILLAGE
GENERAL IMPROVEMENT DISTRICT
ONE DISTRICT - ONE TEAM
EFFLUENT EXPORT POND LINING PROJECT

Jacobs
CIVIL
**POND 1 GRADING PLAN
STORAGE TANK OPTION**

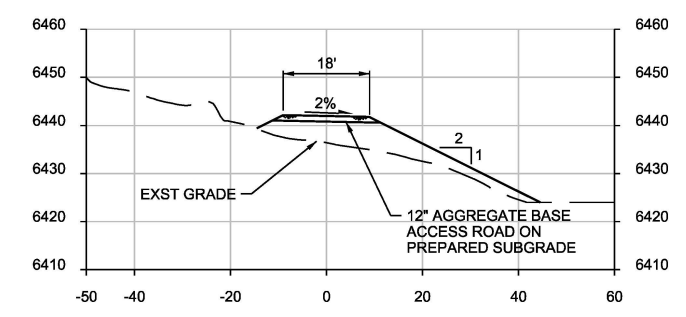
VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"	
DATE	MAY 2022
PROJ	W8Y12900
DWG	060-C-2002
SHEET	110 of 110

NO.	DATE	DR	CHK	REVISION	BY	APVD
		T HOWARD	K BISHOP		B CHELONIS	A KELLOGG

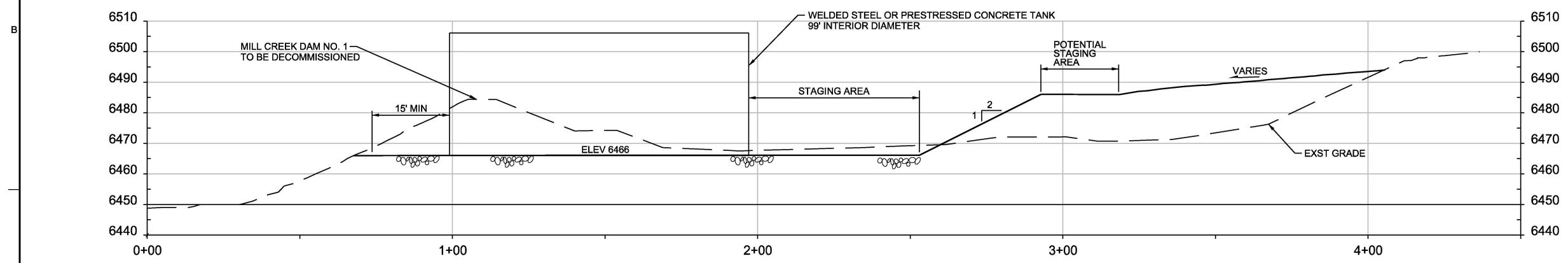
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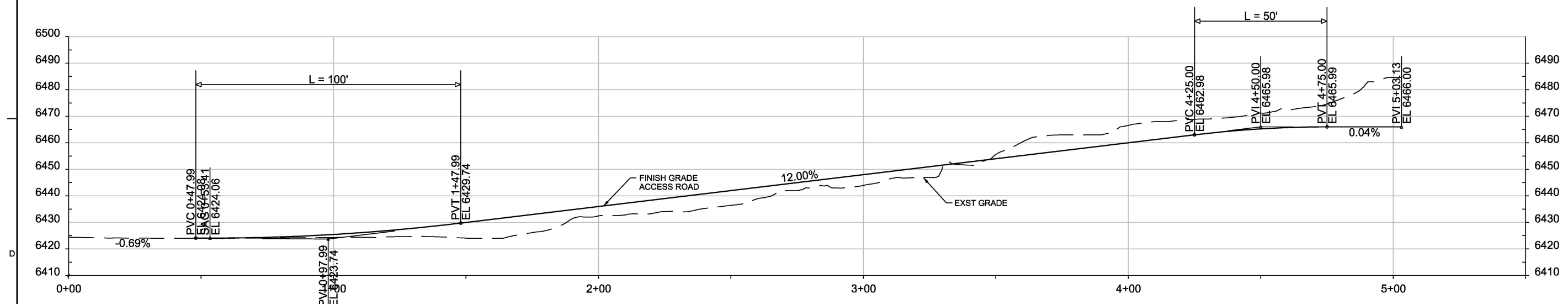
A SECTION
1"=20'
060-C-2002



C SECTION
1"=20'
060-C-2002



B SECTION
1"=20'
060-C-2002



PROFILE
1"=20'
060-C-2002

INCLINE VILLAGE
GENERAL IMPROVEMENT DISTRICT
ONE DISTRICT - ONE TEAM
EFFLUENT EXPORT POND LINING PROJECT

Jacobs CIVIL
POND 1 GRADING SECTION & DETAILS
STORAGE TANK OPTION

VERIFY SCALE	BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE	MAY 2022
PROJ	W8Y12900
DWG	050-C-3001
SHEET	11 of

60% DESIGN - NOT FOR CONSTRUCTION
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Criteria	IVGID Pond 1 Effluent Storage Alternatives		
	Prestressed Concrete Tank	Welded Steel Tank	HDPE Liner System
Total Cost	\$6.8 M	\$8.0 M	\$8.5 M
Health & Safety Element	Limited, lockable access locations. Dam removed	Limited, lockable access locations. Dam removed	Open water risk. Dam failure risk. 825LF perimeter fence. Continued Regulatory Agency annual safety inspections.
Mill Creek Dam No. 1 Impact	Dam Decommissioning Application. Hydrologic Investigation/report.	Dam Decommissioning Application. Hydrologic Investigation/report.	Dam investigation, analysis, design and anticipated reconstruction. Hydrologic investigation/report.
Plant Integration	Daily, full integration option available.	Daily, full integration option available.	Limited plant integration, emergency storage event only. RETREATMENT of pond-stored effluent required.
Future Opportunities	Opportunity for plant expansion. Continued decant facility* use.	Opportunity for plant expansion. Continued decant facility* use.	Reduces available land area suitable for future WRRF expansion. Decant facility* relocation required.
Lifetime Maintenance/Cost Implication	Very limited, anticipate inspection only.	Lifetime inspection & known maintenance schedule required. Mandatory coating replacements.	Full replacement after 25-30 years. Ongoing perimeter fencing/signage maintenance.
Constructability (Availability of Materials)	Local Material Suppliers. Established CMAR relationships.	Future supply chain unknown.	Future supply chain unknown.
Environmental Permitting	TRPA - tree removal & scenic assesment required. County/NDEP Grading/Special Use Permit	TRPA - tree removal & scenic assesment required. County/NDEP Grading/Special Use Permit	TRPA -Significant Coverage implications to Pond 1 assumed (coordination with TRPA ongoing).
External Funding	Army Corp Funding available	Army Corp Funding available	Army Corp Funding available
Construction Schedule	160 Days	185 Days	95 Days

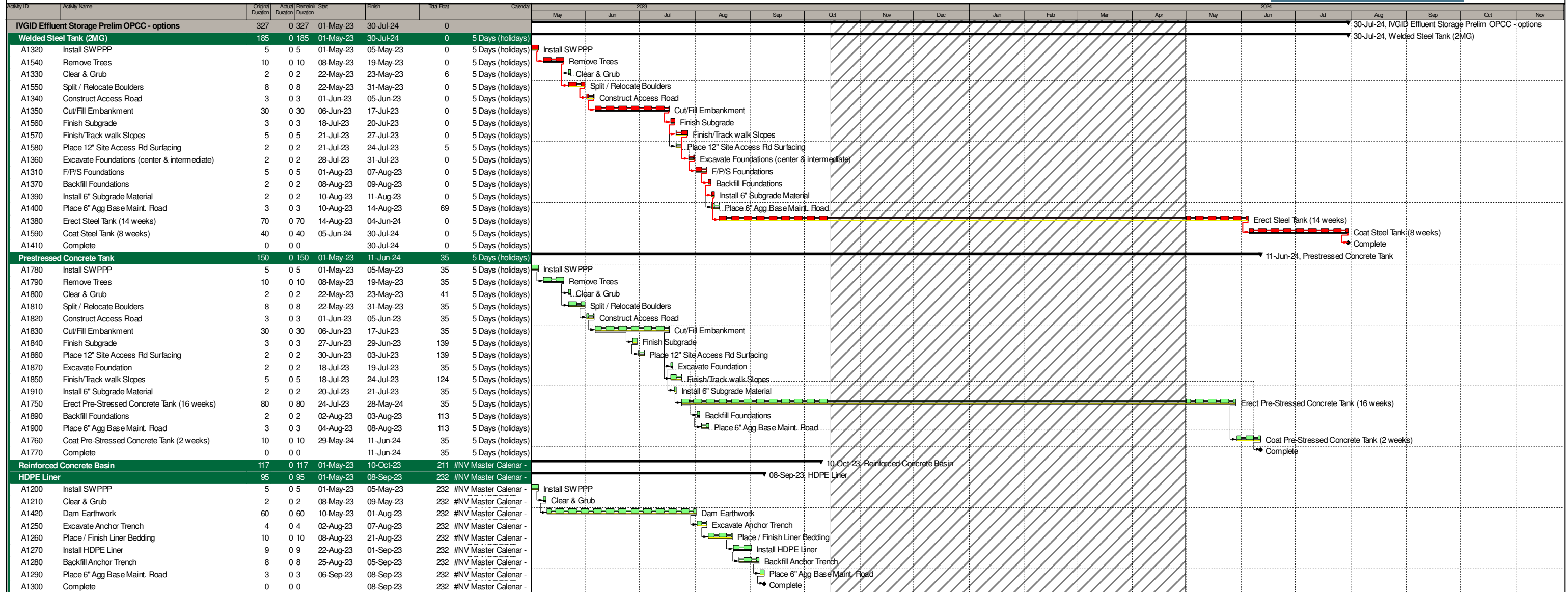
Overall Recommendation	Prestressed Concrete Tank	Welded Steel Tank	HDPE Liner System
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Assessed Criteria Consequence Rating	Lower
	Medium
	Higher
	Maximum

* - Decant facility located in Pond 1; regular use by IVGID PW Pipeline/Operations dept. for Vacuum Truck aggregate disposal



IVGID CMAR - Effluent Storage Options
30% OPCC's (06.01.22)



- █ Remaining Level of Effort
- █ Actual Level of Effort
- Primary Baseline
- Second Baseline
- Third Baseline
- Actual Work
- Remaining Work
- Critical Remaining Work
- ◆ Milestone
- ▶ Summary

IVGID Effluent Export Pond Lining

Effluent Storage Alternatives—Final Recommendation

Board of Trustees meeting—June 8, 2022

IVGID Effluent Export Pond Lining



Pond 1 Permanent Effluent Storage Alternatives

- IVGID must provide a permanent effluent storage option to meet operating permit requirements
- Preliminary Design and Estimates presented for 4 Alternatives in March 2022
 - Reinforced Concrete Basin alternative eliminated
- 30% Design Advancement:
 - HDPE Liner System
 - Welded Steel Tank
 - Prestressed Concrete Tank

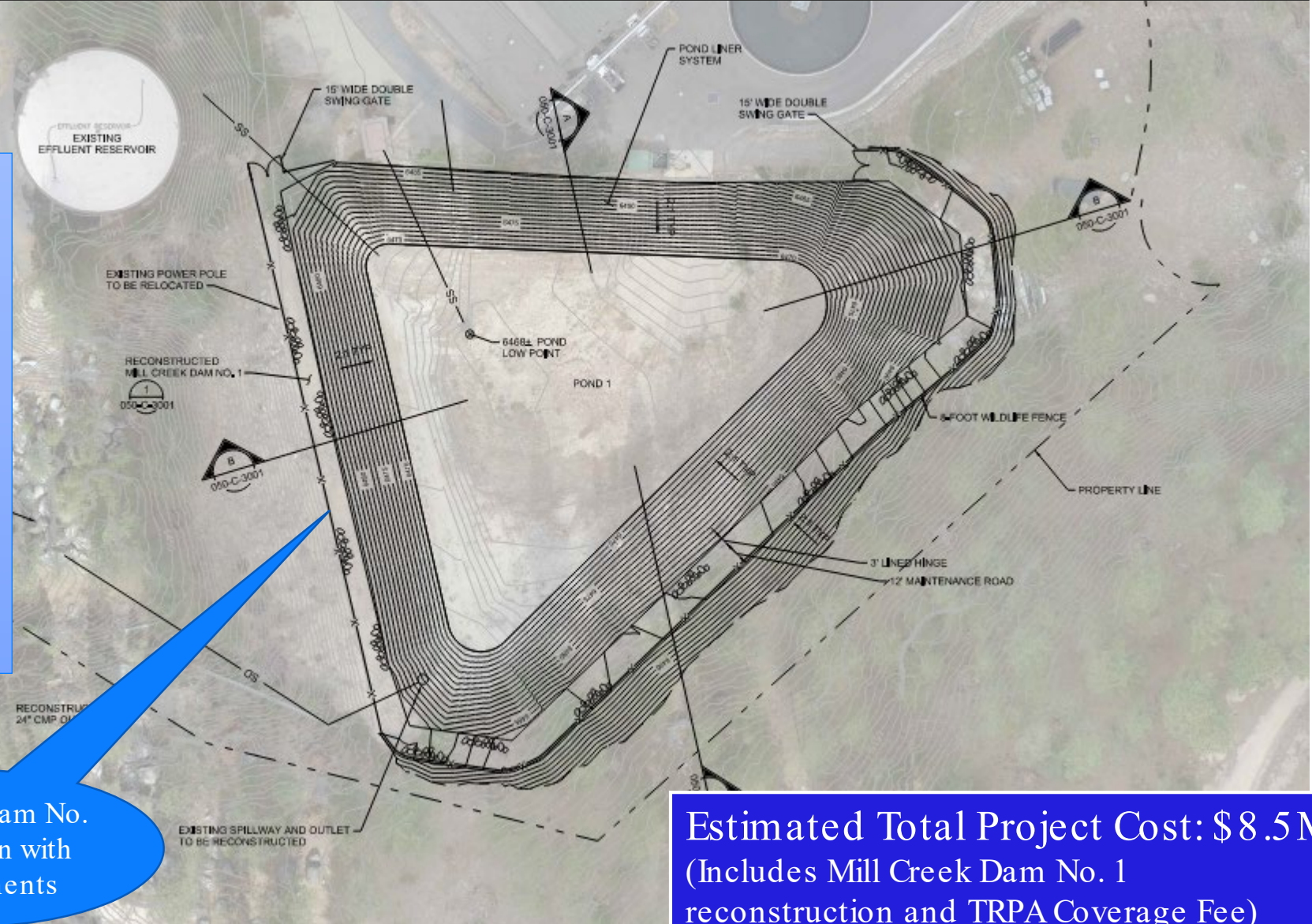
Alternatives 30% Design Development

- Agency Meeting with NDEP, NV DWR held on 4/20/22
 - NDEP will accept either pond liner system or enclosed tank system for operating permit
 - NV DWR will require dam application for any improvements proposed within Pond 1
 - NV DWR recommended decommissioning of Mill Creek Dam No. 1 in lieu of dam application
- Advancement of Enclosed Tank Site Grading
 - Development of access road from northwest to avoid construction traffic through the plant.
 - Opportunity for earthwork balance with access road construction and site grading within the existing pond footprint
- Continued communication with tank manufacturer's and advanced input on construction methods, schedule and estimate.

HDPE Liner System– 30% Design

- Shortest Construction Duration
- Earthwork export required
- Meets NDEP requirements
- Stored effluent may be retreated prior to discharge
- Assumed liner design life of 20-30 years
- TRPA Coverage Fee assumed
- NV DWR dam application required

Mill Creek Dam No. 1 to Remain with improvements

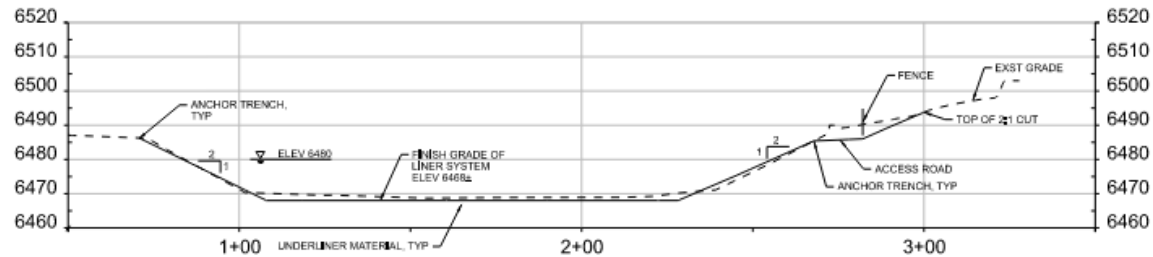


Estimated Total Project Cost: \$8.5M
(Includes Mill Creek Dam No. 1 reconstruction and TRPA Coverage Fee)

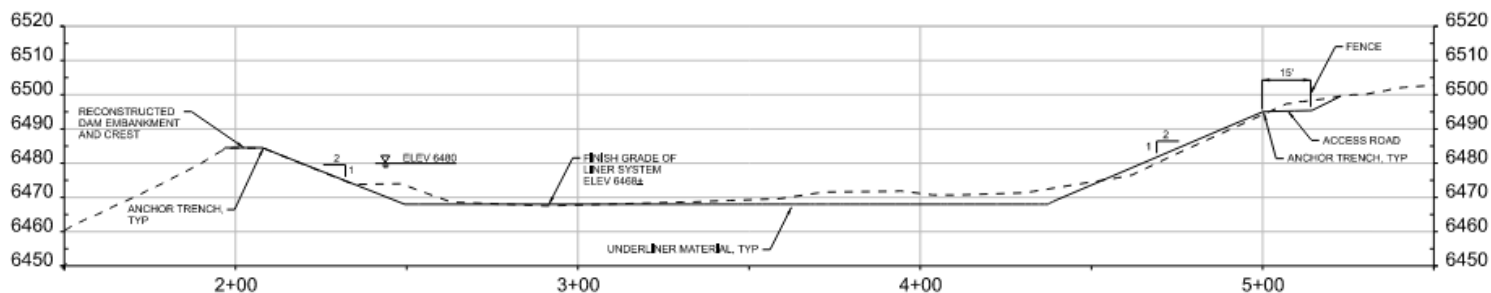
HDPE Liner– Mill Creek Dam No. 1

- ❑ Mill Creek Dam No. 1 is a high hazard dam built prior to Division of Dam oversight
- ❑ As-builts indicate dam to be sub-standard with reconstruction required
- ❑ Extensive earthwork export and material import required for upgrade

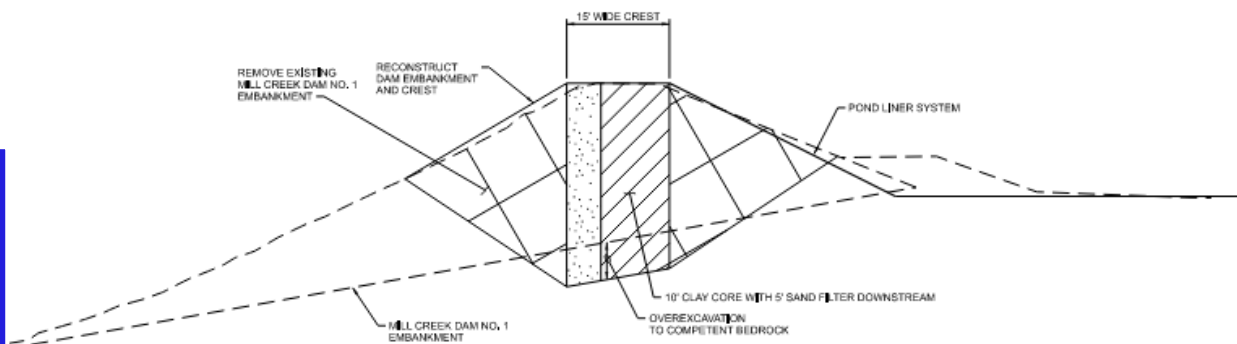
Estimated Mill Creek Dam No. 1 Cost (Design and Construction): \$2.1 M (25% of total project cost)



(A) SECTION
1"=20'
050-C-2002



(B) SECTION
1"=20'
050-C-2002



(1) DETAIL - MILL CREEK DAM NO. 1
NTS
050-C-2002

Enclosed Storage Tank

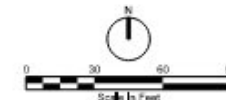
18' Wide Access Road

Earthwork balance for future site expansion

Mill Creek Dam No. 1 Removed

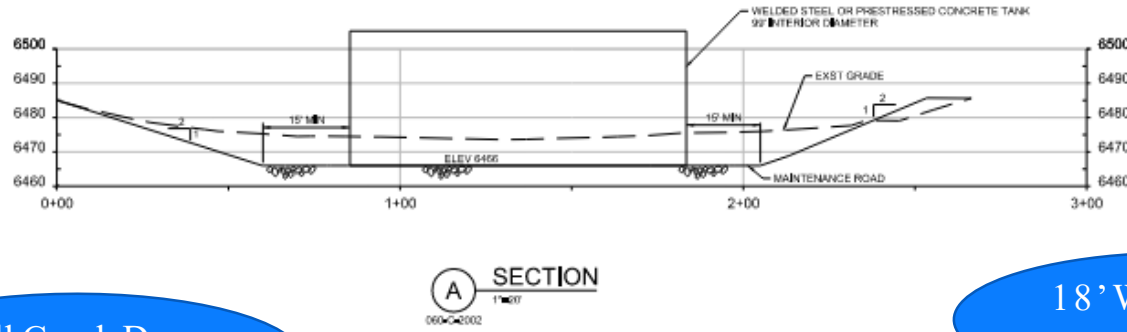
Proposed site grading accommodates:
 Welded Steel Tank
or
 Prestressed Concrete Tank

PLAN
1"=30'

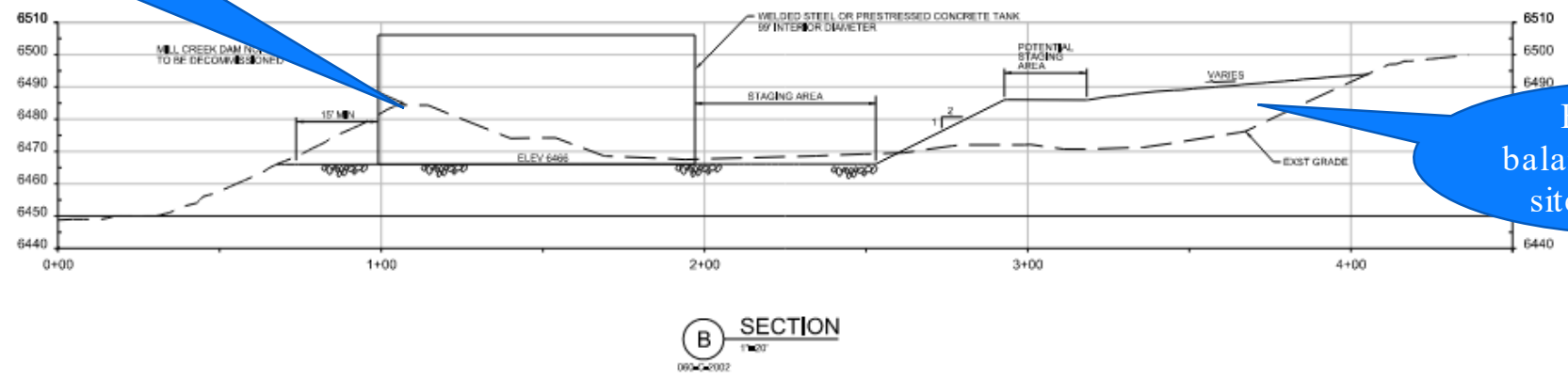
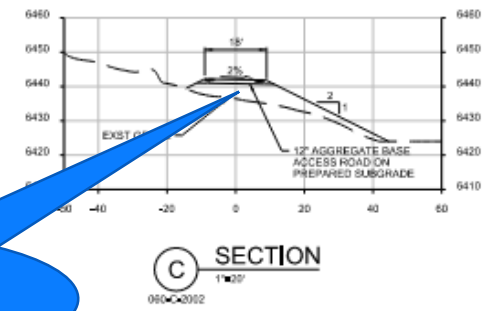


Enclosed Storage Tank

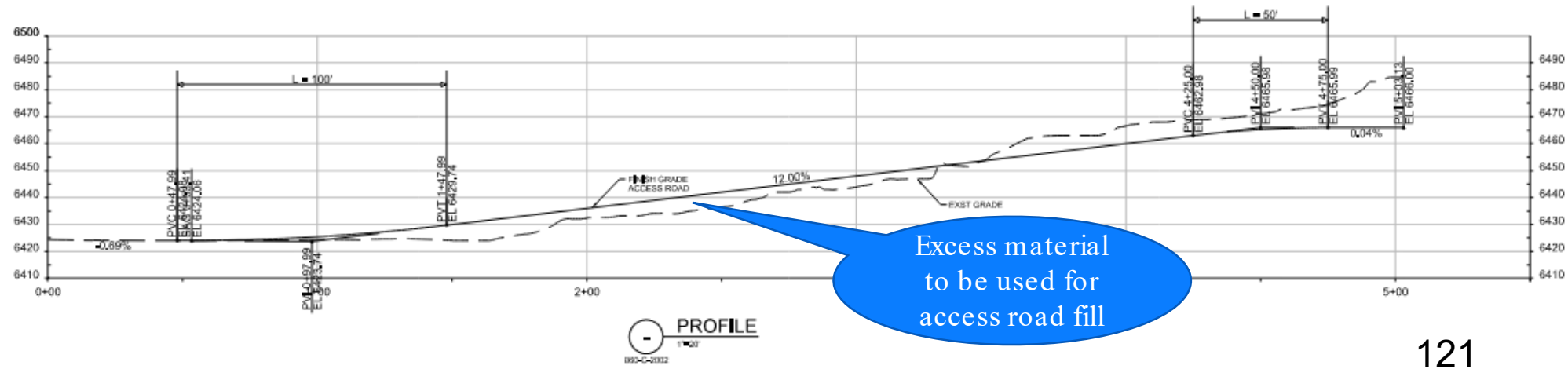
Mill Creek Dam No. 1 Removed



18' Wide Access Road



Earthwork balance for future site expansion



Excess material to be used for access road fill

Welded Steel Tank

- Familiar effluent storage system (steel tank)
- Closed system, no re-treatment of effluent required
- Mill Creek Dam No. 1 decommissioned
- Earthwork balance opportunity
- Lifetime maintenance required
- Highest material cost (steel tank)

Estimated Total Project Cost: \$8.0M

Prestressed Concrete Tank

- Closed system, no re-treatment of effluent required
- Mill Creek Dam No. 1 decommissioned
- Ability to partially bury tank
- Earthwork balance opportunity
- Minimal lifetime maintenance

Estimated Total Project Cost: \$6.8M

Effluent Storage Alternative Comparison

Criteria	Prestressed Concrete Tank	Welded Steel Tank	HDPE Liner System
Total Cost	\$6,801,871	\$8,015,395	\$8,546,851
Health & Safety Element	Limited, lockable access locations. Dam removed	Limited, lockable access locations. Dam removed	Open water risk. Dam failure risk. 825LF perimeter fence. Continued Regulatory Agency annual safety inspections.
Mill Creek Dam No. 1 Impact	Dam Decommissioning Application. Hydrologic Investigation/report.	Dam Decommissioning Application. Hydrologic Investigation/report.	Dam investigation, analysis, design and anticipated reconstruction. Hydrologic investigation/report.
Plant Integration	Daily, full integration option available.	Daily, full integration option available.	Limited plant integration, emergency storage event only. Retreatment of pond-stored effluent may be required.
Future Opportunities	Opportunity for plant expansion. Continued decant facility use.	Opportunity for plant expansion. Continued decant facility use.	Reduces available land area suitable for future WRRF expansion. Decant facility relocation required.
Lifetime Maintenance/Cost Implication	Very limited, anticipate inspection only.	Lifetime inspection & known maintenance schedule required. Mandatory coating replacements.	Full replacement after 20-30 years. Ongoing perimeter fencing/signage maintenance.
Constructability (Availability of Materials)	Local Material Suppliers. Established CMAR relationships.	Future supply chain unknown.	Future supply chain unknown.
Environmental Permitting	TRPA - tree removal & scenic assessment required. County/NDEP Grading/Special Use Permit	TRPA - tree removal & scenic assessment required. County/NDEP Grading/Special Use Permit	TRPA – Significant Coverage implications to Pond 1 currently assumed (coordination with TRPA ongoing).
External Funding	Potential Army Corp Funding	Potential Army Corp Funding	Potential Army Corp Funding
Construction Schedule	160 Days	185 Days	95 Days

Effluent Storage Alternative Comparison

Assessed Criteria Consequence Rating	Lower
	Medium
	Higher
	Maximum

Overall Recommendation	Prestressed Concrete Tank	Welded Steel Tank	HDPE Liner System
Estimated Total Project Cost	\$6.8 M	\$8.0 M	\$8.5 M

Next Steps

Pond 1 Effluent Export Storage

- Jacobs to provide scope and fee amendment for Pond 1- Final Design for Board approval at June 29th meeting.
- Jacobs to develop and deliver 60%, 90% and Final Design documents for Granite and IVGID review.
- Jacobs to complete NV DWR dam decommissioning per NAC 535.220
- Granite to prequalify potential subcontractors per the CMAR process and procure competitive bid for 2MG prestressed concrete effluent storage tank.
- IVGID to progress:
 - Environmental documents
 - US Army Corps Funding agreement
 - TRPA coverage evaluations



Thank You

Jacobs

Challenging today.
Reinventing tomorrow.



DRAFT 30% Opinion Of Probable Construction Cost (OPCC)				
Project	IVGID Effluent Pond Lining Project		<i>Computed</i>	Jacobs/Granite
Subject	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)		<i>Date</i>	6/1/2022
Task	Pre-Design Cost Estimate - Welded Steel Tank		<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
GENERAL REQUIREMENTS				
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 678,236.00	\$ 678,236.00
Insurance and Bonds	1.00	LS	\$ 22,939.00	\$ 22,939.00
SUBTOTAL				\$ 701,175.00
Pond Earthwork				
Clear & Grub	2.00	AC	\$ 54,500.00	\$ 109,000.00
Remove Trees	50.00	EA	\$ 1,550.00	\$ 77,500.00
Site Access Road	500.00	LF	\$ 100.00	\$ 50,000.00
Excavation (Export)	685.00	CY	\$ 93.00	\$ 63,705.00
Embankment (Cut To Fill)	8,860.00	CY	\$ 21.00	\$ 186,060.00
Subgrade Material (6" Under Tank)	140.00	CY	\$ 211.00	\$ 29,540.00
Maintenance Road Surfacing (6" Aggregate Base)	300.00	CY	\$ 176.00	\$ 52,800.00
Site Access Road Surfacing (12" Aggregate Base)	310.00	CY	\$ 126.00	\$ 39,060.00
SUBTOTAL				\$ 607,665.00
Effluent Storage				
Concrete Perimeter Foundation (Earthwork/Conc)	44.00	CY	\$ 800.00	\$ 35,200.00
Concrete Column Footings (9 total)	26.00	CY	\$ 907.00	\$ 23,582.00
Welded Steel Tank (99' Diameter, 39' Height) 2MG	1.00	EACH	\$ 2,812,000.00	\$ 2,812,000.00
16" Effluent Piping	300.00	LF	\$ 542.00	\$ 162,600.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 52,100.00	\$ 52,100.00
SCADA System	1.00	LS	\$ 80,000.00	\$ 80,000.00
SUBTOTAL				\$ 3,165,482.00
Subtotal 1				\$4,474,322
Contractor Overhead and Profit (14% of Subtotal 1)				\$626,405
Subtotal 2				\$5,100,727
Construction Contingencies (15% of Subtotal 1)				\$ 671,148.30
Design				\$ 400,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 100,000.00
Subtotal 3				\$ 1,621,148.30
TRPA Coverage Fee (\$40/SF)				\$ 1,293,520.00
TOTAL ESTIMATED PROJECT CONSTRUCTION COST				\$ 6,721,875.38
TOTAL ESTIMATED PROJECT COST				\$ 8,015,395.38

DRAFT 30% Opinion Of Probable Construction Cost (OPCC)				
<i>Project</i>	IVGID Effluent Pond Lining Project			<i>Computed</i> Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)			<i>Date</i> 6/1/2022
<i>Task</i>	Pre-Design Cost Estimate - Pre-stressed Concrete Tank			<i>Reviewed</i>
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
GENERAL REQUIREMENTS				
Mobilization/Demobilization and General Condions	1.00	LS	\$ 669,695.00	\$ 669,695.00
Insurance and Bonds	1.00	LS	\$ 17,068.00	\$ 17,068.00
SUBTOTAL				\$ 686,763.00
Pond Earthwork				
Clear & Grub	2.00	AC	\$ 54,500.00	\$ 109,000.00
Remove Trees	50.00	EACH	\$ 1,550.00	\$ 77,500.00
Site Access Road	500.00	LF	\$ 100.00	\$ 50,000.00
Excavation (Export)	685.00	CY	\$ 93.00	\$ 63,705.00
Embankment (Cut To Fill)	8,860.00	CY	\$ 21.55	\$ 190,933.00
Subgrade Material (6" Under Tank)	160.00	CY	\$ 211.00	\$ 33,760.00
Maintenance Road Surfacing (6" Aggregate Base)	285.00	CY	\$ 176.00	\$ 50,160.00
Site Access Road Surfacing (12" Aggregate Base)	310.00	CY	\$ 126.00	\$ 39,060.00
SUBTOTAL				\$ 614,118.00
Effluent Storage				
Concrete Perimeter Foundation (Earthwork Only)	75.00	CY	\$ 107.00	\$ 8,025.00
Prestressed Concrete Tank (99' Dia, 37' Height) 2MG	1.00	EACH	\$ 1,830,000.00	\$ 1,830,000.00
Exterior Coatings / Aethetics	1.00	LS	\$ 100,000.00	\$ 100,000.00
16" Effluent Piping (Gravity)	300.00	LF	\$ 542.00	\$ 162,600.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 52,100.00	\$ 52,100.00
SCADA System	1.00	LS	\$ 80,000.00	\$ 80,000.00
SUBTOTAL				\$ 2,232,725.00
Subtotal 1				\$3,533,606.00
Contractor Overhead and Profit (14% of Subtotal 1)				\$494,705
Subtotal 2				\$4,028,310.84
Construction Contingencies (15% of Subtotal 1)				\$ 530,040.90
Design				\$ 400,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 100,000.00
Subtotal 3				\$ 1,480,040.90
TRPA Coverage Fee (\$40/SF)				\$ 1,293,520.00
TOTAL ESTIMATED PROJECT CONSTRUCTION COST				\$ 5,508,351.74
TOTAL ESTIMATED PROJECT COST				\$ 6,801,871.74

DRAFT 30% Opinion Of Probable Construction Cost (OPCC)

<i>Project</i>	IVGID Effluent Pond Lining Project	<i>Computed</i>	Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)	<i>Date</i>	6/1/2022
<i>Task</i>	Pre-Design Cost Estimate - HDPE Pond Liner	<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE
			TOTAL COST
GENERAL REQUIREMENTS			
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 594,012.00
Insurance and Bonds	1.00	LS	\$ 19,651.00
SUBTOTAL			\$ 613,663.00
Pond Earthwork			
Clear & Grub	1.60	AC	\$ 53,750.00
Maintenance Access Road	825.00	LF	\$ 39.00
Pond Re-Grading	500.00	CY	\$ 79.65
Excavation (Export)	3,800.00	CY	\$ 93.00
Liner Bedding	500.00	CY	\$ 200.00
Maintenance Road Surfacing (6" Aggregate Base)	230.00	CY	\$ 170.00
SUBTOTAL			\$ 650,500.00
Mill Creek Dam No. 1 Improvement			
Embankment Removal (Export)	2,800.00	CY	\$ 93.00
Over Excavation	1,100.00	CY	\$ 190.00
Clay Core (Import)	2,600.00	CY	\$ 323.00
Sand Filter (Import)	1,300.00	CY	\$ 151.00
Dam Embankment (Remove & Replace)	5,800.00	CY	\$ 34.50
Dam Outlet (24" CMP)	200.00	LF	\$ 160.00
SUBTOTAL			\$ 1,737,600.00
Effluent Storage			
Install Pond Liner	61,000.00	SF	\$ 6.30
16" Effluent Piping	250.00	LF	\$ 542.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 52,100.00
Pond Outfall and Piping	110.00	LF	\$ 620.00
SUBTOTAL			\$ 640,100.00
Pond Security and Safety			
8' Wildlife Chainlink Fence	800.00	LF	\$ 200.00
8' - 12' Wide Double Swing Gate	2.00	EACH	\$ 15,000.00
Security Signage	4.00	EACH	\$ 300.00
SUBTOTAL			\$ 191,200.00
Subtotal 1			\$3,833,063
Contractor Overhead and Profit (14% of Subtotal 1)			\$536,629
Subtotal 2			\$4,369,692
Construction Contingencies (15% of Subtotal 1)			\$ 574,959.45
Design			\$ 200,000.00
Mill Creek Dam No. 1 Investigation, Analysis, Design, Review & Permitting			\$ 400,000.00
Administrative Costs			\$ 250,000.00
Construction Management			\$ 200,000.00
Environmental Documentation and Permitting			\$ 100,000.00
Subtotal 3			\$ 1,724,959.45
TRPA Coverage Fee (\$40/SF)			\$ 2,452,200.00
TOTAL ESTIMATED PROJECT CONSTRUCTION COST			\$ 6,094,651.27
TOTAL ESTIMATED PROJECT COST			\$ 8,546,851.29