Nevada Irrigation District

Staff Report

for the Board of Directors Meeting of March 13, 2019

TO: Honorable Board of Directors

FROM: Greg Jones, M.B.A., Assistant General Manager GJ

DATE: March 6, 2019

SUBJECT: **Combie Reservoir Sediment & Mercury Removal Project Update (FATR #2135)**

ADMINISTRATION

RECOMMENDATION:
Receive an update on the Combie Reservoir Sediment and Mercury Removal Project, FATR #2135.

BACKGROUND:
In partnership with the Department of Water Resources' Riverine Stewardship Program and the State of California, NID's Combie Reservoir Sediment and Mercury Removal Project was appropriated $5.5M from the Proposition 13 Bay-Delta Multipurpose Water Management Program in July 2017.

The Combie Reservoir Sediment and Mercury Removal Project is a pilot water supply maintenance project that removes sediment from Combie Reservoir while introducing an innovative mercury recovery process. This project intends to help implement the Governor's Water Action Plan by restoring water storage capacity in Combie reservoir, while meeting the co-equal goals for the Delta by removing mercury for benefits to aquatic habitat and removing mercury contaminants from abandoned mines of the Bear River watershed.

This project will have lasting benefits that protect human health, water supply, storage capacity, ecosystem health, scientific evaluation, effectiveness monitoring, and enhanced recreational opportunities by recovering mercury and aggregate material.

The project will utilize a patented centrifuge technology to remove elemental mercury from removed sediments. The project will also conduct scientific research and analysis in order to quantify the effects of the operation on water quality and biota.

This project intends to demonstrate scientifically proven and cost effective methodologies of removing mercury-contaminated sediment from a reservoir.

When complete, this project can act as a replicate process, applied at other impacted reservoirs throughout the Sierra Nevada. Findings from this project will become valuable to state regulators and help water managers address mercury in our aquatic food chain.

Funding Agreement Resolution & Budget Amendment

On April 25, 2018, the NID Board of Directors approved Resolution #2018-08 authorizing the General Manager to execute the Funding Agreement (#4600012439) for $5,500,000 with the Department of Water Resources for the Combie Sediment and Mercury Removal Project.

On June 20, 2018, the NID Board of Directors approved Budget Amendment Request #2018-87, increasing the grant revenue and capital budget accounts for the project in preparation for contracting for the entire project. The DWR funding of $5.5M is targeted for the sediment removal and treatment processes of the project.

The project is estimated to cost $7.67M, where $2.17M is being funded from NID's Capital Reserves. To maintain sufficient short-term reserves, in June 2018 the District liquidated approximately $7.67M of its' long-term portfolio to cash flow the project. This saves the District from having to finance the project at short-term rates of approximately 4% for six months, thus saving $150,000 in interest.

CEQA Addendum

On September 23, 2009, a Mitigated Negative Declaration was adopted by the NID Board of Directors, State Clearinghouse #2009072068, for this project. The 2009 CEQA adopted project consists of three process components. The first involves the dredging of upper Combie Reservoir in the aquatic environment. The second involves a mercury separation from sediment process using a centrifuge. The third involves the sale/transport of the sediment and aggregate byproduct to a third party and removal from the watershed.

In May 16, 2018, the NID Board of Directors adopted an Addendum to the CEQA Mitigated Negative Declaration Project (SCH No. 2009072068). This Addendum evaluated modifying the adopted sediment removal process. The proposed change affected only the removal component, and allowed NID to supplement the wet removal process with dry removal during the low water season. To address the proposed changes to the adopted project, NID, acting as lead agency, determined that an Addendum was the appropriate environmental document under CEQA because the proposed changes would not be substantial, thus not requiring the preparation of a Subsequent MND or an EIR, per Section 15162 of the 2018 CEQA Guidelines.

The modifications presented within the 2018 Addendum include minor technical modifications as follows:

- Allow an option of sediment removal in the dry during the low water season, in addition to removal with a dredge in the wet environment

- Environmental evaluation of noise impacts while introducing additional off-road equipment into the project area during the low water season
- Minor descriptive modifications to the sediment and mercury processing

Permits

- CFWD 1600 Lake and Streambed Alteration (No. 1600-2010-0180-R2): Updated and complete.
- CCVRWQCB NOA General Waste Discharge Order R5-2016-0076-019 and National Pollutant Discharge Elimination System (NPDES) Permit No. CAG995002: Updated and complete.
- CVRWQCB 401 Water Quality Certification: Awaiting final permit update from the Water Board. There is no indication this should be denied. Permit is currently good through 12/31/2018.
- USACE 404 Nationwide Permit Number 16: Complete.
- California EPA Department of Toxic Substances Control ID: Complete (#CAL000441570).

Contracts Execution

Implementation:

On November 1, 2017, NID sent a Request for Proposal (RFP) for Project Implementation to seven companies, including Teichert Aggregates, Great Lakes Environmental & Infrastructure, Robinson Enterprises, Hansen Brothers, Kiewit, and Granite Construction. A combined GLEI/Teichert bid was the only respondent to the RFP. The GLEI response provided industry insight on the challenges & constraints in implementing the project as originally defined and detailed the need for further analysis and planning in order to develop a work plan, which is both cost effective and project goal oriented. In January 2018, NID engaged in a pre-construction services contract with GLEI who has since been working to design an effective and efficient project.

In assessing this unique project, GLEI, NID and project partners recognized multiple different options for sediment and mercury removal given budget constraints. Together, we narrowed the project to one solution – dry excavation in the fall of 2018 and wet dredging with 100% sediment processing in the spring/summer 2019. During the spring/summer of 2019, GLEI will continue sediment and mercury removal procedures with a suction cutter head dredge to remove an additional approx. 20,000 cubic yards of sediment, processing 100% through the mercury concentrator.

This contract is a time and materials budget with a not to exceed cost of $4,618,723.

Project Management:

On November 1, 2017, NID sent a Request for Proposal (RFP) for Project Management to four companies, including H&K/NV5, Cavello, Stillwater Sciences and the Sierrans. NID received two proposals in response, one from H&K/NV5 for $542,580 and the other from the Sierrans for $1,335,401. Due to their experience, expertise, capabilities, knowledge of the project, and cost NID chose to work with

H&K/NV5 as the contract project manager. In January 2018, NID engaged in a preliminary services contract with H&K/NV5 to begin this work.

Since January 2018, H&K/NV5 has been active in assisting NID and other project partners with permitting, CEQA update, process flow assessments, project planning and design review, creation and monitoring of an implementation work plan, quality assurance plan, and health & safety plan, regulatory compliance, laboratory testing, effectiveness monitoring, and process review and documentation.

NV5 re-evaluated their initial proposal and reduced the overall cost proposal by 4% by the time of contract execution. The NV5 contract is through time and materials budget thru the end of 2020 not to exceed $519,774.

Biological Research & Reporting
On June 20, 2018, NID Board of Directors approved amendment #4 of a sole-source Joint Funding Agreement (JFA) #17WSCA6001020 with the United States Geological Survey (USGS) for $868,670 for the collection and analysis of sediment, water, and zooplankton from Combie Reservoir.

The purpose of Amendment 4 is a continuation of previous Amendments in Q4 2017 and Q1 2018. The earlier Amendments 1 – 3 of the project began with pre-project assessments totaling $191,596 as approved by the APC on February 6, 2018.

Under this agreement, the USGS will engage in pre, during and post-project research-monitoring activities, which will ultimately address how the sediment removal process effects the biological environment of the reservoir.

The total USGS agreement of $1,060,266 will comprise of ongoing research, quarterly summaries, annual summary reports and a final report synthesizing all the data. This is a multi-year Agreement, ending December 31, 2022. The USGS project cost share is $41,211, or 4% of total cost.

Education & Outreach
NID has collaborated with a local non-profit, The Sierra Fund, to conduct education, outreach and expert technical review for the project. TSF is currently in their 2nd year of an annualized not-to-exceed $25K agreement. Through the agreement, the Sierra Fund will conduct four tasks: (i) An annual Headwater Mercury Source Reduction Technical Advisory Committee meeting that addresses the role reservoir management activities play in the fate and transport of mercury; (ii) Technical Communication and Review in functioning on an as-needed basis for presentations, expert advice, legislature communications, etc; (iii) Outreach and Education to the public through fish advisory postings and angler surveys; and (iv) the development of a Gold Rush Curriculum and Activity Guide for teachers in Nevada and Placer counties, grades 4 – 6 educating on the history of mercury in the Sierra during the Gold Rush days.

Mercury Concentrator Alterations

NID has engaged a not-to-exceed contract with Mr. Ted Reimchen for $100,000 for consulting and alteration to the mercury removal process for effectiveness and efficiency. Mr. Reimchen will field test and install necessary concentrator alterations in cooperation with NID and project partners.

Knelson Concentrator Centrifuge
NID purchased the KC-CDMR30 Concentrator from FLSmidth. The Concentrator currently is at NID headquarters in Grass Valley. Total purchase price including equipment, insurance and freight was $188,147.

Knelson Concentrator in Grass Valley

<u>Removal Activities / Storm Water Prevention – Fall 2018 / Winter 2019</u>
From October 1 to November 19, 2018 Great Lakes Environmental moved sediment in dry lakebed conditions. As of the final day of removing sediment in the reservoir, GLEI moved approximately 40,000 cubic yards utilizing conventional removal techniques. GLEI used an excavator / front loader to remove the sediment from the dry lakebed, loaded the material into dump trucks and utilized the existing levee road to move the material to the sediment stockpile area. During this period of operation, we did not process the material thru the centrifuge nor did we have any discharge from the project to the river.

Sediment Removed

Throughout this period, we also have successfully initiated the Rain Event Action Plan containing erosion and sediment control BMP's as identified in the Storm Water Pollution Prevention Plan (SWPPP) during storm events from December thru March. BMP activities in the project area included stockpile management, sediment control, erosion control and haul road control.

Sediment Stockpile SWPPP

Sediment Sale

At the June 20, 2018 Board of Directors meeting, staff informed the Board of its difficulty to determine market value for the Combie sediment until it has been removed from the reservoir. Since then, staff has identified a location on Teichert property near the project processing area which can serve as short-term (3-year) storage for the extracted sediment. NID and Teichert have finalized a lease agreement to temporarily store the sediment while either: (i) A buyer purchases the material; or (ii) NID identifies a different permanent location for the material.

At the same June 20 meeting, staff presented results of the subsurface inorganic and organic analysis of 21 borings (up to 32' depth) and 5 bulk samples (up to 6' depth) of sediment at Combie Reservoir. The investigation, in part, was to characterize the sediment within the project study area in respect to the California EPA Department of Toxic Substances Control (DTSC) human health screening levels for total mercury (THg) concentrations. Based on our sampling, THg concentrations were found to be well below the human health screening levels for designation of hazardous waste in California.

In September 2018, NV5 conducted additional pre-excavation sampling on over 4,000 lbs. of sediment from the project removal area. Results from these efforts continue to validate homogeneous distribution and low levels of total mercury in the sediment (0.2 to 0.4 ppm Hg in whole samples; 0.1 to 0.2 ppm Hg in the sand fractions; and 0.4 to 0.6 ppm Hg in the silt fractions). These findings are well below DTSC human health screening levels and, when dry, pose no significant threat the human health. Further, our results did not find any elemental mercury in the sediment fractions.

On January 25, 2019, NID sent an RFP for the purchase and removal of sediment to 18 regional and local contractors. The RFP stated that NID wishes to enter into a P\purchase and sale of material contract with one firm for the purchase, loading,

and off-hauling of all sediment from the storage site, and the smoothing and cleaning up of the storage site upon completion of loading and off-hauling. The agreement shall be subject to a "Removal Plan", yet to be negotiated between NID and Teichert Aggregates. We had one respondent to the RFP and are in the process of coordinating the Removal Plan with Teichert. Once the Removal Plan is complete, staff will bring the sediment purchase agreement to the Board for approval.

Major Accomplishments of the Project to Date:

- Greater understanding of sediment removal process
- Adjustment to the delivery method from airfreight to ocean freight of the concentrator for a $22,665 savings on shipping cost from the manufacturer.
- Stakeholder outreach and engagement with in-person meetings with the Combie Rod & Gun Club and the Combie Homeowners Association
- Amended CEQA to reflect sediment removal in dry conditions
- Removal of approximately 40,000 cubic yards of sediment from the reservoir utilizing conventional sediment removal techniques.
- Successful implementation of the erosion and sediment control BMP's as identified in the Storm Water Pollution Prevention Plan (SWPPP) during storm events
- The Knelson Concentrator is at the NID office in Grass Valley.
- The Request for Proposals for the sale of the Combie sediment was distributed on January 25 to seventeen (18) organizations in the region – one response at $1/cubic yard.
- Universal coordination with project partners

Project Budget

		DWR (10115-52915)	NID Funds (10115-52915)	Totals	Contractor	FY Period
Task	**Description**					
	Project Administration	$ -	$ 247,663	$ 247,663	NID	2017 - 2022
1	Project Management / Compliance Activities	$ -	$ 519,774	$ 519,774	H&K/NV5	2018 - 2020
2	Concentrator Alteration & Mercury Consultation	$ 100,000	$ -	$ 100,000	T. Reimchen	2018 - 2019
3	Knelson Concentrator	$ 209,143	$ -	$ 209,143	FLSmidth	2017 - 2018
4	Sed Removal & Mercury Recovery Operations	$ 4,576,000	$ 42,723	$4,618,723	GLEI	2018 - 2020
5	Sediment Disposal	$ -	$ 600,000	$ 600,000	Teichert	2018 - 2020
6	Biological Research Activities & Reporting	$ 400,000	$ 660,263	$1,060,263	USGS	2017 - 2022
7	Community Engagement & Outreach	$ -	$ 100,000	$ 100,000	TSF	2017 - 2020
N/A	Budget Unallocated	$ 214,857		$ 214,857	Unallocated	
	Project Total	**$ 5,500,000**	**$ 2,170,423**	**$7,670,423**		2017 - 2022

BUDGETARY IMPACT:
N/A

Attachments (1):

- Power Point Presentation

COMBIE RESERVOIR SEDIMENT AND MERCURY REMOVAL PROJECT

Project Update & Overview

NID Board of Directors Meeting
March 13, 2019

LAKE COMBIE SEDIMENT & MERCURY REMOVAL PROJECT

PROJECT OWNER

NID

MISSION STATEMENT

The District will provide a dependable, quality water supply; continue to be good stewards of the watersheds, while conserving the available resources in our care.

For more information regarding this project, please visit:
www.nidwater.com/projects

PROJECT CONTRACTOR

GREAT LAKES ENVIRONMENTAL & INFRASTRUCTURE

MISSION STATEMENT

Committed to minimizing your risk and liability, through a culture of safety, innovation, and excellence.

PROJECT PARTNERS

NV5

USGS science for a changing world

THE SIERRA FUND

PERMITTING AGENCIES

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

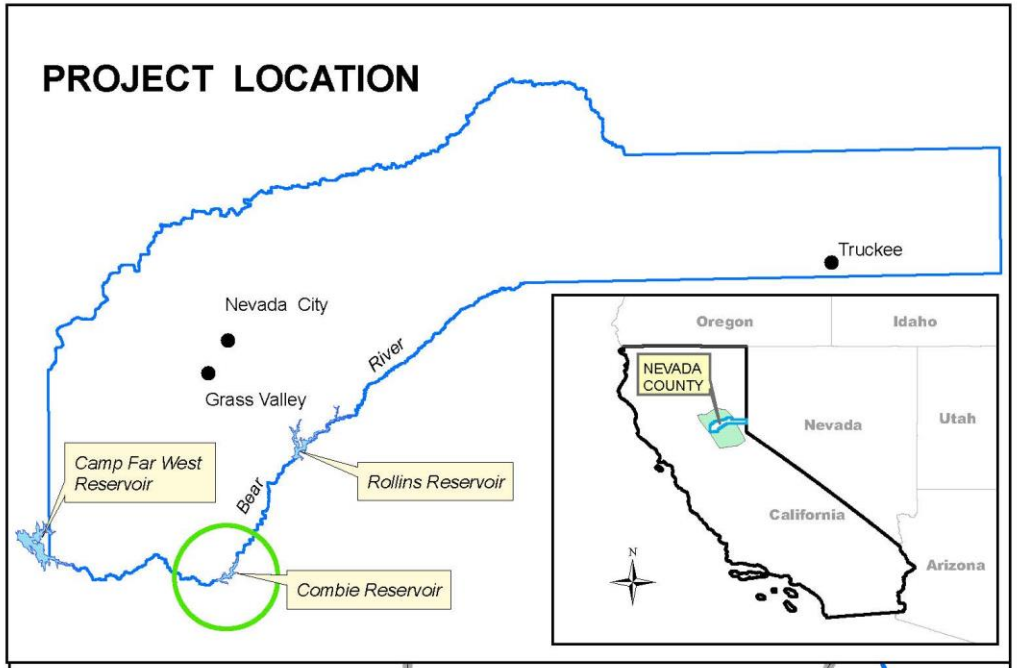
STATE OF CALIFORNIA CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

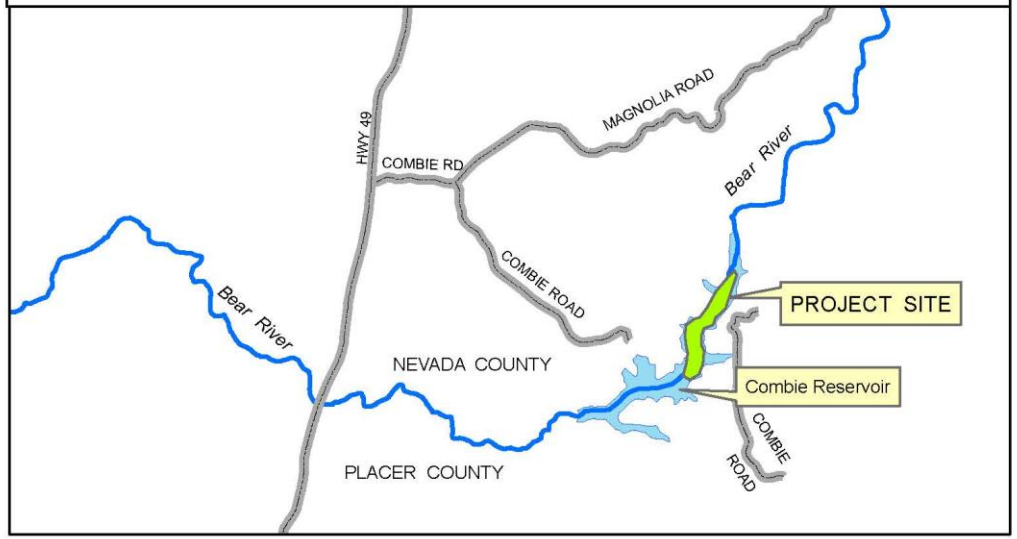
US Army Corps of Engineers

PROJECT FUNDING

Funding for this project has been provided in part by the Costa-Machado Water Act of 2000 (Proposition 13) and through an agreement with the State Department of Water Resources.

DEPARTMENT OF WATER RESOURCES STATE OF CALIFORNIA





Job Title: **COMBIE RESERVOIR SEDIMENT AND MERCURY REMOVAL PROJECT**

NEVADA IRRIGATION DISTRICT
NEVADA COUNTY -- PLACER COUNTY
GRASS VALLEY, CALIFORNIA

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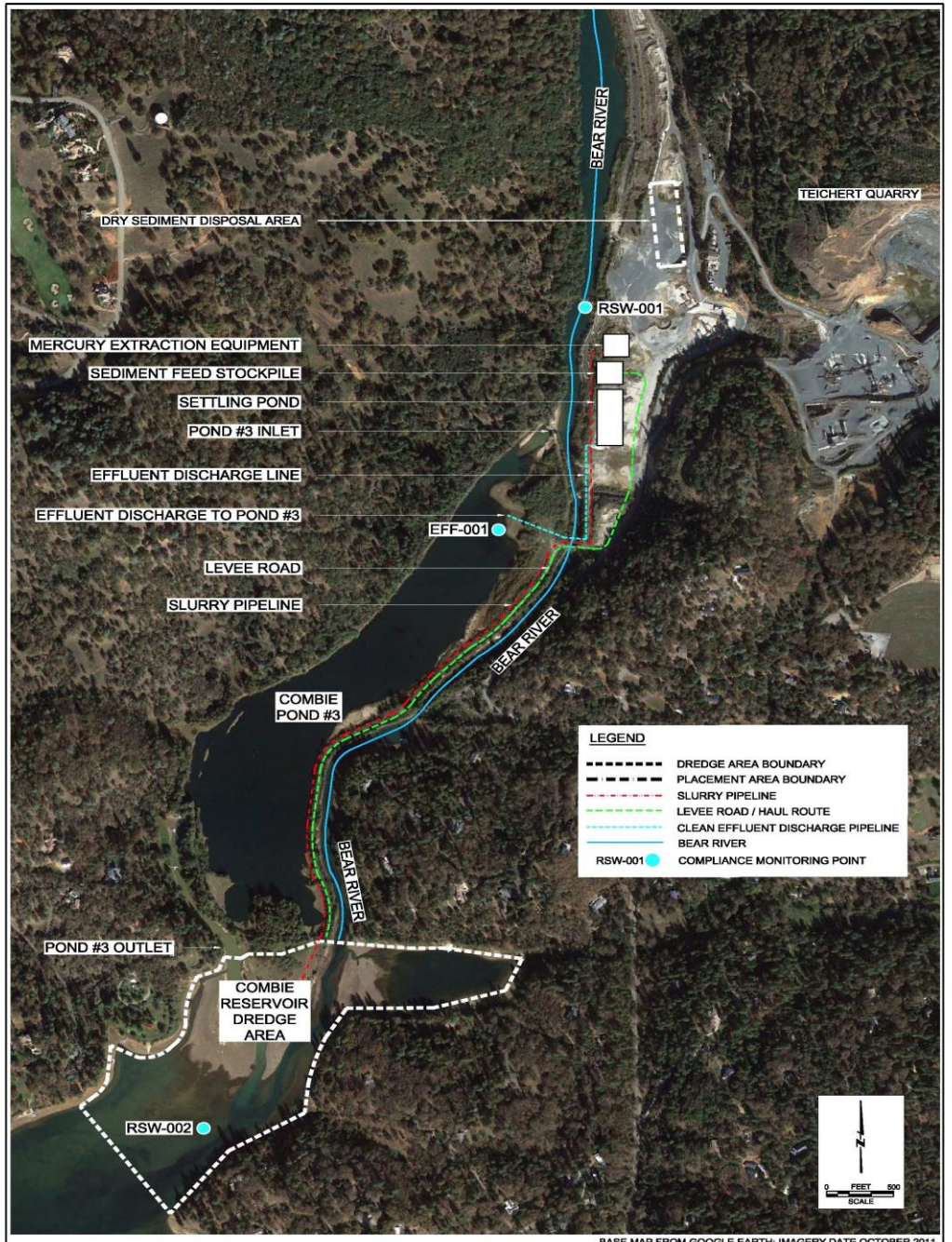
Sheet: 2 of 2



BASE MAP FROM GOOGLE EARTH; IMAGERY DATE OCTOBER 2011

SITE MAP - LOW WATER
COMBIE RESERVOIR SEDIMENT AND MERCURY REMOVAL PROJECT
MEADOW VISTA, CALIFORNIA

WDID #	5A29CR00068
NPDES #	CAG995002
NVS PROJECT	4688.02
DATE	APRIL 2018

FIGURE 4

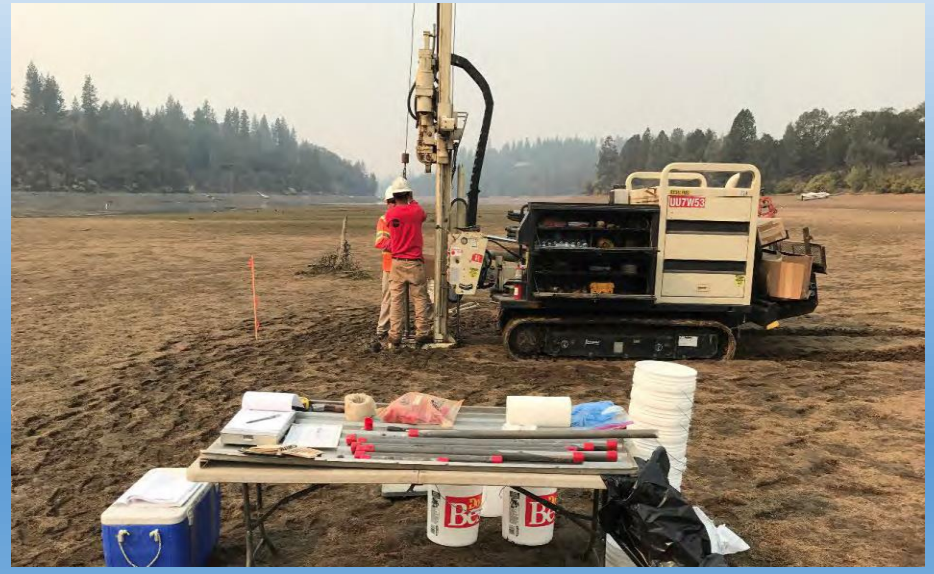
NID

Project Purpose

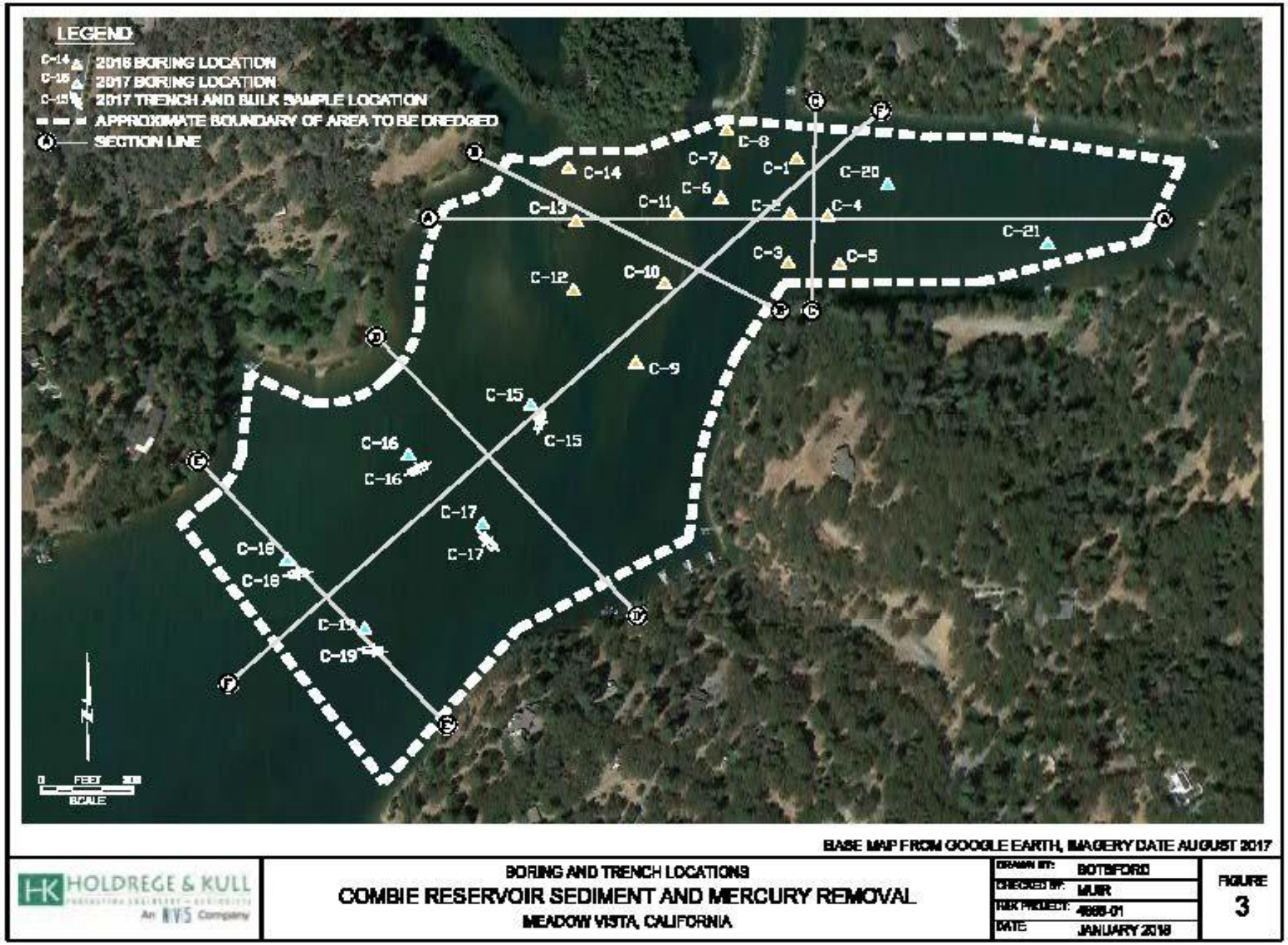
The Combie Sediment & Mercury Removal Project is intended to:

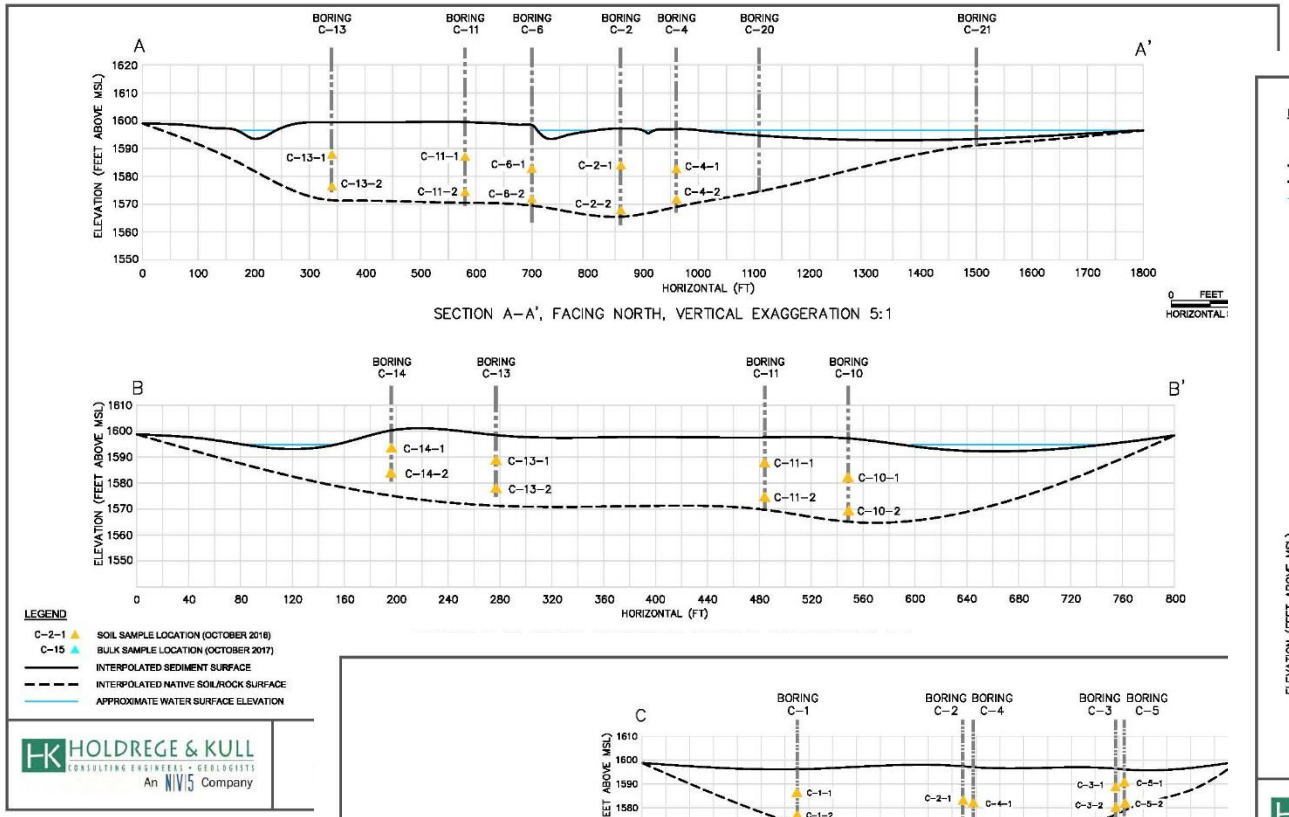
- Remove accumulated sediment and mercury from Combie Reservoir, thus restoring reservoir capacity for agriculture, domestic drinking, hydroelectric power generation and recreation use.
- Measure and analyze ecological effects of MeHg concentrations in Combie prior and post removal activities.
- Develop an efficient, compliant and sustainable combination of processes for sediment removal at similar mercury-impacted reservoirs.

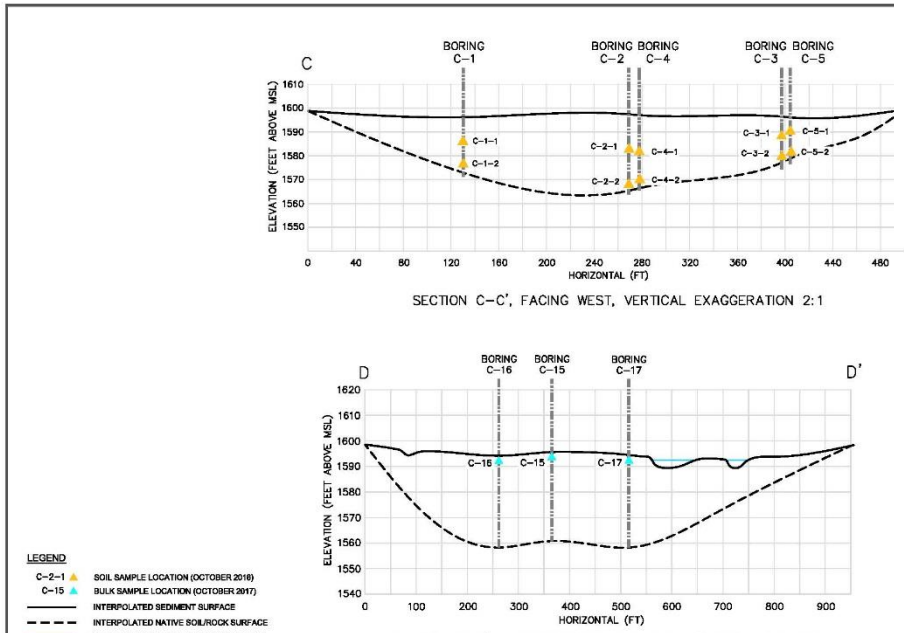
Core Boring & Bulk Sediment Sampling 2016 - 2017

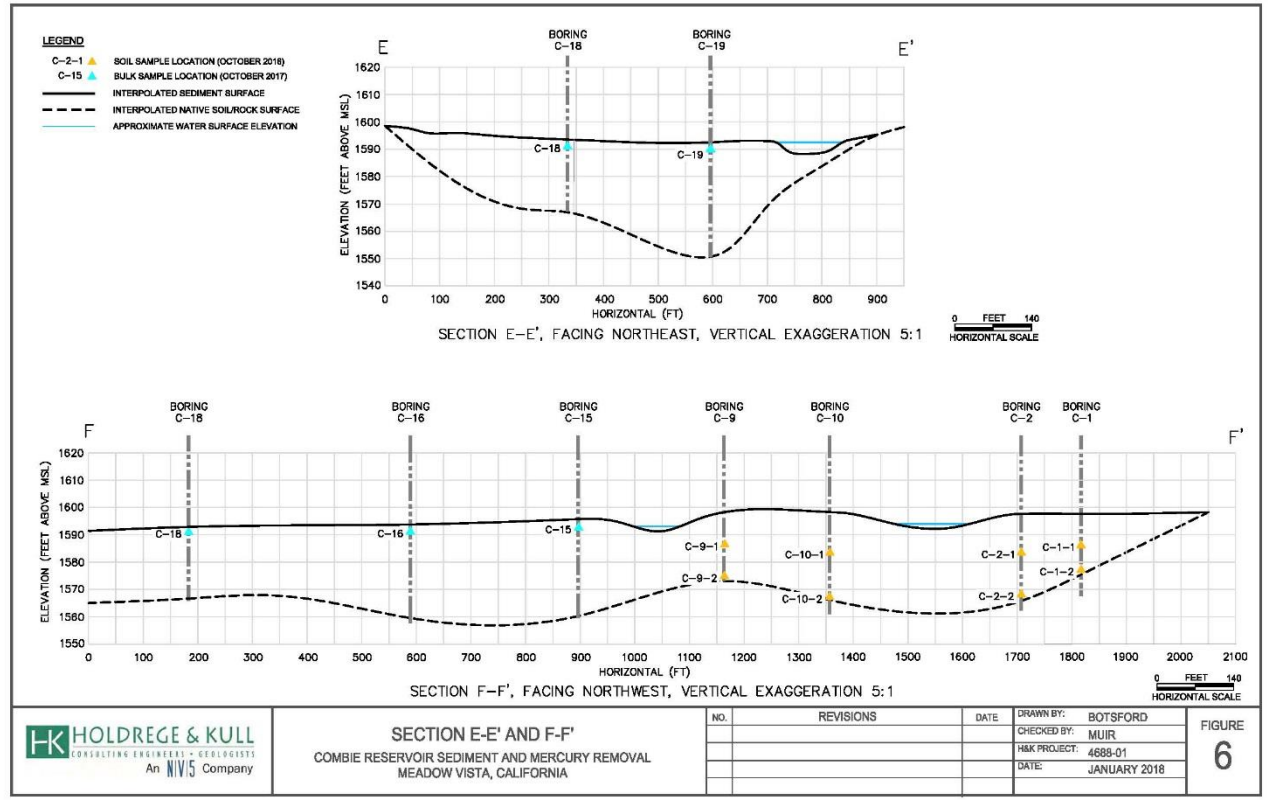


Sediment Pre-Project Boring 2016 / 2017





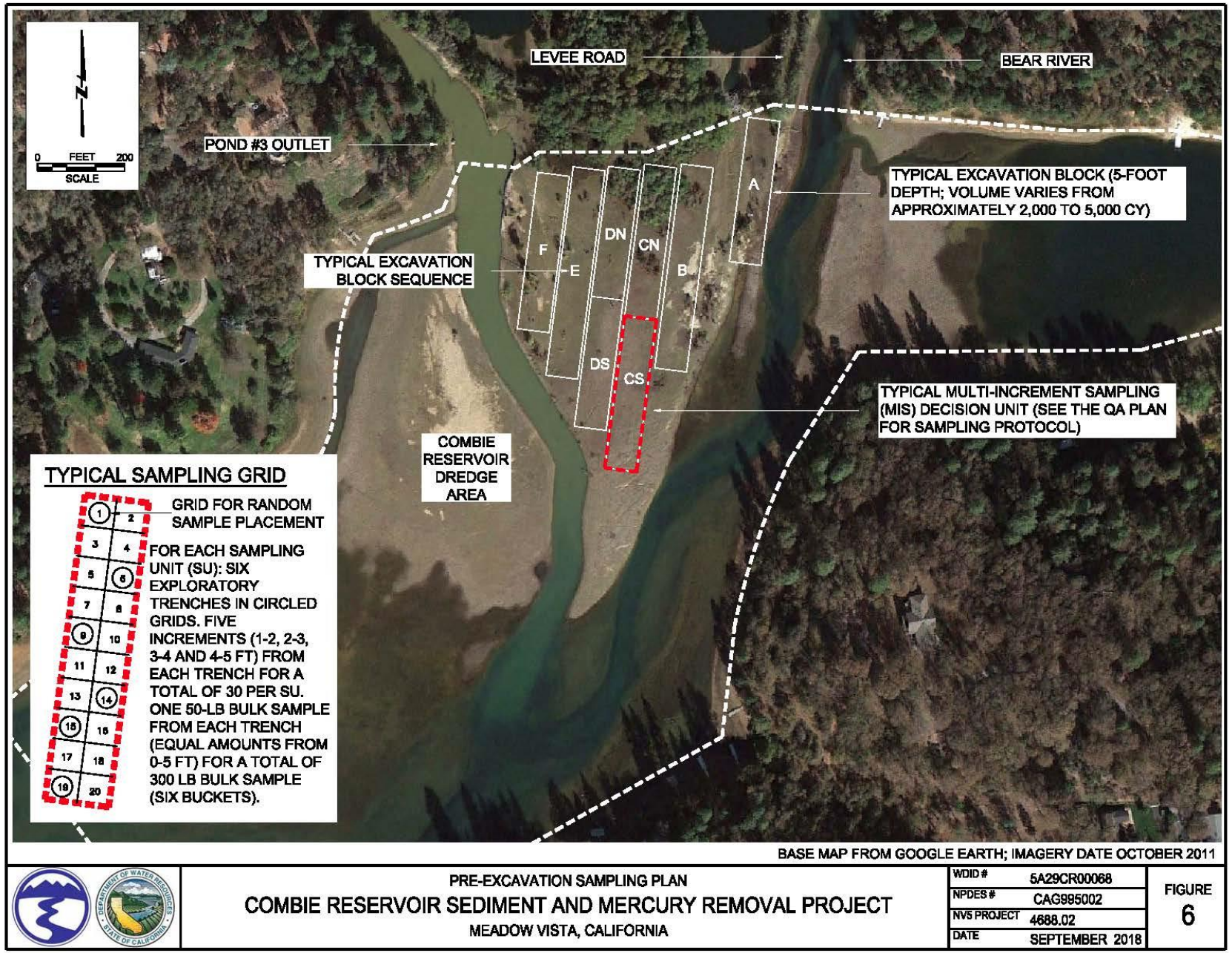




Sediment Pre-Project Boring 2016 / 2017

- ~ 5' – 50' Deep

Dry Excavation Preparation – Aug / Sept 2018



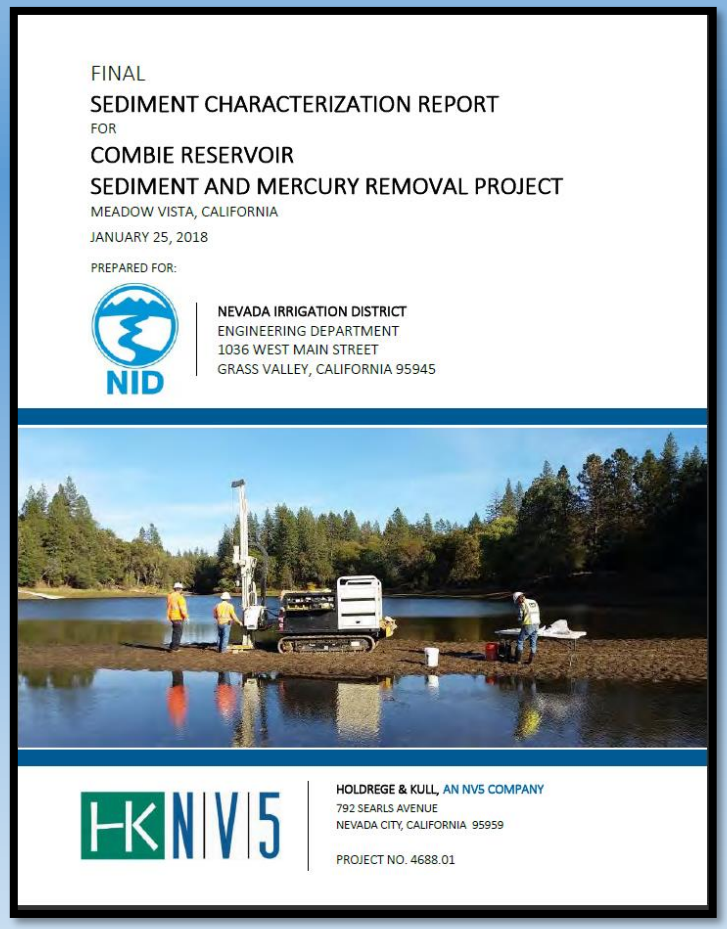
Bulk Sediment Sampling Aug/Sept 2018

Sediment Core Boring Results

	Hg (ppm)
DTSC-SL & RSL's	**1**
Average	**<0.42**
C-1	0.22
C-2	0.18
C-3	0.61
C-4-1	<0.1
C-4-2	0.3
C-5	0.48
C-6	<.01
C-7-1	<.01
C-7-2	<.01
C-8	<.01
C-9	<.01
C-10-1	<.01
C-10-2	<.01
C-11-1	<.01
C-11-2	<.01
C-12-1	<.01
C-12-2	<.01
C-13	<.01
C-14	<.01
C-15	0.42
C-16	0.63
C-17	0.47
C-18	0.48
C-19	0.38

Additional 4,000 lbs Bulk Sampling

- 0.2 to 0.4 ppm Hg in whole samples
- 0.1 to 0.2 ppm Hg in the sand fractions
- 0.4 to 0.6 ppm Hg in the silt fractions


FINAL

SEDIMENT CHARACTERIZATION REPORT

FOR

COMBIE RESERVOIR

SEDIMENT AND MERCURY REMOVAL PROJECT

MEADOW VISTA, CALIFORNIA

JANUARY 25, 2018

PREPARED FOR:

NID

NEVADA IRRIGATION DISTRICT
ENGINEERING DEPARTMENT
1036 WEST MAIN STREET
GRASS VALLEY, CALIFORNIA 95945

HK NV5

HOLDREGE & KULL, AN NV5 COMPANY
792 SEARLS AVENUE
NEVADA CITY, CALIFORNIA 95959

PROJECT NO. 4688.01

Dry Excavation – Oct/Nov 2018

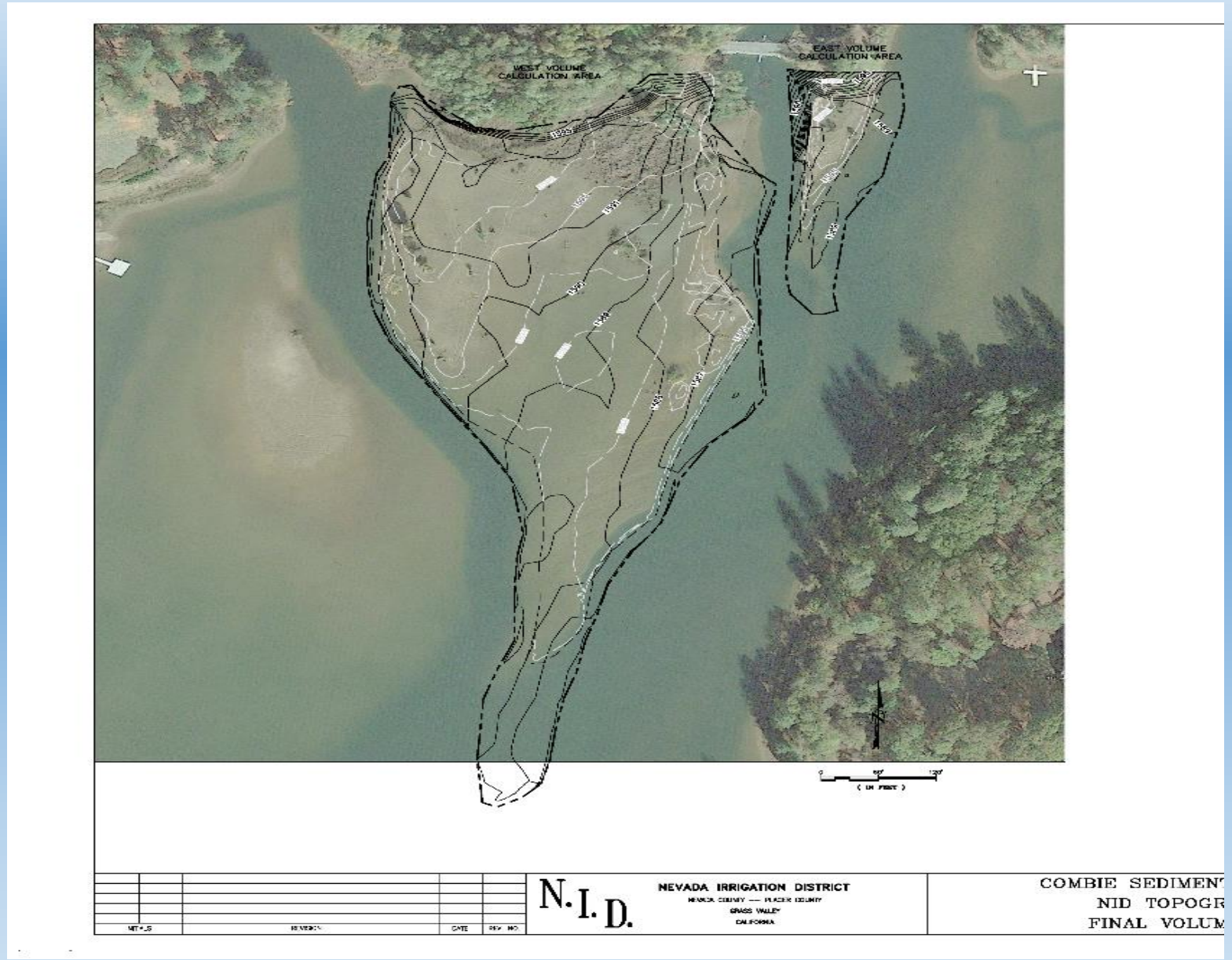
Dry Excavation – Oct/Nov 2018

Dry Excavation – Oct/Nov 2018

Dry Excavation – Oct/Nov 2018

Dry Excavation – November 2018

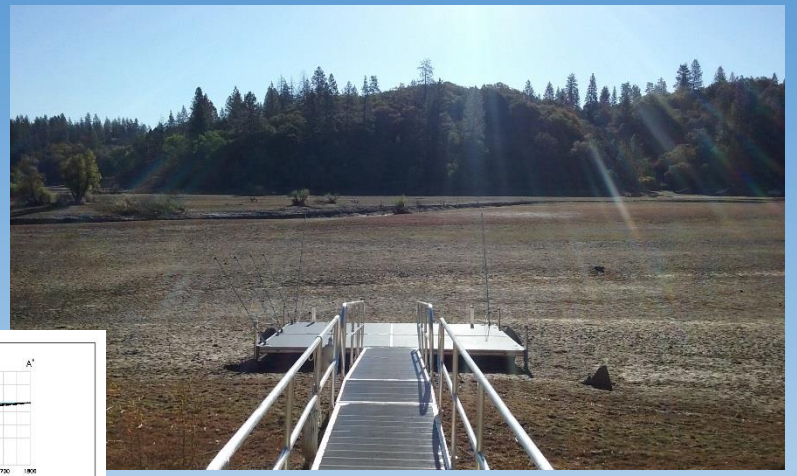
Dry Excavation Survey – 40,000 cu/yd

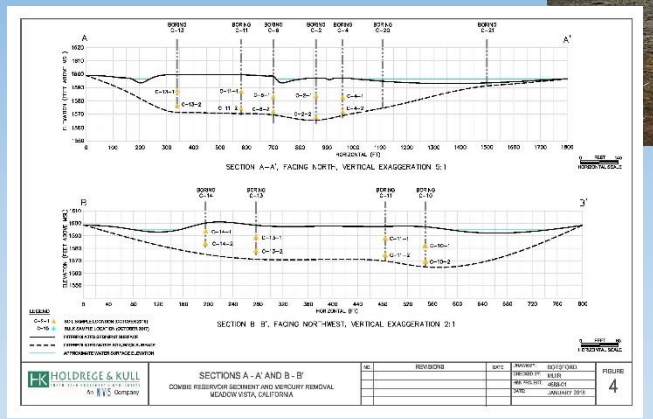


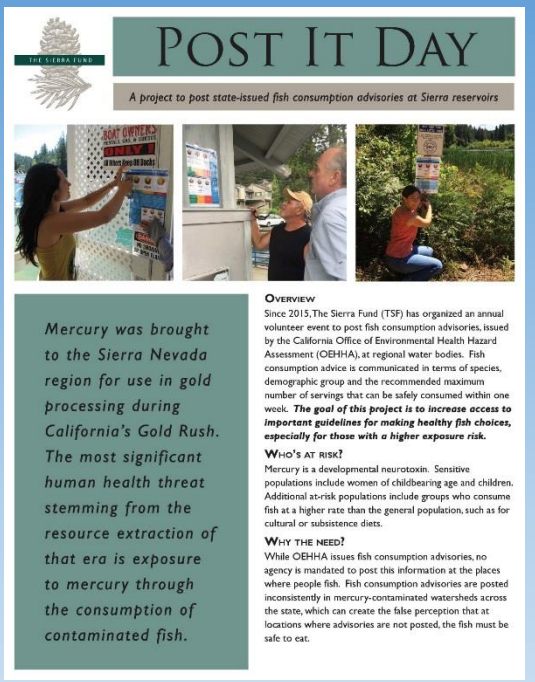
Stockpile Management / SWPP Plan
November 2018 – March/April 2019

Measures of Success

- ✓ 40,000 cu/yd Removed
- ✓ Regulatory Compliance – 401 / NPDES
- ✓ Partner / Community Communication & Coordination
- ✓ Documentation, Analysis & Adaptive Management
- ✓ Sediment Buyer Identified







Budget YTD

TASKS	Total Project Cost	Non-DWR Funding Share	DWR Prop 13 Share	YTD Cost	% of Total
1: Project Administration	$247,663	$247,663	$-	**NID Labor**	
2: Project Management	$400,000	$400,000	$-	**$193,454**	**32%**
3: Reg Comp & Permit	$200,000	$200,000	$-	**$2,268**	**0%**
4: Const/ Mob/ Demob	$500,000	$-	$500,000	**$354,672**	**6%**
5: Sed Removal & Mercury Recovery Ops	$5,250,000	$650,000	$4,600,000	**$1,462,490**	**23%**
6: Bio Assess/ Reporting	$1,000,000	$600,000	$400,000	**$134,147**	**13%**
7: Outreach/ Education	$100,000	$100,000	$-	**$24,738**	**25%**
CONTRACT TOTALS :	$7,697,663	$2,197,663	$5,500,000	**$2,171,770**	**28%**

Project Timeline

October/November 2018

- Excavation in Dry

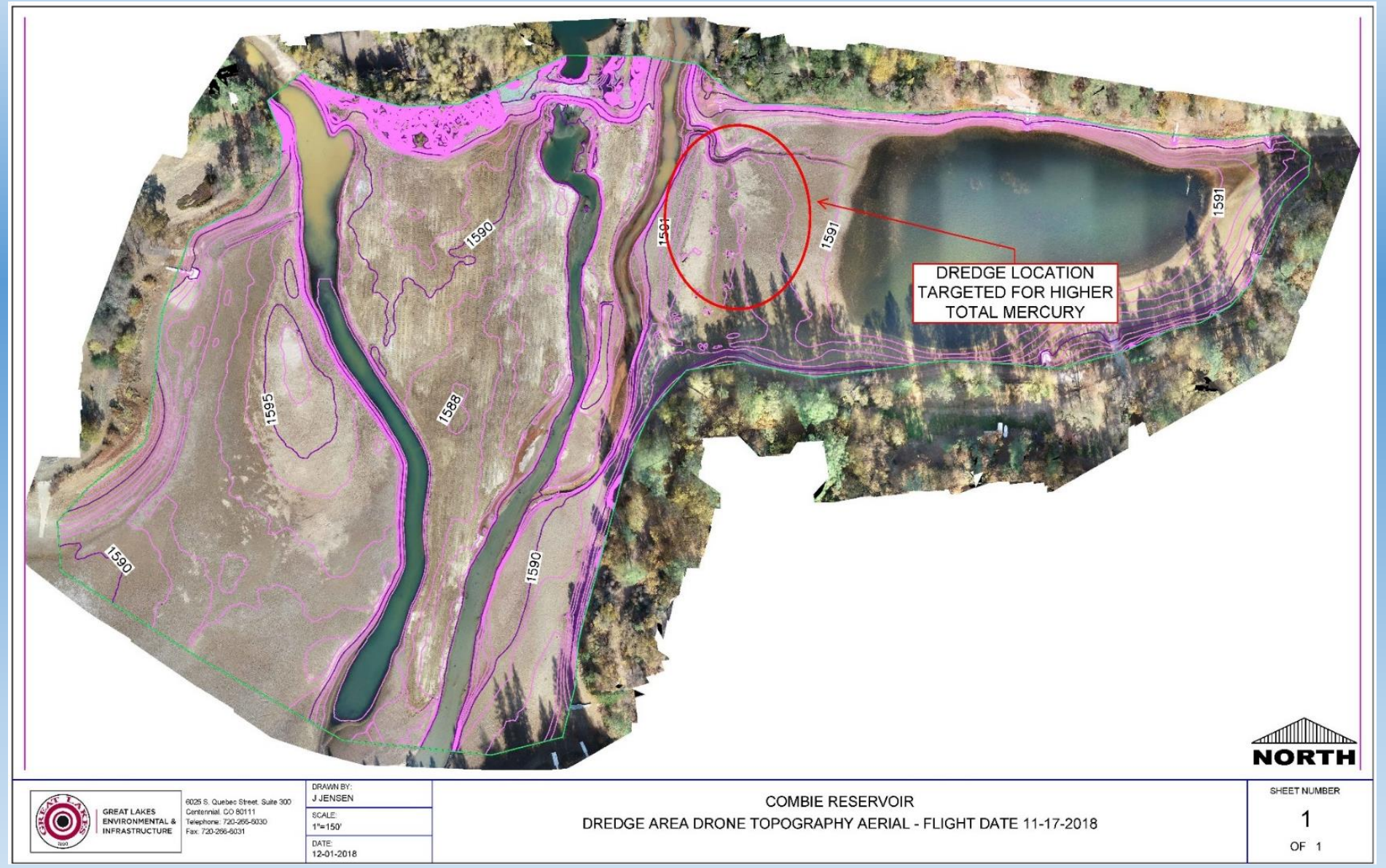
Continued Removal as Reservoir Maintenance

April – August 2019

- Removal in Wet using dredge
- Centrifuge

Dredging Execution – Spring/Summer 2019

Targeted dredge location for higher anticipated mercury concentration



Dredging Execution – Spring/Summer 2019

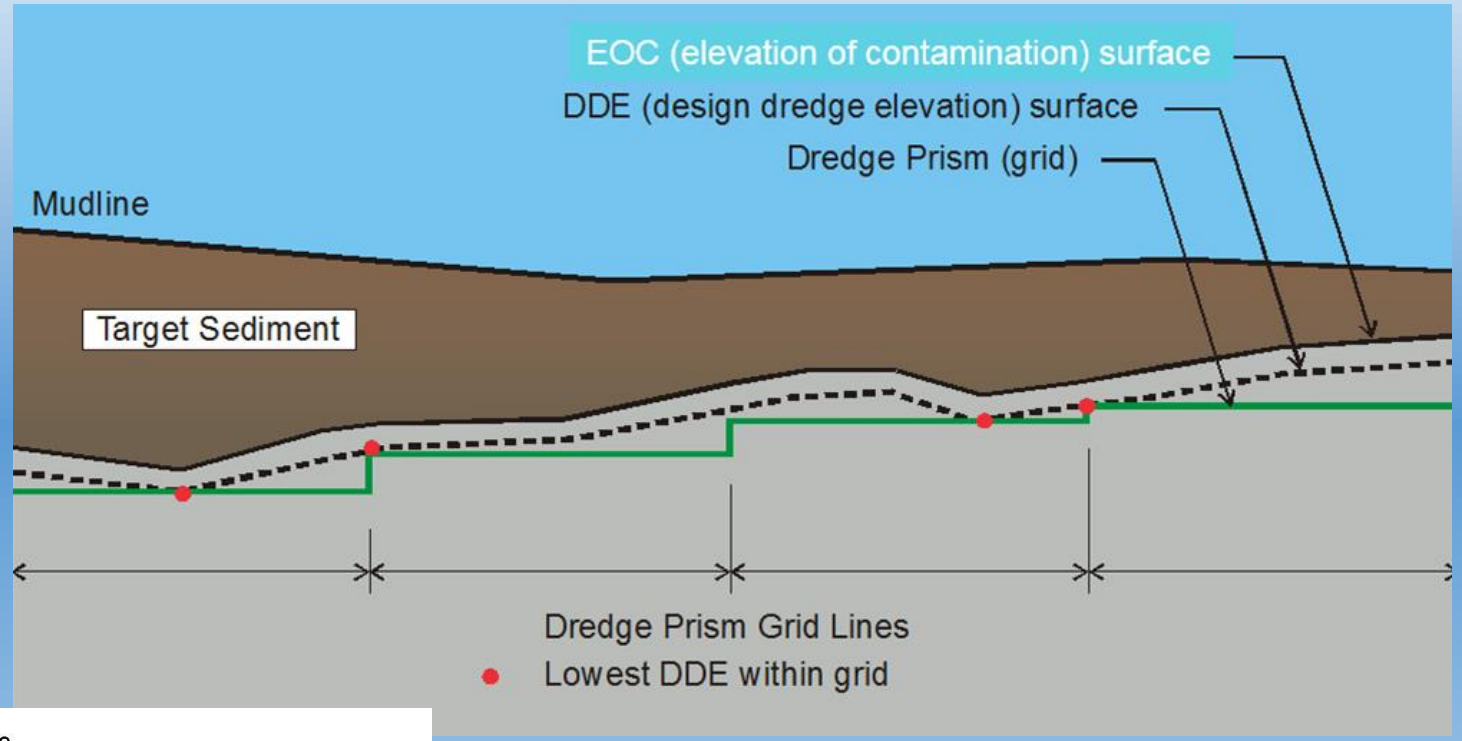
DREDGING BY CUTTER-HEAD SUCTION DREDGE

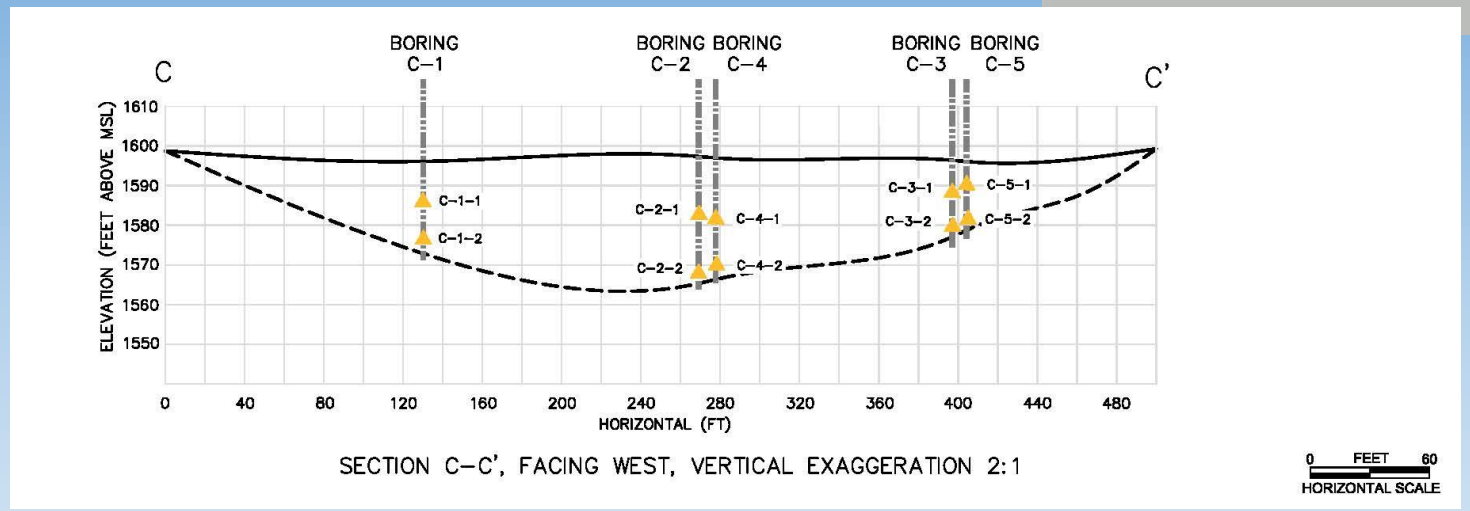
- Suction dredge is mounted to excavator
- Same method as floating cutter-head suction dredge
- Allows operator to manage spuds, swing radius, and down pressure of dredge
- Variable pumping rates (targeted 800 to > 1000 GPM)

Dredging Execution – Spring/Summer 2019

PRECISION DREDGE PLAN

- Dredge locations and target sediment removal based on previous investigations
- Dredge areas located using GPS
- GPS positioning corresponding with Holdrege and Kull soil sample locations



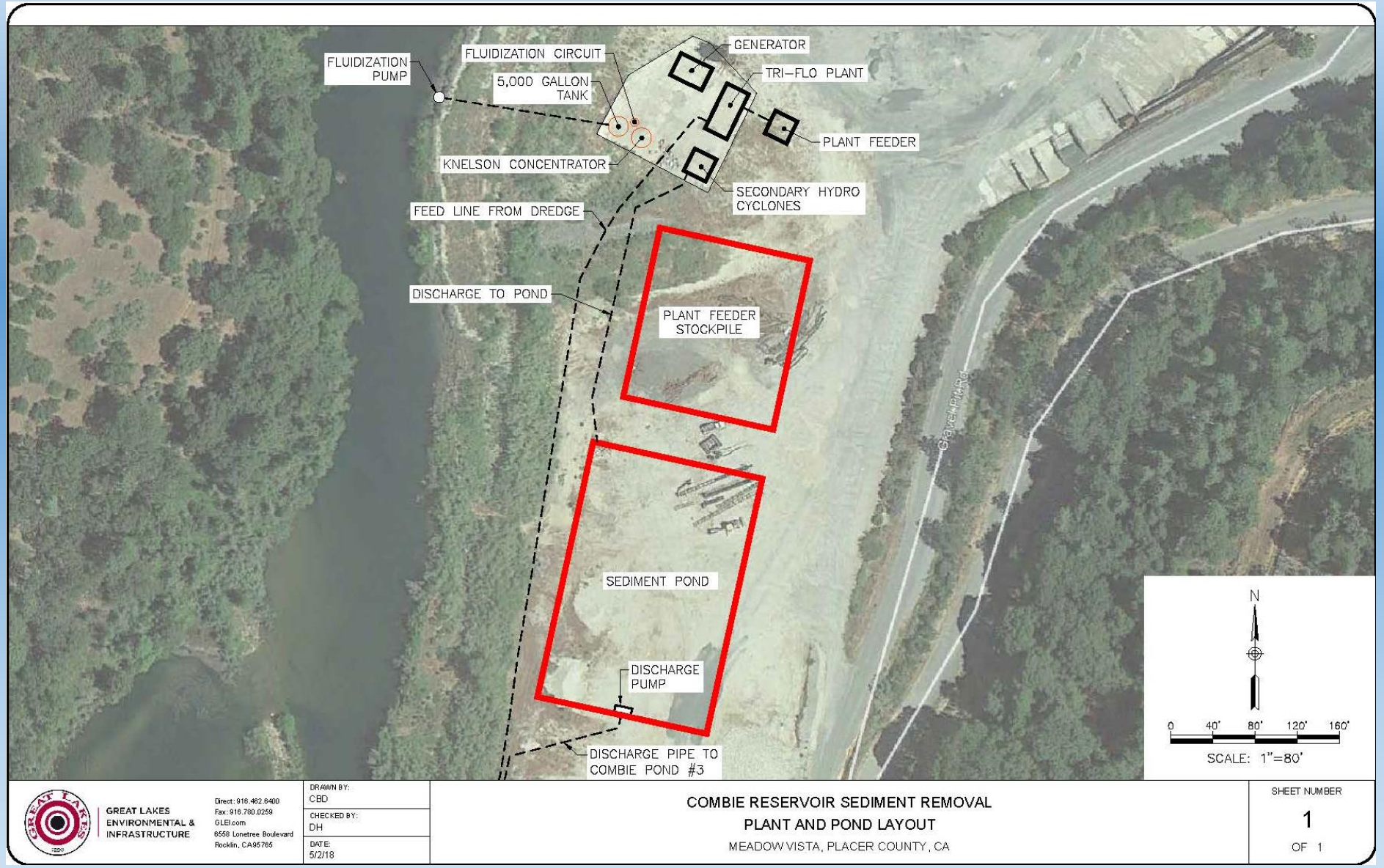


NID

DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

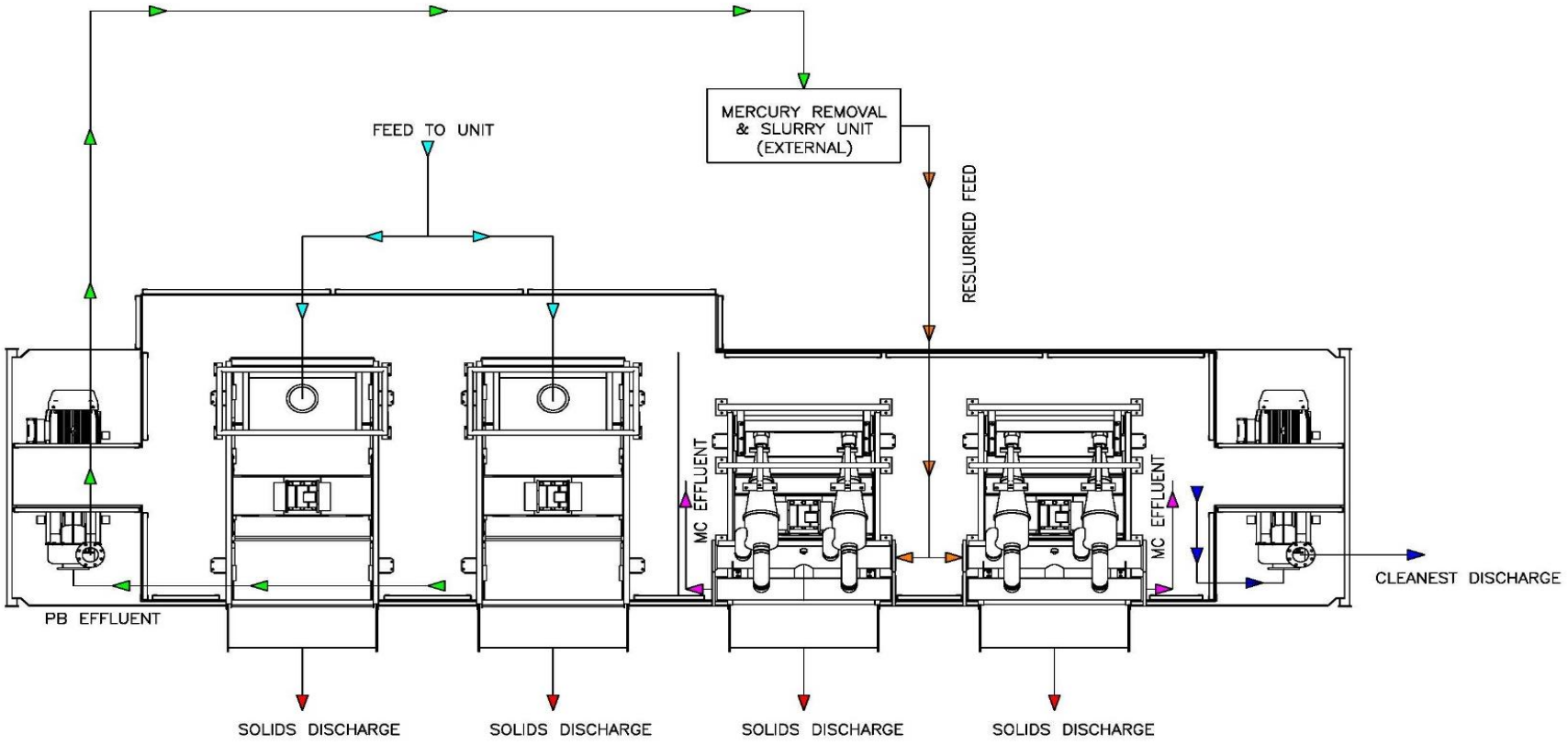
Dredging Execution – Spring/Summer 2019

PLAN VIEW OF PROCESS LAYOUT



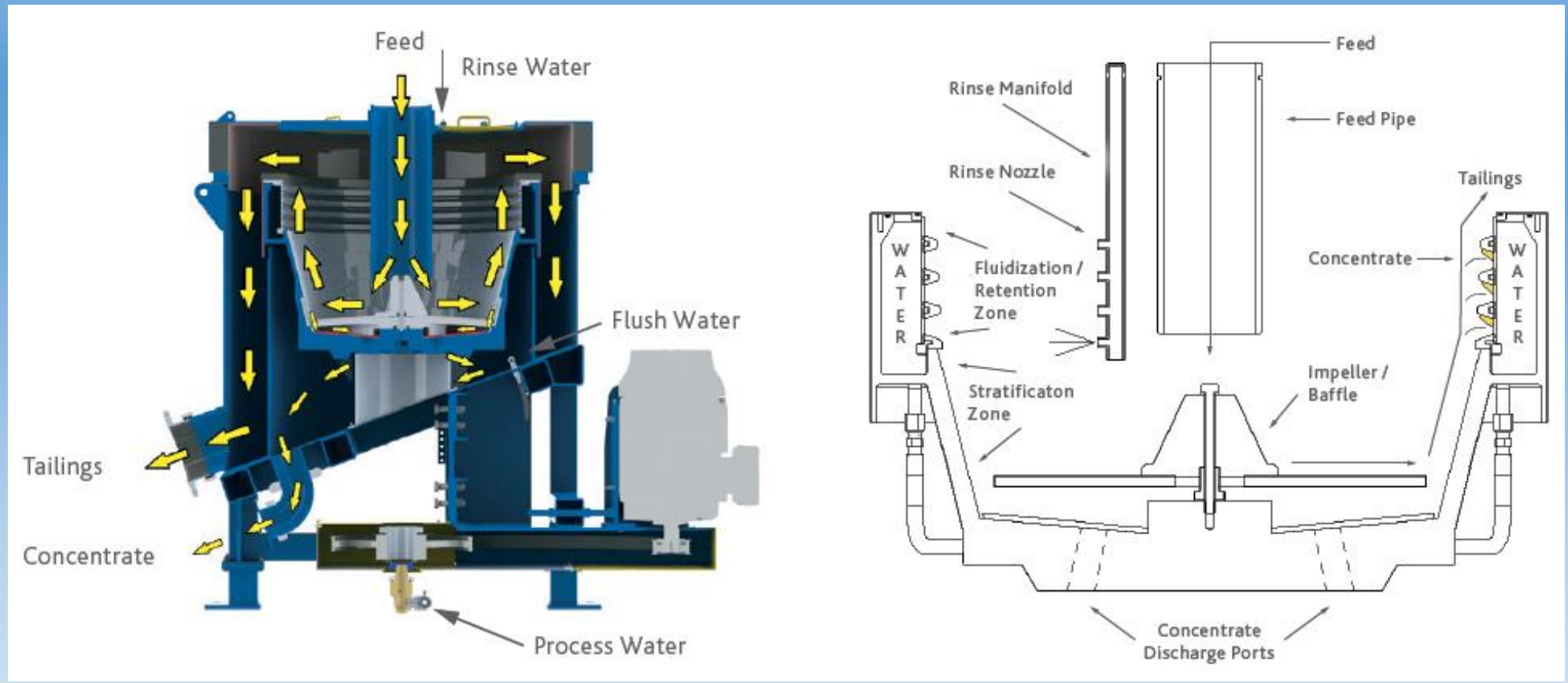
Treatment Process – Spring/Summer 2019

- **Treatment process diagram – tri-flow, concentrator, and hydro cyclones**
  - **Material passes 10 mesh screen**
  - **Effluent is pumped through concentrator**
  - **Concentrator effluent then goes through hydro cyclone and process water is sent to flocculation circuit, settling pond**



Concentrator Flow Diagram

- **600-480 GPM , Assumed 11-15% solids in feed**
- **Fluidization circuit connected from separate clean water feed**
- **Concentrator tailings pumped to hydro cyclones for finer material removal**



LAKE COMBIE SEDIMENT & MERCURY REMOVAL PROJECT

THANK YOU

PROJECT OWNER

NID

MISSION STATEMENT

The District will provide a dependable, quality water supply; continue to be good stewards of the watersheds, while conserving the available resources in our care.

For more information regarding this project, please visit:
www.nidwater.com/projects

PROJECT CONTRACTOR

GREAT LAKES ENVIRONMENTAL & INFRASTRUCTURE

MISSION STATEMENT

Committed to minimizing your risk and liability, through a culture of safety, innovation, and excellence.

PROJECT PARTNERS

NV5

USGS science for a changing world

THE SIERRA FUND

PERMITTING AGENCIES

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

STATE OF CALIFORNIA CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

US Army Corps of Engineers

PROJECT FUNDING

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DEPARTMENT OF WATER RESOURCES STATE OF CALIFORNIA