El Dorado Irrigation District

AGENDA
REGULAR MEETING OF THE BOARD OF DIRECTORS

District Board Room, 2890 Mosquito Road, Placerville, California
February 25, 2019 — 9:00 A.M.

Board of Directors

Alan Day—Division 5
President

George Osborne—Division 1
Vice President

Pat Dwyer—Division 2
Director

Michael Raffety—Division 3
Director

Lori Anzini—Division 4
Director

Executive Staff

Jim Abercrombie
General Manager

Brian D. Poulsen, Jr.
General Counsel

Jennifer Sullivan
Clerk to the Board

Jesse Saich
Communications

Brian Mueller
Engineering

Mark Price
Finance

Jose Perez
Human Resources

Tim Ranstrom
Information Technology

Dan Corcoran
Operations

PUBLIC COMMENT: Anyone wishing to comment about items not on the Agenda may do so during the public comment period. Those wishing to comment about items on the Agenda may do so when that item is heard and when the Board calls for public comment. Public comments are limited to five minutes per person.

PUBLIC RECORDS DISTRIBUTED LESS THAN 72 HOURS BEFORE A MEETING: Any writing that is a public record and is distributed to all or a majority of the Board of Directors less than 72 hours before a meeting shall be available for immediate public inspection in the office of the Clerk to the Board at the address shown above. Public records distributed during the meeting shall be made available at the meeting.

AMERICANS WITH DISABILITIES ACT: In accordance with the Americans with Disabilities Act (ADA) and California law, it is the policy of El Dorado Irrigation District to offer its public programs, services, and meetings in a manner that is readily accessible to everyone, including individuals with disabilities. If you are a person with a disability and require information or materials in an appropriate alternative format; or if you require any other accommodation for this meeting, please contact the EID ADA coordinator at 530-642-4045 or email at adacoordinator@eid.org at least 72 hours prior to the meeting. Advance notification within this guideline will enable the District to make reasonable accommodations to ensure accessibility.

CALL TO ORDER

Roll Call
Pledge of Allegiance
Moment of Silence

ADOPT AGENDA

COMMUNICATIONS

General Manager's Employee Recognition

PUBLIC COMMENT

COMMUNICATIONS

General Manager
Clerk to the Board
Board of Directors

Brief reports on community activities, meetings, conferences and seminars attended by the Directors of interest to the District and the public.

APPROVE CONSENT CALENDAR

Action on items pulled from the Consent Calendar

CONSENT CALENDAR

1. **Finance (Pasquarello)**
   Ratification of EID General Warrant Registers for the period ending February 5 and February 12, 2019, and Employee Expense Reimbursements for these periods.

   Option 1: Ratify the EID General Warrant Register as submitted to comply with Section 24600 of the Water Code of the State of California. Receive and file Employee Expense Reimbursements.
   Option 2: Take other action as directed by the Board.
   Option 3: Take no action.

   Recommended Action: Option 1.

2. **Clerk to the Board (Sullivan)**
   Approval of the minutes of the February 11, 2019 regular meeting of the Board of Directors.

   Option 1: Approve as submitted.
   Option 2: Take other action as directed by the Board.
   Option 3: Take no action.

   Recommended Action: Option 1.

3. **Engineering (Wilson)**
   Consideration to award a contract to Bailey Valve Inc. in the not-to-exceed amount of $139,876 to furnish two Model B-5 sleeve valves with appurtenances; and authorize funding of $139,876 for El Dorado Main 1 Pressure Reducing Station 5 (EDM1 PRS5) Upgrade, Project No. 17016.01.

   Option 1: Award a contract to Bailey Valve Inc. in the not-to-exceed amount of $139,876 to furnish two Model B-5 sleeve valves with appurtenances; and authorize funding of $139,876 for EDM1 PRS5 Upgrade, Project No. 17016.01.
   Option 2: Take other action as directed by the Board.
   Option 3: Take no action.

   Recommended Action: Option 1.

END OF CONSENT CALENDAR

ACTION ITEMS

4. **Engineering (Mutschler)**
   Consideration to award a contract to GEI Consultants in the not-to-exceed amount of $181,558 for design of the Pacific Tunnel rehabilitation; and authorize funding of $338,762 for the Pacific Tunnel rehabilitation, Project No. 16044.

   Option 1: Award a contract to GEI Consultants in the not-to-exceed amount of $181,558 for design of the Pacific Tunnel rehabilitation; and authorize funding of $338,762 for the Pacific Tunnel rehabilitation, Project No. 16044.
   Option 2: Take other action as directed by the Board.
   Option 3: Take no action.

   Recommended Action: Option 1.

CLOSED SESSION

A. **Conference with Real Property Negotiators (Leeper)**
   Government Code Section 54956.8
   Property: Assessor's Parcel Number 126-100-25-100
   District negotiators: General Manager, General Counsel
   Under negotiation: price and terms of sale
   Negotiating parties: Omni Financial, Martin Boone

B. **Conference with General Counsel – Anticipated Litigation (Poulsen)**
   Initiation of litigation pursuant to Government Code Section 54956.9(d)(4): (one potential case)

C. **Conference with General Counsel – Anticipated Litigation (Poulsen)**
   Significant exposure to litigation pursuant to Government Code section 54956.9(d)(2) (*In re PG&E Corporation, and Pacific Gas and Electric Company* (Bankr. N.D.Cal., Case No. 19-30088(DM)))

REVIEW OF ASSIGNMENTS

ADJOURNMENT

TENTATIVELY SCHEDULED ITEMS FOR FUTURE MEETINGS

Engineering

- Design contract for El Dorado Hills Water Treatment Plant automation upgrade, Action, March 11 (Wilson)
- Purchase of pre-fabricated bridge for the Pacific Crest Trail crossing, Action, March 11 (Mutschler)
- Construction contract for the El Dorado Hills odor control project, Action, March 11 (Carrington)

EL DORADO IRRIGATION DISTRICT
February 25, 2019

General Manager Communications

Awards and Recognitions

a) Excellence in Financial Reporting – Summary by Tony Pasquarello

Staff Reports and Updates

None

Summary by Tony Pasquarello

General Manager Communications

February 25, 2019

Excellence in Financial Reporting

EID was notified in January of 2019 that it had been awarded the Certificate of Achievement for Excellence in Financial Reporting for its 2017 Comprehensive Annual Financial Report (CAFR).

This marks 22 years in a row that the district has earned the award. The award is issued by the national Government Finance Officers Association of the United States and Canada (GFOA) after an impartial panel judged that that EID's CAFR demonstrated a constructive spirit of full disclosure to clearly communicate its financial story.

The Certificate of Achievement is the highest form of recognition in the area of governmental accounting and financial reporting, and its attainment represents a significant accomplishment by a government and its management.

The GFOA is a nonprofit professional association serving approximately 19,000 government finance professionals.

EL DORADO IRRIGATION DISTRICT

Subject: Ratification of EID General Warrant Registers for the period ending February 5 and February 12, 2019, and Employee Expense Reimbursements for these periods.

Previous Board Action

February 4, 2002 – The Board approved to continue weekly warrant runs, and individual Board member review with the option to pull a warrant for discussion and Board ratification at the next regular Board meeting.

Board Policies (BP), Administrative Regulations (AR) and Board Authority

Section 24600 of the Water Code of the State of California provides no claim is to be paid unless allowed by the Board.

Summary of Issue

The District's practice has also been to notify the Board of proposed payments by email and have the Board ratify the Warrant Registers. Copies of the Warrant Registers are sent to the Board of Directors on the Friday preceding the Warrant Register's date. If no comment or request to withhold payment is received from any Director by the following Tuesday morning, the warrants are mailed out and formal ratification of said warrants is agendized on the next regular Board agenda.

On April 1, 2002, the Board requested staff to expand the descriptions on the Warrant Registers and modify the current format of the Warrant Registers.

On July 30, 2002, the Board requested staff to implement an Executive Summary to accompany each Warrant Register which includes all expenditures greater than $3,000 per operating and capital improvement plan (CIP) funds.

Background/Discussion

Warrant registers submitted for February 5 and February 12, 2019 totaling $768,600.40, and Employee Expense Reimbursements for these periods.

Current Warrant Register Information
Warrants are prepared by Accounts Payable; reviewed and approved by the Accounting Manager; the Director of Finance and the General Manager or their designee.

Register Date	Check Numbers	Amount
February 5, 2019	672579 – 672678	$439,144.10
February 12, 2019	672679 – 672793	$329,456.30

Current Board/Employee Expense Payments and Reimbursement Information
The items paid on Attachment B are expense and reimbursement items that have been reviewed and approved by the Clerk to the Board, Accounting Manager and the General Manager before the warrants are released. These expenses and reimbursements are for activities performed in the interest of the District in accordance with Board Policy 12065 and Resolution No. 2007-059.

Additional information regarding employee expense reimbursement is available for copying or public inspection at District headquarters in compliance with Government Code Section 53065.5.

Board Options

Option 1: Ratify the EID General Warrant Register as submitted to comply with Section 24600 of the Water Code of the State of California. Receive and file Employee Expense Reimbursements.

Option 2: Take other action as directed by the Board.

Option 3: Take no action.

Recommendation
Option 1

Attachments
Attachment A: Executive Summaries
Attachment B: Employee Expenses/Reimbursements totaling $100 or more

Tony Pasquarello
Finance Manager

Mark Price
Finance Director

Jennifer Sullivan
Clerk to the Board

Jim Abercrombie
General Manager

Executive Summary for February 5, 2019 -- $439,144.10:

This summary highlights significant disbursements made by major business activity:

General District Operations (Fund 110)

- $3,349—C & H Motor Parts, Inc. for vehicle maintenance and supply parts
- $3,490—Golden State Flow Measurement, Inc. for water meters
- $10,692—Hunt & Sons, Inc. for card lock fuels and fuel deliveries at various locations
- $5,950—Liebert Cassidy Whitmore for MOU negotiations
- $5,000—Pitney Bowes Reserve Account for postage for warehouse meter
- $3,309—Ron Dupratt for truck boxes and vehicle repair supplies

Engineering Operations (Fund 210)

- $11,353—All Pro Backflow, Inc. for backflow testing services

Water Operations (Fund 310)

- $13,906—Aqua Tech Company for tank cleaning services

Wastewater Operations (Fund 410)

- $5,400—DKF Solutions Group, LLC for Standard Operating Procedures (SOP) application development
- $8,591—Industrial Electrical Company for Skinner Lane pump rebuild labor and materials
- $6,250—Sweet Septic, Inc. for septic pumping service
- $5,834—Univar USA, Inc. for caustic soda at EDHWWTP

Recycled Water Operations (Fund 510) none to report

Hydroelectric Operations (Fund 610) none to report

Recreation Operations (Fund 710) none to report

Capital Improvement Projects (Construction Funds 140, 340, 440, 540, 640 and 740)

- $15,202—Black & Veatch Corporation for preparation and design services – EDHWWTP Waste-Activated Sludge, Dissolved Air Floatation Thickening Unit Rehabilitation (Project #18035.01)
- $9,028—Dudek for environmental engineering services:
  >Project #17034.01 – Wastewater Collection Facility Relocation ($5,107)
  >Project #06076H.01 – FERC:C38.48 Caples Lake Stabilization ($3,921)
- $3,022—Garcia and Associates for engineering services:
  >Project #17013.01 – Forebay Dam Modification ($750)
  >Project #07003H.01 – FERC:C37.9 Water Quality ($2,272)
- $3,264—GEI Consultants, Inc. for engineering services – El Dorado Hills Raw Water Pump Station (Project #15024.01)
- $92,134—GHD, Inc. for engineering services:
  >Project #16022.01 – Flume 38-40 Canal Conversion ($38,710)
  >Project #STUDY01.01 – Canal Assessment ($3,431)
  >Project #14024.01 – Flume 44 Replacement ($49,993)
- $5,500—Network Design Associates, Inc. for consulting services – EUC Phase 1 Desktop (Project #18032.01)
- $23,921—Stantec Consulting Services, Inc. for engineering services – Main Ditch-Forebay to Reservoir 1 (Project #11032.01)
- $11,288—TerraVerde Energy, LLC for financial feasibility assessment – Solar Assessment and Design (Project #16030.01)
- $134,489—TNT Industrial Contractors, Inc. for construction services ($141,567) – Outingdale Lower Tank Replacement (Project #13015.01) Retention held $7,078

Executive Summary for February 12, 2019 -- $329,456.30:

This summary highlights significant disbursements made by major business activity:

General District Operations (Fund 110)

- $15,416—Golden State Flow Measurement, Inc. for water meters, meter parts, and batteries
- $3,265—Key2life Janitorial for January janitorial services
- $4,238—Les Schwab Tire Centers of California, Inc. for tires
- $3,978—Life Insurance Company of North America for February 2019 life insurance premiums
- $3,439—Meyers, Nave, Riback, Silver & Wilson for outside legal services
- $7,671—PG&E for electric service
- $9,500—Reeb Government Relations, LLC for February 2019 retainer

Engineering Operations (Fund 210)

- $5,216—Backflowparts USA for backflow repair kits

Water Operations (Fund 310)

- $6,615—Aqua Tech Company for tank cover leak repairs
- $4,785—Hastie's Capitol Sand and Gravel Company for aggregate base rock
- $3,551—PG&E for electric service

Wastewater Operations (Fund 410)

- $28,134—Denali Water Solutions, LLC for sludge hauling and disposal at EDHWWTP and DCWWTP
- $60,311—PG&E for electric service
- $5,511—Suez Treatment Solutions, Inc. for 20 ballasts
- $6,730—Univar USA, Inc. for caustic soda at EDHWWTP

Recycled Water Operations (Fund 510)

- $3,687—PG&E for electric service

Hydroelectric Operations (Fund 610)

- $4,386—PG&E for electric service
- $4,124—Transcat, Inc. for an electronic pressure calibrator

Recreation Operations (Fund 710)

- $6,435—Sierra Site Services, LLC for a toilet/shower trailer rental

Capital Improvement Projects (Construction Funds 140, 340, 440, 540, 640 and 740)

- $4,461—California Department of Fish and Wildlife for streambed alteration application fees – FERC:C38.4B Caples Lake Stabilization (Project #06076H.01)
- $3,637—Corix Water Products (US), Inc. for a tank meter cover – Sierra Tank Meter Replacement (Project #17036.01)
- $4,890—GEI Consultants, Inc. for engineering services – Siphon Assessment (Project #STUDY07.01)
- $22,625—GHD, Inc. for engineering services:
  >Project #18051.01 – Alarm 5 Canal Rehabilitation ($663)
  >Project #17041.01 – Flume 30 Rehabilitation Project ($21,962)
- $19,896—Meyers, Nave, Riback, Silver & Wilson for legal representation – Camp 2 Bridge Replacement (Project #06030H.01)
- $5,255—Pipelogix, Inc. for GIS modules – Wastewater Collection System Pipeline (Project #17020.01)
- $5,438—Quantum Resolve, Inc. for consulting services – Hansen 7 Software Replacement (Project #18055.01)
- $7,989—Stantec Consulting Services, Inc. for engineering services – Main Ditch-Forebay to Reservoir 1 (Project #11032.01)

Attachment B

Employee Expenses/Reimbursements
Warrant Registers dated 02/05/19 - 02/12/19

EMPLOYEE	DESCRIPTION	AMOUNT
Ryan Deakyne	CAPPO Training Seminar Expenses	$118.56
Ryan Rothwell	Water Sampler Battery	$137.72
Mark Price	Government Accounting and Accounting Laws CPE Courses	$1,180.00
Brian Poulsen	ACWA Conference Lodging	$206.20
Jose Perez	LCW Employment Law Conference Expenses	$1,993.10
Jason Ide	Food for UB Staff During Power Outage	$114.50
		$3,750.08

El Dorado Irrigation District

MINUTES
REGULAR MEETING OF THE BOARD OF DIRECTORS

District Board Room, 2890 Mosquito Road, Placerville, California
February 11, 2019 — 9:00 A.M.

Board of Directors

Alan Day—Division 5
President

George Osborne—Division 1
Vice President

Pat Dwyer—Division 2
Director

Michael Raffety—Division 3
Director

Lori Anzini—Division 4
Director

Executive Staff

Jim Abercrombie
General Manager

Brian D. Poulsen, Jr.
General Counsel

Jennifer Sullivan
Clerk to the Board

Jesse Saich
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Brian Mueller
Engineering

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CALL TO ORDER

President Day called the meeting to order at 9:00 A.M.

Roll Call
Board

Present: Directors Osborne, Dwyer, Raffety, Anzini and Day

Staff

Present: General Manager Abercrombie, General Counsel Poulsen and Clerk to the Board Sullivan

Pledge of Allegiance and Moment of Silence

President Day led the Pledge of Allegiance.

ADOPT AGENDA

ACTION: Closed Session Item No. A was removed. Agenda was adopted as amended.

MOTION PASSED

Ayes: Directors Osborne, Raffety, Dwyer, Anzini and Day

COMMUNICATIONS

General Manager's Employee Recognition

Awards and Recognitions

General Manager Abercrombie thanked staff for their efforts in the recent and upcoming storms.

PUBLIC COMMENT

Paul Raveling, El Dorado Hills
Lisa Richmond, Pollock Pines
Susan Fredericks

COMMUNICATIONS

General Manager

Staff Reports and Updates

None

Clerk to the Board

None

Board of Directors

Director Dwyer reported on his participation on recent tours of District facilities. He also reported on his attendance at the El Dorado County Chamber of Commerce Installation Dinner.

APPROVE CONSENT CALENDAR

ACTION: Consent Calendar was approved.

MOTION PASSED
Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

CONSENT CALENDAR

1. **Finance (Pasquarello)**
   Ratification of EID General Warrant Registers for the periods ending January 22 and January 29, 2019, and Board and Employee Expense Reimbursements for these periods.

   ACTION: Option 1: Ratified the EID General Warrant Register as submitted to comply with Section 24600 of the Water Code of the State of California. Received and filed Board and Employee Expense Reimbursements.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

2. **Clerk to the Board (Sullivan)**
   Approval of the minutes of the January 28, 2019 regular meeting of the Board of Directors.

   ACTION: Option 1: Approved as submitted.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

3. **Finance (Pasquarello)**
   Consideration to authorize funding approval for District Capital Improvement Plan (CIP) Projects: FERC C37.8 Water Temperature, Project No. 06021H in the amount of $20,000; FERC C15 Pesticide Use, Project No. 07010H in the amount of $60,000; FERC38 Adaptive Management, Project No. 07011H in the amount of $20,000; FERC C44 Noxious Weeds, Project No. 08025H in the amount of $10,000.

   ACTION: Option 1: Authorized funding approval for District Capital Improvement Plan (CIP) Projects: FERC C37.8 Water Temperature, Project No. 06021H in the amount of $20,000; FERC C15 Pesticide Use, Project No. 07010H in the amount of $60,000; FERC38 Adaptive Management, Project No. 07011H in the amount of $20,000; FERC C44 Noxious Weeds, Project No. 08025H in the amount of $10,000.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

4. **Engineering (Money)**
   Consideration to authorize staff to transfer District funds in the amount of $489,621 to an interest bearing escrow account at Wells Fargo Bank for the benefit of the Solar Assessment and Design Program Escrow Funds, Project No. 16030.

   ACTION: Option 1: Authorized staff to transfer District funds in the amount of $489,621 to an interest bearing escrow account at Wells Fargo Bank for the benefit of the Solar Assessment and Design Program Escrow Funds, Project No. 16030.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

5. **Finance (Downey)**
   Consideration to authorize funding for Capital Improvement Plan (CIP) Project No. 19006 for AMR/Meter Replacement in the amount of $150,000 and to authorize the General Manager to approve purchases throughout the year in the not-to-exceed amount of $150,000.

   ACTION: Option 1: Authorized funding for CIP Project No. 19006 for AMR/Meter Replacement in the amount of $150,000 and to authorize the General Manager to approve purchases throughout the year in the not-to-exceed amount of $150,000.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

6. **Finance (Pasquarello)**
   Consideration to receive and file the District's Investment Report for the quarter ending December 31, 2018.

   ACTION: Option 1: Received and filed the District's Investment Report for the quarter ending December 31, 2018.

   MOTION PASSED
   Ayes: Directors Osborne, Dwyer, Raffety, Anzini and Day

END OF CONSENT CALENDAR

ACTION ITEMS

7. Finance (Downey)

Consideration to amend Administrative Regulation (AR) 9024 (Small Farm and Agricultural Metered Irrigation) to lower the required minimum threshold for Small Farm irrigation rate eligibility from $3,500 to $1,000 in annual gross sales of "agricultural products of the lands."

Public Comment: The Board Clerk reported that one email was received regarding this item And provided it to the Board and made it available to the public.

Susan Fredericks Paul Raveling
Cheryl
Craig Schmidt provide a three-page handout that included a letter dated February 10, 2019, with an attachment (USDA letter dated December 9, 2016), and a blank IRS Schedule F form, and addressed the Board
John Wilson, Shingle Springs

MOTION: Motion by Director Anzini and seconded by Director Day to approve option 2 and take other action as directed by the Board to continue this item so that the Small Farm irrigation rate can be considered in the District's upcoming Cost of Services Study.

MOTION FAILED
Ayes: Directors Anzini and Day
Noes: Directors Osborne, Dwyer and Raffety

MOTION: Motion by Director Osborne and seconded by Director Raffety to approve option 1 and amend Administrative Regulation 9024 (Small Farm and Agricultural Metered Irrigation) to lower the required minimum threshold for Small Farm irrigation rate eligibility from $3,500 to $1,000 in annual gross sales of "agricultural products of the lands."

MOTION: Motion by Director Day and seconded by Director Anzini to approve option 2 and take other action as directed by the Board to amend Administrative Regulation 9024 (Small Farm and Agricultural Metered Irrigation) to lower the required minimum threshold for Small Farm irrigation rate eligibility from $3,500 to $1,000 in annual gross sales of "agricultural products of the lands" and to require the applicant to submit the appropriate IRS-certified form.

ACTION: Option 2: Take other action as directed by the Board.
Amended Administrative Regulation 9024 (Small Farm and Agricultural Metered Irrigation) to lower the required minimum threshold for Small Farm irrigation rate eligibility from $3,500 to $1,000 in annual gross sales of "agricultural products of the lands" and to require the applicant to submit the appropriate IRS-certified form.

MOTION PASSED
Ayes: Directors Day, Anzini and Dwyer
Noes: Directors Osborne and Raffety

8. **Engineering (Kessler)**
   Consideration to approve contract amendments to Shimmick Construction Co. in the not-to-exceed amount of $265,638.75, and to GEI Consultants, Inc. in the not-to-exceed amount of $515,604 for construction management and engineering support services for the El Dorado Forebay Dam Modification, Project No. 17013.

   Public Comment: Lisa Richmond

   ACTION: Option 1: Approved contract amendments to Shimmick Construction Co. in the not-to-exceed amount of $265,638.75, and to GEI Consultants, Inc. in the not-to-exceed amount of $515,604 for construction management and engineering support services for the El Dorado Forebay Dam Modification, Project No. 17013.

   MOTION PASSED
   Ayes: Directors Osborne, Raffety, Dwyer, Anzini and Day

CLOSED SESSION

A. **Conference with Labor Negotiators**
   Government Code Section 54957.6
   Agency Negotiators: Jack Hughes, Jim Abercrombie, Brian Poulsen, Jose Perez, and Mark Price
   Employee Organization: El Dorado Irrigation District Managers and Supervisors Employee Unit

   At the request of staff, this item was removed at the adoption of the agenda.

B. **Conference with General Counsel – Anticipated Litigation (Poulsen)**
   Initiation of litigation pursuant to Government Code Section 54956.9(d)(4): (one potential case)

   ACTION: The Board met with counsel and provided direction but took no reportable action.

REVIEW OF ASSIGNMENTS

None

ADJOURNMENT

President Day adjourned the meeting at 11:23 A.M.

Alan Day
Board President
EL DORADO IRRIGATION DISTRICT

ATTEST

Jennifer Sullivan
Clerk to the Board
EL DORADO IRRIGATION DISTRICT

Approved: _____

EL DORADO IRRIGATION DISTRICT

Subject: Consideration to award a contract to Bailey Valve Inc. in the not-to-exceed amount of $139,876 to furnish two Model B-5 sleeve valves with appurtenances; and authorize funding of $139,876 for El Dorado Main 1 Pressure Reducing Station 5 (EDM1 PRS5) Upgrade, Project No. 17016.01.

Previous Board Action

September 11, 2017 – The Board approved $150,000 in funding for the purchase and installation of a line stop, isolation valves and fittings, and capitalized labor to facilitate the EDM1 PRS5 valve installation.

January 28, 2019 – The Board adopted the 2019-2023 CIP, which included the EDM1 PRS5 upgrade project.

Board Policies (BP), Administrative Regulations (AR) and Board Authority

BP 3060 – Contracts and Procurement

Summary of Issue

The EDM1 PRS5 upgrade was planned to start construction in 2018 with District crews by installing all the necessary valving prior to reconstructing the station in 2019. Due to competing priorities among staff resources, District crews were unable to complete the work in 2018 and it will now be necessary to bid the work along with the intertie project to an outside contractor. The District must have this station upgraded prior to the Caltrans Camino Safety Project, which is set to start in the fall of 2019, to allow for operational flexibility during the required relocation of a section of EDM1 and El Dorado Main 2 (EDM2). To implement the project according to this schedule, staff is seeking Board authorization to pre-purchase two 10-inch sleeve valves from Bailey Valve, Inc. in the not-to-exceed amount of $139,876. These valves will be installed as part of the EDM1 PRS5 upgrade project, which is anticipated to be considered for Board approval in June 2019.

Background/Discussion

EDM1 and EDM2 are parallel large diameter transmission mains that convey drinking water on the north side of the District's water system from Pollock Pines to the Lotus/Coloma area. EDM2 then transitions to the Gold Hill Intertie (GHI) and continues delivering water to Cameron Park and El Dorado Hills. Along the way, large pressure reducing stations are used to divert water from the transmission mains into several storage tanks located at various locations in the water system.

At the 1.5 million gallon Reservoir 3 water storage tank east of Placerville, the current operation is to utilize EDM2 to fill the storage tank. In order to accommodate the Camino Safety Project and maintain storage in key reservoirs throughout the western portion of the District's service area during periods of increased demand and necessary maintenance activities, the District needs to re-operate Reservoir 3 to be supplied primarily from EDM1 PRS5 instead of EDM2 and utilize EDM2 as a lag emergency feed. This will be accomplished by constructing a short intertie (approximately 420 feet) between EDM1 and EDM2.

Caltrans is scheduled to begin construction of the Camino Safety Project in Fall 2019, which will provide a new underpass for Highway 50 at Camino Heights. This new underpass will require the relocation of both EDM1 and EDM2, as the existing grades must be lowered over 15 feet to accommodate the underpass. The District will be financially responsible for the relocation of EDM1 because the transmission main is located in County right-of-way with no prior District rights. However, EDM2 was installed on private property with the benefit of an easement, and thus Caltrans is financially responsible for relocating the EDM2 pipeline. During the relocations the District will need to maintain water transmission capability, and thus is working in parallel on a design for an intertie at Reservoir 3 between EDM1 and EDM2. This intertie will provide key benefits to the District moving forward not just to accommodate the Caltrans project, but also provide better capabilities to deliver water to Cameron Park and El Dorado Hills through EDM2 and GHI as well as any future potential outages between Reservoir 2 and Reservoir 3. The intertie will provide much needed redundancy between the two transmission mains, and the EDM1 PRS5 upgrade project is a piece of the puzzle.

Upgrading the EDM1 PRS5 will be instrumental in reducing high-pressure flows originating uphill at the Reservoir 2 tanks prior to discharge into the Reservoir 3 tank. The valves at this facility were originally installed in 1960 and were designed to fill the previous in-ground open Reservoir 3. When the open reservoir was converted into a tank, the valves, which were not designed to fill a tank, remained and thus the EDM2 PRS1 became the lead to fill the tank and EDM1 PRS5 became the lag. Furthermore, due to their age, the valves have reached the end of their useful lives and are in need of replacement. Upgrading this PRS5 will allow EDM1 to once again become the main feed for Reservoir 3, and combined with a new intertie will meet the District operational needs moving forward.

The replacement valves will be installed as part of the proposed EDM1 and EDM 2 intertie project in conjunction with EDM1 PRS5 upgrade project. Combining both of these projects should achieve cost savings compared to two separate projects.

Pre-purchase
Given the typical lead times for the submittal process during construction (4-6 weeks) and the sleeve valve production time after submittal approval (4-5 months), it is critical to pre-purchase the sleeve valves prior to awarding a construction contract later this year. A direct purchase by the District will eliminate the need for a submittal review process, and will allow the valves to arrive on site in August during the planned construction schedule.

Quotes
Staff requested quotes for two 10-inch sleeve valves with electronic control resulting in the quotes below:

	Bidder	**Total Bid Price**
1	Bailey Valve	$139,876
2	Municipal Valve & Equipment	$142,134
3	BK Valves & Equipment	$147,237

The bids were reviewed for responsiveness and it was determined that Bailey Valve (Attachment A) was the low and responsive bid for the sleeve valves. If approved, Bailey Valve would supply the valves and the District would complete plans and specifications for the subsequent installation of these valves along with the intertie project at Reservoir 3 in the summer of 2019.

Funding

The EDM1 PRS5 upgrade project is included in the approved 2019-2023 CIP (Attachment B) for construction in 2022. However, given the accelerated schedule for the Caltrans Camino Safety Project the District must complete the project in 2019. Funding for the purchase of the valves is requested at this time, and additional funding for construction will be requested at a future date once full plans and specifications are complete and an updated cost estimate can be developed.

Board Options

Option 1: Award a contract to Bailey Valve Inc. in the not-to-exceed amount of $139,876 to furnish two Model B-5 sleeve valves with appurtenances; and authorize funding of $139,876 for EDM1 PRS5 Upgrade, Project No. 17016.01.

Option 2: Take other action as directed by the Board.

Option 3: Take no action.

Recommendation

Option 1

Attachments

Attachment A: Bailey Valve Quote
Attachment B: CIP Summary

Patrick Wilson
Senior Civil Engineer

Radenko Odzakovic
Drinking Water Operations Manager

Elizabeth Dawson Wells
Engineering Manager

Brian Mueller
Engineering Director

Dan Corcoran
Operations Director

Mark Price
Finance Director

Jim Abercrombie
General Manager

BAILEY VALVE INC
moving water forward

264 W. Fallbrook Ave., Ste. 105, Fresno California 93711
o: (559) 434-2838 | f: (559) 434-3653 | www.baileyvalve.com

QUOTATION

To:	Eldorado Irrigation District	**Fax:**	
Date:	February 7, 2019	**Quote #:**	2019667 Rev D
Attn:	Patrick Wilson	**By**:	BH
Project:	EID		
Terms:	FFA Jobsite		

Bailey Valve is pleased to offer you the following equipment quotation for the above referenced project. Please verify all quantities and sizes with project plans and specifications. Bailey Valve does not guarantee the quantity and sizes shown are complete to all specifications and addendum.

QTY	SIZE	DESCRIPTION	UNIT PRICE
2	**10”**	**Model B-5** - 10” 304 SS Sleeve - 10” Class 150# Inlet/Outlet Flange - Electric Motor Operator - Fusion Epoxy Coating - Ductile iron Body - Stellite Hard Faced 304 SS Seat Ring	**$ 64,607.43 ea.**

Tax Rate:	**8.25%**
Shipping:	**$ 0.00**
Item Total:	**$ 69,937.54 ea.**
Package Total:	**$139,875.08**

NOTE PRICES ARE UNIT PRICES.

Deliveries: Submittals 4 - 6 Weeks after acceptance of purchase order.
Shipment 14 – 16 Weeks after final approvals / release of order.

EXCLUSIONS AND CLARIFICATIONS

1. Price is in US Dollars.
2. Taxes are not included.
3. Freight is not included.
4. No special testing or x-raying of the metals is included in this quotation unless otherwise stated.
5. Standard welding procedures are preformed in the construction of the valve(s) quoted unless otherwise stated.
6. Unless otherwise stated, Bailey Valve is not responsible for any expenses incurred for factory onsite inspection required or requested on the above quotation. All expenses will be paid by either by the district or the customer.
7. Installation of the valve or any related installation of accessories is not included in this quotation and will be performed by others.

Attachment B

2019 CAPITAL IMPROVEMENT PLAN Program: Water

Project Number: 17016

Project Name: El Dorado Main #1 PRS #5

Project Category: Reliability & Service Level Improvements

Priority: 2 **PM:** Wilson **Board Approval:** 01/28/19

Project Description:

The El Dorado Main #1 Pressure Reducing Station #5 (EDM1PRS5) is in need of replacement control and isolation valves due to failure issues from operating infrastructure that has outlived its useful life. Additionally, EDM1PRS5 is not equipped with bypass capabilities resulting in large area water service outages in order to complete maintenance activities. During a review of the site it was determined that an extensive shutdown would be required to install new isolation and pressure reducing valves. The shutdown would be from Moose Hall Reservoir to Carson Road and North Canyon Road. The shutdown would also require that the Swansboro supply line be shutdown and the community would rely only upon Swansboro Tank. The alternative to the extensive shutdown is to install a temporary line stop which would isolate the station without causing customer interruption of service. EDM #1 would need to be exposed, and a specialized service company would then come in to perform the insertion and removal of the temporary line stop. Next the station needs to be moved down to the tank elevation to allow for full valve control to properly operate the tank. This will require the installation of approximately 100' of 24" DIP to move the station down from the old reservoir edge. Staff also reviewed the alternatives and decided that in addition to the line stop a new permanent isolation valve setup would provide the District with better operational flexibility and service reliability in the future for EDM #1. The intent is to install a new tee, two isolation valves to allow for any future required shutdowns. This option will provide the District with the opportunity to later connect to EDM #2 to allow for system optimization and flexibility and reduce future water service outage impacts to our customers.

Basis for Priority:

Potential interruption to service throughout the District in the event of failures and continued use of expiring equipment that may pose a threat to the health and safety of customers, employees, and the public.

Project Financial Summary:			
Funded to Date:		**Expenditures through end of year:**	**$ -**
Spent to Date:		**2019 - 2023 Planned Expenditures:**	**$ 550,000**
Cash flow through end of year:	**$ -**	**Total Project Estimate:**	**$ 550,000**
Project Balance	**$ -**	**Additional Funding Required**	**$ 550,000**

Description of Work	**Estimated Annual Expenditures**					
	2019	**2020**	**2021**	**2022**	**2023**	**Total**
Design			**$ 50,000**			**$ 50,000**
Construction				**$ 500,000**		**$ 500,000**
TOTAL	**$ -**	**$ -**	**$ 50,000**	**$ 500,000**	**$ -**	**$ 550,000**

Estimated Funding Sources	**Percentage**	**2019**	**Amount**
Water Rates	100%		$0
Total	**100%**		**$0**

Funding Comments: Work involves planning the upgrade of existing facilities for reliability of service and does not increase capacity.

EL DORADO IRRIGATION DISTRICT

Subject: Consideration to award a contract to GEI Consultants in the not-to-exceed amount of $181,558 for design of the Pacific Tunnel rehabilitation; and authorize funding of $338,762 for the Pacific Tunnel rehabilitation, Project No. 16044.

Previous Board Action

January 28, 2019 – The Board adopted the 2019-2023 CIP, which included this project subject to funding availability.

Board Policies (BP), Administrative Regulations (AR) and Board Authority

BP 3060 – Contracts and Procurement
BP 8010 – Hydroelectric System Management

Summary of Issue(s)

The Pacific Tunnel was constructed in 1923 and is approximately 187 feet in length. The upstream and downstream tunnel portals were rehabilitated in 2003 with untreated timber, which are now in a degraded condition and must be replaced. The tunnel between the portals is unlined and comprised of relatively soft volcanic rock that has eroded below the high water line. To prevent continued erosion of the tunnel and prevent failure, a new steel reinforced shotcrete liner and invert slab is proposed.

Background/Discussion

Starting in and through 2017, EID's tunnels were inspected and evaluated, and from that evaluation, Pacific Tunnel's scope was developed. As currently envisioned, the Pacific Tunnel rehabilitation will be implemented in one construction season during the 2020 fall maintenance outage. Staff anticipates the design will replace the wooden portals, tunnel invert and sidewalls with reinforced shotcrete.

In the event of a blockage or failure of Pacific Tunnel, the District is at risk of overtopping and failure of the canal because the nearest remotely controlled spillway (Spillway 32) is located over 1 mile upstream of the tunnel. Therefore, staff recommends the rehabilitation work to ensure the continued safe and reliable operation of the canal.

Road improvements will also need to be completed before the project begins to allow construction equipment and materials to be brought to the site. Road improvements include improving turn radii to allow material truck access and improving road surfaces to be all weather to ensure construction is able to continue in winter months when maintenance needs are the greatest.

Request for Proposals

A Request for Proposals (RFP) was released on December 14, 2018 and also emailed to the Engineering on-call list. Nine consultants attended the pre-proposal meeting and the following two proposals were received:

Proposal Fee Summary

Engineering Firm	Fee Proposal
GEI Consultants	$181,558
McMillen Jacobs Associates	$235,765

Proposal Evaluation and Ranking
The proposals were measured against the following criteria established in the RFP:

- Responsiveness to RFP
- Experience and expertise on similar projects
- Project team makeup and capabilities
- Rates and charges, affordability and reasonableness of cost for expertise required to meet project needs
- Client references

GEI has provided several designs and construction services for the District, including the Forebay Remediation project currently underway, over the last few years and has the experience and knowledge to design this project. Therefore, staff is recommending award to GEI.

Environmental Review
The District is evaluating California Environmental Quality Act (CEQA) review and regulatory permitting requirements for the Project. The appropriate level of CEQA review and regulatory permitting requirements will continue to be evaluated as the design of the Project is further developed. No CEQA documentation is required at this time as no physical effects to the environment will occur associated with the design process.

Funding
Staff is requesting funding in the amount of $338,762 for design and environmental review for the project as summarized below:

Pacific Tunnel Rehab Funding Requirements

	Amount
GEI – Design, surveying, geotechnical, regulatory support	$181,558
Capitalized labor – Engineering, environmental staff support	107,204
Professional services to support environmental review	50,000
TOTAL	**$338,762**

Board Options
Option 1: Award a contract to GEI Consultants in the not-to-exceed amount of $181,558 for design of the Pacific Tunnel rehabilitation; and authorize funding of $338,762 for the Pacific Tunnel rehabilitation, Project No. 16044.

Option 2: Take other action as directed by the Board.

Option 3: Take no action.

Recommendation
Option 1

Attachments
Attachment A: GEI Consultants proposal
Attachment B: CIP summary

Cary Mutschler
Senior Civil Engineer

Brian Deason
Environmental Resources Supervisor

Elizabeth Dawson Wells
Engineering Manager

Brian Mueller
Engineering Director

Dan Corcoran
Operations Director

Mark Price
Finance Director

Jim Abercrombie
General Manager

Attachment A

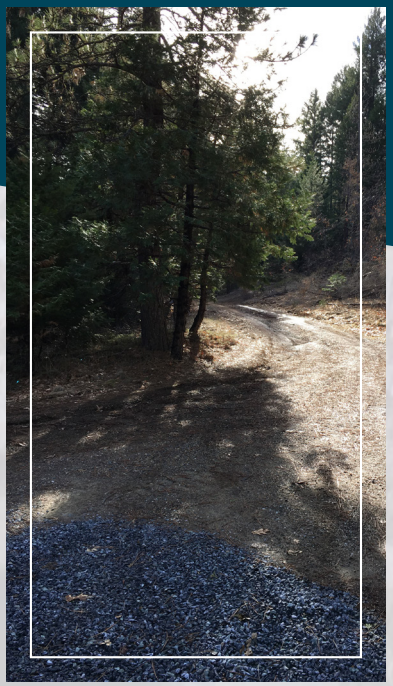
GEI Consultants

Pacific Tunnel Rehab Professional Services Proposal

RFP18-09 | Project No. 16044.01

Proposal Prepared for: El Dorado Irrigation District

February 8, 2019



February 8, 2018

Consulting Engineers and Scientists

ContractManagement@eid.org
El Dorado Irrigation District
2890 Mosquito Road
Placerville, CA 95667

Subject: Proposal for RFP 18-09 – Pacific Tunnel Rehab Project

GEI Consultants, Inc. (GEI) has prepared our proposal for the Pacific Tunnel Rehab Project in accordance with the Request for Proposal issued by the El Dorado Irrigation District (District) on December 14, 2018. We acknowledge receipt of Addendum No. 1 (January 8, 2019).

We have reviewed the District's contract and insurance requirements and will adhere to the contract developed by the District and agreed to between GEI and the District for previous projects. Our insurance coverage also meets District requirements.

We have included with our proposal a detailed cost estimate to be provided including all rates and charges to perform the services with detailed itemization of each task to be performed. Our proposed cost estimate and rate schedule are included as Appendix B of our proposal and will be valid for a period of 90 days from the date of this submittal.

We look forward to our continued relationship working with the District to implement the Pacific Tunnel Rehab Project. Please contact me at 510.350.2906 (mfreitas@geiconsultants.com) or Mike Monaghan at 510.350. 2923 (mmonaghan@geiconsultants.com) if you have any questions.

Sincerely yours,

GEI Consultants, Inc.

Mark Freitas, PE, GE
Vice President, Principal-in-Charge

Michaele (Mike) Monaghan, PE, LEED AP
Project Manager

GEI Consultants, Inc.
180 Grand Avenue, Suite 1410, Oakland, CA 94612
510.350.2900 fax: 510.350.2901

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SECTION 1 – SCOPE OF WORK

PROJECT UNDERSTANDING

The El Dorado Irrigation District (District) is seeking a consultant team to evaluate the requirements to replace the Pacific Tunnel in El Dorado County. The Pacific Tunnel is part of the District's El Dorado FERC Project No. 184-CA El Dorado Project consisting of a series of dams, canals, flumes, siphons, tunnels penstocks, and powerhouse to deliver water from the South fork of the American River for drinking water and power generation.

2018 14-mile Tunnel-box culvert connection foundation preparation

The Pacific Tunnel located south-west of Pacific House, California is approximately 187 feet long, has a design flow of 165 cubic feet per second (cfs), and an approximate velocity of seven feet per second. Most of the tunnel is unlined and approximately seven feet wide by seven feet high with a modified horseshoe section. The upstream and downstream portals of the Pacific Tunnel were re-timbered in 2002 with untreated timber (treated timber was not available in time for the project). The untreated timber had an expected design-period of approximately seven years. The untreated timber is 14 years old and degraded, resulting in a lack of support at the portals.

The District has issued a Request for Proposals (RFP 18-09) to address the complete replacement of the upstream and downstream portals; reinforced air placed concrete tunnel liner that extends approximately six inches above the tunnel high water line, reinforced tunnel invert, and design improvements to existing access roads to provide all weather and heavy equipment access. The project is to be constructed during the fall outage in 2020 from October to December.

GEI has prepared the following scope of work based on RFP 18-09 and on information gathered during the January 4, 2019 mandatory preproposal site meeting attended by GEI staff. GEI has formulated the following Tasks based on the task structure outlined in the RFP.

PROJECT APPROACH

GEI understands that access to the project site will need to be established. Currently, there are two access routes to the project site. The access that is available year-round is much longer and traverses private land, U. S. Forest Service land, Sierra Pacific Industries (SPI) land, and the District's land. The other access is on Park Creek Road and is more direct, though it is currently unpassable when the rains have begun and remains so throughout the winter.

Both access routes will be evaluated for considerations of permitting, construction costs, construction schedule and overall impact on the Pacific Rehab Tunnel project. Per the mandatory site-walk on January 4, 2019, we were informed that the road work may begin in advance of the tunnel rehabilitation work (July 1 or August 15, 2020) once permitting is obtained for this work. Since the Park Creek Road is accessible during the late summer, this would be an opportunity to grade down the existing road bed and install appropriate drainage and a built-up road bed that would be passable year-round.

14-mile tunnel inside looking downstream

The tunnel replacement requires removal of the existing timber portals, invert, and side walls. GEI's current understanding is that air-placed concrete would be used to replace the wood. Because there is a short window of time for the actual construction (October 1 to December 15, 2020) the replacement work must be as efficient as possible. Since the timber invert has been in place for close to 100 years, the condition beneath the timber invert is not well known. We propose that once the timber liner is removed, the invert be cleaned and filled with self-consolidating concrete (SCC) to within 6 inches of the final invert to fill voids and uneven surfaces in the floor of the tunnel. Dowels would be installed in the invert and tunnel side walls to anchor the new liner and a welded-wire mesh tied to the dowels and placed for crack control in the new invert and lining. Air entrained shotcrete could then be used to build up the liner. This approach would mitigate the need for formwork in the tunnel and improve schedule requirements for curing of concrete. GEI proposes that the portals follow the current geometry with the addition of a cantilevered eye-brow on the portals above the spring line to the crown to deflect rocks and debris away from the channel.

TASK 1: MEETINGS AND SITE VISITS

This task is necessary to support a clear understanding of the District's concerns for initializing the project as well as addressing the development of the project through design and delivery of the Construction Documents for bid. The GEI Team will prepare for, attend, and document the following meetings and site visits:

- A project kick-off meeting
- Design review meetings at the 50%, 75%, 90%, 99%, and 100% design completion levels
- Additional site visits as required for the team to evaluate further site conditions (the District has identified a total of three site visits)

GEI's team will provide meeting agendas and minutes for the District's review and approval.

TASK 2: PROGRESS REPORTS AND SCHEDULES

This task is important as a means of providing the District with timely reporting of project progress to ensure project milestones are achieved. The GEI Team will work closely with the District to communicate progress, decision points, project risks, and potential issues. All our project staff are available to the District at any time. Progress reports will be prepared monthly and provided to the District. These reports will include the following:

- Progress-to-date
- Schedule updates
- District action items
- Consultant's team action items
- Deliverable status
- Problems encountered, including suggested solutions
- Monthly spending forecasts
- Monthly accruals and invoices
- Meeting and teleconference minutes

In addition to the progress reports, GEI will provide and maintain a design schedule that meets the District's desire for 90% design to be completed by August 19, 2019 and the start of construction to begin in August 2020. Road

work may begin earlier depending on environmental permitting. Construction of road improvements may start on July 1, or August 15, 2020. Project close out and warranty will continue into 2021. GEI will prepare the schedule in Microsoft Project and the schedule will include the following activities:

- Planning
- Geotechnical investigation
- Design
- Environmental Permitting
- Bidding
- Construction

TASK 3: FIELD TOPOGRAPHIC AND LiDAR SURVEYS

We understand that the District has just completed LiDAR surveys of the entire route of the Project 184 canal system and this is available for the Consultant's team and will be incorporated with the project mapping.

Additional field topographic survey as needed to augment the LiDAR survey for mapping and design of the Pacific Tunnel Rehab Project. This task will also allow development of an overall map of the project site that would be used to evaluate site accessibility for construction. Local existing roads can be mapped allowing the design team to determine the best access road route.

The field topographic surveys will be conducted by Andregg Psomas, a surveying firm located in Auburn, California, as a subconsultant to GEI. This firm has a unique knowledge of the Project location, the District's flumes, and GEI has worked with them before. Their EID Pacific Tunnel Rehabilitation Project survey and mapping work will include:

- **Limits:** The project limits for the field surveys at the EID Pacific Tunnel Rehabilitation Project are defined as follows: within the FERC boundary along El Dorado Ditch near station 76+000 on the southerly slope above State Highway 50. Survey along the El Dorado Ditch approximately 150'± upstream of the tunnel entrance, 150'± downstream of the tunnel outlet and 75'± of the hillside slope above the tunnel entrance and outlet along the tunnel alignment. Pacific Tunnel is approximately 187' in length.
- **Datums:** The horizontal datum for this survey will be NAD83 California State Plane Zone II and the vertical datum will be NAVD88 based on nearest found NGS monuments with GPS observations.
- **Topographic Survey**: Andregg Psomas field surveyors will perform field and office work for complete site mapping within the FERC boundary along the El Dorado Canal, including setting and surveying semi-permanent survey control points suitable for future construction and additional design surveys. Locate physical site features including but not limited to the following will be located: tunnel entrance and outlet, edge of concrete, fencing, toe of slope, top of slope, stream channel, edge of water, culverts including pipe size and inverts, trees 6" dbh and larger with number tags, grade breaks, all visible utilities and ground spot shots. Incorporate the new mapping into the existing LiDAR mapping. For purposes of this proposal, we estimate one day of field work.
- **Mapping**: Andregg Psomas surveyors will produce a composite archival base map with the ground survey topographic information. All base mapping will be prepared in AutoCAD 2018 Civil 3D dwg format. A surface will be generated using AutoCAD Terrain Model Explorer. Contours will be generated at an interval of 1 foot with a mapping scale of 1 inch = 40 feet or match LiDAR base mapping. The mapping information will be on individual layers within the electronic drawing files. Frozen layers will contain the

remainder of the survey information (information not required to be viewed on the based map). Information shown on frozen and unfrozen layers will be free of conflicts.

In addition to surveying of the project access roads, evaluation of both routes will be evaluated for feasibility. The Park Creek Road access is the shortest route to the project site and may be easier to permit as it is owned by SPI and the US Forest Service. However, it is currently unpassable once the rains come and would not support construction traffic without significant improvements. The alternate access route is more circuitous and passes through SPI, US Forest Service, and privately-owned land, but is passable year round and would require less improvements. GEI will consider both routes and provide a Technical Memorandum addressing the advantages and disadvantages of both including construction costs, permitting concerns, schedule for road improvements and schedule impacts for the Pacific Rehab Tunnel Project.

TASK 4: GEOTECHNICAL INVESTIGATIONS

Geotechnical investigations have been conducted by others, additional investigations would include:

Task 4.1 – Field Investigations

We will review existing published geologic data and geotechnical data provided by the District and perform site reconnaissance. A dewatered walk-down of the tunnel is suggested to confirm field conditions for final design of the tunnel invert and lining.

2015 14-mile Tunnel inspection

Task 4.2 – Borrow Site and Staging Areas

There is one potential borrow source identified for the project roads currently. The soil stockpiles are located at the Sierra Pacific Industries (SPI) staging area. Staging areas and additional borrow sites may be identified as design progresses and may require additional testing.

TASK 5: PROJECT DESIGN AND DESIGN DOCUMENTS

The 50% design phase will commence after the design kick-off meeting. This submittal will include the following deliverables:

- 50% level design drawings identifying the following:
  - Impacted wetlands or waters of the United States
  - Borrow and fill sites
  - Site access and staging
  - Clearing and grubbing
  - Trees to be removed
  - Project improvements
- Draft technical specifications
- Detailed project description to be used to obtain permits, agency approvals, and associated environmental documents. At minimum, the Pacific Tunnel Rehab Project will include the following:
  - Project locations
  - Project summary and statement of objectives sought by the proposed project
  - Project description with detailed descriptions of all project related elements including:
    - Construction activities and methods

        - Site specific photos showing key elements of the project
        - Access and staging
        - Access improvements
        - Construction equipment
        - Mobilization and demobilization
        - Work shifts and schedule
        - Dust abatement
        - Fire prevention and protection plan
        - Hazardous materials
        - Types and number of construction vehicles and equipment to be used to complete the project
    - Description of the project schedule, duration, and timing of activities
    - Estimated cut and fill quantities, concrete and air placed concrete and the total area of project disturbance
    - Description of the best management plant and weed free practices that would be implemented during the project
    - List of related environmental review and consultation requirements mandated by federal, state of local laws, and regulation or policies
- Opinion of Probable Cost based on a Class 3 cost estimate for preliminary design in accordance with ASTM E2516
- Updated Microsoft Project schedule

The 75% design submittal will include the following deliverables:

- 75% level drawings
- Written response to the comments provided for the 50% design
- Revised Opinion of Probable Cost based on a Construction Class 2 Cost Estimate for substantial design in accordance with ASTM E2516
- Updated Microsoft Project schedule
- Draft technical specification in Microsoft Word format

The 90% design submittal is intended to be essentially the biddable documents that are suitable for submittal to FERC. Deliverables will be provided on a flash drive and will include the following deliverables:

- Written response to the comments provided for the 75% design
- 90% level drawings in AutoCAD:
    - Total of 4 – 12x18 plan sets
    - High resolution PDF in 11x17 and 24x36 format
- Final specifications including Division 0 and 1 District provided standard specifications with sections of the standard specifications updated to reflect project requirements as well as technical specifications. Specifications will be provided in Microsoft Word format and high-resolution PDF.
- Final Design Report outlining the design development, construction considerations and constructability review. This report will be appended with calculations developed for each discipline and will be thoroughly checked in accordance with GEI's quality program requirements. Project QA/QC documentation will be included in the appendices of the report.

- Copy of the FERC Quality Control Inspection Program (QCIP) documentation for submission to FERC
- Revised Opinion of Probable Cost based on a Construction Class 1 Cost Estimate for definitive design in accordance with ASTM E2516
- Updated Microsoft Project schedule
- District signature on coversheet and stamped plan set by Engineer of Record. (Note: Per the California Professional Engineers Act, all documents sealed at this level of design must be identified as "Not For Construction")

The 100% design submittal will include all final drawings, front end and technical specifications, construction cost estimates, and construction schedule. This submittal will be provided on a flash drive and will include the following deliverables:

- Final signed and stamped drawings (sealed according to the technical discipline engineer in charge of the specific drawings) – in addition to AutoCad and high definition PDF files, a total of 4 12x18 plan sets and 2 24x36 plan sets will also be provided.
- Final specifications including Division 0 and 1 modified specification, and all technical specifications signed and stamped by the Engineer of Record.
- Final Design Report outlining the design development, construction considerations and constructability review. This report will be appended with calculations developed for each discipline including all QA/QC review documentation.
- Final opinion of Probable Cost based on the Construction Class 1 Cost Estimate for definitive design in accordance with ASTM E2516.
- Final Microsoft Project schedule.

TASK 6: REGULATORY AND FERC / LEGAL DESCRIPTIONS

The District is responsible for obtaining regulatory and environmental permits required for the work. It is anticipated that the 50% design drawings will be used to obtain regulatory permits. The Consultant will prepare supporting documents, including drawings and details, as needed for the approvals and respond to comments received.

SECTION 2 – RELEVANT EXPERIENCE, QUALIFICATIONS, AND EXPERIENCE

GEI has worked closely with the District for the past 20 years, including on-call support. Through this long-standing association we are well acquainted with District staff, procedures, and project delivery requirements. We recognize that some tasks may require rapid response, such as during the summer of 2008 when the District called upon GEI to help with an urgent situation involving the failing outlet gates and towers at Silver and Caples Lakes. With over 180 staff located in Sacramento area and Oakland offices, the District can be assured that the GEI Team has the resources and commitment to respond on an expedited basis, when needed.

GEI has provided geotechnical engineering consulting services for countless landmark construction projects including commercial, institutional and industrial buildings, and structures; dams, levees and pipelines; tunnels, highways and bridges, and construction-related structures such as slurry walls and excavation support systems. Many of these projects draw on GEI's environmental, water resources, and ecological expertise, fields that are highly synergistic with our comprehensive knowledge of soil behavior, groundwater flow, and earth science. Some of our

current/recent clients include the California Department of Water Resources, U.S. Army Corps of Engineers, Sacramento Area Flood Control Agency, Santa Clara Valley Water District, Marin County Flood Control District, and El Dorado County, to name a few. We are familiar with FERC requirements as well.

REPRESENTATIVE PROJECTS/CLIENT EXPERIENCE

GEI has operated in California since 1959 (as legacy company Bookman-Edmonston), providing the state, cities, counties, water agencies, and special districts with services ranging from feasibility studies, analyses, planning, and design of water facilities through to construction management. **Table 1** compares the location, status, size, and operational activities of the project clients.

TABLE 1 – COMPARISON OF REPRESENTATIVE CLIENTS

CLIENT NAME/LOCATION	PUBLIC OR PRIVATE STATUS	SIZE	OPERATIONAL ACTIVITIES
1. **El Dorado Irrigation District** Placerville, CA	Public	220 square miles; 100,000 residents	Water utility serving over 100,000 people
2. **Browns Valley Irrigation District** Browns Valley, CA	Public	55,000-acre service area; 1,500 customers	Delivers water for agriculture
3. **Yuba Water Agency** Yuba County, CA	Public	Delivers about 310,000 acre-feet of water to irrigation districts annually.	Hydroelectric power, flood control, water conservation, storage and sales, recreation, fisheries enhancement
4. **South Sutter Water District** Sutter and Placer Counties, CA	Public	64,000-acre service area	Delivers water for agriculture
5. **State of California** Department of Water Resources	Public	Approximately 25 million residents	Manage and protect California's water.

SECTION 3 – PROJECT TEAM

The organization chart shown in **Figure 1** features the proposed team members and delineates lines of responsibility and communication. The team will be led by Ms. Michaele "Mike" Monaghan, PE. As the project manager and main point of contact, she will be the primary point of contact for the District. We have also included Andregg Psomas on our team who will provide surveying services. **Table 2** summarizes lead team member qualifications and resumes for each person on the organizational chart are provided in the **Appendix.**

FIGURE 1 – ORGANIZATION CHART

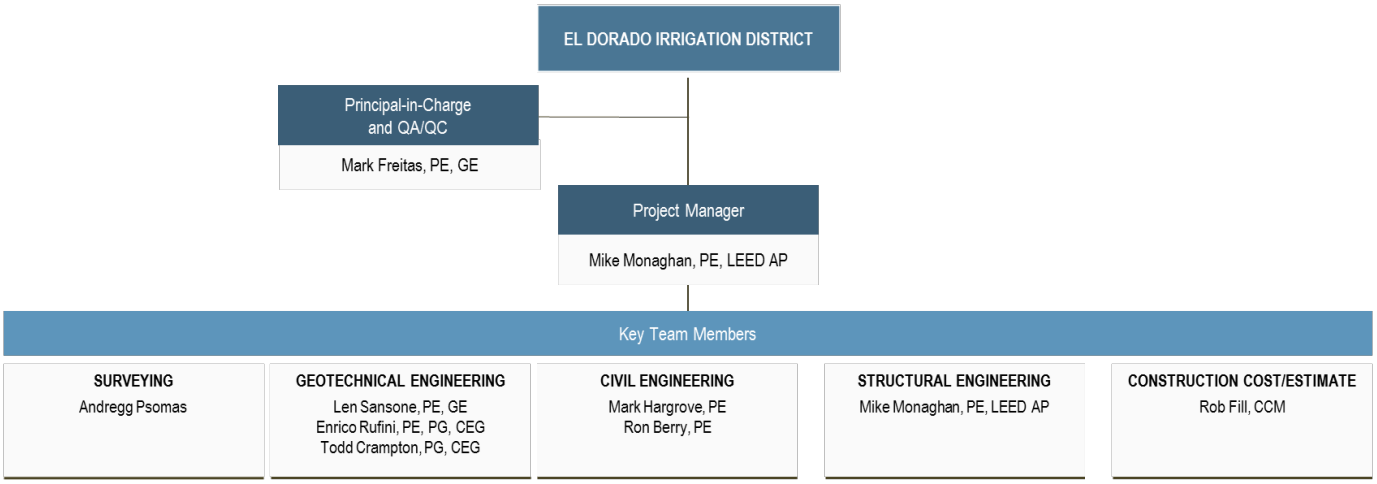

TABLE 2 – KEY STAFF QUALIFICATIONS

KEY TEAM MEMBER	AREAS OF EXPERTISE / KEY QUALIFICATIONS
Mike Monaghan *Project Manager/Structural Lead* **Education** *BS, Civil Engineering* **Registration** *PE, CA No. 56775*	Ms. Monahan has over 30 years of civil engineering hydraulic structures experience. Her experience includes hydraulic structures work on dams under FERC and DSOD regulation. Ms. Monaghan has experience working on multiple aspects of engineering design from conceptual level work to final design and engineering support during construction. Types of structures she has been involved in include water conveyance tunnels, dams, intake and outlet structures, water control structures, penstocks and gates of all kinds. She worked on El Dorado Forebay Dam and Project 184 Dams for the District. has served as project manager for large multiple discipline hydraulic structures projects from conceptual design through final design and into construction support
Mark Freitas *Principal-In-Charge Quality Assurance* **Education** *MS/BS, Civil Engineering* **Registration** *PE, CA No. 36451* *GE, CA No. 2017*	Mr. Freitas has 35 years of geotechnical experience. He manages and provides senior-level quality control and direction on numerous geotechnical studies for a variety of structures, including levees, dams, treatment plants, manufacturing facilities, port facilities, roads, highways, bridges, commercial high-rise buildings, and large site developments. He is highly experienced in field exploration, data interpretation and site characterization, foundation analysis and design, seepage and stability analyses, pavement design, site grading, report preparation, and construction inspection. Mr. Freitas has conducted stability evaluations and prepared remediation designs for landslides, roads, dams and levees. He has provided independent review of USACE designs for levee and embankment improvements.
Len Sansone *Geotechnical Lead* **Education** *MS/BS, Civil Engineering* **Registration** *PE, CA No. 59653* *GE, CA No. 2654*	Mr. Sansone has 23 years of experience. He has extensive geotechnical expertise that includes numerous slope stability evaluations, foundation investigations, and earth structure/levee designs, for projects located throughout California. His expertise includes project management and development of subsurface investigation and laboratory testing programs; analysis of geotechnical field and laboratory data; analysis, preparation and review of technical reports; and direction of geotechnical construction testing and observation programs. He is also experienced in the selection of design criteria for design of pipelines, earth retaining structures/levees, shallow and deep foundation systems, pavements, retaining walls, and surface and subsurface drainage systems. Mr. Sansone has experience in conducting settlement, slope stability, and seismicity/seismic risk evaluations, and observing geotechnical construction on weak and compressible soils.
Enrico Rufini *Geotechnical Engineer* **Education** *MS, Geotechnical Engineering* *BS, Geology* **Registration** *PE, CA No. 67714*	Mr. Rufini has 23 years of geotechnical engineering, heavy civil construction, and environmental mitigation experience acquired from projects in Italy and in the U.S. He has conducted geotechnical investigations and engineering geologist studies for residential and commercial projects, prepared written reports, and recommendations for mitigating hazards and foundation design. His experience includes conceptual engineering, field investigation for feasibility studies, sub-surface exploration, laboratory testing, engineering analysis, and instrumentation installation. He has been responsible the geotechnical exploration work on multiple project sites and was involved the coupon cutting and manway installation on the District's El Dorado Penstock project. He also provided the dynamic stability review, alternatives,

KEY TEAM MEMBER	AREAS OF EXPERTISE / KEY QUALIFICATIONS
GE, CA No. 6665 *CEG, CA No. 2228*	and preliminary feasibility analysis and geotechnical data report for the District's Forebay Dam Modification project.
Todd Crampton *Senior Engineering Geologist* **Education** *MS, Earth Sciences* *BS, Earth Sciences* **Registration** *PG, CA No. 6973* *CEG, CA No. EG-2179*	Mr. Crampton specializes in conducting and managing engineering geologic studies to support design, feasibility, site characterization, and geologic hazard assessment projects throughout California and abroad. His project experience encompasses dams and embankments; water-systems infrastructure, including tanks, reservoirs, pipelines, penstocks, and canals; transportation and water conveyance tunnels; nuclear facilities; hospitals; and evaluation of seismic and geologic hazards for various critical and non-critical facilities. Through his project work, Mr. Crampton has developed strong working relationships with representatives from DWR, DSOD, and FERC. During the past decade, Mr. Crampton has acted as the Lead Engineering Geologist on several important dam tunnel projects in California, including Mountain Tunnel and Interlake Tunnel.
Mark Hargrove *Civil Lead* **Education** *BS, Civil Engineering* **Registration** *PE, CA No. 63762*	Mr. Hargrove is a registered civil engineer with 18 years of experience in the management, design, construction support, and operation and maintenance of water conveyance and storage facilities, including pipelines, canals, pump stations, and storage reservoirs. His management experience includes but is not limited to preparing and tracking project budgets and schedules, coordinating with clients and subconsultants, and allocating and managing resources. His design experience includes preparing detailed calculations, drawings, specifications, and engineer cost estimates. His construction support services include responding to contractor questions, reviewing bid proposals, reviewing contractor, submittals, and preparing record drawings. His operations and maintenance services include working with the districts, agencies, landowners, and equipment suppliers to develop detailed operational and maintenance plans and costs.
Ron Berry *Civil Engineer* **Education** *MS/BS, Civil Engineering* **Registration** *PE, CA No. 65879*	Mr. Berry is a senior engineer and project manager with over 22 years of civil engineering experience. He specializes in sizing, planning, and designing hydropower facilities, water and wastewater treatment facilities, and various hydraulic conveyance and drainage facilities. His hydropower design projects include hydro turbine system selection, sizing and design, and designing penstocks and dam inlet and outlet works. Mr. Berry also specializes in water and wastewater process and detail design projects, including process selection, optimization, automation, and retrofits for both municipal and industrial clients. His hydraulic/conveyance projects have included modeling and design of sanitary and storm water pipelines, open channel/river systems, and pump stations.
Rob Fill *Construction Cost/Schedule* **Education** *BS, Engineering and Construction Management* **Registration** *Certified Construction Manager, No. 4199*	Mr. Fill is a skilled, certified construction manager with over 40 years of industry experience. His qualifications include management and supervision of public works and private construction projects, such as hydroelectric power plants, pumping plants, pipelines, reservoirs, dams, tunnels, aqueducts, levees, control structures, highways, roadways, and buildings. He is experienced in both heavy civil and building construction of various types and sizes. Mr. Fill is knowledgeable in project management, construction scheduling, cost estimating, surveying, materials testing, contract administration, change order negotiation, dispute resolution and claims management. His experience working with the DWR's Division of Engineering has included work on major projects/programs such as Pyramid Powerplant, Alamo Powerplant, Pear blossom Pumping Plant Enlargement, Mojave Siphon Powerplant, the Coastal Branch Phase II, the East Branch Extension Phases I and II, the South Bay Aqueduct Enlargement and the Emergency Levee Erosion Repairs (ordered in 2006 by then Governor Arnold Schwarzenegger under an Emergency Declaration). Rob is currently the CM on the El Dorado Forebay Dam.

SECTION 4 – QUALITY ASSURANCE AND CONTROL, CONFLICTS

GEI has Quality Assurance/Quality Control (QA/QC) procedures in place and is committed to providing the District with quality and service through our system of integrating quality control with the project management process. GEI's policy is to establish quality management systems necessary to ensure continuous improvement in customer relationships, management processes, and overall quality and value of our technical, budgetary, and

schedule performance consistent with the needs and expectations of the District. All staff assigned to the District will be briefed on the use of GEI's QA/QC procedures prior to commencing work.

We are committed to systematically ensuring that we understand the District's needs for all aspects of each task order. GEI will provide a level of service that meets or exceeds those needs. It also means that we undertake continuous efforts to improve the quality of our services over the life of the contract. This policy is implemented by establishing controls that ensure continuous improvement. Quality control is performed by the technical team leaders identified on the organization chart, and these leaders will ensure that QA/QC procedures are followed from task order inception through sign-off of all criteria, reports, and design documents. The GEI Project Manager has the ultimate responsibility for submitting internally reviewed, approved, and signed deliverables.

GEI will maintain overall QA/QC responsibility, including briefing staff prior to commencing work, ensuring compliance as work is performed, and executing final sign-off of deliverables. As needed, GEI will develop project-specific QA/QC Plans for task orders as requested by the District. Relative to conflicts, GEI does not anticipate having any conflicts with ongoing work we are performing for the District or other clients that would prevent us from timely and thorough completion of tasks under this agreement.

SECTION 5 – CLIENT REFERENCES

GEI encourages the District to contact the following references for an assessment of GEI's performance on their projects.

David Tsztoo, PE, San Francisco Public Utilities Commission, 415.934.5792, dtsztoo@sfwater.org, **Project:** Mountain Tunnel Rehabilitation Project-Hetch Hetchy Water & Power, engineering geology, inspection, and rehabilitation of tunnel to Priest Reservoir

Brent Bouche, PE, Monterey County Water Resources Agency, Assistant General Manager, 831.755.4860, bucheb@co.monterey.ca.us, **Project:** Interlake Tunnel, engineering geology, investigations for new 2-mile tunnel, intake, and outlet structures

Curt Aikens, General Manager, Yuba County Water Agency, 530.741.5015 caikens@ycwa.com**, Project:** Secondary Spillway and Tunnel, Project-feasibility, investigations, engineering geology for new outlet tunnel at New Bullards Bar Dam

SECTION 6 – CONTRACT AND INSURANCE REQUIREMENTS

GEI will adhere to the contract developed by the District and agreed to between GEI and District for previous projects. Our insurance coverage meets District requirements.

SECTION 7 – ADDENDA

We acknowledge receipt of Addendum 1 issued on January 8, 2019.

ADDENDA A – STAFF RESUMES

Michaele Monaghan, P.E., LEED AP
Civil Engineer

resume

Michaele Monaghan is a hydraulic structures engineer working in GEI's Oakland office. Her areas of expertise include structural analysis, structural and civil design, and hydraulic structures. Ms. Monaghan has performed structural design and analysis of concrete dams, spillways, intake/outlet towers, radial gates, tunnels, water storage tanks. She also has provided project direction for preparation of construction contract documents and construction oversight for multiple hydraulic structures projects.

EDUCATION
B.S., Civil Engineering, San Francisco State University

EXPERIENCE IN THE INDUSTRY
41 years

EXPERIENCE WITH GEI
Less than one year

REGISTRATIONS/CERTIFICATIONS
Professional Engineer, CA No. C56775, WA No. 54035, MT No. 48954, P Eng British Columbia No. 192975
LEED Accredited Professional (2006)

PREVIOUS PROJECT EXPERIENCE

New Bullards Bar and Lake Francis Spillways, Yuba Water Agency, CA. Conducting spillway condition assessments of the concrete spillways at New Bullards Bar Dan and Lake Francis Dam. Preparation of repair plans for short- and long-term spillway operations. Conducting stability analyses of gravity walls and weirs.

El Dorado Forebay Dam Upgrade Project, El Dorado Irrigation District, CA. Construction management support reviewing structural submittals and responding to RFI's.

Guadalupe Dam Seismic Retrofit Project, Santa Clara Valley Water District, CA. Lead structural design engineer for the replacement of the Guadalupe dam spillway. After initial explorations of the project site were completed, the District proposed a full replacement to bring the spillway up to current standards. Design is 60-percent complete.

Avista, Nine Mile Dam Sediment Bypass Structure Upgrade Project, Spokane, WA. As a Design Manager for a multi-discipline team, led the design team in a collaborative effort together with Avista staff to develop design of retrofit of the existing sediment bypass system that had not been functioning since 2010. This fast pace project is currently under FERC review and is now in construction. Currently supporting the construction.

Sacramento Municipal Utility District, South Fork Powerhouse and Boating Flow Release Facility Design-Build Project, Camino, CA. Led the structural design team to develop designs for a new powerhouse and boating flow release facility immediately downstream from the Slab Creek Dam. Conducted overall QA of the project design documents and provides construction support for the project.

Upper San Leandro Reservoir Outlet Tower Retrofit Project, East Bay Municipal Utility District (EBUD), Oakland, CA. Served as the Project Manager for multiple discipline project involving updating seismic loading, environmental permitting, geotechnical investigations, structural analysis, mechanical, electrical, instrumentation, civil design and Building Information Modelling (BIM). Intake retrofit includes bracing the tower to the shore and removing and replacing all

mechanical, electrical and structural systems. Responsible for production of construction contract drawings and specifications through bidding support.

Minne Lusa Stormwater Conveyance Sewer, City of Omaha, Omaha, NE. Lead structural engineer responsible for design of segmented tunnel, intake structure, and portal. Preparation of design methodology and criteria, led team in finite element analysis design of structures, preparation of design documents including Basis of Design, Contract Drawings and Specifications, and final design to 90% level.

Red Hill Tunnel Rehabilitation Project, Department of the Navy, Naval Facilities Engineering Command (NAVFAC) Honolulu, HI. Technical design lead for design/build rehabilitation of existing in-service fuel tunnel in Pearl Harbor Hawaii. Responsible for preparation of design documents and construction support for completion of proposed design repairs.

Crystal Springs San Andreas Transmission System Upgrade Project, San Francisco Public Utilities Commission (SFPUC), San Mateo, CA. Lead structural designer for retrofit of two existing intake towers at San Andreas Reservoir portion of the system. Design includes new adit terminal structures to support new fish screens and new concrete liner within the towers. Performed structural assessment of existing pipelines and supports, existing building structures, and existing tunnels.

Pit 3, 4, and 5 EPC, Devine and Tarbell, Inc., Burney, CA. Project Manager and Lead Structural Designer for installation and support of a 96-inch diameter pipe from a new intake structure and pipe supports on the upstream face of the Pit 3 dam, the penetration of the dam with this pipe and a new valve house. Additionally, responsible for design of the penetration of a 96-inch diameter pipe through the Pit 4 dam.

Upper Northwest Interceptor, Sacramento Regional County Sanitation District (SRCSD), Sacramento, CA. Design and analysis of pre-cast concrete and polymer concrete segmental tunnel liner as well as transition structures. Also responsible for preparation of contract specifications for manufacture and installation concrete and segment elements.

Turkey Creek Tunnel Improvements, U.S. Army Corps of Engineers (USACE), Kansas City, KS. Design and analysis of retrofitted tunnel liner. Also involved in ongoing construction support.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Member

U.S. Green Building Council, Member

PUBLICATIONS

"Indian Valley Radial Gates Evaluation," Association of State Dam Safety Officials (ASDSO) 1999 Annual Meeting Proceedings, October 1999

"Seismic Design of Radial Gates," Earthquake Engineering Research Institute (EERI) 100th Anniversary Earthquake Conference Proceedings, April 2006

"Lined Concrete Segments: An Alternative Construction Method for Large Diameter Sewer Tunnel," North American Tunneling Conference Proceedings, July 2010

"Facility for Instream Flow Release Compliance at Pit 3 Dam," Hydro Vision Conference Proceedings, July 2012

"Seismic Upgrades in the Watershed," Design Development and Construction of the Crystal Springs San Andreas Pipeline Transmission Project, San Francisco Public Utilities Commission (SFPUC), American Society of Civil Engineers (ASCE) Pipeline Conference Proceedings, June 2013

"Water Delivery After a Large San Andreas Earthquake – An Unconventional Retrofit Approach," Design of Articulated Retrofit of Intake Structures 100 Feet from the San Andreas Fault, United States Society on Dams 35th Annual Conference Proceedings, April 2015

Mark Freitas, P.E., G.E.
Senior Project Manager

resume

Mark Freitas has successfully managed and provided senior-level direction on numerous geotechnical studies for a variety of structures, including roads, highways, bridges, treatment plants, levees, dams, , manufacturing facilities, commercial high-rise buildings, and large site developments. Mr. Freitas is highly experienced in field exploration, data interpretation and site characterization, foundation analysis and design, seepage and stability analyses, pavement design, earthwork construction and site grading, report preparation, and construction inspection. He has provided third party review of geotechnical reports for public agencies.

RELEVANT PROJECT EXPERIENCE

Guadalupe Dam Seismic Retrofit Project, Santa Clara Valley Water District, San Jose, CA. Lead Geotechnical Engineer for final design of the seismic retrofit of Guadalupe Dam, a 140-foot-high, 650-foot-long compacted earth embankment. The remediation includes a downstream earthfill buttresses with an internal filter and drain system, a new outlet including a new sloping intake and new 700-foot-long tunneled outlet, and spillway improvement to pass the PMF. Directed the field investigations that includes over 30 borings with rock coring, both onshore and overwater, and 15 test pits to define conditions within the existing embankment, at the planned buttress and along the tunneled outlet, and within the planned borrow area for the buttress fill along the reservoir rim. Additional team direction includes site characterization, deformation analyses and geotechnical design and preparation of Geotechnical Baseline Reports. The field program work and design work is being performed with approvals from the California Division of Safety of Dams (DSOD).

Black Butte Re-Regulating Basin Erosion Repair Project, City of Santa Clara, Orland, CA. Project Director for the investigation, analyses, design and environmental permitting for repair of bank erosion areas at the Black Butte Re-Regulating Basin downstream of Black Butte Dam. The basin is associated with the City's hydropower facility. The project involves geotechnical and hydraulic evaluations, development of alternative concepts for erosion repair, selection of a preferred alternative for stabilization, performing design analyses and preparing plans, specifications and cost estimates for the final design. Additionally the project includes acquiring the necessary permitting and regulatory agency/stakeholder approvals to construct the repair. Key agencies and stakeholders include USACE, FERC, DSOD, CADFW, and CVWQCB.

Oakland Inner Harbor Pipeline Crossing Project, East Bay Municipal Utility District, Oakland and Alameda, CA. Project Director for the geotechnical investigation and analyses for the new Oakland Inner Harbor Pipeline, an approximately 3-mile essential water transmission pipeline extending from Oakland to Alameda Island with over 3000 feet installed through soft compressible Bay Mud below the

EDUCATION
M.S., Civil Engineering, University of California, Berkeley
B.S., Civil Engineering, University of California, Berkeley

EXPERIENCE IN THE INDUSTRY
36 years

EXPERIENCE WITH GEI
9 years

REGISTRATIONS AND LICENSES
Professional Geotechnical Engineer, CA No. GE2017
Professional Civil Engineer, CA No. C36451

PROFESSIONAL ASSOCIATIONS
American Society of Civil Engineers, ASCE
Geo-Institute, ASCE
Association of State Dam Safety Officials, ASDSO
Society of American Military Engineers, SAME
International Association of Foundation Drilling, ADSC
American Council of Engineering Companies, California, ACEC

Inner Harbor using horizontal directional drilling (HDD) technology. Directed and coordinated the site reconnaissance, deep on-shore and off-shore geotechnical borings, cone penetration tests (CPT's), in-situ vane shear testing, and seismic velocity testing. liquefaction analyses for estimation of transient and permanent ground deformations along the alignment.

Geotechnical Investigation of San Francisquito Creek Flood Protection, San Francisquito Joint Powers Authority, Menlo Park, CA. Project Director for the geotechnical engineering services associated with the 8,000 feet of new levees and floodwalls along the Creek. The site is underlain by shallow fill over soft compressible silty clay known locally as Bay Mud. Services included site reconnaissance and review of existing levee data, drilling and sampling programs, cone penetration testing (CPT), processing and compilation of boring, laboratory test and CPT information (gINT), and engineering analyses. Geotechnical analyses included seepage, stability, settlement, and seismic performance evaluations following the USACE guidelines. Geotechnical evaluation included development of design criteria for new levees, including staged construction to account for the low strength and high compressibility of the Bay Mud. Design Criteria was also developed for sheet pile and retaining wall-type floodwalls.

Eastridge Reservoir and Pipeline, City of Fairfield, Fairfield, CA. Project Director for the geologic and geotechnical studies for design of a new 16-million-gallon potable water reservoir and a 5,400-foot-long transmission pipeline at the site of the planned Eastridge Hills Development. The work involved reviewing aerial photographs and existing information, performing field geologic mapping, conducting geophysical surveys, and investigating the site by excavating 22 test pits and drilling 5 borings. Significant issues included assessing the ripability and volumes of volcanic rocks underlying the site, and the pipeline/Cordelia fault crossing.

South Cordelia Reservoir, City of Fairfield, Fairfield, CA. Project Director (Principal-in-Charge) for the geologic and geotechnical engineering studies associated with the new 10 million gallon, below-grade reservoir, booster pump station and pipeline. The geologic and geotechnical studies included geologic mapping, drilling and coring borings, excavating and logging test pits, developing earthwork and excavation recommendations, providing foundation design recommendations and evaluating settlement, and providing trench excavation and backfill design criteria. Significant issues included assessing the rippability and volumes of volcanic rocks underlying the site and assessing slope stability, both in the reservoir excavation and along the pipeline as it crossed a historic landslide. Services also included submittal review, earthwork and foundation construction monitoring, testing, and quality assurance.

Vision 2000, Joint Intermodal Terminal Oakland, Port of Oakland, Oakland, CA. Project Manager for the geotechnical studies associated with redevelopment of the Naval Supply Center, Oakland, into a rail terminal for handling containerized freight. Loose granular fill and soft compressible silty clay (Bay Mud) underlie the 180-acre site. The project included raising the site grade by up to four feet, installing over 20,000 feet of new track and heavy-duty pavements. Studies included field exploration with borings up to 40 feet deep, design of site grading using dredge spoils and recycled fill, evaluation of liquefaction and site settlements, and design of heavy-duty pavements.

I-580 San Ramon Road/Foothill Road Interchange Improvement, City of Dublin, Dublin, CA. Principal-in-Charge for the geotechnical study for the reconstruction and widening of the westbound off-ramp from I-580 to San Ramon Road/Foothill Road. The study included field exploration and laboratory testing, evaluation of foundation support and design criteria for retaining walls, and development of requirements for earthwork, construction slopes, subgrade compaction, allowable materials, and pavement sections. The project deliverables included a materials and foundation report reviewed and accepted by Caltrans.

Redwood Road and Geranium Place Landslide, City of Oakland, CA. Project Engineer for the evaluation and geotechnical design of the road repair. Project work included geologic, hydrogeologic and geotechnical investigations to evaluate the landslide and groundwater conditions, and the development of alternative schemes to stabilize the hillside and reconstruct the road. The final design included a permanent tie-back retaining wall utilizing double corrosion protected, multistrand anchors and concrete wall panels.

Leonard J. Sansone, P.E., G.E.
Principal Geotechnical Engineer

resume

Leonard Sansone has geotechnical expertise that includes numerous slope stability evaluations, foundation investigations, and earth structure/levee designs, for projects located throughout California. His expertise includes project management and development of subsurface investigation and laboratory testing programs; analysis of geotechnical field and laboratory data; analysis, preparation and review of technical reports; and direction of geotechnical construction testing and observation programs. He has experience in the selection of design criteria for design of pipelines, earth retaining structures/levees, shallow and deep foundation systems, pavements, retaining walls, and surface and subsurface drainage systems. In addition, he also has experience in conducting settlement, slope stability, and seismicity/seismic risk evaluations, and observing geotechnical construction on weak and compressible soils.

Mr. Sansone's civil design experience includes preparation of layouts for dam and reservoir facilities, hydrologic evaluations to determine reservoir spillway sizing, culvert and grading design, and design of erosion and sedimentation control facilities for Stormwater Pollution and Prevention Plans (SWPPPs). He also has experience with solid waste facilities and has designed landfill module expansions and closures.

EDUCATION
M.S., Civil Engineering, Drexel University
B.S., Civil Engineering, Drexel University

EXPERIENCE IN THE INDUSTRY
26 years

EXPERIENCE WITH GEI
9 years

REGISTRATIONS AND LICENSES
Professional Engineer, CA No. C59653
Professional Geotechnical Engineer, CA No. 2654

PROJECT EXPERIENCE

Moccasin Dam Emergency Repairs, San Francisco Public Utilities Commission (SFPUC), Moccasin, CA. Project Engineer for the development of design drawings specifications and engineer's estimate for emergency repairs including a low-permeability barrier along the crest of Moccasin Dam and the replacement of two culverts downstream of Priest Reservoir. Both projects designs are being developed on a fast track basis as part of the design and engineering services during construction for the 2018 Moccasin Emergency. The design projects include seepage mitigation of Moccasin Dam and repairs to appurtenant facilities within the Moccasin Dam watershed because of a historic storm event in March 2018.

Field engineering coordinator and senior geotechnical engineer for a trenching and exploration pit investigation to determine the causes of seepage at the downstream face of the Moccasin Dam during the 2018 Storm Event Emergency. Provided review and coordination support for the preparation of geotechnical data and evaluation memoranda associated with the investigation.

San Gabriel Coastal Spreading Grounds (SGCSG) Levee Retrofit Project- Los Angeles County Department of Public Works, Pico Rivera, CA. Lead Civil/Geotechnical Engineer for the geotechnical exploration and design of a 3,000-foot-long, 40-foot-deep, sheet pile cutoff wall in the Desilting Basin and Basin No. 1 areas of the SGCSG project to mitigate for seepage from the infiltration ponds to the dry bed of the San Gabriel River. Addressing the constructability of the

proposed sheet pile cutoff wall and managing the interferences with the existing pipelines and other utilities was a significant component of the design. This includes special provisions for hydraulic push only sheet pile advancement methods, equipment load restriction protection of numerous utilities located in the project areas, and jet grouting at utility crossings where the sheet pile cannot be advanced.

American River Pump Station Project, U.S. Bureau of Reclamation, Placer County, CA. Field engineer for the rock coring and characterization studies at American River Pump Station. The project, completed in 2007, included a pump station and related facilities on the North Fork American River near Auburn, California to allow the Placer County Water Agency to convey water to the Auburn Ravine Tunnel to meet demands within its service area. Field responsibilities included logging of rock core extending 80 feet in area of vertical turbine shafts for the pump station, supervision and oversight for single wall packer testing in phyllite and mica schist materials, interface with USBR field engineers and geologists, and preparation of ta technical memorandum documenting the investigation, rock characterization and findings regarding grout take potentials in rock materials. Office responsibilities included interface with engineering geologists to evaluate and characterize adverse joint sets in the cutslope above the pump station. S-wedge analyses were performed to determine cutslope areas where rock doweling and tensioned rock anchors were required to mitigate for adverse bedding planes and instabilities in the rock cutslope. Findings of the evaluation were presented in a memorandum to the USBR.

Lake Ranch Reservoir Outlet Replacement Project, San Jose Water Company, San Jose, CA. Served as the lead geotechnical engineer for the evaluation of subsurface data and development of pipeline recommendations for new outlet pipes at Lake Ranch Reservoir. Lake Ranch Reservoir is under the jurisdiction of the California Department of Water Resources, Division of Safety of Dams (DSOD). DSOD is requiring that the existing outlet pipes be replaced, due to their poor condition. Performed geotechnical studies to support the design of siphons to replace the existing outlet pipes at both embankments. Also provided assessments regarding liquefaction and liquefaction-related hazards (e.g., lateral spreading) at the site.

Calero and Guadalupe Dams Seismic Retrofit Project Santa Clara Valley Water District, Santa Clara County, CA. Supervised a borrow study evaluation associated with a seismic retrofit planning project of two dam sites for the Santa Clara Valley Water District. The borrow study was an important part of the planning project to inform the District of suitability of local borrow sources for use as downstream buttress fill to improve the seismic stability of the dams. The study included preliminary desktop and field reconnaissance studies and a workshop with the District to screen preferred borrow sources in the vicinity of the dams. After preferred sites were selected, an exploration program was conducted including borings, excavation pits and geophysical surveys to further assess borrow source suitability, including characteristics such as rippability, processibility, and processed material strengths. Responsibilities included coordination of a multidiscipline team of geotechnical, engineering geology and environmental permitting subconsultants during the screening studies and exploration program. Responsibilities also included the supervision of borrow screening and geotechnical data memoranda preparation.

Waimanalo Gulch Sanitary Landfill, Waste Management Holdings, Inc., Oahu, HI. Served as the project engineer supervising the final design of a 6,500-foot long surface water diversion system at the Waimanalo Gulch Landfill on the western side of Oahu. The Western Surface Water Drainage Project will convey storm runoff along the western periphery of the landfill, minimizing storm water run-on into the landfill area that would require on-site retention and treatment. The Western Surface Water Drainage Project includes an upstream drainage diversion structure and 10' x 10' buried box culvert that transitions to a buried fiberglass polymer mortar pipe, with diameters ranging between 78 inches and 104 inches. The termination of the diversion system includes a downstream discharge point with a flip bucket and plunge pool to dissipate the water energy from the pipe, and allow for more manageable discharge velocities in an existing spillway channel. The Western Surface Water Drainage Project has several hydraulic and geologic design challenges including 700 feet of topographic relief over a short distance between the upstream and downstream ends of the system, and cut slopes with highly variable basalt rock strengths.

Enrico G. Rufini, P.E., P.G., C.E.G.
Senior Engineer

resume

Enrico Rufini has 23 years of geotechnical engineering, heavy civil construction, and environmental mitigation experience acquired from projects in Italy and in the U.S. He has conducted geotechnical investigations and engineering geologist studies for residential and commercial projects, prepared written reports, and recommendations for mitigating hazards and foundation design. Mr. Rufini's range of services includes conceptual engineering, field investigation for feasibility studies, sub-surface exploration, laboratory testing, engineering analysis, and instrumentation installation.

EDUCATION
M.S., Geotechnical Engineering, University of California, Berkeley
B.S., Geology, University of Perugia, Italy

EXPERIENCE IN THE INDUSTRY
23 years

EXPERIENCE WITH GEI
10 years

REGISTRATIONS AND LICENSES
Professional Engineer, CA No. 67714
Professional Geologist, CA No. 6665
Certified Engineering Geologist, CA No. 2228

PROJECT EXPERIENCE

Forebay Dam Modifications, El Dorado Irrigation District, Placerville, CA. Provided services for the dynamic stability review, alternatives and preliminary feasibility analysis, and geotechnical data report for a homogeneous, compacted, earthfill embankment dam which is constructed on weathered phyllites and meta-sandstones rocks of Paleozoic age. The dam is 91 feet high and is 836 feet long. For the dynamic stability review, directed the field exploration and laboratory testing, collaborating in the engineering analyses for the dam stability, liquefaction potential, and seismic vulnerability. The alternatives and preliminary feasibility analysis examined, at a preliminary level, the scope, order of magnitude of costs, schedule, and feasibility of alternatives for the repair, strengthening or raising of the existing dam that would enhance adequate water storage and reservoir operation in a safe manner that also addressed the dam safety concerns identified by DSOD and FERC. Coordinated the efforts of the preliminary designs for appurtenance structure repairs and strengthening, and evaluated the four embankment modification design alternatives and stability analyses to meet project objectives. Also, drafted the geotechnical data report including geologic reconnaissance of the site, coordination of a supplemental exploration of the site subsurface conditions by drilling of geotechnical test borings, excavation of test pits, laboratory testing of selected soil samples, seismic refraction survey, and installation and pump testing of two temporary monitoring wells. The data report presented available surface and subsurface information in support of the engineering analysis and design of dam upgrades.

Manway Installation, Coupon Sampling and Testing for Assessment of the El Dorado High Pressure Penstock, El Dorado Irrigation District, Placerville, CA. Worked as part of the GEI team that conducted an internal inspection of the low- and high-pressure penstock. The penstock system is approximately three miles long (16,080-feet) and was originally constructed in 1922. The penstock is one of the highest head systems in the state with 1,910 feet of head. During these activities, two locations were targeted for analysis using destructive testing methodologies. Provided the QA/QC for construction during the field operations for the coupons extraction and

manways installation. The coupons were tested to determine material properties of the weld and parent materials and imperfections within the Hammer Forged Steel (HFS) weld.

Oroville Emergency Recovery – Spillways, California Department of Water Resources, Oroville, CA. During heavy winter rains in early 2017, the Flood Control Outlet (FCO) Spillway and the Emergency Spillway downstream apron at the Oroville Dam were severely damaged. As initial field operations efforts responded to the emergency conditions, DWR sought to begin recovery efforts. GEI responded by providing key personnel to blend into a cohesive, multi-organization Oroville Spillway Recovery Team headed by DWR. The team participated in planning development of spillway recovery alternatives and provided team leadership, geotechnical, geologic, hydrologic, hydraulics, and construction expertise during the design, procurement, and mobilization phases of the project. GEI continues to support the project during the construction phase. Provided geotechnical engineering observation and support during FCO construction, including foundation preparation for leveling concrete and roller compacted concrete (RCC), foundation preparation for underdrain, anchor installation and testing, and landslide investigation and mitigation. The duration of the assignment was from June to September 2017 and 100% of my time was spent on site. Reported directly to Dale Brown, Jesse Dillon and Jim Lopes, Deputy Project Managers with DWR. Worked in collaboration with other engineers from DSOD, FERC, DWR and the contractor (Kiewit) performing site inspection for compliance with the specifications of the project.

Pile Load Testing Plans, Huntington Beach and Los Alamitos Energy Centers, Huntington Beach, CA. The project sites were active natural gas power plants owned and operated by AES California. The plants were undergoing a modernization to meet new California environmental laws. The modernization construction was being conducted by Kiewit Power. GEI designed the foundations for the AES Huntington Beach modernization project. GEI field tasks which included overseeing the installation of several auger cast test piles, executing a load testing program on the piles, and managing a geotechnical subsurface exploration. Provided the oversight for the pile load testing program which consisted of approximately thirty tests between compression and lateral procedures. The test piles were Non-Displacement Auger Cast Piles (ACIP) and Displacement Auger Cast Piles (DACP). The intent behind testing different pile types was to aid in the selection of a suitable pile type for production. During the lateral testing, responsible for installing the Shape Accel Array Scan (SAAS) inside a one-inch PVC pipe, centered into the tested pile. The SAAS allowed the measurement of the lateral deflection at several increments along the pile.

Cross Hole Sonic Logging Peer Review and Recommendations - Trans Bay Tower Foundations, Bencor Corporation, San Francisco, CA. Performed Crosshole Sonic Log (CSL) integrity tests on foundation Load Bearing Elements (LBEs) for the Transbay Tower construction project. CSL and CSL Tomography were performed on 42 barrette foundations constructed by Bencor Construction (Division of Layne). The barrettes are approximately 5 feet by 10.5 feet in plan and up to 300 feet deep. Top of concrete was between 60 to 70 feet below grade at the time of testing. The CSL testing was focused in providing location and approximate dimension of a series of flaws in the concrete. These flaws were mostly located at the same level in each barrette (approximately 20 feet below top of concrete) where additional reinforcing steel was added in the rebar cage.

Construction Management Support: Levee Improvements, Sutter-Butte Flood Control Agency, Sutter-Butte Area, CA. Performed on-site construction management for the Sutter Butte Flood Control Agency drainage/flood control project in Yuba City, CA. Inspected levee improvement operations by means of conventional wall methods, excavating and backfilling with a bentonite soil mix, as well as deep soil mixing methods with a bentonite cement soil mix. Tasks included inspection and document contractor's work, prepare change orders as required, review and check plans, special provisions and schedules furnished by construction contractor.

Dam Safety Surveillance and Monitoring Plans and Reports, Confidential Client, Oakland, CA. Compiled hundreds of reports for dams within the Sierra Nevada geomorphic province of California for Sacramento Municipal Utility District (SMUD) and El Dorado Irrigation District (EID); the reports were compiled to assist FERC Commission) in reviewing and evaluating the safety and performance of the dams.

Mark Hargrove, P.E.
Senior Engineer

resume

Mark Hargrove is a registered civil engineer who extensive experience in the management, design, construction support, and operation and maintenance of water conveyance and storage facilities, including pipelines, canals, pump stations, and storage reservoirs. His management experience includes but is not limited to preparing and tracking project budgets and schedules, coordinating with clients and subconsultants, and allocating and managing resources. His design experience includes preparing detailed calculations, drawings, specifications, and engineer cost estimates. His construction support services include responding to contractor questions, reviewing bid proposals, reviewing contractor, submittals, and preparing record drawings. His operations and maintenance services include working with the districts, agencies, landowners, and equipment suppliers to develop detailed operational and maintenance plans and costs.

EDUCATION
B.S., Civil Engineering, California State University Sacramento

EXPERIENCE IN THE INDUSTRY
18 years

EXPERIENCE WITH GEI
12 years

REGISTRATIONS AND LICENSES
Professional Engineer, CA No. C63762

PROJECT EXPERIENCE

East Porterville Water Supply, California Department of Water Resources, Porterville, CA. Served as the technical adviser and led the utility investigation work for the water pipeline design and was the lead responsible design engineer for the East Porterville Booster Pump Station Expansion for the Phase 1 work. Serves currently as the project engineer for the Phase 2 work. The Phase 1 work consisted of expanding the City of Porterville's East Porterville Booster Pump Station (adding vertical pump, motor, VFD, piping, valves and appurtenances, electrical, and controls), constructing 12 miles of potable water pipelines (8-inches to 18-inches), connecting 320 water services and restoring road pavement sections. Phase 1 duties included reviewing site conditions; collecting utility data; coordinating utility investigation work; participating in stakeholder document review meetings; preparing calculations, drawings, specification, cost estimates; reviewing calculations, drawings, specifications, cost estimates; responding to RFI's; reviewing submittals; preparing record drawings. Phase 2 consists of two new water production wells, a 1.2 MG welded steel water storage tank, a booster pump station, 4 miles of potable water pipelines (12-inches to 18-inches), 800 water service connections, and road pavement section restoration. Phase 2 duties included reviewing site conditions; participating in stakeholder document review meetings; technical design team coordination; subconsultant coordination (including task order preparation); review of drawings, specifications, and cost estimates; and preparing responses to comments.

Central Valley Flood Management Planning Program, California Department of Water Resources, Sacramento, CA. Served as the lead engineer on the conceptual design and cost estimating team for the Basin-Wide Feasibility Study of the Sacramento Basin. The purpose of this Study was to advance ongoing and long-term implementation of the system wide features of the existing bypass system in the Sacramento River Basin, including the Sutter Bypass and the Yolo

Bypass with all associated structures, inflow weirs and reservoirs. Duties included the constructability review of previous conceptual designs, developing new conceptual designs, reviewing historical construction costs, developing a standard unit cost library, developing standard cost estimating sheet templates, developing standard cost estimating tools for various project features and preparing reports documenting conceptual design and cost estimating work.

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project, City of Palmdale, Antelope Valley, CA. Served as a design engineer for this project. The project involved preliminary design, final design, bidding support and construction support for the design and construction of a project that includes the following facilities: gravity diversion structure off the California Aqueduct, including site work, metering facilities, and electrical facilities; over 1 mile of 48-inch CM&L steel pipeline, including valves and manholes, along residential streets; realignment, re-engineering, and lining of approximately ¾-mile of Upper Amargosa Creek; approximately 20 acres of recharge basins including pond excavation, embankments, site piping, interconnection structures, and spillways; approximately 20 acres of native habitat and conservation area; and a community nature park including multi-use pathways, informative signage, and habitat enhancement area. Duties included alternative analysis the pipeline alignment and diversion location, hydraulic calculations, pipe sizing and design calculations, pipeline plan and profiles, realignment and re-engineering of creek, recharge pond earthwork analysis, and the preparation of plans, specifications and construction cost estimate.

Ecosystem Restoration and Floodwater Attenuation Project at the San Joaquin River National Wildlife Refuge, ESA PWA, Coachella, CA. Served as the project engineer and conceptual designer for this project. Provided engineering services to ESA PWA to prepare conceptual designs for water control structures to control floodwaters from the San Joaquin River onto the Lara and Hagemann parcels of the San Joaquin River National Wildlife Refuge (Refuge). The primary goal of the project was to study whether or not transitory flood storage during large flood events could be achieved at reasonable costs and with ecosystem benefits. Duties included attending coordination meetings, developing conceptual sketches, preparing calculations, preparing drawings, and preparing cost estimates for the water control structures. Used AutoCAD™ in to aide in production of drawings for this project.

Canal Automation Project, Butte Water District, Gridley, CA. Served as the project engineer and technical advisor for this project. The purpose of the project was to replace the existing concrete Thresher Weir canal structure with a new automated gated weir concrete structure. The total capacity of the weir is 900 cfs. Two new 16-feet wide, solar powered, Langemann gates were installed in the weir. As part of the work, fencing and solar powered lighting were installed for security. Duties included advising the technical design team, aiding in the preparation of design calculations, aiding in the preparation of plans and specifications, aiding in the preparation of construction cost estimates, reviewing submittals, reviewing RFI's, preparing construction changes, and communicating with the Client and Contractor.

Thomas E. Levy Groundwater Replenishment Facility, Coachella Valley Water District, Coachella, CA. Served as a design engineer and technical advisor for the Thomas E. Levy Groundwater Replenishment Facility Dike No. 4 Groundwater Recharge Pump Station. The project included a 1550 HP pump station, two 60-foot diameter welded steel forebay reservoirs, one-half mile of 48-inch diameter welded steel pipe, 14-inch and 24-inch plug valves for inlet flow control and architectural design so the building architecture blended in with the adjacent residences. Duties included preparation of final design plans for the pump station site and technical advisor for the layout of the pump station building and pump selection. Construction support responsibilities included review of submittals and RFI's and providing interpretations of the design documents.

Phase II Lateral Pipelines, Stevinson Water District, Newman, CA. Served as the project and design engineer for the design of this project. The purpose of the project was to replace existing earthen irrigation ditches with cast-in-place concrete pipe (CIPP) as part of an overall water conservation project. The project consisted of 1.5 miles of 30-inch CIPP, 2 miles of 36-inch CIPP, and 1 mile of 42-inch CIPP. The project also included concrete junction boxes, manholes, turnouts, and County road crossings. Duties included performing design calculations, preparing plans and specifications, and communicating with the Client. Used AutoCAD™ and Land Development Desktop Civil Design™ in production of drawings for this project.

Ron Berry, P.E., P.Eng.
Senior Engineer

resume

Ron Berry is a senior engineer and project manager with over 22 years of civil engineering experience. He specializes in sizing, planning, and designing hydropower facilities, water and wastewater treatment facilities, and various hydraulic conveyance and drainage facilities. His hydropower design projects include hydro turbine system selection, sizing and design, and designing penstocks and dam inlet and outlet works. Ron also specializes in water and wastewater process and detail design projects, including process selection, optimization, automation, and retrofits for both municipal and industrial clients. His hydraulic/ conveyance projects have included modeling and design of sanitary and storm water pipelines, open channel/river systems, and pump stations. Other design experience spans water and sewer master planning, process design, and detail design of facilities, including civil-site service, utility building design, mechanical systems, and electrical coordination. Mr. Berry is a team leader who values regular client communication and the importance of team member collaboration to ensure project deliverables are of the highest quality, on time, and on budget.

EDUCATION
M.S. Civil Engineering, University of New Brunswick
B.S., Civil Engineering, University of New Brunswick

EXPERIENCE IN THE INDUSTRY
22 years

EXPERIENCE WITH GEI
Less than one year

REGISTRATIONS/CERTIFICATIONS
Professional Engineer, CA No. C65879
Professional Engineer, ON No. 100104198
Professional Engineer, AB No. 155995
Professional Engineer, BC No. 37662
Professional Engineer, NB No. M4902

RELAVANT PROJECT EXPERIENCE

Spillway Assessments, City of San Diego, CA. Senior Project Engineer on the spillway assessment at the El Capitan Dam, Morena Dam, Savage Dam, and Hodges Dam. Project activities included: review of available record drawings, spillway reports, and other available information; onsite field assessments of spillway weir and downstream channel/chute structures; geologic assessment based on surface field inspection and review of available geologic data and reports; and presentation of recommendations for short-term maintenance and long-term refurbishment based on adequacy of design and current conditions.

Santa Felica Dam Outlet Works Rehabilitation, United Water Conservation District. Senior Project Engineer for the replacement of the outlet works intake tower, tunnel, penstock, and energy dissipation valves. Designed multi-level sloping intake structure with associated remotely operated valves, travelling fish screens, and intake works. Project design also included a 1,400 tunnel with 78-inch diameter outlet pipe and 24-inch diameter low conduit for low flows; hooded fixed-coned valves were designed for each of the outlet works conduits.

Santa Felica Dam Outlet Works Rehabilitation, United Water Conservation District. Senior Project Engineer for the replacement of a 1.3 MW hydropower facility. As part of the outlet works rehabilitation, the existing hydropower facility was demolished and replaced with a two-turbine (one for low flows; one for high flows) vertical Francis powerhouse arrangement.

Loma Rica Hydroelectric Station Design, Nevada Irrigation District (NID), CA. Project Manager and Senior Project Engineer for the design of a 1.44 MW hydropower facility bifurcating from NID's

Banner Cascade water transmission pipeline. Project included turbine selection and specifications, pile design for powerhouse foundation, transient analysis of penstock, and electric grid interconnection, including negotiating an interconnection agreement with PG&E.

Boca Powerhouse and Prosser Creek Powerhouse, Pyramid Lake Paiute Tribe, CA. Project Manager and Senior Project Engineer for the design of one 750 kW and one 1.7 MW Kaplan turbine hydroelectric station at the U.S. Bureau of Reclamation (USBR) Boca Dam and one 3.5 MW Kaplan turbine hydroelectric station at the USBR Prosser Creek Dam. The project included an economic analysis, system design, and connection at the outlet works at each facility. Detail design of facilities included civil, structural, electrical, and mechanical facilities.

Warm Springs Hydropower Facilities, U.S. Army Corps of Engineers (USACE), CA. Project Manager and Senior Project Engineer for the design of a 300-kW hydropower facility bifurcating off of an existing outlet structure stilling basin. This project included CFD hydraulic analysis to determine effects of intake and system losses, an alternatives analysis study with a cost estimate, detail design for civil, structural, electrical, and mechanical facilities.

Loon Lake Spiral Scroll Case Rehabilitation, Sacramento Municipal Utilities District (SMUD), CA. Project Engineer for the inspection and recommendations report for rehabilitating the interior surfaces of the reaction turbine scroll case. The work included determining sources of leaking at outlet ports as well as a structural assessment of effects of leakage on the structural concrete. Following inspection, a detail design was developed for the repairs.

Pipeline Design, Confidential Client, CA. Project Engineer for the design of 350 feet of 96-inch diameter spiral welded steel pipe to replace existing riveted steel pipeline and the design of 1500 feet of 36-inch diameter spiral welded steel pipe and pipe saddles extending from the Asbury Pump Station to a downstream pipeline bifurcation. This project included hydraulic analysis to determine effects of catastrophic break at the siphon valley and detail design of a 30-inch bifurcation inlet pipeline to the siphon. Design included specifying gate valves and check valves for a bifurcation pipeline. The hydraulic analysis also included HGL analysis and air/vacuum valve design.

Air Valve Design, Confidential Client, CA. Project Manager and Engineer of Record for the design of two 16-inch diameter air/vacuum valve systems; one for each of two 54-inch diameter penstocks leading to the power house. This project included design of an access platform, replacing 36-inch diameter standpipes, and bracing design for various penstock appurtenances.

Yazoo Basin Hydropower Facility Hydraulic Analysis, Free Flow Power, Various Locations, MS. Project Engineer for hydraulic modeling of four hydropower facilities proposed for installation on USACE flood control dam and outlet works. The facilities included Arkabutla Lake (1,400 cfs – 5.1 MW), Enid Lake (1,100 cfs – 4.5 MW), Grenada Lake (2,250 cfs – 9 MW), and Sardis Lake (3,100 cfs – 14.6 MW). The project included establishing power generation capabilities and studying the hydraulic effects of modifications to existing outlet works.

Pipeline Replacement, Confidential Client, CA. Project Engineer for advanced hydraulic modeling of approximately 4,320 feet design of welded steel penstock with diameter varying from 16-inches to 54-inches. The pipeline contains various complex features including an inverted siphon, very steep pipe slopes requiring supercritical flow analysis, and transient air blowback issues. Model results enabled selection of a design configuration that eliminated various operational problems. Completed the detailed design of the pipeline facilities for the project.

Robert M. Fill, CCM
Construction Manager

resume

Robert Fill is a skilled, certified construction manager with 40 years of industry experience. His qualifications include management and supervision of public works and private construction projects, such as hydroelectric power plants, pumping plants, pipelines, reservoirs, dams, tunnels, aqueducts, levees, control structures, highways, roadways, and buildings. He is experienced in both heavy civil and building construction of various types and sizes.

Mr. Fill is knowledgeable in project management, construction scheduling, cost estimating, surveying, materials testing, contract administration, change order negotiation, dispute resolution and claims management. His experience working with the California Department of Water Resources' Division of Engineering has included work on major projects/programs such as Pyramid Powerplant, Alamo Powerplant, Pearblossom Pumping Plant Enlargement, Mojave Siphon Powerplant, the Coastal Branch Phase II, the East Branch Extension Phases I and II, the South Bay Aqueduct Enlargement and the Emergency Levee Erosion Repairs (ordered in 2006 by then Governor Arnold Schwarzenegger under an Emergency Declaration).

In addition to his qualifications as a successful construction manager, negotiator and facilitator, Mr. Fill's experience also includes providing expert support to help resolve current and outstanding potential and formal public works construction claims. He is a member of the International Partnering Institute and the Dispute Resolution Board Foundation. Mr. Fill strives to bring a fair, impartial, and neutral owner's perspective to the dispute resolution process. He has completed Dispute Resolution Board training through the DRBF and Dispute Resolution Team training through the California and Nevada Departments of Transportation.

EDUCATION
B.S., Engineering, Construction Management, California State University, Sacramento

EXPERIENCE IN THE INDUSTRY
40 years

EXPERIENCE WITH GEI
2 years

CERTIFICATIONS
Certified Construction Manager, No. 4199

PROJECT EXPERIENCE

El Dorado Forebay Dam Modification Project, El Dorado Irrigation District, El Dorado County, CA. Resident Engineer for $19 million project to modify the El Dorado Forebay Dam and associated facilities, including the intake tower, spillway, penstocks, a valve house, and water treatment facility and to construct an earthen buttress to strengthen and raise the dam. Coordinated between the District, the Contractor, and all stakeholders and administered the construction contract for the District.

Santa Felicia Dam Outlet Works Improvement, United Water Conservation District, Ventura County, CA. Assisted in the preparation of a Constructability Analysis report and provided equipment, manpower, and scheduling information for the Project, which included the assessment of both sloping intake and intake tower options.

Bell Canyon Reservoir Intake Tower Replacement, City of St. Helena, Napa County, CA. Providing constructability/biddability

GEI Consultants

analyses, cost estimating, and scheduling support for the design to replace an aging intake tower facility that no longer meets seismic standards and is now at the end of its useful life.

PREVIOUS PROJECT EXPERIENCE

Crafton Hills Reservoir Enlargement – East Branch Extension Phase I Improvements, California Department of Water Resources (DWR), San Bernardino County, CA. $11 million construction project to complete a new earthen embankment dam, concrete structures, and roadways to enlarge the existing Crafton Hills Reservoir. Served as Chief of the Construction Branch, responsible for construction management oversight. Coordinated establishment of a field office, guided staff in hiring and training of a construction management team, and provided oversight for complex project documentation and decision making. Ensured project's scheduling was maintained contemporaneously such that responsibility for delays was resolved as the project progressed.

Citrus Reservoir – East Branch Enlargement Phase II, California Department of Water Resources, San Bernardino County, CA. $21 million construction project to complete the Citrus Reservoir, including earthwork, asphalt liner, and concrete inlet and outlet structures. Served as the Chief of the Construction Branch for DWR, responsible for construction management oversight. Coordinated establishment of a field office, guided staff in hiring and training of a construction management team, and provided oversight for complex project documentation and decision making. The project was completed early and within budget.

Mentone Pipeline, South and East, Foothill Pipeline to Crafton Hills Pump Station – East Branch Extension Phase II, Department of Water Resources, San Bernardino County, CA. $41 million construction project to complete approximately six miles of 72 and 66-inch cement mortar lined steel pipeline, structures, and appurtenances. Served as Chief of the Construction Branch for DWR, responsible for construction management oversight. Coordinated establishment of a field office, guided staff in hiring and training of a construction management team, and provided oversight for complex project documentation and decision making. Managed and prepared complex dispute defenses on the project concurrent with role responsibilities.

Dyer Reservoir, South Bay Aqueduct Enlargement, California Department of Water Resources, Alameda County, CA. $18 million construction project to complete Dyer Reservoir, a 500-acre-foot storage area, including earthwork, asphalt liner, pipelines, inlet and outlet structures, and control systems. Served as Chief of the Construction Branch for DWR, responsible for construction management oversight. Assisted with construction oversight and dispute resolution and participated and testified in the formal claims phase of the project.

Excavation, Inspection, and Repair, Phase III, Santa Ana Pipeline, California Department of Water Resources, Santa Ana, CA. $3.5 million construction project to repair corroded sections of pre-stressed concrete cylinder pipe in the Santa Ana Pipeline. Served as the Field Engineer responsible for training and supervision of inspection staff, meetings with the contractor, responses to RFIs and submittals, generation of project correspondence, preparation of construction pay estimates, monitoring of the project schedule, and negotiation of changes in the work. The project was completed on time and within budget.

Adit Refurbishment, A. D. Edmonston Pumping Plant Discharge Line Tunnel, San Joaquin County, CA. $1.5 million construction project to refurbish the Edmonston discharge line tunnel, including rock removal, lagging and wedges, chain link containment, hazardous waste removal, coal tar coating of pipelines, and air quality management. Served as Field Engineer responsible for training and supervision of inspection staff, meetings with the contractor, responses to RFIs and submittals, generation of project correspondence, preparation of construction pay estimates, monitoring of the project schedule, and negotiation of delays and changes in the work. The project was completed on time and within budget.

Todd Crampton, P.G., C.E.G.
Senior Engineering Geologist

resume

Todd Crampton is a Senior Engineering Geologist who specializes in conducting and managing engineering geologic studies to support design, feasibility, site characterization, and geologic hazard assessment projects throughout California and abroad. His project experience encompasses dams and embankments; water-systems infrastructure, including tanks, reservoirs, pipelines, penstocks, and canals; transportation and water conveyance tunnels; nuclear facilities; hospitals; and evaluation of seismic and geologic hazards for various critical and non-critical facilities.

As an engineering geologist, Mr. Crampton is skilled in all aspects of field geology and exploration, interpretation of geologic and geotechnical data sets, interpretation of aerial photographs and LiDAR, and evaluating geologic and seismic hazards. Through his project work, Mr. Crampton has developed strong working relationships with representatives from the California Department of Water Resources (DWR), Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC). During the past decade, Mr. Crampton has acted as the Lead Engineering Geologist on several important dam tunnel projects in California, including Mountain Tunnel and Interlake Tunnel.

EDUCATION
M.S., Earth Sciences, University of California, Santa Cruz
B.S., Earth Sciences, University of California, Santa Cruz

EXPERIENCE IN THE INDUSTRY
24 years

EXPERIENCE WITH GEI
4 years

REGISTRATIONS AND LICENSES
Professional Geologist, CA No. 6973
Certified Engineering Geologist, CA No. EG-2179

PROJECT EXPERIENCE

Interlake Tunnel and San Antonio Spillway Modification Project, Monterey County Water Resources Agency, Monterey and San Luis Obispo Counties, CA. Lead Engineering Geologist for ongoing geologic and geotechnical studies to support design of the project. Responsible for developing and implementing the geotechnical work plan and characterizing geologic conditions at the spillway and along the tunnel alignment, both of which are crossed by the Rinconada fault zone. Work will involve compiling and reviewing existing data, geologic field mapping, drilling and logging rock core borings to depths up to about 500 feet, downhole borehole testing, surface geophysical surveys, and exploratory test pits near the tunnel portals. GEI will prepare Geotechnical Data Reports that will include and summarize the geologic/geotechnical data obtained from the geotechnical investigations. The exploration program is being coordinated with DSOD.

Mountain Tunnel Improvement Projects, San Francisco Public Utilities Commission, Tuolumne and Mariposa Counties, CA. Project manager and Lead Engineering Geologist for ongoing geologic and geotechnical studies to support the alternatives analysis and conceptual design of the project. The alternatives include retrofit of the lined section of the existing tunnel and construction of a bypass tunnel. Responsible for developing and implementing the geotechnical Work Plan and characterizing geologic conditions along the tunnel alignment. Phase 1 field studies included geologic field mapping and preparation of a project geologic map of the 11-mile-long project alignment,

drilling and logging nine rock core borings (angled and vertical) to depths up to about 1,400 feet, downhole borehole testing, including Packer permeability, hydro-jacking, and geophysical surveys (televiewer and temperature profiles), and construction of multiple vibrating wire piezometers in each boring. GEI prepared a Geotechnical Data Report that includes and summarizes all of the geologic/geotechnical data obtained from the Phase 1 geotechnical investigation.

Oroville Spillway Emergency Design, California Department of Water Resources, Butte County, CA. Advisor to the geology discipline group of the Oroville Spillway Recovery Design Team. Attend meetings and participate in technical discussions related to geologic and geotechnical matters pertaining to the emergency design efforts.

Isabella Dam Auxiliary Spillway and Borel Conduit Tunnel Alternatives Study, U.S. Army Corps of Engineers (USACE), Lake Isabella, CA. Project engineering geologist responsible for overseeing geologic mapping to support preliminary design recommendations of tunnel alternatives to the replace the Borel Conduit at the Auxiliary Dam, which is intersected by the Kern Canyon fault. Performed field geologic mapping and a review of existing geologic information. Provided geologic input for site characterization and assessment of rock mass properties. Attended meetings in the office and field with USACE personnel to discuss findings.

Guadalupe Dam Seismic Retrofit Final Design, Santa Clara Valley Water District, Santa Clara County, CA. Lead engineering geologist for field and office studies to evaluate the foundation conditions for planned improvements at Guadalupe Dam. Work will involve reviewing and compiling existing geologic and geotechnical information; geologic mapping; drilling over 30 boreholes on land and over water to explore borrow sources and foundation conditions for a new downstream buttress, outlet tunnel, and spillway improvements; surface and downhole geophysical surveys; and developing and coordinating a laboratory test program.

Iowa Hill Pumped-Storage Development Project, Sacramento Municipal Utility District (SMUD), El Dorado County, CA. Project geologist for geologic and geotechnical studies to support preliminary design of the Project's Upper Reservoir. Work involved reviewing, compiling, and summarizing existing data; field geologic mapping and analysis of available LiDAR data; and preparation of a field exploration plan. Prepared technical memorandum summarizing geologic conditions at the site and provided oversight for surface geophysical surveys. Also managed and conducted geologic studies to support the preliminary design of the project's underground structures, which include a concrete-lined vertical shaft extending approximately 1,200 feet down from the bottom of the upper reservoir, a high-pressure concrete-lined inlet tunnel about 1,700 feet long, a powerhouse cavern (that will house three variable-speed generating units), and a low-pressure concrete-lined tailrace tunnel about 1,000 feet long. Work involved reviewing, compiling, and summarizing existing data; logging one, 1,500-feet-long vertical rock-core boring; and preparing an interim Geotechnical Data Report that includes all field and laboratory data obtained for the Task 1A studies. Also performed field geologic mapping and analysis of available LiDAR data and a bedrock structural analysis, including a kinematic analysis of bedrock discontinuities.

El Dorado Penstock, El Dorado Irrigation District, El Dorado County, CA. Project geologist for walkdown inspection of the El Dorado penstock, including the high-head and low-head sections. The work involved reviewing existing reports and information; conducting a field reconnaissance and mapping to document existing conditions and potential hazards; and preparing a summary report that included recommendations for future inspections and mitigation of specific erosion features.

Characterization of Erosion Features at Hydroelectric Tunnel Spoil-Pile and Road, Confidential Client, North Fork Feather River, Butte County, CA. Project geologist for a study to evaluate erosion at a hydroelectric tunnel spoil-pile along the North Fork Feather River and along a five-mile stretch of unimproved county access road. The work involved reviewing available information and aerial photographs, performing field mapping, characterizing erosional processes along the project, and developing cost-effective alternative erosion mitigation measures to maintain a passable road. Developed cross sections of the debris spoil-pile, estimated debris volumes to quantify historical erosion, and prepared geologic maps for the project.

ADDENDA B – COST ESTIMATE AND RATE SCHEDULE

Pacific Tunnel Rehab Project

	Budget: February, 2019		GEI Labor																
	STAFF		Senior Consultant/Principle in Charge - Grade 8 (Mark Fratas)	QA/QC, Technical Review (Bill Rattberg)	Senior Professional/Project Manager - Grade 7 (Mike Monaghan, Todd Crampton)	Senior Professional - Grade 6	Senior Professional - Grade 5	Project Professional - Grade 4	Project Professional - Grade 3	Staff Professional - Grade 2	Senior CADD	CADD Drafter	Word Processor, Administrative Support	GEI Total HOURS	GEI Labor Cost	GEI ODCs	Psomas	Total Level of Effort (HOURS)	Total Cost
	2019 Fee Schedule Rates		$286	$286	$255	$214	$188	$160	$142	$130	$142	$130	$106						
	TASK																		
1.0	Meetings and Site Visits	Comments, Assumptions and Deliverables																	
1.1	Kickoff Meeting	Assume 1-3 hour meeting	3		3		3							9	$2,187			9	$2,187
	Mileage	Assume 150 miles each way, $.55/mi														$165			$165
1.2	Design Review Meetings	Assume 3 meetings at 4 hours each for 50%, 75%, and 90%, Assume 2 meetings at 2 hours each for 99% and 100%	15	4	15		15							49	$12,079			49	$12,079
	Mileage	Assume 150 miles each way, $.55/mi														$675			$675
1.3	Team Site Visits	Assume 3 site visits at 8 hours each	10		24		24							58	$13,492			58	$13,492
	Milage	Assume 150 miles each way, $.55/mi														$660			$660
	Task 1 Subtotal		28	4	42		42							116	$27,758	$1,500		116	$29,258
2.0	Progress Reports and Schedules	Comments, Assumptions and Deliverables																	
2.1	Monthly Progress Reports	Assume 6 month duration for design phase of work	6		12								12	30	$6,048			30	$6,048
2.2	Schedule	Assume 2 hours monthly for PM and 1 hour monthly for PIC	6	2	12									20	$5,348			20	$5,348
	Task 2 Subtotal		12	2	24								12	50	$11,396			50	$11,396
3.0	Field Topographic and LiDAR Surveys	Comments, Assumptions and Deliverables																	
3.1	Upload existing LiDAR and conduct survey		2		2						8			12	$2,218		$4,250	12	$6,468
3.2	Evaluate both access roads	Assume a TM describing both alternatives, construction costs, permitting and decision matrix for evaluation of both	2	4	16		40		24		8	16	2	112	$20,152			112	$20,152
	Task 3 Subtotal		4	4	18		40		24		16	16	2	124	$22,370		$4,250	124	$26,620
4.0	Geotechnical Investigations	Comments, Assumptions and Deliverables																	
4.1	Field Investigations	Site reconnaissance and review of existing geotechnical data - 1 day site visit plus 2.5 hours travel	1	1	16	16		8						42	$9,356			42	$9,356
4.2	Borrow Site and Staging Areas		1	1	4	12		4						22	$4,800			22	$4,800
	Task 4 Subtotal		2	2	20	28		12						64	$14,156			64	$14,156
5.0	Project Design and Design Documents	Comments, Assumptions and Deliverables																	
5.1	Prepare 50% Design Documents	Drawings, Specifications, Class 2 Cost Estimate	2	2	16		20	20	40		24	40	4	168	$26,896			168	$26,896
5.2	Prepare 75% Design Documents	Drawings, Specfications, Class 2 Cost Estimate submitted for final review	2	2	16		20	20	16		24	40	4	144	$23,488			144	$23,488
5.3	Prepare 90% Design Documents	Drawings, Specfications, Class 1 Cost Estimate submitted for final review	2	2	16		20	20	16		24	40	4	144	$23,488			144	$23,488
5.4	Prepare 99% Design Documents	Drawings, Specfications, Class 1 Cost Estimate submitted for final review	1	1	4		12	12	4		12	24	2	72	$11,372			72	$11,372
5.5	Prepare 100% Design Documents	Signed and Sealed Bid Documents	1	1	4		12	12	4		12	24	2	72	$11,372			72	$11,372
	Task 5 Subtotal		8	8	56		84	84	80		96	168	16	600	$96,616			600	$96,616
6.0	Regulatory and FERC / Legal Descriptions	Comments, Assumptions and Deliverables																	
6.1	Prepare supporting documentation		2	2	4						8		2	18	$3,512			18	$3,512
	Task 6 Subtotal		2	2	4						8		2	18	$3,512			18	$3,512
	TASK 1 TO 6 TOTAL - Hours		56	22	164	28	166	96	104		120	184	32	972				972	
	TASK 1 TO 6 TOTAL - Cost														$ 175,808	$ 1,500	$ 4,250		$ 181,558

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2019 CAPITAL IMPROVEMENT PLAN Program: Hydroelectric

Project Number: 16044

Project Name: Pacific Tunnel Portal Rehab

Project Category: Reliability & Service Level Improvements

Priority: 2 **PM:** Mutschler **Board Approval:** 01/28/19

Project Description:

The Pacific Tunnel was constructed in 1929 and is approximately 300 feet in length. The upstream and downstream tunnel portals were replaced in 2003 and constructed of untreated timber, which are now in degraded condition and must be replaced with new timber or permanent steel reinforced shotcrete portals. The tunnel between the portals is unlined and comprised of soft relatively volcanic rock that has eroded below the high water line. To prevent continued erosion of the tunnel and prevent failure, a new steel reinforced shotcrete liner and invert slab must be installed to stop further erosion of the tunnel invert and walls. The geotechnical assessment and design for the project have not been started so the construction costs shown in this CIP is an estimate based on construction costs for the Esmeralda Tunnel. Construction cost estimates will be refined upon completion of the geotechnical assessment and design.

Basis for Priority:

The Pacific Tunnel portals, interior side walls, and invert will continue to degrade that will result in the ultimate collapse of the tunnel if not addressed. Failure of the tunnel would cause interruption of Project 184 water deliveries that provides one-third of the District's water supply and hydroelectric power generation for an extended period in order to make emergency repairs.

Project Financial Summary:			
Funded to Date:	$ 50,000	Expenditures through end of year:	$ 30,476
Spent to Date:	$ 30,476	2019 - 2023 Planned Expenditures:	$ 1,977,500
Cash flow through end of year:		Total Project Estimate:	$ 2,007,976
Project Balance	$ 19,524	Additional Funding Required	$ 1,957,976

Description of Work	Estimated Annual Expenditures					
	2019	2020	2021	2022	2023	Total
Study/Planning/Env	$ 15,000	$ 10,000				$ 25,000
Design	$ 160,000					$ 160,000
Construction		$ 1,667,500	$ 25,000			$ 1,692,500
FERC/QCIP		$ 75,000	$ 25,000			$ 100,000
TOTAL	$ 175,000	$ 1,752,500	$ 50,000	$ -	$ -	$ 1,977,500

Estimated Funding Sources	Percentage	2019	Amount
Water Rates	47%		$73,074
Water FCCs	53%		$82,402
			$0
Total	100%		$155,476

Funding Comments:

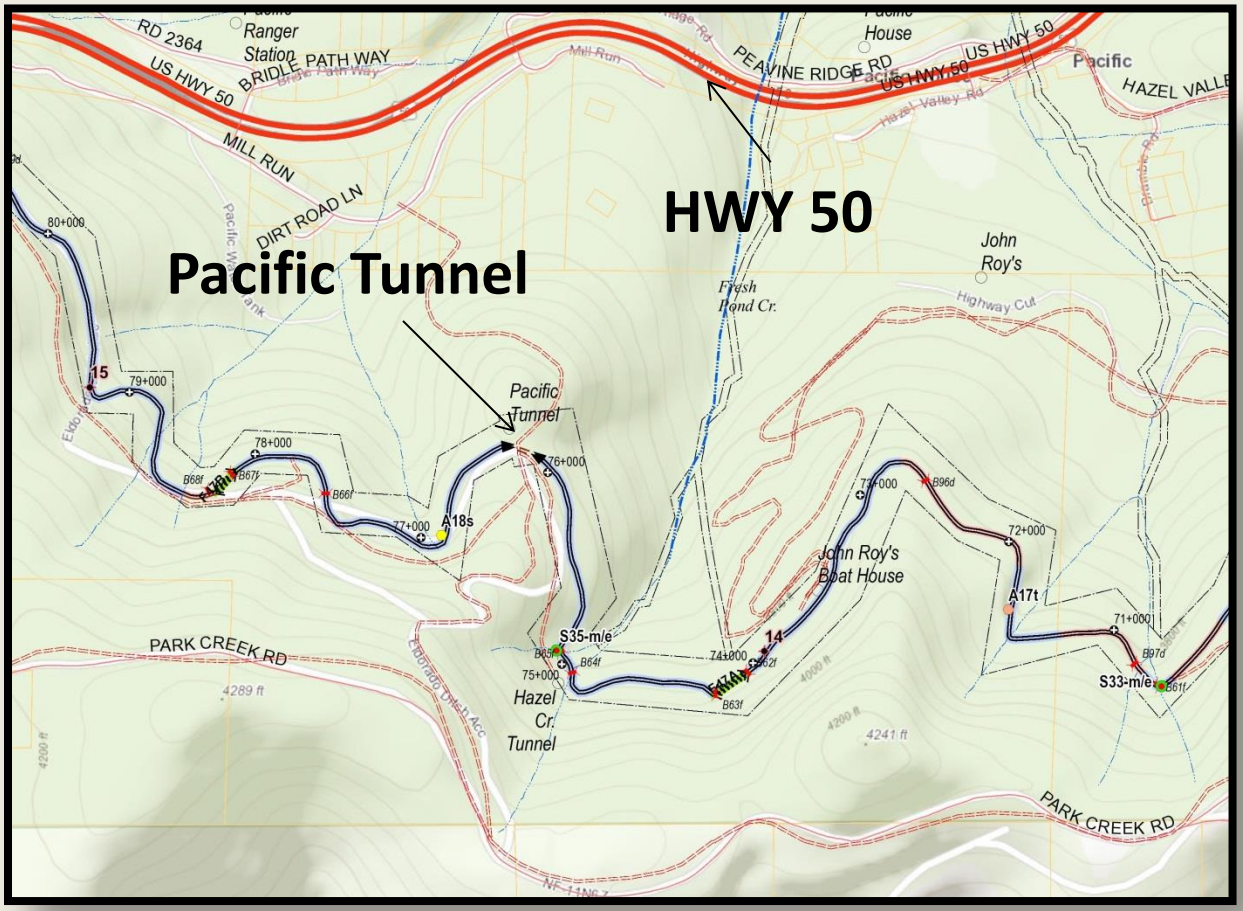
Consideration to Award a Contract to GEI Consultants for the Pacific Tunnel Rehabilitation Design

February 25, 2019

By: Cary Mutschler
Senior Civil Engineer

El Dorado Irrigation District

Project Site



Summary of Issues

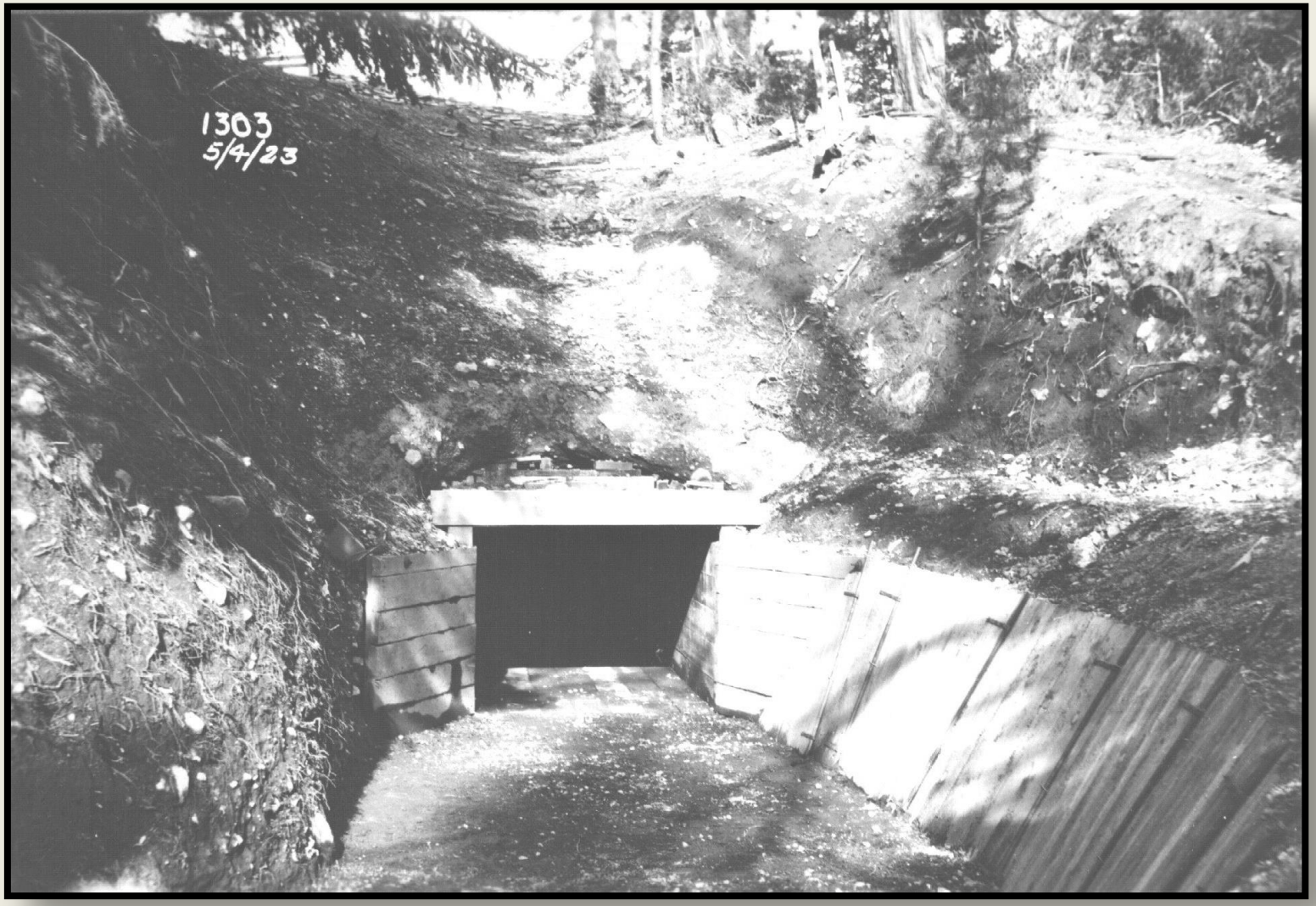
- Pacific Tunnel is approximately 187 feet long
- Upstream and downstream portals were replaced in 2002 with untreated timbers
- Invert of the tunnel is lined with wood in spots and is comprised of soft volcanic rock
- Requesting approval of design contract for improvements to the tunnel
  - Construction scheduled for 2020

Summary of Issues

- Condition assessment done in 2014 as a result of Esmeralda tunnel failure.
- Estimated 5 year life
- Work is to prevent Esmeralda type failure
- Last tunnel needing rehabilitation

Pacific Tunnel 1922

Pacific Tunnel 1923



Pacific Tunnel 2002

Pacific Tunnel Issues

Pacific Tunnel Issues

Pacific Tunnel Issues

Pacific Tunnel Issues

Scope of Work

- Rebuild portals with reinforced concrete
- Concrete line invert and sidewalls (1 foot above high water mark)
- Improve road access for all weather purposes

Proposals

Consulting Firm	Fee Proposal
GEI Consultants	$181,558
McMillen Jacobs Associates	$235,765

Cost Breakdown

Pacific Tunnel Rehabilitation Funding Requirements

	Amount
GEI – Design, Surveying, Geotechnical, regulatory support	$181,558
Capitalized Labor – Engineering and environmental staff support for design and bidding of project	$107,204
Environmental - Permits and studies	$50,000
TOTAL	**$338,762**

Board Options

- **Option 1**: Award a contract to GEI Consultants in the not-to-exceed amount of $181,558 for design of the Pacific Tunnel rehabilitation; and authorize funding of $338,762 for the Pacific Tunnel rehabilitation, Project No. 16044.
- **Option 2**: Take other action as directed by the Board.
- **Option 3**: Take no action.

Recommendation

Option 1

Questions?