City of Ridgecrest Kern County Inyo County San Bernardino County Indian Wells Valley Water District

INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

Ridgecrest City Hall 100 W California Ave., Ridgecrest, CA 93555 760-499-5002

BOARD OF DIRECTORS
A G E N D A

Wednesday, September 13, 2023
Closed Session – 10:00 a.m.
Open Session – No earlier than 11:00 a.m.

Pursuant to California Government Code 54953(b)(1) two additional call-in locations have been established for Board Members who will attend this meeting via teleconference at 14955 Dale Evans Parkway Apple Valley, CA. 92307 and at 1360 N Main St Bishop, CA. 93514.

NOTICE: ***In accordance with the evolving public health declarations, we will continue to provide live stream video for those wishing to participate virtually. Please see the Public Comment Notice below for detailed instructions on submitting public comment as well as websites for livestream broadcasting.***

In compliance with the Americans with Disabilities Act, if you are a disabled person and you need a disability-related modification or accommodation to participate in this meeting, please contact April Keigwin at (805) 764-5452. Requests must be made as early as possible and at least one full business day before the start of the meeting. Documents and material relating to an open session agenda items that are provided to the IWVGA Board of Directors prior to a regular meeting will be available for public inspection and copying at Ridgecrest City Hall, 100 W California Ave, Ridgecrest, CA 93555, or online at https://iwvga.org/.

Statements from the Public
The public will be allowed to address the Board during Public Comments about subjects within the jurisdiction of the IWVGA Board and that are NOT on the agenda. No action may be taken on off-agenda items unless authorized by law. Questions posed to the Board may be answered after the meeting or at future meeting. Dialog or extended discussion between the public and the Board or staff will be limited in accordance with the Brown Act. All Public Comment portions of the meeting shall be limited to three (3) minutes per speaker. Each person is limited to one comment during Public Comments.

1. **CALL TO ORDER**

2. **ADOPTION OF AGENDA**

3. **PUBLIC COMMENT ON CLOSED SESSION**

4. **CLOSED SESSION**

   - CONFERENCE WITH LEGAL COUNSEL – INITIATION OF LITIGATION – (Government Code Section § 54956.9(d(4))) – 4 Cases.

   - CONFERENCE WITH LEGAL COUNSEL – INITIATION OF LITIGATION – (Government Code Section § 54956.9(c)) – 1 Case.

- CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION
(Government Code Section 54956.9(d)(1)): IWVGA v. Inyokern CSD – Kern County Superior Court BCV-22-100281

- CONFERENCE WITH LEGAL COUNSEL – EXISTING LITIGATION
(Government Code Section 54956.9(d)(1) - Name of case: Searles Valley Minerals Inc v. Indian Wells Valley Groundwater Authority, et. al. - Orange County Superior Court 30-2022-01239487-CU-MC-CJC

- CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION
(Government Code Section 54956.9(d)(1) - Name of case: Mojave Pistachios, LLC, a California limited liability company, et.al. v. Indian Wells Valley Groundwater Authority, a California Joint Powers Authority, et. al. - Orange County Superior Court 30-2022-0139479-CU-MC-CJC

5. OPEN SESSION – No earlier than **11:00 a.m.**

a. Report on Closed Session
b. Pledge of Allegiance
c. Roll Call

6. PUBLIC COMMENT

This time is reserved for the public to address the Board about matters NOT on the agenda. No action will be taken on non-agenda items unless authorized by law. Comments are limited to three minutes per person.

7. BOARD MEMBER COMMENTS

This time is reserved for comments by Board members and/or staff and to identify matters for future Board business.

8. CONSENT AGENDA

a. Approve Minutes of Board Meeting August 23, 2023
b. Approve Expenditures
**To view itemized invoices please visit https://iwvga.org/iwvga-meetings*
   i. $118,443.65 – Stetson Engineers
   ii. $300.00 – Regional Government Services – (Replenishment / Extraction)
   iii. $13,831.25 – Capitol Core Group – (Replenishment)
   iv. $512,375.12 – Provost & Pritchard – (SGMA IP Grant)
   v. $7,955.00 – TranSystems – (SGMA IP Grant)
   vi. $125,000.00 – City of Ridgecrest

9. AUTHORIZATION TO AWARD CONTRACT FOR AUDIT SERVICES

10. REQUEST FROM BYERLY FOR SHALLOW WELL MITIGATION FUNDING

11. BOARD DIRECTION AND POSSIBLE APPROVAL OF FUNDING PATH FOR IMPORTED WATER PIPELINE PROJECT

12. APPROVAL OF PAYMENT TO SOUTHERN CALIFORNIA EDISON FOR PROCESSING REQUEST TO CROSS HIGH VOLTAGE TRANSMISSION LINES

13. WATER RESOURCES MANAGER REPORT

a. Grant Funding
b. GSP Implementation Projects/Management Action Updates
   i. Recycled Water Project
   ii. Imported Water Project
   iii. Shallow Well Mitigation Program
   iv. Preview of 5 Year Update Schedule
   v. Schedule for 2023 Annual Report
c. Miscellaneous Items
   i. Data Collection and Monitoring
   ii. IWVGA Basin Model Configuration Management Plan
   iii. CMP Timeline
   iv. Rose Valley Subflow Update
   v. Update on LADWP Releases

14. GENERAL MANAGER'S REPORT

a. Monthly Financial Report
b. C&E Plan Update
c. Report on IWVGA's Water Marketer (Capitol Core Group)
d. Legislative Update and Direction

15. DATE OF NEXT MEETING – OCTOBER 11, 2023

16. ADJOURN

PUBLIC COMMENT NOTICE

IWVGA meetings will be open to the public for physical attendance; However, for those who wish to continue using virtual alternatives please follow the directions below for access to live stream video as well as ways to submit public comment.

- **Watch meetings on-line:**
  All of our meetings are streamed live at https://ridgecrest-ca.gov/369/Watch (4 second streaming delay) or on YouTube at https://www.youtube.com/cityofridgecrest/live (22 second streaming delay) and are also available for playback after the meeting.

- **Call in for public comments:**
  If you wish to make verbal comment, ***please call (760) 499-5010.*** This phone line will allow only one caller at a time, so if the line is busy, please continue to dial. We will be allowing a 20-30 second pause between callers to give time for media delays and callers to dial in. Due to media delays, please mute your streaming device while making public comment. If you wish to comment on multiple items, you will need to call in as each item is presented.
  *Please Note – This process will be a learning curve for all, *please be patient.*

- **Submit written comments:**
  We encourage submittal of written comments supporting, opposing, or otherwise commenting on an agenda item, for distribution to the Board prior to the meeting. Send emails to akeigwin@rgs.ca.gov written correspondence may be sent to April Keigwin, Clerk of the Board, 100 W. California Ave., Ridgecrest, CA 93555. Please specify to which agenda item your comment relates.

- **Large Groups:**
  If you are part of a large group that would like to comment on an agenda item, please consider commenting in writing. This will be as impactful to the Board as having a large group in attendance.

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INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

City of Ridgecrest, Indian Wells Valley Water District, Inyo County, Kern County, San Bernardino County

BOARD OF DIRECTORS MEETING MINUTES

Wednesday, August 23, 2023

IWVGA Members Present:

Chairman Scott Hayman, City of Ridgecrest	Carol Thomas-Keefer, IWVGA General Manager
Phillip Peters, Kern County	Keith Lemieux, Legal Counsel
Chuck Griffin, IWVWD	Steve Johnson, Stetson Engineers
John Vallejo, Inyo County	Commander Benjamin Turner, US Navy, DoD Liaison
Tim Itnyre, San Bernardino County	April Keigwin, Clerk of the Board
Thomas Bickauskas, Bureau of Land Management	

Attending via teleconference is Tim Itnyre, and John Vallejo.

Meeting recording, public comment letters submitted, and all board meeting related documents are made available at:
https://iwvga.org/iwvga-meetings/

1. CALL TO ORDER:

Chairman Hayman calls the meeting to order at 10:13 a.m.

2. ADOPTION OF AGENDA:

Motion made by Phillip Peters and seconded by Chuck Griffin to approve adoption of the agenda. Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Aye
Director Vallejo	Absent

3. PUBLIC COMMENT ON CLOSED SESSION:

None.

Chairman Hayman calls the meeting into Closed Session at 10:14 a.m.

4. CLOSED SESSION:

- CONFERENCE WITH REAL PROPERTY NEGOTIATIONS
  (Government Code Section 54956.8) - Property: Jackson Ranch - Kings County Assessor's Parcel Numbers 048-010-016, 048-010-018, and 048-020-030; Agency Negotiator: Capitol Core Group; Negotiating Parties: Various; Under Negotiation: Price and terms of payment.

- CONFERENCE WITH LEGAL COUNSEL – INITIATION OF LITIGATION
  (Government Code Section § 54956.9(d(4))) – 4 Cases.

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  (Government Code Section 54956.9(c)): IWVGA v. Inyokern CSD

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Closed Session adjourns at 11:22 a.m.

5. OPEN SESSION – No earlier than 11:00 a.m.

Meeting reconvenes into Open Session at 11:28 a.m.

a. Report on Closed Session – Counsel Lemieux reports no action was taken that would require disclosure under The Brown Act.
b. Pledge of Allegiance is led by Chairman Hayman
c. Roll Call

Chairman Hayman	Present
Vice Chair Peters	Present
Director Itnyre	Present
Director Griffin	Present
Director Vallejo	Present

6. PUBLIC COMMENT:

The Board hears public comment from Judie Decker and Renee Westa-Lusk.

7. BOARD MEMBER COMMENTS:

Director Griffin thanks city staff and citizens for coming together to help with Hurricane Hilary. Griffin would like to see IWVGA and IWVWD come together to work on some type or banking or storage project in the future.

8. CONSENT AGENDA:

a. Approve Minutes of Board Meeting July 12, 2023
b. Approve Expenditures

**To view itemized invoices please visit https://iwvga.org/iwvga-meetings*

i. $95,838.64 – Stetson Engineers
ii. $51,412.80 – Regional Government Services – (Replenishment / Extraction)
iii. $15,025.00 – Capitol Core Group – (Replenishment)
iv. $356,231.09 – Provost & Pritchard – (SGMA IP Grant)
v. $11,629.00 – TranSystems – (SGMA IP Grant)
vi. $140.00 – California State Lands Commission – (Extraction)
vii. $125,000.00 – City of Ridgecrest

Motion made by Phillip Peters and seconded by Chuck Griffin to approve Minutes of Board Meeting July 12, 2023, and the following expenditures in the amount of, $95,838.64 to Stetson Engineers, $51,412.80 to Regional Government Services, $15,025.00 to Capitol Core Group, $356,231.09 to Provost & Pritchard, $11,629.00 to TranSystems, $140.00 to California State Lands Commission, and $125,000.00 to City of Ridgecrest.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Aye
Director Vallejo	Aye

9. UPDATE ON IMPORTED WATER PIPELINE PROJECT:
Jeff Davis from Provost & Pritchard provides presentation update on Imported Water Pipeline Project.

The Board hears public comment from Renee Westa-Lusk.

10. APPROVAL OF CHANGE IN SCOPE OF WORK AND BUDGET FOR CONTRACT WITH PROVOST & PRITCHARD CONSULTING GROUP FOR CEQA/NEPA DOCUMENTS AND PERMIT DOCUMENTATION SERVICES FOR THE IMPORTED WATER PIPELINE:
Jeff Helsley of Stetson Engineers provides staff report and scope of work changes for CEQA/NEPA work completed for the Imported Water Pipeline Project.

Motion made by John Vallejo and seconded by Phillip Peters to approve the change in scope of work and budget for contract with Provost & Pritchard for CEQA/NEPA documents and permit documentation for imported water pipeline project.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Nay
Director Vallejo	Aye

11. APPROVAL OF CHANGE IN SCOPE OF WORK AND BUDGET FOR CONTRACT WITH PROVOST & PRITCHARD CONSULTING GROUP FOR DESIGN SERVICES FOR THE IMPORTED WATER PIPELINE:
Jeff Helsley provides staff report and scope of work changes for design services completed for the Imported Water Pipeline Project.

Motion made by Phillip Peters and seconded by John Vallejo to approve the change in scope of work and budget for contract with Provost & Pritchard for design services for imported water pipeline project.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Nay
Director Vallejo	Aye

12. APPROVAL OF CHANGE IN SCOPE OF WORK AND BUDGET FOR CONTRACT WITH TRANSYSTEMS (PREVIOUSLY OVERLAND, PACIFIC AND CUTLER, LLC) FOR RIGHT-OF-WAY AND PARCEL ACQUISITION SERVICES FOR THE IMPORTED WATER PIPELINE:
Jeff Helsley provides staff report and scope of work changes and budget for Right of Way services completed for the Imported Water Pipeline Project.

Motion made by Phillip Peters and seconded by John Vallejo to approve the change in scope of work and budget for contract with TranSystems for right of way and parcel acquisition services for imported water pipeline project.

Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Nay
Director Vallejo	Aye

13. REPORT FROM CAPITOL CORE GROUP ON FUNDING STATUS – RECYCLED WATER:
Michael McKinney of Capitol Core Group provides documents regarding funding status for Recycled Water Project.

Chairman Hayman calls for a recess at 1:00 p.m.
Meeting reconvenes at 1:31 p.m.

14. BOARD DIRECTION AND POSSIBLE APPROVAL OF FUNDING PATH FOR IMPORTED WATER PIPELINE:

Michael McKinney provides report detailing funding path opportunity for the imported water pipeline project.

The Board hears public comment from Don Decker.

Item tabled until the September 13, 2023 meeting.

15. APPROVAL OF APPLICATION AND AGREEMENT FOR USE OF KERN COUNTY RIGHT-OF-WAY FOR THE IMPORTED WATER PIPELINE:
Jeff Helsley and Phillip Hall provide staff report and agreement.
Motion made by John Vallejo and seconded by Phillip Peters to approve agreement for use of Kern County Right of Way Services.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Aye
Director Vallejo	Aye

16. APPROVAL OF REIMBURSEMENT AGREEMENT WITH CALIFORNIA CITY FOR THE IMPORTED WATER PIPELINE:
Jeff Helsley provides staff report and reimbursement agreement with California City.

Motion made by Phillip Peters and seconded by John Vallejo to approve reimbursement agreement with California City.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Aye
Director Vallejo	Aye

17. DESERT TORTOISE AND MOJAVE GROUND SQUIRREL MITIGATION FOR THE IMPORTED WATER PIPELINE:

Jeff Helsley provides staff report.

18. REQUEST FOR VARIANCE

a. CHLT
b. Hammar Water Co-op

Jeff Helsley provides staff report for request for variance for both CHLT and Hammar Water Co-op.

Motion made by Phillip Peters and seconded by John Vallejo to approve the request for variance for both CHLT and Hammar Water Co-op.
Motion carries by the following roll call vote:

Chairman Hayman	Aye
Vice Chair Peters	Aye
Director Itnyre	Aye
Director Griffin	Aye
Director Vallejo	Aye

Director Vallejo leaves the meeting at 2:45 p.m.

19. WATER RESOURCES MANAGER REPORT:

Steve Johnson and Jean Moran provide updates on the following grants/programs:

a. Grant Funding
b. GSP Implementation Projects/Management Action Updates
    i. Recycled Water Program
    ii. Imported Water Program
c. Miscellaneous Items
    i. Data Collection and Monitoring
    ii. IWVGA Basin Model Configuration Management Plan
    iii. Rose Valley Subflow Update
    iv. Update on LADWP Releases

The Board hears public comment from Renee Westa-Lusk.

20. GENERAL MANAGER'S REPORT:

Carol Thomas-Keefer provides the monthly financial report. Michael McKinney of Capitol Core Group provides a report on lobbying activities as well as legislative updates.

21. POLICY ADVISORY COMMITTEE REPORT

Dave Janiec provides a report on the June 22, 2023 PAC meeting.

The board hears public comment from Judie Decker, Renee Westa-Lusk Larry Mead, Don Decker, West Katzenstein, and Joshua Nugent.

22. DATE OF NEXT MEETING – SEPTEMBER 13, 2023

23. ADJOURN:

Chairman Hayman adjourns the meeting at 2:56 p.m. on July 12, 2023.

Respectfully submitted,

April Keigwin
Clerk of the Board
Indian Wells Valley Groundwater Authority

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STETSON ENGINEERS INC.
2171 E. Francisco Blvd., Suite K • San Rafael, California 94901
Phone: (415) 457-0701 • FAX: (415) 457-1638 • Website: www.stetsonengineers.com
Northern California • Southern California • Arizona • Colorado • Oregon

Invoice

Indian Wells Valley Groundwater Authority
Mr. Alan Christensen
100 W. California Ave.
Ridgecrest, CA 93555

Invoice Number: **2652-72**
Invoice Date: **08/22/23**

Project #: 2652 **Indian Wells Valley Groundwater Authority**

Professional Services through 7/31/2023

Water Resources Management 2023

01 - Meetings & Prep

Professional Services	Bill Hours	Bill Rate	Charge
Principal	9.50	$237.00	$2,251.50
Supervisor I	20.25	$206.00	$4,171.50
Senior Associate	1.50	$128.00	$192.00
Associate III	3.50	$111.00	$388.50
Assistant I	41.00	$98.00	$4,018.00
Assistant II	16.25	$93.00	$1,511.25
	Professional Services Subtotal:		*$12,532.75*

Reimbursables	Charge
Reproduction (Color)	$9.79
Reproduction	$3.45
Reimbursables Subtotal:	*$13.24*
Meetings & Prep Subtotal:	*$12,545.99*

01.01 - LADWP Release Coordination and Meetings

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	2.50	$206.00	$515.00
Supervisor II	4.00	$191.00	$764.00
GIS Manager	1.50	$122.00	$183.00
	Professional Services Subtotal:		*$1,462.00*
	LADWP Release Coordination and Meetings Subtotal:		*$1,462.00*

02 - Prop 1 / Prop 68 Grant Administration

Professional Services	Bill Hours	Bill Rate	Charge
Senior Associate	4.00	$128.00	$512.00
Assistant I	3.00	$98.00	$294.00
	Professional Services Subtotal:		*$806.00*
	Prop 1 / Prop 68 Grant Administration Subtotal:		*$806.00*

02.01 - SGMA IP Grant Administration

Professional Services	Bill Hours	Bill Rate	Charge
Senior Associate	3.00	$128.00	$384.00
Assistant I	17.50	$98.00	$1,715.00
	Professional Services Subtotal:		*$2,099.00*
	SGMA IP Grant Administration Subtotal:		*$2,099.00*

03 - Grant Review & Application Preparation

03 - Grant Review & Application Preparation

Professional Services	Bill Hours	Bill Rate	Charge
Principal	5.50	$237.00	$1,303.50
Supervisor I	2.75	$206.00	$566.50
Senior Associate	8.50	$128.00	$1,088.00
GIS Specialist I	1.75	$101.00	$176.75
Assistant I	1.00	$98.00	$98.00
	Professional Services Subtotal:		*$3,232.75*
	Grant Review & Application Preparation Subtotal:		*$3,232.75*

04 - Data Mgmt System Support

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	2.00	$206.00	$412.00
Senior III	5.25	$134.00	$703.50
GIS Manager	0.50	$122.00	$61.00
Associate III	6.75	$111.00	$749.25
	Professional Services Subtotal:		*$1,925.75*

Reimbursables	Charge
Data	$34.10
Reimbursables Subtotal:	*$34.10*
Data Mgmt System Support Subtotal:	*$1,959.85*

05 - General Project Mgmt

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	12.75	$206.00	$2,626.50
Senior Associate	6.00	$128.00	$768.00
Associate III	1.50	$111.00	$166.50
	Professional Services Subtotal:		*$3,561.00*
	General Project Mgmt Subtotal:		*$3,561.00*

06 - Model Transfer & Upgrade

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	6.75	$206.00	$1,390.50
Supervisor II	2.00	$191.00	$382.00
	Professional Services Subtotal:		*$1,772.50*

Sub-Contractors	Charge
Board of Regents	$8,359.52
Ryan Smith	$237.50
Sub-Contractors Subtotal:	*$8,597.02*
Model Transfer & Upgrade Subtotal:	*$10,369.52*

07.01 - Imported Water: Planning/Design/Environmental

Professional Services	Bill Hours	Bill Rate	Charge
Principal	14.00	$237.00	$3,318.00
Supervisor I	43.25	$206.00	$8,909.50
Supervisor II	2.00	$191.00	$382.00
Assistant I	54.00	$98.00	$5,292.00
	Professional Services Subtotal:		*$17,901.50*
	Imported Water: Planning/Design/Environmental Subtotal:		*$17,901.50*

07.02 - Imported Water: Engagement/Outreach

07.02 - Imported Water: Engagement/Outreach

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	0.50	$206.00	$103.00
		Professional Services Subtotal:	*$103.00*
		Imported Water: Engagement/Outreach Subtotal:	*$103.00*

08 - Imported Water: Negotiations & Coordination

Professional Services	Bill Hours	Bill Rate	Charge
Principal	3.50	$237.00	$829.50
		Professional Services Subtotal:	*$829.50*
		Imported Water: Negotiations & Coordination Subtotal:	*$829.50*

09 - Recycled Water

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	6.25	$206.00	$1,287.50
GIS Specialist I	1.50	$101.00	$151.50
Assistant I	8.00	$98.00	$784.00
Assistant II	28.00	$93.00	$2,604.00
		Professional Services Subtotal:	*$4,827.00*
		Recycled Water Subtotal:	*$4,827.00*

11 - Data Collection, Monitoring & Data Gaps

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	9.00	$206.00	$1,854.00
Supervisor II	1.00	$191.00	$191.00
Associate I	0.75	$129.00	$96.75
Senior Associate	0.25	$128.00	$32.00
Associate I	15.50	$122.00	$1,891.00
Associate III	2.00	$111.00	$222.00
		Professional Services Subtotal:	*$4,286.75*

Reimbursables	Charge
Overnight Mail	$30.54
Other Expenses	$47.00
Reimbursables Subtotal:	*$77.54*
Data Collection, Monitoring & Data Gaps Subtotal:	*$4,364.29*

12 - Shallow Well Consolidation Project

Professional Services	Bill Hours	Bill Rate	Charge
GIS Manager	0.75	$122.00	$91.50
GIS Specialist I	3.50	$101.00	$353.50
Assistant II	28.00	$93.00	$2,604.00
		Professional Services Subtotal:	*$3,049.00*
		Shallow Well Consolidation Project Subtotal:	*$3,049.00*

14 - Production Reporting, Transient Pool & Fee Support

Professional Services	Bill Hours	Bill Rate	Charge
Principal	1.50	$237.00	$355.50
Supervisor I	3.00	$206.00	$618.00
Senior Associate	6.50	$128.00	$832.00
Associate I	0.50	$122.00	$61.00
Associate III	31.50	$111.00	$3,496.50

14 - Production Reporting, Transient Pool & Fee Support

Professional Services	Bill Hours	Bill Rate	Charge
Assistant I	10.00	$98.00	$980.00
Assistant II	6.50	$93.00	$604.50
Professional Services Subtotal:			*$6,947.50*
Production Reporting, Transient Pool & Fee Support Subtotal:			*$6,947.50*

16 - TSS: General Coordination/Application Support

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	2.00	$206.00	$412.00
Supervisor II	5.00	$191.00	$955.00
Professional Services Subtotal:			*$1,367.00*

Sub-Contractors	Charge
Ryan Smith	$225.00
Sub-Contractors Subtotal:	*$225.00*
TSS: General Coordination/Application Support Subtotal:	*$1,592.00*

17 - Navy/Coso Royalty Fund: Develop FY24 Projects & Secure Funding

Professional Services	Bill Hours	Bill Rate	Charge
Principal	4.75	$237.00	$1,125.75
Supervisor I	9.50	$206.00	$1,957.00
Supervisor II	6.00	$191.00	$1,146.00
Professional Services Subtotal:			*$4,228.75*
Navy/Coso Royalty Fund: Develop FY24 Projects & Secure Funding Subtotal:			*$4,228.75*

18.1 - Navy/Coso Cooperative Agreement

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	5.50	$206.00	$1,133.00
Associate I	4.00	$122.00	$488.00
Professional Services Subtotal:			*$1,621.00*
Navy/Coso Cooperative Agreement Subtotal:			*$1,621.00*

19 - Brackish Water Group: Data Review & Coordination

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	2.50	$206.00	$515.00
Associate III	38.25	$111.00	$4,245.75
Professional Services Subtotal:			*$4,760.75*

Reimbursables	Charge
Car Rental	$623.52
Field Supplies	$124.87
Lodging	$241.40
Meals	$54.81
Mileage	$3.54
Overnight Mail	$15.61
Reimbursables Subtotal:	*$1,063.75*
Brackish Water Group: Data Review & Coordination Subtotal:	*$5,824.50*

20 - Shallow Well Mitigation Program: Outreach & Impacts Evaluation

Professional Services	Bill Hours	Bill Rate	Charge
Principal	1.50	$237.00	$355.50
Supervisor I	1.50	$206.00	$309.00
Assistant I	2.50	$98.00	$245.00

20 - Shallow Well Mitigation Program: Outreach & Impacts Evaluation

		Professional Services Subtotal:	*$909.50*
		Shallow Well Mitigation Program: Outreach & Impacts Evaluation Subtotal:	*$909.50*

21 - General Engineering

Professional Services	Bill Hours	Bill Rate	Charge
Principal	3.50	$237.00	$829.50
Supervisor I	3.75	$206.00	$772.50
		Professional Services Subtotal:	*$1,602.00*
		General Engineering Subtotal:	*$1,602.00*

22 - GSP 5-Year Update

Professional Services	Bill Hours	Bill Rate	Charge
Principal	5.00	$237.00	$1,185.00
Supervisor I	9.75	$206.00	$2,008.50
Supervisor II	64.00	$191.00	$12,224.00
Senior Associate	14.00	$128.00	$1,792.00
GIS Manager	4.25	$122.00	$518.50
GIS Specialist I	3.00	$101.00	$303.00
Technical Illustrator	63.50	$88.00	$5,588.00
		Professional Services Subtotal:	*$23,619.00*
		GSP 5-Year Update Subtotal:	*$23,619.00*

23 - Annual Report Preparation

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	1.50	$206.00	$309.00
		Professional Services Subtotal:	*$309.00*
		Annual Report Preparation Subtotal:	*$309.00*

25 - Allocation Plan & Rules & Regs on Pumping/Restrictions

Professional Services	Bill Hours	Bill Rate	Charge
Supervisor I	1.25	$206.00	$257.50
		Professional Services Subtotal:	*$257.50*
		Allocation Plan & Rules & Regs on Pumping/Restrictions Subtotal:	*$257.50*

26 - Budget Support

Professional Services	Bill Hours	Bill Rate	Charge
Senior Associate	1.00	$128.00	$128.00
		Professional Services Subtotal:	*$128.00*
		Budget Support Subtotal:	*$128.00*

27 - Litigation Support

Professional Services	Bill Hours	Bill Rate	Charge
Principal	17.00	$237.00	$4,029.00
Supervisor I	0.75	$206.00	$154.50
Associate III	1.00	$111.00	$111.00
		Professional Services Subtotal:	*$4,294.50*
		Litigation Support Subtotal:	*$4,294.50*
		Water Resources Management 2023 Subtotal:	***$118,443.65***

***** Invoice Total ***** **$118,443.65**

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REGIONAL GOVERNMENT SERVICES
SERVING PUBLIC AGENCIES SINCE 2002

PO Box 1350
Carmel Valley, CA 93924

Invoice

Date	Invoice #
7/31/2023	15494

Bill To:

Indian Wells Valley Groundwater Authority
100 W California Ave
Ridgecrest, CA 93555

P.O. No.	Due Date	Inv Sent
	9/15/2023	8/30/2023

Date	Description	Amount
7/31/2023	Reimbursable Expenses for Ridgecrest Monthly Rent - please see attached	300.00

Electronic Payment Information:Five Star Bank
Routing:121143037 Account:003528782

Total **$300.00**

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Capitol Core Group, Inc.
205 Cartwheel Bend (Operations Dept.)
Austin, TX 78738 US
512.568.3084
operations@capitolcore.com
www.capitolcore.com

BILL TO
Indian Wells Valley Groundwater Authority
500 West Ridgecrest Blvd.
Ridgecrest, California 93555
USA

INVOICE 2023-043

DATE 09/01/2023 **TERMS** Net 45

DUE DATE 10/16/2023

VENDOR ID
195953

INVOICE PERIOD
August 2023

DATE	ACCOUNT SUMMARY	AMOUNT
08/01/2023	Balance Forward	15,025.00
	Other payments and credits after 08/01/2023 through 08/31/2023	0.00
09/01/2023	Other invoices from this date	0.00
09/01/2023	Other payments from this date	-15,025.00
	New charges (details below)	13,831.25
	Total Amount Due	13,831.25

ACTIVITY	HOURS	RATE	AMOUNT
Charges			
Task 1: Secure Imported Water Supplies			
Government Relations:Intergovernmental Affairs Subtask A: Water Rights Update Call {Simonetti}	1	250.00	250.00
Government Relations:Intergovernmental Affairs Subtask B: AVEK Interconnection and other Agreements {Simonetti}	1	250.00	250.00
Government Relations:Intergovernmental Affairs Subtask D: 2023 Water Purchases {Tatum}	7	275.00	1,925.00
Government Relations:Intergovernmental Affairs Subtask D: 2023 Water Purchases {Simonetti}	2.50	250.00	625.00
Invoice Total Task 1:$3,050.00 (11.5 hours)			
Task 2: Interconnection Pipeline Project			
Government Relations:Federal Interconnection Pipeline Project Report Development, process research and discussions with USACE {McKinney}	3.50	275.00	962.50
Government Relations:Federal Interconnection Funding Report Update/Proofreading {Simonetti}	2	250.00	500.00
Invoice Total Task 2: $1,462.50 (5.5 hours)			
Task 3: Water Recycling Plant			

ACTIVITY	HOURS	RATE	AMOUNT
Government Relations:Federal Water Recycling Plant Report development, process, and research {McKinney}	2.75	275.00	756.25
Government Relations:Federal Water Recycling Plant Report Update/Proofreading {Simonetti}	1.50	250.00	375.00
Invoice Total Task 3: $1,131.25 (4.25 hours)			
Task 4: Waste Water Treatment Plant			
Government Relations:California Legislative: AB 444 CALDCIP author, internal and coalition members {McKinney	1	275.00	275.00
Government Relations:California Legislative: Direct Advocacy -- AB 444 Senate Committee on Appropriations	1.75	250.00	437.50
Invoice Total Task 4: $712.50 (2.75 hours)			
Task 5: Other Tasks Supporting GSP			
Government Relations:California Legislative/Administrative: Direct Advocacy -- AB 560 Members of the Senate Committee on Appropriations, DWR (Amendments), SWRCB (Amendments), and internal calls {McKinney}	5	275.00	1,375.00
Government Relations:California Legislative/Administrative: Direct Advocacy AB 779 Member of the Senate Committee on Appropriations, DWR, SWRCB	3	275.00	825.00
Government Relations:California Legislative: DIrect Advocacy: AB 560/AB 779 Members of the Senate Committee on Appropriations {Simonetti}	7.25	250.00	1,812.50
Government Relations:California Agency: DWR Advocacy AB 560/AB 779 {Simonetti}	1	250.00	250.00
Invoice Total Task 5: $4,262.50 (16.25 hours)			
Task 6: Project Adminisistration			
General Business Items:Project Administration Board: August Meeting, materials preparation, and presentation {McKinney}	4.50	275.00	1,237.50
General Business Items:Project Administration Board: August Meeting {Tatum}	4	275.00	1,100.00
General Business Items:Project Administration Board Meeting: Materials Update {Simonetti}	1.50	250.00	375.00
General Business Items:Project Administration Board: August Meeting {Simonetti}	2	250.00	500.00
Invoice Total Task 6: $3,212.50 (12 hours)			
**********			
Compliance Reporting Notes for Invoice:			
Federal Reporting Requirement IWVGA: $2,593.75			
Federal Reporting Requirement City of Ridgecrest:$0.00			
State Reporting Requirement IWVGA: $4,262.50			
State Reporting Requirement City of Ridgecrest: $712.50			
**********			

Thank you for your business. Please make checks payable to TOTAL OF NEW 13,831.25

Capitol Core Group, Inc.

CHARGES

TOTAL DUE	**$13,831.25**

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PROVOST&PRITCHARD
CONSULTING GROUP

455 W Fir Ave • Clovis, CA 93611 • (559) 449-2700
www.provostandpritchard.com

April Keigwin
Indian Wells Valley Groundwater Authority
100 West California Avenue
Ridgecrest, CA 93555

September 08, 2023
Project: No: 04101-23-002
Invoice No: 103319

Project Name: **IWVGA Imported Water Conveyance Design Services**

Client Project #:

See Monthly Progress Report for June included in this folder. Attach to front of invoice.

Professional Services from July 01, 2023 to August 31, 2023

Phase: 111P Kickoff Meeting

Labor

	Hours	Rate	Amount	
Principal Engineer	.30	227.00	68.10	
Totals	.30		68.10	
Total Labor				**68.10**
		Total this Phase:		**$68.10**

Phase: 121P Coordination Meetings

Labor

	Hours	Rate	Amount	
Senior Engineer	1.50	186.00	279.00	
Senior Engineer	34.80	195.00	6,786.00	
Assistant Engineer	.80	105.00	84.00	
Associate Engineer	4.50	156.00	702.00	
Principal Engineer	7.50	217.00	1,627.50	
Principal Engineer	1.00	207.00	207.00	
Principal Engineer	1.00	227.00	227.00	
Principal Engineer	9.20	238.00	2,189.60	
Project Administrator	.60	94.00	56.40	
Project Administrator	2.50	108.00	270.00	
Senior Technician	.50	150.00	75.00	
Assistant Planner	.50	103.00	51.50	
Totals	64.40		12,555.00	
Total Labor				**12,555.00**
		Total this Phase:		**$12,555.00**

Phase: 131P P&P General PM

Labor

	Hours	Rate	Amount
Senior Engineer	81.50	195.00	15,892.50
Principal Engineer	3.60	217.00	781.20
Principal Engineer	2.30	227.00	522.10
Principal Engineer	62.60	238.00	14,898.80
Project Administrator	.40	94.00	37.60
Project Administrator	26.80	101.00	2,706.80

*** Please make checks payable to Provost & Pritchard Consulting Group ***
For billing inquiries, please email BillingInquiries@ppeng.com.

Project Administrator	1.00	108.00	108.00	
Senior Technician	36.50	150.00	5,475.00	
Travel Time	1.80	80.00	144.00	
Totals	216.50		40,566.00	
Total Labor				**40,566.00**

Reimbursable Expenses

Travel & Mileage			152.16	
Total Reimbursables			**152.16**	**152.16**
		Total this Phase:		**$40,718.16**

Phase: 132S Stantec General PM

Consultants

Consultants			12,631.31	
Total Consultants			**12,631.31**	**12,631.31**
		Total this Phase:		**$12,631.31**

Phase: 211P Preliminary Design Coordination

Labor

	Hours	**Rate**	**Amount**	
Principal Engineer	.50	207.00	103.50	
Project Administrator	1.20	101.00	121.20	
Senior Technician	.50	150.00	75.00	
Totals	2.20		299.70	
Total Labor				**299.70**
		Total this Phase:		**$299.70**

Phase: 211S Coordination Edison MOS Application

Labor

	Hours	**Rate**	**Amount**	
Senior Engineer	9.30	195.00	1,813.50	
Principal Engineer	.50	238.00	119.00	
Totals	9.80		1,932.50	
Total Labor				**1,932.50**
		Total this Phase:		**$1,932.50**

Phase: 221P Env & ROW Consultant Coord

Labor

	Hours	**Rate**	**Amount**	
Senior Engineer	16.50	195.00	3,217.50	
Totals	16.50		3,217.50	
Total Labor				**3,217.50**
		Total this Phase:		**$3,217.50**

Phase: 231P Surveying

Labor

	Hours	**Rate**	**Amount**	
Licensed Surveyor	10.50	180.00	1,890.00	
Totals	10.50		1,890.00	
Total Labor				**1,890.00**

Total this Phase: $1,890.00

Phase: 241P Utility Research/Coordination

Labor

	Hours	Rate	Amount	
Senior Engineer	87.00	178.00	15,486.00	
Senior Engineer	2.50	195.00	487.50	
Assistant Engineer	18.48	126.00	2,328.48	
Associate Engineer	.50	156.00	78.00	
Principal Engineer	3.50	207.00	724.50	
Project Administrator	.40	94.00	37.60	
Intern	5.50	65.00	357.50	
Totals	117.88		19,499.58	
Total Labor				**19,499.58**

Total this Phase: $19,499.58

Phase: 251P P&P Coord Geotechnical Services

Labor

	Hours	Rate	Amount	
Senior Engineer	1.00	195.00	195.00	
Totals	1.00		195.00	
Total Labor				**195.00**

Total this Phase: $195.00

Phase: 252G SEI Geotechnical Services

Consultants

Consultants	80,742.65	
Total Consultants	**80,742.65**	**80,742.65**

Total this Phase: $80,742.65

Phase: 262C FW Yeager CP Design

Consultants

Consultants	6,762.00	
Total Consultants	**6,762.00**	**6,762.00**

Total this Phase: $6,762.00

Phase: 271P BLM Special Use Permit

Labor

	Hours	Rate	Amount	
Senior Engineer	29.70	195.00	5,791.50	
Assistant Engineer	26.60	126.00	3,351.60	
Senior GIS Specialist	13.20	147.00	1,940.40	
Associate GIS Specialist	10.50	105.00	1,102.50	
Totals	80.00		12,186.00	
Total Labor				**12,186.00**

Total this Phase: $12,186.00

Phase: 273P City of California City Permit

Labor

	Hours	Rate	Amount	
Senior Engineer	13.00	178.00	2,314.00	
Senior Engineer	.50	195.00	97.50	
Principal Engineer	7.00	207.00	1,449.00	
Project Administrator	.80	94.00	75.20	
Totals	21.30		3,935.70	
Total Labor				**3,935.70**

Total this Phase: **$3,935.70**

Phase: 274P Kern Roads Agreement/Encroachment Permit

Labor

	Hours	Rate	Amount	
Senior Engineer	10.20	178.00	1,815.60	
Principal Engineer	4.00	207.00	828.00	
Totals	14.20		2,643.60	
Total Labor				**2,643.60**

Total this Phase: **$2,643.60**

Phase: 275P SCE Encroachment Permit

Labor

	Hours	Rate	Amount	
Senior Engineer	3.30	195.00	643.50	
Principal Engineer	16.20	207.00	3,353.40	
Totals	19.50		3,996.90	
Total Labor				**3,996.90**

Total this Phase: **$3,996.90**

Phase: 281P P&P Preliminary Design Report

Labor

	Hours	Rate	Amount	
Senior Engineer	11.00	186.00	2,046.00	
Senior Engineer	18.50	178.00	3,293.00	
Senior Engineer	142.40	195.00	27,768.00	
Associate Engineer	47.30	140.00	6,622.00	
Assistant Engineer	42.00	112.00	4,704.00	
Assistant Engineer	13.60	105.00	1,428.00	
Assistant Engineer	20.00	126.00	2,520.00	
Associate Engineer	14.50	156.00	2,262.00	
Principal Engineer	33.00	217.00	7,161.00	
Principal Engineer	2.50	207.00	517.50	
Principal Engineer	27.30	227.00	6,197.10	
Principal Engineer	11.60	238.00	2,760.80	
Project Administrator	.40	94.00	37.60	
Senior Technician	66.50	150.00	9,975.00	
Associate Technician	29.40	119.00	3,498.60	
Associate GIS Specialist	4.40	105.00	462.00	
Principal Const. Manager	2.50	215.00	537.50	
Totals	486.90		81,790.10	
Total Labor				**81,790.10**

Total this Phase: $81,790.10

Phase: 282D P&P Drafting Preliminary Design

Labor

	Hours	Rate	Amount	
Senior Engineer	2.00	186.00	372.00	
Senior Engineer	3.50	178.00	623.00	
Senior Engineer	31.00	195.00	6,045.00	
Associate Engineer	3.80	140.00	532.00	
Assistant Engineer	24.60	105.00	2,583.00	
Senior Technician	11.20	143.00	1,601.60	
Assistant Engineer	48.50	126.00	6,111.00	
Associate Engineer	9.00	156.00	1,404.00	
Principal Engineer	6.90	227.00	1,566.30	
Principal Engineer	1.00	248.00	248.00	
Senior Technician	22.60	158.00	3,570.80	
Senior Technician	51.50	150.00	7,725.00	
Associate Technician	20.70	119.00	2,463.30	
Intern	19.00	65.00	1,235.00	
Totals	255.30		36,080.00	
Total Labor				**36,080.00**

Total this Phase: $36,080.00

Phase: 283S Stantec Preliminary Design Report

Consultants

Consultants		11,222.85	
Total Consultants		**11,222.85**	**11,222.85**

Total this Phase: $11,222.85

Phase: 285T Bennett Trenchless Prelim Design Report

Consultants

Consultants		14,777.50	
Total Consultants		**14,777.50**	**14,777.50**

Total this Phase: $14,777.50

Phase: 286Q Dahl Preliminary Design Report

Consultants

Consultants		828.00	
Total Consultants		**828.00**	**828.00**

Total this Phase: $828.00

Phase: 28T2 Pipe Optimizations TM

Labor

	Hours	Rate	Amount
Senior Engineer	4.50	195.00	877.50
Assistant Engineer	12.10	112.00	1,355.20
Principal Engineer	8.00	217.00	1,736.00
Principal Engineer	12.20	227.00	2,769.40
Principal Engineer	1.00	238.00	238.00

Project Administrator	.20	94.00	18.80	
Totals	38.00		6,994.90	
Total Labor				**6,994.90**
			Total this Phase:	**$6,994.90**

Phase: 28T3 Power Availability & Coord with SCE TM S

Labor

	Hours	Rate	Amount	
Senior Engineer	.80	195.00	156.00	
Associate Engineer	.60	156.00	93.60	
Principal Engineer	1.00	238.00	238.00	
Totals	2.40		487.60	
Total Labor				**487.60**
			Total this Phase:	**$487.60**

Phase: 311P P&P 30% Submittal

Labor

	Hours	Rate	Amount	
Senior Engineer	6.50	178.00	1,157.00	
Senior Engineer	38.50	195.00	7,507.50	
Assistant Engineer	2.20	105.00	231.00	
Assistant Engineer	10.00	126.00	1,260.00	
Principal Engineer	3.50	207.00	724.50	
Principal Engineer	17.90	227.00	4,063.30	
Project Administrator	11.90	94.00	1,118.60	
Senior Technician	2.00	158.00	316.00	
Associate GIS Specialist	9.50	105.00	997.50	
Intern	.50	65.00	32.50	
Totals	102.50		17,407.90	
Total Labor				**17,407.90**
			Total this Phase:	**$17,407.90**

Phase: 312D P&P Drafting 30% Submittal

Labor

	Hours	Rate	Amount	
Senior Engineer	65.50	178.00	11,659.00	
Senior Engineer	84.70	195.00	16,516.50	
Assistant Engineer	4.00	112.00	448.00	
Assistant Engineer	24.50	105.00	2,572.50	
Senior Technician	40.60	143.00	5,805.80	
Assistant Engineer	174.00	126.00	21,924.00	
Associate Engineer	2.00	156.00	312.00	
Principal Engineer	7.60	217.00	1,649.20	
Senior Technician	53.90	158.00	8,516.20	
Senior Technician	38.50	150.00	5,775.00	
Senior GIS Specialist	6.00	147.00	882.00	
Associate Technician	48.00	119.00	5,712.00	
Associate GIS Specialist	1.20	105.00	126.00	
Assistant Engineer	.10	133.00	13.30	
Totals	550.60		81,911.50	
Total Labor				**81,911.50**

Project	04101-23-002	IWVGA Imported Water Conveyance Design	Invoice	103319

Total this Phase: **$81,911.50**

Billing Limits	**Current**	**Prior**	**To-Date**
Total Billings	454,774.05	908,924.54	1,363,698.59
Budget			3,770,969.00
Budget Remaining			2,407,270.41

Total this Invoice **$454,774.05**

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PROVOST&PRITCHARD
CONSULTING GROUP

455 W Fir Ave • Clovis, CA 93611 • (559) 449-2700
www.provostandpritchard.com

April Keigwin
Indian Wells Valley Groundwater Authority
100 West California Avenue
Ridgecrest, CA 93555

August 30, 2023
Project: No: 04101-23-001
Invoice No: 103193

Project Name: **Indian Wells Valley Groundwater Authority-CEQA/NEPA Documents and Permit Documentation**

Client Project #:

TSK 1 Initial Coordination: Initial Coordination tasks with staff and agencies to keep project schedule on track. Weekly coordination meetings and tasks for project progression. Meeting with legal for deposition.

TSK 2 Geotechnical Studies: Preparations and discussions for geotechnical survey field work. Reimbursable expenses – travel time to California City for field surveys and site construction monitoring on geotechnical investigation work, rental car expense and gas, mileage for additional company vehicle, meals.

TSK 3 Technical Studies: Biological - Preparation and research for additional technical reports and agency coordination. Biological staff coordination for surveys and fieldwork. Prepare, draft, review and revisions for Biological Evaluation Report, Rare Plant Survey and Joshua Tree Update. Collect biological field data, import and export data for staff. Prepare Geotech maps for biological field surveys. Cultural - Meeting with cultural sub about extended buffer for survey. Scope amendment discussion with subs. Coordination and discussion with BLM regarding project description for cultural work. Prepare spreadsheet of APNs for bio and cultural technical surveys and studies. Air Quality/Greenhouse Gas/Noise – Email correspondence with sub consultant on needs and status of reports for project.

TSK 4 Public Outreach: Preparations and coordination meeting with Stantec to discuss details for Scoping Meeting in California City and Ridgecrest. Prepare final Notice of Preparation and send for approval. Coordinate with marketing on posters and hardware needed for scoping meeting. Prepare distribution list for affected parcels to receive NOP. Stantec subconsultant tasks for scoping meeting preparation. Email correspondence regarding scoping meetings items. Update and save files for administrative record.

TSK 5 Regulatory Compliance and Permitting: Meeting with BLM to discuss permitting needs and progress. Questions and coordination regarding Aquatic Resources Delineation tasks and schedule. Email correspondence between staff, BLM, and subconsultant. Review questions regarding ARDR. Process subconsultant invoices for phase tasks.

TSK 6 CEQA/NEPA Documentation: Weekly check-in meeting for CEQA & NEPA tasks and coordination. Continue research and continue drafting Project Description and Alternatives analysis needed for environmental documentation. Drafting sections for CEQA and NEPA reports and Alternatives Analysis. Drafting and revising exhibits for reports. Email correspondence and coordination amongst staff. File Notice of Preparation with County and State Clearinghouse.

Professional Services from July 01, 2023 to July 31, 2023

Phase: TSK1 Initial Coordination

Labor

	Hours	Rate	Amount	
Principal Engineer	1.30	217.00	282.10	
Project Administrator	2.60	108.00	280.80	
Principal Planner	14.20	188.00	2,669.60	
Totals	18.10		3,232.50	
Total Labor				**3,232.50**

Consultants

Consultants			1,674.69	
Total Consultants			**1,674.69**	**1,674.69**
		Total this Phase:		**$4,907.19**

Phase: TSK2 Geotechnical Studies

Labor

	Hours	Rate	Amount	
Project Administrator	1.20	94.00	112.80	
Project Administrator	1.80	108.00	194.40	
Principal Planner	4.00	188.00	752.00	
Associate Biologist	15.80	130.00	2,054.00	
Travel Time	6.00	80.00	480.00	
Totals	28.80		3,593.20	
Total Labor				**3,593.20**

Consultants

Consultants			5,847.75	
Total Consultants			**5,847.75**	**5,847.75**
		Total this Phase:		**$9,440.95**

Phase: TSK3 Technical Studies

Labor

	Hours	Rate	Amount	
Project Administrator	5.70	108.00	615.60	
Senior GIS Specialist	1.70	147.00	249.90	
Principal Planner	10.40	188.00	1,955.20	
Associate Planner	6.50	138.00	897.00	
Associate GIS Specialist	.30	105.00	31.50	
Associate Biologist	51.20	130.00	6,656.00	
Principal Biologist	6.00	165.00	990.00	
Totals	81.80		11,395.20	
Total Labor				**11,395.20**

Consultants

Consultants			4,715.00	
Total Consultants			**4,715.00**	**4,715.00**

Reimbursable Expenses

Travel & Mileage			446.38	
Total Reimbursables			**446.38**	**446.38**
		Total this Phase:		**$16,556.58**

Phase: TSK4 Public Outreach

Project	04101-23-001	CEQA/NEPA Documents and Permit Documenta	Invoice	103193

Labor

	Hours	Rate	Amount	
Administrative Assistant	1.50	76.00	114.00	
Project Administrator	4.60	101.00	464.60	
Project Administrator	50.70	108.00	5,475.60	
Senior GIS Specialist	3.40	147.00	499.80	
Principal Planner	20.00	188.00	3,760.00	
Senior Planner	1.60	173.00	276.80	
Associate GIS Specialist	3.30	105.00	346.50	
Senior Project Administrator	.70	200.00	140.00	
Totals	85.80		11,077.30	
Total Labor				**11,077.30**

Consultants

Consultants			3,036.00	
Total Consultants			**3,036.00**	**3,036.00**
		Total this Phase:		**$14,113.30**

Phase: TSK5 Regulatory Compliance and Permitting

Labor

	Hours	Rate	Amount	
Project Administrator	.70	108.00	75.60	
Principal Planner	4.60	188.00	864.80	
Totals	5.30		940.40	
Total Labor				**940.40**

Consultants

Consultants			5,253.94	
Total Consultants			**5,253.94**	**5,253.94**
		Total this Phase:		**$6,194.34**

Phase: TSK6 CEQA/NEPA Documentation

Labor

	Hours	Rate	Amount	
Project Administrator	1.90	94.00	178.60	
Project Administrator	1.30	108.00	140.40	
Assistant Planner	8.50	110.00	935.00	
Assistant Planner	18.40	90.00	1,656.00	
Principal Planner	12.00	188.00	2,256.00	
Senior Planner	2.10	173.00	363.30	
Associate GIS Specialist	.90	105.00	94.50	
Associate GIS Specialist	.30	125.00	37.50	
Associate Biologist	.10	116.00	11.60	
Associate Biologist	5.50	130.00	715.00	
Totals	51.00		6,387.90	
Total Labor				**6,387.90**

Reimbursable Expenses

Postage/Shipping/Delivery			.81	
Total Reimbursables			**.81**	**.81**
		Total this Phase:		**$6,388.71**
		Total this Invoice		**$57,601.07**

Billing Backup

Wednesday, August 30, 2023

Provost & Pritchard Consulting Group Invoice 103193 Dated 8/30/2023 2:40:27 PM

Phase: TSK1 Initial Coordination

Labor

		Hours	Rate	Amount	
Principal Engineer					
1102 - Bashian, Heather	7/20/2023	.50	217.00	108.50	
1102 - Bashian, Heather	7/27/2023	.80	217.00	173.60	
Project Administrator					
1119 - Lancaster, Jacqueline	7/6/2023	1.00	108.00	108.00	
1119 - Lancaster, Jacqueline	7/7/2023	.50	108.00	54.00	
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80	
1119 - Lancaster, Jacqueline	7/12/2023	.50	108.00	54.00	
1119 - Lancaster, Jacqueline	7/26/2023	.50	108.00	54.00	
Principal Planner					
1214 - Giacomini, Dena	7/5/2023	2.70	188.00	507.60	
1214 - Giacomini, Dena	7/6/2023	1.10	188.00	206.80	
1214 - Giacomini, Dena	7/11/2023	.20	188.00	37.60	
1214 - Giacomini, Dena	7/13/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/17/2023	1.90	188.00	357.20	
1214 - Giacomini, Dena	7/18/2023	.60	188.00	112.80	
1214 - Giacomini, Dena	7/20/2023	.70	188.00	131.60	
1214 - Giacomini, Dena	7/21/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/24/2023	.20	188.00	37.60	
1214 - Giacomini, Dena	7/25/2023	1.30	188.00	244.40	
1214 - Giacomini, Dena	7/26/2023	1.30	188.00	244.40	
1214 - Giacomini, Dena	7/27/2023	.70	188.00	131.60	
1214 - Giacomini, Dena	7/28/2023	.40	188.00	75.20	
1214 - Giacomini, Dena	7/31/2023	2.10	188.00	394.80	
Totals		18.10		3,232.50	
Total Labor					**3,232.50**

Consultants

Consultants				
AP 61347	7/31/2023	Stantec Consulting Services Inc. / 4101-23-001 TSK1 / Invoice: 2105796, 7/17/2023	1,674.69	
Total Consultants			**1,674.69**	**1,674.69**

Total this Phase: $4,907.19

Phase: TSK2 Geotechnical Studies

Labor

		Hours	Rate	Amount
Project Administrator				
1117 - Bravo, Vivian	7/5/2023	.90	94.00	84.60
1117 - Bravo, Vivian	7/5/2023	.30	94.00	28.20
Project Administrator				
1119 - Lancaster, Jacqueline	7/6/2023	.50	108.00	54.00
1119 - Lancaster, Jacqueline	7/7/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80
1119 - Lancaster, Jacqueline	7/12/2023	.20	108.00	21.60
Principal Planner				
1214 - Giacomini, Dena	7/5/2023	.70	188.00	131.60

1214 - Giacomini, Dena	7/6/2023	.40	188.00	75.20	
1214 - Giacomini, Dena	7/7/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/10/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/11/2023	.20	188.00	37.60	
1214 - Giacomini, Dena	7/12/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/25/2023	.70	188.00	131.60	
1214 - Giacomini, Dena	7/28/2023	.50	188.00	94.00	
Associate Biologist					
1237 - Bourne, Mary	7/3/2023	2.60	130.00	338.00	
1237 - Bourne, Mary	7/5/2023	1.40	130.00	182.00	
1237 - Bourne, Mary	7/6/2023	.30	130.00	39.00	
1237 - Bourne, Mary	7/7/2023	.30	130.00	39.00	
1237 - Bourne, Mary	7/9/2023	1.50	130.00	195.00	
1237 - Bourne, Mary	7/10/2023	6.00	130.00	780.00	
1237 - Bourne, Mary	7/11/2023	1.50	130.00	195.00	
1237 - Bourne, Mary	7/14/2023	.70	130.00	91.00	
1237 - Bourne, Mary	7/17/2023	.30	130.00	39.00	
1237 - Bourne, Mary	7/18/2023	.40	130.00	52.00	
1237 - Bourne, Mary	7/26/2023	.40	130.00	52.00	
1237 - Bourne, Mary	7/31/2023	.40	130.00	52.00	
Travel Time					
40 - Bourne, Mary	7/9/2023	3.00	80.00	240.00	
40 - Bourne, Mary	7/10/2023	3.00	80.00	240.00	
Totals		28.80		3,593.20	
Total Labor					**3,593.20**

Consultants

Consultants				
AP 61347	7/31/2023	Stantec Consulting Services Inc. / 4101-23-001 TSK2 / Invoice: 2105796, 7/17/2023	5,847.75	
Total Consultants			**5,847.75**	**5,847.75**
		Total this Phase:		**$9,440.95**

Phase: TSK3 Technical Studies

Labor

		Hours	**Rate**	**Amount**
Project Administrator				
1119 - Lancaster, Jacqueline	7/6/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/7/2023	.10	108.00	10.80
1119 - Lancaster, Jacqueline	7/10/2023	.50	108.00	54.00
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80
1119 - Lancaster, Jacqueline	7/12/2023	1.50	108.00	162.00
1119 - Lancaster, Jacqueline	7/13/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/21/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/26/2023	.50	108.00	54.00
Senior GIS Specialist				
1142 - Slater, Philip	7/10/2023	.30	147.00	44.10
1142 - Slater, Philip	7/12/2023	.60	147.00	88.20
1142 - Slater, Philip	7/14/2023	.80	147.00	117.60
Principal Planner				
1214 - Giacomini, Dena	7/5/2023	1.00	188.00	188.00
1214 - Giacomini, Dena	7/6/2023	.20	188.00	37.60
1214 - Giacomini, Dena	7/7/2023	.50	188.00	94.00
1214 - Giacomini, Dena	7/10/2023	.30	188.00	56.40
1214 - Giacomini, Dena	7/11/2023	.20	188.00	37.60

1214 - Giacomini, Dena		7/12/2023	1.00	188.00	188.00	
1214 - Giacomini, Dena		7/14/2023	.50	188.00	94.00	
1214 - Giacomini, Dena		7/17/2023	.50	188.00	94.00	
1214 - Giacomini, Dena		7/18/2023	1.00	188.00	188.00	
1214 - Giacomini, Dena		7/20/2023	.50	188.00	94.00	
1214 - Giacomini, Dena		7/21/2023	1.00	188.00	188.00	
1214 - Giacomini, Dena		7/25/2023	.20	188.00	37.60	
1214 - Giacomini, Dena		7/26/2023	.10	188.00	18.80	
1214 - Giacomini, Dena		7/27/2023	1.20	188.00	225.60	
1214 - Giacomini, Dena		7/28/2023	1.20	188.00	225.60	
1214 - Giacomini, Dena		7/31/2023	1.00	188.00	188.00	
Associate Planner						
1216 - Olsen, Jarred		7/13/2023	3.00	138.00	414.00	
1216 - Olsen, Jarred		7/14/2023	3.50	138.00	483.00	
Associate GIS Specialist						
1226 - Hunter, Cheryl		7/5/2023	.30	105.00	31.50	
Associate Biologist						
1237 - Bourne, Mary		7/3/2023	2.00	130.00	260.00	
1237 - Bourne, Mary		7/5/2023	2.30	130.00	299.00	
1237 - Bourne, Mary		7/6/2023	2.20	130.00	286.00	
1237 - Bourne, Mary		7/7/2023	3.60	130.00	468.00	
1237 - Bourne, Mary		7/11/2023	1.60	130.00	208.00	
1237 - Bourne, Mary		7/12/2023	2.00	130.00	260.00	
1237 - Bourne, Mary		7/13/2023	1.80	130.00	234.00	
1237 - Bourne, Mary		7/14/2023	3.00	130.00	390.00	
1237 - Bourne, Mary		7/17/2023	4.80	130.00	624.00	
1237 - Bourne, Mary		7/18/2023	4.00	130.00	520.00	
1237 - Bourne, Mary		7/19/2023	2.60	130.00	338.00	
1237 - Bourne, Mary		7/20/2023	3.40	130.00	442.00	
1237 - Bourne, Mary		7/21/2023	3.40	130.00	442.00	
1237 - Bourne, Mary		7/24/2023	5.10	130.00	663.00	
1237 - Bourne, Mary		7/25/2023	2.40	130.00	312.00	
1237 - Bourne, Mary		7/26/2023	3.80	130.00	494.00	
1237 - Bourne, Mary		7/27/2023	2.20	130.00	286.00	
1237 - Bourne, Mary		7/31/2023	1.00	130.00	130.00	
Principal Biologist						
1346 - Cline, Geoffrey		7/20/2023	4.00	165.00	660.00	
1346 - Cline, Geoffrey		7/21/2023	2.00	165.00	330.00	
	Totals		81.80		11,395.20	
	Total Labor					**11,395.20**

Consultants

Consultants					
AP 60999	7/13/2023	Ambient Air Quality & Noise Consulting / 04101-23-001 TSK1 / Invoice: 942, 7/12/2023		2,397.75	
AP 61055	7/14/2023	ASM Affiliates / 04101-23-001 TSK1 / Invoice: 26309, 7/13/2023		2,317.25	
	Total Consultants			**4,715.00**	**4,715.00**

Reimbursable Expenses

Travel & Mileage					
AP 60829	7/10/2023	Enterprise Rent-A-Car / 04101-23-001 TSK3 / Invoice: 656574201, 7/4/2023		446.38	
	Total Reimbursables			**446.38**	**446.38**
			Total this Phase:		**$16,556.58**

Phase: TSK4 Public Outreach

Labor

		Hours	Rate	Amount
Administrative Assistant				
1111 - Riggi, Mary	7/24/2023	1.50	76.00	114.00
Project Administrator				
1118 - Giovannoni, Cara	7/19/2023	.70	101.00	70.70
1118 - Giovannoni, Cara	7/24/2023	1.80	101.00	181.80
1118 - Giovannoni, Cara	7/25/2023	.30	101.00	30.30
1118 - Giovannoni, Cara	7/26/2023	1.20	101.00	121.20
1118 - Giovannoni, Cara	7/31/2023	.60	101.00	60.60
Project Administrator				
1119 - Lancaster, Jacqueline	7/6/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80
1119 - Lancaster, Jacqueline	7/12/2023	.50	108.00	54.00
1119 - Lancaster, Jacqueline	7/13/2023	3.00	108.00	324.00
1119 - Lancaster, Jacqueline	7/14/2023	5.50	108.00	594.00
1119 - Lancaster, Jacqueline	7/17/2023	.50	108.00	54.00
1119 - Lancaster, Jacqueline	7/18/2023	4.60	108.00	496.80
1119 - Lancaster, Jacqueline	7/19/2023	3.00	108.00	324.00
1119 - Lancaster, Jacqueline	7/20/2023	5.00	108.00	540.00
1119 - Lancaster, Jacqueline	7/21/2023	3.00	108.00	324.00
1119 - Lancaster, Jacqueline	7/22/2023	8.00	108.00	864.00
1119 - Lancaster, Jacqueline	7/24/2023	8.00	108.00	864.00
1119 - Lancaster, Jacqueline	7/25/2023	1.00	108.00	108.00
1119 - Lancaster, Jacqueline	7/26/2023	3.00	108.00	324.00
1119 - Lancaster, Jacqueline	7/31/2023	4.50	108.00	486.00
Senior GIS Specialist				
1142 - Slater, Philip	7/25/2023	.20	147.00	29.40
1142 - Slater, Philip	7/26/2023	1.10	147.00	161.70
1142 - Slater, Philip	7/27/2023	2.10	147.00	308.70
Principal Planner				
1214 - Giacomini, Dena	7/5/2023	.30	188.00	56.40
1214 - Giacomini, Dena	7/6/2023	1.00	188.00	188.00
1214 - Giacomini, Dena	7/10/2023	1.00	188.00	188.00
1214 - Giacomini, Dena	7/11/2023	.20	188.00	37.60
1214 - Giacomini, Dena	7/12/2023	3.10	188.00	582.80
1214 - Giacomini, Dena	7/13/2023	1.40	188.00	263.20
1214 - Giacomini, Dena	7/14/2023	2.20	188.00	413.60
1214 - Giacomini, Dena	7/17/2023	1.50	188.00	282.00
1214 - Giacomini, Dena	7/19/2023	1.00	188.00	188.00
1214 - Giacomini, Dena	7/20/2023	.90	188.00	169.20
1214 - Giacomini, Dena	7/21/2023	.50	188.00	94.00
1214 - Giacomini, Dena	7/24/2023	2.20	188.00	413.60
1214 - Giacomini, Dena	7/26/2023	3.20	188.00	601.60
1214 - Giacomini, Dena	7/27/2023	.80	188.00	150.40
1214 - Giacomini, Dena	7/28/2023	.70	188.00	131.60
Senior Planner				
1219 - Sholars, Briza	7/19/2023	.60	173.00	103.80
1219 - Sholars, Briza	7/24/2023	.20	173.00	34.60
1219 - Sholars, Briza	7/25/2023	.20	173.00	34.60
1219 - Sholars, Briza	7/26/2023	.20	173.00	34.60
1219 - Sholars, Briza	7/27/2023	.20	173.00	34.60
1219 - Sholars, Briza	7/31/2023	.20	173.00	34.60

Associate GIS Specialist					
1226 - Hunter, Cheryl	7/14/2023	.50	105.00	52.50	
1226 - Hunter, Cheryl	7/26/2023	.50	105.00	52.50	
1226 - Hunter, Cheryl	7/28/2023	2.00	105.00	210.00	
1226 - Hunter, Cheryl	7/31/2023	.30	105.00	31.50	
Senior Project Administrator					
1605 - Kirk, Karen	7/19/2023	.70	200.00	140.00	
Totals		85.80		11,077.30	
Total Labor					**11,077.30**

Consultants

Consultants				
AP 61347	7/31/2023	Stantec Consulting Services Inc. / 4101-23-001 TSK4 / Invoice: 2105796, 7/17/2023	3,036.00	
Total Consultants			**3,036.00**	**3,036.00**
		Total this Phase:		**$14,113.30**

Phase: TSK5 Regulatory Compliance and Permitting

Labor

		Hours	**Rate**	**Amount**	
Project Administrator					
1119 - Lancaster, Jacqueline	7/6/2023	.20	108.00	21.60	
1119 - Lancaster, Jacqueline	7/7/2023	.20	108.00	21.60	
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80	
1119 - Lancaster, Jacqueline	7/12/2023	.20	108.00	21.60	
Principal Planner					
1214 - Giacomini, Dena	7/6/2023	.20	188.00	37.60	
1214 - Giacomini, Dena	7/7/2023	1.00	188.00	188.00	
1214 - Giacomini, Dena	7/12/2023	.80	188.00	150.40	
1214 - Giacomini, Dena	7/13/2023	.30	188.00	56.40	
1214 - Giacomini, Dena	7/18/2023	.20	188.00	37.60	
1214 - Giacomini, Dena	7/21/2023	1.00	188.00	188.00	
1214 - Giacomini, Dena	7/24/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/26/2023	.50	188.00	94.00	
1214 - Giacomini, Dena	7/27/2023	.10	188.00	18.80	
Totals		5.30		940.40	
Total Labor					**940.40**

Consultants

Consultants				
AP 61347	7/31/2023	Stantec Consulting Services Inc. / 4101-23-001 TSK5 / Invoice: 2105796, 7/17/2023	5,253.94	
Total Consultants			**5,253.94**	**5,253.94**
		Total this Phase:		**$6,194.34**

Phase: TSK6 CEQA/NEPA Documentation

Labor

		Hours	**Rate**	**Amount**
Project Administrator				
1117 - Bravo, Vivian	7/26/2023	.40	94.00	37.60
1117 - Bravo, Vivian	7/27/2023	.90	94.00	84.60
1117 - Bravo, Vivian	7/28/2023	.60	94.00	56.40
Project Administrator				
1119 - Lancaster, Jacqueline	7/11/2023	.10	108.00	10.80

1119 - Lancaster, Jacqueline	7/12/2023	.20	108.00	21.60
1119 - Lancaster, Jacqueline	7/14/2023	1.00	108.00	108.00
Assistant Planner				
1205 - Czeshinski, Wyatt	7/13/2023	.70	110.00	77.00
1205 - Czeshinski, Wyatt	7/27/2023	1.30	110.00	143.00
1205 - Czeshinski, Wyatt	7/28/2023	.50	110.00	55.00
1205 - McKelvey, Ryan	7/13/2023	2.00	110.00	220.00
1205 - McKelvey, Ryan	7/14/2023	3.00	110.00	330.00
1205 - McKelvey, Ryan	7/26/2023	.30	110.00	33.00
1205 - McKelvey, Ryan	7/27/2023	.20	110.00	22.00
1205 - McKelvey, Ryan	7/28/2023	.50	110.00	55.00
Assistant Planner				
1207 - Dill, Kyler	7/7/2023	4.10	90.00	369.00
1207 - Dill, Kyler	7/10/2023	4.10	90.00	369.00
1207 - Dill, Kyler	7/11/2023	3.80	90.00	342.00
1207 - Dill, Kyler	7/12/2023	1.00	90.00	90.00
1207 - Dill, Kyler	7/13/2023	.30	90.00	27.00
1207 - Dill, Kyler	7/14/2023	1.30	90.00	117.00
1207 - Dill, Kyler	7/19/2023	.10	90.00	9.00
1207 - Dill, Kyler	7/20/2023	1.60	90.00	144.00
1207 - Dill, Kyler	7/24/2023	1.00	90.00	90.00
1207 - Dill, Kyler	7/26/2023	.30	90.00	27.00
1207 - Dill, Kyler	7/27/2023	.40	90.00	36.00
1207 - Dill, Kyler	7/28/2023	.40	90.00	36.00
Principal Planner				
1214 - Giacomini, Dena	7/5/2023	1.50	188.00	282.00
1214 - Giacomini, Dena	7/6/2023	.20	188.00	37.60
1214 - Giacomini, Dena	7/7/2023	.50	188.00	94.00
1214 - Giacomini, Dena	7/13/2023	3.30	188.00	620.40
1214 - Giacomini, Dena	7/14/2023	1.20	188.00	225.60
1214 - Giacomini, Dena	7/18/2023	.30	188.00	56.40
1214 - Giacomini, Dena	7/21/2023	.50	188.00	94.00
1214 - Giacomini, Dena	7/25/2023	2.00	188.00	376.00
1214 - Giacomini, Dena	7/26/2023	1.00	188.00	188.00
1214 - Giacomini, Dena	7/28/2023	.50	188.00	94.00
1214 - Giacomini, Dena	7/31/2023	1.00	188.00	188.00
Senior Planner				
1219 - Sholars, Briza	7/13/2023	.50	173.00	86.50
1219 - Sholars, Briza	7/18/2023	1.00	173.00	173.00
1219 - Sholars, Briza	7/20/2023	.60	173.00	103.80
Associate GIS Specialist				
1226 - Hunter, Cheryl	7/13/2023	.80	105.00	84.00
1226 - Hunter, Cheryl	7/14/2023	.10	105.00	10.50
Associate GIS Specialist				
1229 - Serrao, Mallory	7/13/2023	.30	125.00	37.50
Associate Biologist				
1235 - Stark, Shaylea	7/19/2023	.10	116.00	11.60
Associate Biologist				
1237 - Bourne, Mary	7/7/2023	.80	130.00	104.00
1237 - Bourne, Mary	7/24/2023	.30	130.00	39.00
1237 - Bourne, Mary	7/25/2023	.30	130.00	39.00
1237 - Bourne, Mary	7/26/2023	1.00	130.00	130.00
1237 - Bourne, Mary	7/27/2023	.80	130.00	104.00
1237 - Bourne, Mary	7/28/2023	.10	130.00	13.00

Project	04101-23-001	CEQA/NEPA Documents and Permit Documenta			Invoice	103193
1237 - Bourne, Mary		7/31/2023	2.20	130.00	286.00	
	Totals		51.00		6,387.90	
	Total Labor					**6,387.90**

Reimbursable Expenses

Postage/Shipping/Delivery

MI	000POSTAGE01	7/31/2023	Bakersfield Postage / 7/26/23 1 unit @ $0.70 per unit	.81
	Total Reimbursables			**.81**

Total this Phase:	**$6,388.71**
Total this Project:	**$57,601.07**
Total this Report	**$57,601.07**

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Invoice

TRANSYSTEMS

TranSystems Corporation

www.transystems.com

Please remit payment to:
P.O. Box 71368
Chicago, IL 60694-1368

If you have any questions, please call:
(562) 304-2000

Client:

Indian Wells Valley Groundwater Authorit
Attn: April Keigwin - Clerk of the Board
100 W California Ave.
Ridgecrest, CA 93555

Reference:

Invoice Date: 7/31/2023
Project No: P601230025
Invoice No: INV-0004226723

Project Name: IWV-Imported Water Pipeline

For professional services rendered July 1, 2023 through July 31, 2023 for the above referenced project.

Staff Type	Name	Rate	Hours	Amount
Labor				
Analyst II	Corey Nelson	135.00	1.00	$135.00
Industry Specialist 2	Joi Speck	135.00	1.00	$135.00
Industry Specialist IV	Mia J. Garcia	150.00	1.90	$285.00
Project Consultant 3	April C. Harvey	250.00	8.00	$2,000.00
	Donald M. Anderson	150.00	4.00	$600.00
R/W Specialist III	Alia N. Mills	135.00	30.00	$4,050.00
Total Labor			45.90	$7,205.00
Reimbursables				
Title Services				$750.00
Total Reimbursables				$750.00
Invoice Total				$7,955.00

TranSystems Corporation

Donald M. Anderson
Project Manager

TERMS: PAYABLE UPON RECEIPT

1 1/2% INTEREST CHARGE PER MONTH WILL BE ADDED TO ALL PAST DUE INVOICES OLDER THAN 45 DAYS IF INDICATED IN THE CONTRACT TERMS

Hours Charged by Project

For Timesheet Period: 7/1/2023 - 7/31/2023

Project	Name	Time By Day	Entered Hours	Daily Comments
P601230025				
	Donald M. Anderson			
		7/5/2023	1.50	Project Development Team meeting.
		7/12/2023	0.50	Reviewed and signed declaration and worked on Sully-Miller ROE.
		7/14/2023	0.20	Call to Jeff C. @ Sully-Miller and follow up email.
		7/17/2023	1.40	Project Development Team meeting.
		7/25/2023	0.20	Communications with Alpha Ireco.
		7/26/2023	0.20	Worked on Alpha Ireco ROE.
	Mia J Garcia			
		7/10/2023	0.30	Project Set-up/Contract review.
		7/11/2023	1.30	Sub invoice approvals (Inv 00035262). Document Management and sub coordination. QB updates.
		7/13/2023	0.30	Sub coordination.
	Corey Nelson			
		7/6/2023	1.00	Weldon - Owner contact/ROE editing & mailing.
	Joi Speck			
		7/14/2023	0.50	Uploaded documents to P1
		7/20/2023	0.50	Uploaded documents to P1
	April C Harvey			
		7/5/2023	2.00	Project meeting with IVWGA
		7/10/2023	0.50	Provide Sully-Miller contact information to Carol for COI processing Project Management with Alia Mills for ROE outreach with Don Anderson
		7/13/2023	1.50	PM discussion with Alia on notifications on ROEs and spreadsheet updates, work with P&P on DeSantis outreach for ROE

		7/17/2023	2.00	Project Teams Conference call
		7/24/2023	0.50	Follow up with Alia Mills on Ray Hernandez ROE
		7/31/2023	1.50	Project Status meeting with IVWGA project team
	Alia N Mills			
		7/7/2023	5.00	IWV Report; locating prop owners, contacting via email/phone call, records locators, title searches, trust searches, etc
		7/12/2023	8.00	Contacted/attempted to contact, research, track, and locate property owners for ROE permits to be distributed and return fully executed. Updated report on whereabouts/new information. emailed, called, left voicemails, and/or SMS text messages to contact info.
		7/13/2023	8.00	Contacted/attempted to contact, research, track, and locate property owners for ROE permits to be distributed and return fully executed. Updated report on whereabouts/new information. emailed, called, left voicemails, and/or SMS text messages to contact info.
		7/18/2023	4.00	IVW - Research and communication on tracking property owners via email, text, or phone calls. Sourcing title searches for addresses/contact info for sold direct addresses, etc. for ROE permits.
		7/21/2023	4.00	IVW - Research and communication on tracking property owners via email, text, or phone calls. Sourcing title searches for addresses/contact info for sold direct addresses, etc. for ROE permits.
		7/24/2023	1.00	Reached out to prop owners and discussed ROE for IVGWA and the bio/env study to be conducted. Spoke to prop owner, updated report, and mgmt. on response.
P601230025			**45.90**	
Grand Total			**45.90**	

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IWVGA

FY 2023

REPAYMENT SCHEDULE FOR CITY OF RIDGECREST OBLIGATION

PAYMENT FOR SEPTEMBER 2023

125,000

SEPTEMBER PAYMENT

EST PMT DATE	PAYMENT	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	TOTAL
8/23/2023	Payment 1	125,000	-	-	-	125,000
9/13/2023	Payment 2	-	125,000	-	-	125,000
	SUBTOTAL	125,000	125,000	-	-	250,000

REMAINING PAYMENTS

EST PMT DATE	PAYMENT	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	TOTAL
Oct Mtg	Payment 3	-	-	125,000	-	125,000
Nov Mtg	Payment 4	-	-	-	125,000	125,000
	SUBTOTAL	-	-	125,000	125,000	250,000

IWVGA

AS of August 31, 2023

OUTSTANDING OBLIGATIONS

	Kern County	City of Ridgecrest	Augmentation Fund	**Total**
Advance Agreements				
Advance of Funds	500,000	-	-	**500,000**
Advance Repayment	(500,000)	-	-	**(500,000)**
In-Kind Services				
Attorney Srvcs./IT/Chambers -FY23	-	82,133	-	**82,133**
Attorney Srvcs./IT/Chambers -FY22	-	241,204	-	**241,204**
Attorney Srvcs./IT/Chambers -FY 21	-	325,235	-	**325,235**
Attorney Srvcs./IT/Chambers -FY's16-20	-	366,982	-	**366,982**
Repayment	-	(125,000)	-	**(125,000)**
Inter-Fund Loans				
2023 Loan to Extraction Fund-Estimated*	-	-	367,814	**367,814**
Repayment of Adv. Of Funds to IWVWD**	-	-	500,000	**500,000**
Repymt of Adv. Of Funds to Kern Cty-YE Est***	-	-	142,200	**142,200**
Repymt of City of Ridgecrest In-Kind Srvcs-Est****	-	-	125,000	**125,000**
Postponed Invoice Payments				
None	-	-	-	**-**
Total	-	890,554	1,135,014	**2,025,568**

*Estimated and included in proposed budget**

*IWVWD used restricted Augmentation Revenue to repay the Advance Agreement***

Repayment of the IWVWD Advance requires a transfer from the Extraction Fund to the Augmention Fund.

*Kern Cnty Repymnt was $500k but it is estimated only $142,200 will be loaned from the Augmentation Fund at YE****

City of Ridgecrest In-Kind Services includes services associated with Extraction and Augmentation expenses.

*Actual Loan for City of Ridgecrest from Augmentation to Extraction will be reconciled at Year-End.*****

IWVGA

AS of August 31, 2023

ADOPTED 2023 OBLIGATION REPAYMENTS

	Kern County	City of Ridgecrest	Augmentation Fund	**Total**
Advance Agreements				
Advance of Funds-Est. Repayment 12/31/2022	-	-	-	**-**
In-Kind Services				
Attorney Services/IT/Council Chambers	-	500,000	-	**500,000**
Financing				
Water Purchase related Financing- TBD	-	-	-	**-**
	-	500,000	-	**500,000**

Upon repayment of Obligations, an inter-fund loan will be created between the Extraction Fund and Augmentation Fund for amount not funded by the Extraction Fund.

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IWVGA ADMINISTRATIVE OFFICE

MEMORANDUM

DATE: September 9, 2023

TO: IWVGA Board Members

FROM: Carol Thomas-Keefer
IWVGA General Manager

SUBJECT: Authorization to Award Contract for Audit Services – CY 2022 through 2024

DISCUSSION

The Indian Wells Valley Groundwater Authority ("Authority") was formed under a Joint Powers Agreement ("JPA"). As such, the Authority's financial accounts and records are subject to an annual audit by a certified public accountant (Government Code, § 6505). Section 9.06 of the JPA states "The Board shall contract with a certified public accountant to audit the accounts and records of the Authority as required by applicable accounting practices and the Act."

The Authority is due for a financial audit of fiscal year 2022 (January 1 through December 31, 2022). Brown Armstrong Certified Public Accountants conducted IWVGA's past four audits, and for 2022 the IWVGA Board determined that a new proposal solicitation was in order. Consequently, the IWVGA Board approved and staff issued a Request for Proposals for Audit Services for Calendar Year 2022 through 2024 with the opportunity to extend the contract for CY 2025 and 2026. The RFP was provided to several audit firms and posted on the IWVGA website.

In response to the RFP, IWVGA received one proposal for audit services from the firm of Nigro & Nigro and found it to be responsive. Staff interviewed the firm's representatives, reviewed the firm's qualifications, and believe the firm of Nigro & Nigro is well-qualified and can meet IWVGA's schedule and audit needs.

FINANCIAL IMPACT

The audit cost, as proposed, will not exceed $18,500 for each year's audit (2022 – 2024) and is slightly less than the total amount paid to Brown Armstrong for the CY 2021 audit. The three-year term will allow for a known and consistent audit budget for that period.

RECOMMENDATION

Staff recommends that the Board approve and authorize the General Manager to accept the proposal from Nigro & Nigro for audit services for CY 2022 through 2024, with the option to extend the contract for two additional years.

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PROPOSAL FOR PROFESSIONAL AUDITING SERVICES
Indian Wells Valley Groundwater Authority

For the Fiscal Years Ending
December 31, 2022-2024
(with option for two subsequent years)

Respectfully Submitted on June 26, 2023 by:
Paul J. Kaymark, CPA
Nigro & Nigro, PC
pkaymark@nncpas.com
Federal Tax ID: 30-0636241
Nncpas.com
Murrieta Office: 25220 Hancock Ave. #400, Murrieta, CA 92562 • P: (951) 698-8783 • F: (951) 699-1064
Walnut Creek: 2121 N. California Blvd. #290, Walnut Creek, CA 94596 • P: (844) 557-3111 • F: (844) 557-3444

Let's Work Together!

By applying our financial expertise, we partner with our clients to build valuable relationships that inspire success.

TABLE OF CONTENTS

NIGRO & NIGRO PC

A Professional Accountancy Corporation

June 26, 2023

Carol Thomas-Keefer, General Manager
Indian Wells Valley Groundwater Authority
100 W California Ave
Ridgecrest, CA 93555

Dear Carol

Thank you for the opportunity to submit this proposal to continue providing audit services for the Indian Wells Valley Groundwater Authority (Authority). Our understanding of the work to be done is: the annual audit of the Authority's financial statements for the fiscal years ending December 31, 2022-2024, with an option to extend for two additional years. Based on our history with water agencies, I believe our firm would be a great fit, and we would develop a great working relationship. Our staff works hard to help ensure our audits are completed with the highest level of service and meet all deadlines.

Currently, our current State Water Project clients are as follows:

Palmdale Water District, Littlerock Creek Irrigation District and San Gorgonio Pass Water Agency

Although many people think that all water agencies function in the same manner, we know that's not the case. The audit leadership team we've assigned to your Authority, including myself, will take the time to learn the intricacies of your organization. We find that by delving deep into our client's structure and operations we are able to make recommendations that are not only useful, but also practical to implement.

At Nigro & Nigro, PC, our greatest strengths correspond to your most critical needs; we possess the full spectrum of resources needed to most effectively help the Authority's management team and Board members meet their goals – all at a very competitive rate. We believe we are your best choice.

- **Credibility, Reputation, and Resources of a Large Firm** without sacrificing the small-firm touch. Our CPAs and consultants can help you analyze and address financial, operational, and regulatory issues so you can focus attention on serving your citizens. We were originally formed in 1999, and now perform annual audits for approximately 80+ public agencies annually.

- **State-Wide Reach with Local Presence.** At Nigro & Nigro, we have the benefit of having the resources of a state-wide firm while serving you from our Murrieta office. We also have an office in Walnut Creek for additional resources.

- **Efficiency.** Our use of portal software allows you to upload audit documentation at any time, which will minimize disruption to your staff and enable timely completion of all deliverables.

Jeff Nigro, CPA, CFE | Elizabeth Nigro, CPA | Shannon Bishop, CPA | Peter Glenn, CPA, CFE | Paul J. Kaymark, CPA | Jessica Berry, CPA | Angelika Vartikyan, CPA

MURRIETA OFFICE 25220 Hancock Avenue, Suite 400, Murrieta, CA 92562 • P: (951) 698-8783 • F: (951) 699-1064
WALNUT CREEK OFFICE 2121 N. California Blvd. Suite 290, Walnut Creek, CA 94596 • P: (844) 557-3111 • F: (844) 557-3444
www.nncpas.com • Licensed by the California Board of Accountancy

- **An Efficient and Effective Work Plan.** We currently serve over 80+ governmental entities state-wide, which enables our staff to understand the scope of the audit. We also understand the Authority's complexities, not just from a compliance standpoint but also from an operational point of view. We have developed an effective work plan that takes into consideration your needs for high quality audit services, as well as timely deliverables. As a result of our efficient work plan, we commit to meeting your deadlines to complete our auditing services within the time period you specify.

- **Thought Leadership.** Members of our firm have been actively involved as presenters in numerous industry conferences and programs, including the GFOA, CSDA, and CSMFO. We have incorporated our experience with these committees into our audit framework.

- **Engagement Team.** We know that quality people drive quality results, which is why our commitment to you starts with the engagement team members who are selected based on their experience, focus on serving local government agencies, and who are the best fit for you. Each of the Authority's engagement team members have completed and exceeded the mandatory requirement for continuing professional education hours as requested in the RFP. Paul Kaymark, Partner, will be the main contact for the Authority regarding this project.

- **A Focus on Providing Consistent, Dependable Service to Government Entities.** Nigro & Nigro is organized by industry, affording our clients with industry-specific expertise supplemented by valuable local service and insight. Therefore, the Authority will enjoy the service of members of our Governmental Audit Services Team who have experience with similar governmental entities and understand the issues and environment critical to you. You will not have to train our auditors.

You may have many options in selecting a professional audit firm. By choosing Nigro & Nigro, you will gain value-added accounting and operational insights. We are the right fit for the Authority, as we have the expertise and depth of resources within our firm to offer you exceptional service while maintaining a sincere and honest relationship. We understand the work, we are committed to meeting your deadlines, and we would like the opportunity to continue to be your auditors. We also commit to meeting or exceeding your expectations.

Thank you once again for the opportunity to present our qualifications. If you have any questions about our offerings, please do not hesitate to contact me.

Sincerely,

Paul J. Kaymark, CPA
Audit Services Partner

AICPA Governmental Audit Quality Center

LICENSE TO PRACTICE IN CALIFORNIA

The Firm and its entire CPA staff hold licenses to practice in the State of California. The Firm's CPA's are all members in good standing with the California Society of CPA's and the AICPA. We will assign a California licensed CPA as the auditor in charge of the audit.

PROFILE OF THE FIRM

Statement of Independence

Our standards require that we be without bias with respect to your operations. The Firm is independent of all entities listed in the RFP, as defined by auditing standards generally accepted in the United States of America and the U.S. General Accounting Office's "Governmental Auditing Standards". In addition, the Firm shall give the Authority written notice of any relevant professional relationships entered into during the period of this agreement.

Experience

Nigro & Nigro team members are highly trained in governmental accounting and auditing, which sets us apart as being able to add value beyond the basic attest engagement. We are comfortable working with clients of various sizes. Within the past five years, we have worked with numerous governmental clients with revenues ranging from $200,000 to over $300 million.

Prior to any audit engagement, our engagement team leader will meet with the Board, Audit Committee and Management to gain a full understanding of the philosophy, objectives and policies for operating the organization, as well as to discuss significant business, regulatory and accounting matters that will affect the audit. At the conclusion of the audit, we will communicate the results of the audit with the Board, Audit Committee and Management.

Areas of specialization include:

- Audit and Review Services
- Government Auditing Standards & Single Audits
- Annual Report of Financial Transactions
- Agreed Upon Procedures Engagements
- Comprehensive Annual Financial Report (CAFR) development

PROFILE OF THE FIRM (CONTINUED)

Size of Our Firm

Firm-wide, we have the following staffing for our governmental audit services:

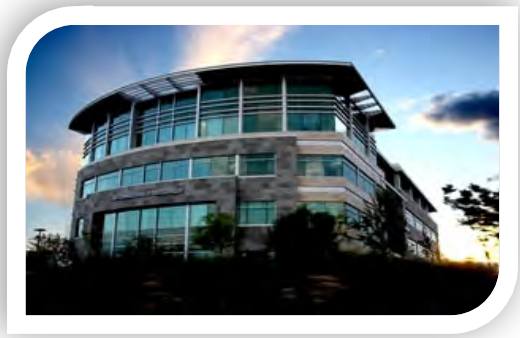
Position	Number of Employees	Number of Licensed CPA's
Partner*	7	7
Senior Manager	1	1
Manager	3	1
Supervisor	5	-
Senior	5	1
Associates	10	-
Support Staff	5	-
Total	**36**	**10**

**Although the term "partner" is used throughout this proposal to avoid confusion, the firm is organized as a Professional Corporation, and the firm's owners are "shareholders."*

Size and Location of Offices

The firm was originally established in 1999. In 2013, we opened our second office in Northern California in order to better serve our growing client base of agencies in the San Francisco Bay Area. The Firm now has five partners and a professional staff of 18 accountants and expects to add more in the coming years as we continue to grow. We are a full service firm, providing audit and review, tax, consulting, and accounting services to local government, non-profit organizations, charter schools, commercial businesses and homeowners' associations. The office serves clients of all sizes and industries, however, we focus on government agencies, just like yours.

We are prepared to do what it takes to provide the extra level of service required to maintain a long-term business relationship.



MURRIETA OFFICE

WALNUT CREEK OFFICE

Range of Activities Performed

- Consulting and other services for numerous other agencies and not-for-profits
- Tax services for individuals, corporations, and non-profit organizations

PROFILE OF THE FIRM (CONTINUED)

Peer Review

Our firm's most recently issued peer review report can be found under the "Additional Documents" section of the proposal. A firm can receive a "Fail", "Pass with Deficiencies", or a "Pass" rating. The firm's most recent peer review report rating was a Pass. This rating indicates that the firm's system of quality control has been suitably designed and complied with to provide the audit organization with reasonable assurance of performing and reporting in conformity with professional standards and applicable legal and regulatory requirements in all material respects. As required by our membership in the Government Audit Quality Center (GAQC), the peer review included a selection of a sample of governmental audit engagements.

Meet Your Audit Leadership Team

Listed on the following pages are the resumes of the management team that will be assigned to your audit. As mentioned previously, our staff members have considerable governmental audit experience. This gives us a pool to draw on in addition to the group listed.

Name	Role	Years of Experience in Audits
Paul J. Kaymark, CPA	Lead Partner	29
Peter Glenn, CPA	Review Partner	15
Jared Solmonsen, CPA	Audit Manager	5
Stacy Macias	Audit Supervisor	5
Anabel Cruz, CPA	Audit Senior	4

Paul J. Kaymark, CPA

Lead Audit Partner

Paul joined the firm in 2019 and has more than 26 years of previous public accounting and auditing governmental entities experience. Paul is our choice for new governmental audit clients, having extensive experience in the areas of governmental entities. His main responsibilities include assistance in the preliminary planning of audit work, review of assistants' work, and performing audit procedures in more complex audit areas.

Audit Services:

Mr. Kaymark has been working on audit engagements of governmental agencies, not-for-profit organizations, as well as for-profit corporations and companies. His previous experience includes audit and consulting work for large and small businesses with a focus on client service. Paul strives to build strong relationships with his clients by assisting them with any emerging issues and being available as a resource.

Consulting Services:

Mr. Kaymark has experience in a variety of governmental issues, garnered from his auditing experience over the years. He regularly consults with clients in areas of:

Special District Accounting:

- Internal controls
- Financial reporting
- Annual report of financial transactions

Financial Reporting:

- Year-end closing procedures
- Cash flows
- Budget development and projections
- Multi-Year projections
- Pension and OPEB accounting

Some Agencies Served:

- Palmdale Water District
- Mojave Water Agency
- Western Municipal Water District
- El Toro Water District
- East Orange County Water District
- Trabuco Canyon Water District

California Special Districts Association
Districts Stronger Together

CSDA Workshop Speaker

AICPA Governmental Audit Quality Center

Education:

Bachelor of Science, Business Administration, Accountancy
California State University, Long Beach
1994

Licenses and Certifications:

- Certified Public Accountant, California
- GFOA Certificate for Excellence in Financial Reporting - Reviewer

Professional Affiliations:

- Government Finance Officers Association (GFOA)
- California Society of Municipal Finance Officers (CSMFO)
- California Special District Association (CSDA)

Continuing Education:

Various municipal accounting courses offered by the AICPA, CalCPA Education Foundation including:

- Governmental and Nonprofit Annual Update
- GASB Basic Financial Statements for State and Local Governments
- Single Audits: Uniform Grant Guidance (formerly OMB Circular A-133)
- Financial Accounting Standards Board Annual Updates

CalCPA

Water and Wastewater Clients Audited and/or Consulted With Over My Career

Water and Wastewater	Water and Wastewater, continued
Metropolitan Water District of Southern California	Phelan Pinon Hills Community Services District
Los Angeles County Sanitation District	Pomona Valley Protective Agency
Long Beach Water Department	Purissima Hills Water District
Glendale Water and Power	Rincon del Diablo Water District
Colton Public Utilities	Rosamond Community Services District
Baldy Mesa Water District	Rossmoor Los Alamitos Area Sewer District
Bear Valley Community Services District	Sacramento Suburban Water District
Beaumont-Cherry Valley Water District	San Bernardino Valley Water Conservation District
Big Bear City Community Services District	San Gabriel Valley Municipal Water District
Cabazon Water District	San Lorenzo Valley Water District
California Domestic Water Company	Santa Ana Watershed Project Authority
Casitas Municipal Water District	Santa Margarita Water District
Castaic Lake Water Agency	Saticoy Sanitary District
Chino Basin Water Conservation District	Solano County Water Agency
Chino Basin Watermaster	Soquel Creek Water District
Coachella Valley Water District	Stallion Springs Community Services District
Diablo Water District	Summerland Sanitary District
East Orange County Water District	Trabuco Canyon Water District
El Toro Water District	Tres Pinos Water District
Farm Mutual Water Company	Triunfo Sanitation District
Golden Hills Community Services District	Twentynine Palms Water District
Goleta Water District	Vallecitos Water District
Hi-Desert Water District	Valley County Water District
Inverness Public Utilities District	Ventura Regional Sanitation District
Irvine Ranch Water District	Victor Valley Water District
Joshua Basin Water District	Victor Valley Wastewater Reclamation Authority
Jurupa Community Services District	Victorville Water District
Leucadia Wastewater District	Water Facilities Authority - Joint Power Agency
Mesa Consolidated Water District	Water Replenishment District
Mojave Water Agency	West County Agency
Monte Vista Water District	West County Wastewater District
Montecito Water District	West Valley Water District
North Coast County Water District	Westborough Water District
North Marin Water District	Western Municipal Water District
Novato Sanitary District	Western Riverside County Regional Wastewater
Palmdale Water District	Yorba Linda Water District

Peter Glenn, CPA

Review Partner

Peter joined the firm in 2011 after nearly three years of previous public accounting and auditing experience. Peter will work under the general direction of the partner. Peter is our choice for new governmental audit clients, having successfully worked on each of the Firm's clients since beginning with the Firm. His main responsibilities include assistance in the preliminary planning of audit work, review of assistants' work, and performing audit procedures in more complex audit areas.

Audit Services:

Peter Glenn began his auditing career with Nigro & Nigro in 2011, participating in audits of special districts, LEAs, other governmental audits, and agreed-upon procedure engagements. Prior to joining the firm, he worked for three years at another public accounting firm, developing his auditing skills. He has previously been the in-charge accountant for some of the firm's largest clients.

Consulting Services:

Mr. Glenn has experience in a variety of governmental accounting issues, derived from his auditing experience at the firm. He regularly consults with clients in areas of:

Special District Accounting:

- Internal controls
- Financial reporting & GASB 34
- Annual report of financial transactions

Financial Reporting:

- Uniform Guidance
- Performance Audits
- Year-end closing procedures
- Cash flows
- Budget development and projections
- Multi-Year projections

Other Agencies Served:

- Palmdale Water District
- Mojave Water Agency
- Western Municipal Water District
- El Toro Water District
- East Orange County Water District
- Trabuco Canyon Water District

Education:

Bachelor of Science, Business Administration, Accounting
California State University,
San Marcos, 2008, Magna Cum Laude

Licenses and Certifications:

- Certified Public Accountant, California

Continuing Education:

- CASBO Annual Conference
- SSC Finance & Management Conferences
- Government Accounting & Auditing Conference
- In-house training for audit staff (presenter)

AICPA Governmental Audit Quality Center

CalCPA

Jared Solmonsen, CPA

Manager

Jared joined the firm in 2019 as a Staff Accountant. After completing his degree, Jared went to work for a midsize construction company where he worked as an estimator and project manager before transitioning into more of an accounting and finance role. It was working in this role that led him to the decision to pursue the goal of becoming a Certified Public Accountant. He continues to hone his skills and expand his knowledge as he branches out into different areas of accounting services and working with various governmental agencies and not-for-profit organizations. Jared will work under the general supervision of the partner and oversee staff as they work together through different audit areas.

Audit Services:

Jared began his career with Nigro & Nigro working on LEA audits before transitioning to focus on special districts and not-for-profit organizations. He focuses on a customer-oriented approach to auditing, striving to build strong relationships by working with clients to help them navigate the ever-changing world of accounting rules and standards.

Consulting Services:

Jared has experience with a variety of governmental and not-for-profit accounting issues, as well as other tax and audit concerns, derived from his audit and consulting experience at the firm. He regularly consults with clients in the areas of:

Special District Accounting:

- Internal control policies, procedures, and best practices
- Year-end closing procedures
- Capital asset and depreciation schedule

Financial Reporting:

- Federal and state compliance
- Single audits
- Revenue and expense tracking by program/grant
- Statement of functional expense
- Compiling financial statements
- Disclosure requirements

Other Agencies Served:

- Palmdale Water District
- Scotts Valley Water District
- Oxnard Harbor District
- Big Bear City Airport District
- Pauma Valley Community Services District
- North County Fire Protection District
- San Gabriel Valley Mosquito & Vector Control District
- Ventura County Resource Conservation District
- Tehachapi Valley Recreation & Park District
- Murrieta Valley Cemetery District

Education:

Bachelor of Science, Business Administration, Finance
California State University, San Marcos, 2013

Licenses and Certifications:

- Certified Public Accountant, California

Continuing Education:

- AICPA webinars and CPE
- California Special Districts Association Conference
- Spidell Tax Seminar
- In-house training for audit staff (presenter)

Additional Areas:

- Tax preparation
- QuickBooks knowledge

Stacy Macias

Supervisor

Stacy joined the firm in 2018 as a staff accountant after completing her degree at California State University, Chico and has worked her way up to Senior Accountant. Stacy has worked in a variety of the firm's audit and tax departments. Stacy continues to expand her knowledge as she branches out into different areas of accounting services and working with varying governmental and not-for profit clients. Stacy will work under the general direction of the partner and oversee staff as they work together through different audit areas.

Audit Services:

Stacy began her auditing career on audit engagements of local education agencies, charter schools, governmental agencies, and non-for-profit organizations. Stacy enjoys auditing governmental agencies and non-for-profit due to their varying structures and sizes. Stacy truly values customer service and building client relationships. Her friendly demeanor makes clients comfortable in reaching out to her during the audit process or throughout the year.

Consulting Services:

Stacy has experience in a variety of governmental and not-for-profit accounting, tax, and audit concerns, derived from her audit and consulting experience those industries. She regularly consults with clients in the areas of:

Financial Reporting:

- Year-end closing procedures
- Internal control policies and procedures and best practices
- Compiling Financial Statements
- Revenue and Expense tracking by program/grant
- Statement of Functional Expenses
- Capital assets and depreciation schedules
- Disclosure requirements
- Federal and State compliance

Additional Areas:

- Tax preparation
- QuickBooks knowledge

Other Agencies Served:

- Palmdale Water District
- Ventura County Conservation District
- Antelope Valley Resource Conservation District
- Rowland Water District
- North County Fire Protection District
- Bolinas Fire Protection District
- Bodega Bay Fire Protection District

Education:

Bachelor of Science, Business Administration, Accounting
California State University, Chico, 2018

Licenses and Certifications:

- CPA License Candidate (expected licensure in 2023)

Continuing Education:

- CalCPA Conferences for Governmental Accounting and Auditing and Not-for-profit Organizations
- Spidell Tax Seminar
- Western CPE Tax update webinars
- In-house training for audit staff (presenter)

Anabel Cruz, CPA

Audit Senior

Anabel began her career in public accounting in 2019 with Nigro & Nigro, PC. Previous to joining the firm, she worked as an Accountant at private sector companies. She has passed the CPA examination and is working towards meeting the requirements needed for licensure. Anabel's audit experience includes audits of governmental and not-for-profit organizations such as cemeteries, resource conservation districts, water Districts, fire Protection Districts and community Service Districts. Anabel values building quality relationships with clients while providing timely and reliable services. Anabel is working under the general direction of the Audit Supervisor.

Audit Services:

Anabel has experience with a variety of governmental and not-for-profit accounting issues derived from her audit and consulting experience at the firm. She regularly consults with clients in the areas of:

Consulting Services:

Anabel has experience in a variety of governmental and not-for-profit accounting and audit concerns, derived from her audit and consulting experience those industries. She regularly consults with clients in the areas of:

Financial Reporting:

- Year-end closing procedures
- Agreed upon procedures
- Internal control policies and procedures and best practices
- Capital assets and depreciation schedules

Other Agencies Served:

- Palmdale Water District
- North County Fire Protection District
- Ventura County Resource Conservation District
- County of San Bernardino ATC
- Winters Cemetery District

Education:

Bachelor of Science, Finance and Accountancy
California State University, Northridge, 2014

Licenses and Certifications:

- Certified Public Accountant, California

Continuing Education:

- Government Accounting & Auditing Conference
- Not-For-Profit Organizations Conference
- In-house training for audit staff

PROFILE OF THE FIRM (CONTINUED)

Training & Resources

The Firm is committed to a continuing professional education program, which emphasizes the areas of expertise of each member of our professional staff. The Firm is required to comply with the *Government Auditing Standards* for each professional practicing in the area of governmental accounting and auditing. We are committed to follow those standards, which result in quality audit services, including continuing education for all staff of 60-80 hours each year, specifically in school districts and governmental auditing. As required by *Government Auditing Standards*, all governmental audit staff receives the required continuing education in the area of governmental auditing and accounting. These policies are monitored internally, reviewed annually and certified periodically by independent peer review.

Library facilities are maintained which include current professional literature and specific information for the industries that we serve. The Firm library is also reviewed as part of the external quality review program. The Firm has in-house training programs specific to our school district clients. We also perform auditing and accounting updates for our clients that are organized by our staff. These practices ensure the quality of our staff over the term of the engagement.

Our staff participates in activities relating to government accounting and reporting issues through our membership and involvement with the following organizations:

a. American Institute of CPA's Governmental Audit Quality Center
b. California Society of CPAs
c. Government Finance Officers Association (GFOA)
d. California Special Districts Association (CSDA)
e. Government Accounting Standards Board (GASB)
f. Association of Certified Fraud Examiners (ACFE)

We recognize that our most important product is prompt and effective service.

Through our participation in these organizations and continuing education provided by them, the Firm continues to stay abreast of all current governmental accounting and reporting issues. Some of the professional education our audit team members have either presented at or attended in the last two years include:

- SSC Annual Finance and Management Conference
- SSC Governor's Budget Workshop
- CSDA Annual Conference
- CSMFO Conference
- GFOA Annual Conference
- Various other governmental workshops

We recognize that our most important product is prompt and effective service. We believe the Authority should work with its CPA firm throughout the entire year. We are available at any time throughout the year to provide any assistance you may need.

PROFILE OF THE FIRM (CONTINUED)

Similar Engagements with Other Special District Water Districts

We currently conduct over 80+ government audits each year and have well rounded experience with local governmental agencies. We are excited for the opportunity to devote our attention to you and your specific needs. Below is a partial list of some similar governmental clients we are currently auditing.

Please contact our clients for a Reference of our services!

Let's start with our State Water Contractor clients:

Palmdale Water District – Dennis Hoffmeyer, CFO (661) 456-1021

Littlerock Creek Irrigation District – Gina Burroughs, OM (661) 944-2015

San Gorgonio Pass Water Agency – Thomas Todd, CFO (951) 845-2577

ACFR Preparation Clients:

Costa Mesa Sanitary District – Kaitlin Tran, FM (949) 645-8400

Hi-Desert Water District – Tanya Gruwell, CFO (760) 228-6271

Las Gallinas Valley Sanitary District – Dale McDonald, ASM (415) 526-1519

Scotts Valley Water District – Nicolas Kuns, FM (831) 600-1904

Trabuco Canyon Water District – Michael Perea, AGM (949) 858-0277

Other Water District Clients:

Calleguas Municipal Water District – Dan Smith, MAS – (805) 579-7132

Montecito Water District – Olivia Rojas, BM (805) 969-2271

Rowland Water District – Myra Malner, DF (562) 697-1726

*** Please check the websites of these above noted clients to review the Financials prepared by our Firm.**

SCOPE OF THE AUDIT

We will audit the basic financial statements of the Authority for the fiscal year ended June 30, 2023-2025 in accordance with the following standards:

- Auditing Standards Generally Accepted in the United States of America
- *Government Auditing Standards*, issued by the Comptroller General of the United States
- Minimum Audit Requirements and Reporting Guidelines for Special Districts

Our audit will be for the purpose of expressing an opinion on the basic financial statements, and will include such auditing procedures as considered necessary to accomplish this purpose. We will also provide an "in-relation-to" opinion on any other supplemental information and statistical schedules. We anticipate issuing the following reports:

- Independent Auditors' Report on the basic financial statements.
- Independent Auditors' Report on Internal Control Over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards.*

In addition, we will provide the Authority with a management letter that will give written appraisals of its accounting and related systems. This letter will identify any control deficiencies, significant control deficiencies or material weaknesses that are identified during the audit. We will work with management before audit fieldwork and during the course of the audit to assess internal controls and review mitigating controls in place in an effort to reduce the control deficiencies, significant control deficiencies and material weaknesses that need to be reported to management in writing, assuming there are mitigating controls in place. The letter will also offer recommendations for the elimination of weaknesses that we identify, and we will suggest any methods we discover to help improve efficiency and effectiveness.

We will schedule an appearance with the Board and the Audit Committee that allows an opportunity for us to present the audit and management letter. This is an excellent time for the Authorityto resolve any questions it has regarding our audit or management letter. As mentioned earlier, the value in hiring our Firm comes from not only the audit, but from our experience and the education, we can provide. We hope that as questions or concerns arise throughout the year, the Authority staff will contact us and draw on our knowledge and experience.

Non-significant deficiencies discovered during the audit process shall be reported in a separate letter to management, the Board and the Audit Committee, which shall be referred to in the report(s) on internal controls. This separate letter also informs the Board and the Audit Committee of the following:

1) The auditor's responsibility under auditing standards generally accepted in the United States of America.
2) Significant accounting policies.
3) Management judgments and accounting estimates.
4) Significant audit adjustments.
5) Other information in documents containing audited financial statements.
6) Disagreements with management.
7) Management consultation with other accountants.
8) Major issues discussed with management prior to retention.
9) Difficulties encountered in performing the audit.

All working papers and reports will be retained at the Firm's expense for a minimum of seven (7) years, unless the Firm is notified in writing by the Authority of the need to extend the retention period.

SCOPE OF THE AUDIT(CONTINUED)

Segmentation of Engagement

STEP 1: Planning
Our goal in preliminary fieldwork is to gain a thorough understanding of your internal controls, processes and procedures. Our goal is to accomplish as much interim fieldwork as possible so that our stay during final fieldwork is kept to a minimum. Our preliminary work focuses on planning and internal control documentation.

STEP 2: Interim Field Work

Internal Control Documentation
Our internal control documentation usually occurs during interim fieldwork. Our documentation process will be as follows:

1) Gather or update documentation for significant processes defined in our preliminary fieldwork.
2) Perform a "walk-through" of these significant processes.
3) Ask "what can go wrong" questions.
4) Identify controls in place. This will include both preventative and detective controls.
5) Evaluate the design of internal controls.
6) Decide whether to test and rely on controls.
7) Summarize preliminary fieldwork and submit management letter of all areas of concern.

STEP 3: Final Fieldwork
We assess risks, design procedures and obtain evidence to support financial statement amounts and disclosures during final fieldwork. Our Firm utilizes a methodology designed specifically for special districts. Our process emphasizes continuous communication with our staff.

Assess Risks and Design Procedures
As outlined in the risk based statements of audit standards (SAS 104 to 111), our Firm uses a risk-based approach to the audit. Our procedures to assess risks and design procedures are as follows:

1) Assess risk of material misstatement from errors or fraud based on internal controls combined with inherent risk of significant accounts.
2) Design procedures to test controls if considered necessary.
3) Design procedures to test details of account balances and classes of transactions based on risk.

Interim and Year End Testing
1) Perform tests of controls if considered necessary.
2) Perform tests of details of account balances and classes of transactions.
3) Evaluate quality and sufficiency of audit evidence.
4) Evaluate misstatements.

STEP 4: Audit Completion

Preparation of Audit Report and Management Letter
After reviewing the financial statements, notes and required supplementary schedules, we will agree the data to our working papers and provide a thorough review of all information by using written Firm standards and checklists. We will also review and incorporate any statistical data. This will verify appropriate presentation and disclosure. We will also at this time prepare our management letter that identifies financial trends and recommendations for improvement, reports required communications to the governing board, and discusses change in the environment in which the Authority operates.

SCOPE OF THE AUDIT (CONTINUED)

Proposed Schedule/Level of Staff & Number of Hours Assigned to Each Segment

We will provide a detailed audit plan and prepare a list of schedules upon proposal acceptance. The following table summarizes our proposed segmentation of the engagement by date, segment, and level of staff:

	Total Hours			
Date/Segment	**Partner/Manager**	**Supervisor**	**Staff/Admin**	**Total**
December				
Preliminary planning and fieldwork	10	4	10	24
January/February				
Interim fieldwork	15	16	20	51
March/April				
Final fieldwork, report preparation, review, finalization, and presentation	25	20	25	70
Total hours	**50**	**40**	**55**	**145**
Preliminary planning and fieldwork	10	4	10	24
Control	15	16	20	51
Substantive	10	10	15	35
Reporting	15	10	10	35
	50	40	55	145

Sample Size and the Extent to Which Statistical Sampling is to be Used

We perform sampling techniques and determine sample size after assessing the risk associated with specific transaction classes. No single "cookie-cutter" approach will be followed in regards to sampling techniques, but the Authority can be assured that an appropriate sampling methodology will be utilized. We use the following methods of sampling during our audits: statistical, haphazard, and judgmental. For statistical sampling we use guidance provided by the AICPA and by federal guidelines in accordance with industry standards, which typically recommends sample sizes between 40 to 60 items.

Type and Extent of Analytical Procedures to be Used

We will perform analytical procedures throughout the course of our audit. Professional standards require that analytical procedures be performed in the planning and wrap-up stages of the audit. Analytical review will be used during our expenditure, revenue, budget information as well as many other areas.

These procedures typically entail a review of interim reports, budgets, and comparisons to prior year data. We also use financial statement amounts to calculate certain ratios to determine whether any unusual or unexpected relationships exist in the financial data.

These procedures are then followed by inquiry of key Authority personnel to corroborate the auditors' expectations based on the data.

SPECIFIC AUDIT APPROACH (CONTINUED)

Approach to be Taken to Gain and Document an Understanding of Internal Control Structure(s)

Our audit approach will entail interviews with key personnel in the Authority involved in the design and implementation of internal controls. In conjunction with the interviews, we will perform tests and observations of how well the controls function. Key areas of internal control generally include: cash receipting, accounts payable/purchasing, payroll/personnel, technology, facilities, and maintenance and operations.

Approach to be Taken in Determining Laws and Regulations That Will be Subject to Audit Test Work

We are required to obtain an understanding of the possible financial statement effect of laws and regulations that have a direct and material effect on the determination of financial statement amounts. The determination of laws and regulations is addressed in the planning stage through reading available grant documentation, inquiry of the client, a preliminary review of finance system accounts and search of the Board minutes. We also have working knowledge of the types of laws and regulations under which California special districts operate. We also obtain further information about federal laws and regulations through the Catalog of Federal Domestic Assistance (CFDA) and the Uniform Guidance.

Approach to be Taken in Drawing Audit Samples

Since each program or grant agreement is different, we use many different approaches to sampling in our tests of compliance. The size of the sample considers many factors; size and risk of the program, program maturity, complexity, level of oversight and prior audit findings. AICPA Guidelines generally recommend sample sizes of 25, 40, or 60 items when the population is greater than 250. Ultimately, our professional judgment determines that a representative number of transactions have been selected. You can be confident in our judgment because our peer reviews and an outside review by the U.S. Department of Education have all accepted our audit sampling techniques and procedures.

Use of Technology/Remote Proficiency

In order to facilitate the exchange of data between us and our clients in a secured manner throughout the course of the audit, we employ the use of an online secured portal. Our clients have appreciated this unique and forward-thinking platform which helps minimize duplicate requests and unnecessary email and phone exchanges to request and receive audit documentation. The software is very user-friendly and easy to understand. This also allows us to perform much of the audit remotely without being onsite to reduce our carbon footprint.

AUDIT FEES

Professional	Hours	Rates Standard	Rates Quoted	Total
Partner	20.00	$ 200.00	$ 175.00	$ 3,500.00
Manager	30.00	175.00	150.00	4,500.00
Senior	40.00	150.00	125.00	5,000.00
Staff Members	55.00	125.00	100.00	5,500.00
Admin	-	100.00	75.00	-
Subtotal	145.00			18,500.00
Out-of-Pocket - Included in Rates (We Are Local)				-
Total Max				$ 18,500.00

Fiscal Year	FY 2022	FY 2023	FY 2024	Total
Audit	$ 18,000	$ 18,000	$ 18,000	$ 54,000
State Controller's	$ 500	$ 500	$ 500	$ 1,500
Total	$ 18,500	$ 18,500	$ 18,500	$ 55,500

Same Price for FY 2025 and FY 2026

Federal Single-Audit $5,000 per major program if not clustered

ADDITIONAL INFORMATION

Testimonial

"Few people have the opportunity to work with someone who was a coach and a mentor-but I did when I worked with Paul. I had the pleasure working directly under Paul's supervision and I was particularly impressed by his ability to handle even the toughest clients – and effortlessly. That skill often takes years to develop, but it seemed to come perfectly natural to him. Paul was one of those rare partners who also naturally serve as an inspiring mentor for the whole staff and I was grateful to learn a lot from him."

Deana Miller
Accounting Manager
PolyCera, Inc.

Fraud Hotline

Throughout the audit process, we will make available our fraud hotline reporting service at no additional charge over the period of the contract to ensure the Authority has an effective anti-fraud program.

ADDITIONAL DOCUMENTS

SPAFFORD AND LANDRY CPAs

HERE TO MAKE THE COMPLEX SIMPLE.

Patrick D. Spafford, CPA
Todd C. Landry, CPA

Licensed by the California Board of Accountancy
Member: American Institute of Certified Public Accountants

Report on the Firm's System of Quality Control

To Nigro & Nigro, PC
and the Peer Review Committee of the California Society of CPAs

We have reviewed the system of quality control for the accounting and auditing practice of Nigro & Nigro, PC (the firm) in effect for the year ended August 31, 2020. Our peer review was conducted in accordance with the Standards for Performing and Reporting on Peer Reviews established by the Peer Review Board of the American Institute of Certified Public Accountants (Standards).

A summary of the nature, objectives, scope, limitations of, and the procedures performed in a System Review as described in the Standards may be found at www.aicpa.org/prsummary. The summary also includes an explanation of how engagements identified as not performed or reported in conformity with applicable professional standards, if any, are evaluated by a peer reviewer to determine a peer review rating.

Firm's Responsibility

The firm is responsible for designing a system of quality control and complying with it to provide the firm with reasonable assurance of performing and reporting in conformity with applicable professional standards in all material respects. The firm is also responsible for evaluating actions to promptly remediate engagements deemed as not performed or reported in conformity with professional standards, when appropriate, and for remediating weaknesses in its system of quality control, if any.

Peer Reviewer's Responsibility

Our responsibility is to express an opinion on the design of the system of quality control and the firm's compliance therewith based on our review.

Required Selections and Considerations

Engagements selected for review included engagements performed under *Government Auditing Standards*, including compliance audits under the Single Audit Act.

As a part of our peer review, we considered reviews by regulatory entities as communicated by the firm, if applicable, in determining the nature and extent of our procedures.

Opinion

In our opinion, the system of quality control for the accounting and auditing practice of Nigro & Nigro, PC in effect for the year ended August 31, 2020, has been suitably designed and complied with to provide the firm with reasonable assurance of performing and reporting in conformity with applicable professional standards in all material respects. Firms can receive a rating of *pass*, *pass with deficiency (ies)*, or *fail*. Nigro & Nigro, PC has received a peer review rating of *pass*.

Spafford & Landry, Inc.

June 11, 2021

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 8/1/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: James Mitchell	
RANCHO CAL INSURANCE SERVICES 29930 Hunter Rd Ste 106 Murrieta, CA 92563	PHONE (A/C, No, Ext): (951)260-0190	FAX (A/C, No): (951)260-0189
	E-MAIL ADDRESS: jim@ranchoins.com	
	INSURER(S) AFFORDING COVERAGE	NAIC #
	INSURER A : Ohio Security Insurance Company	24082
INSURED	INSURER B : Amarican Fire and Casualty Company	24066
Nigro & Nigro, PC PO Box 1247 Murrieta, CA 92564	INSURER C : Sequoia Insurance Company	22985
	INSURER D : Swiss Re Corporate Solutions	29874
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [X] POLICY [ ] PRO-JECT [ ] LOC [ ] OTHER:	X	X	BZS64971750	8/15/2023	8/15/2024	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 500,000 $ 15,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY [ ] ANY AUTO [ ] OWNED AUTOS ONLY [X] SCHEDULED AUTOS [X] HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY	X	X	BAS64971750	8/15/2023	8/15/2024	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
B	[X] UMBRELLA LIAB [X] OCCUR EXCESS LIAB [ ] CLAIMS-MADE DED [ ] RETENTION $			ESA64971750	8/15/2023	8/15/2024	EACH OCCURRENCE AGGREGATE	$ 3,000,000 $ 3,000,000
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N [ ] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		QWC1302193	8/15/2023	8/15/2024	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
D	Cyber Insurance			C-4MQ8-065674-CYBER-2023	8/24/2023	8/24/2024		$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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NIGRO & NIGRO PC

A Professional Accountancy Corporation

August 14, 2023

Board of Directors and Ms. Carol Thomas-Keefer
Indian Wells Valley Groundwater Authority
100 W California Ave
Ridgecrest, CA 93555

We are pleased to confirm our understanding of the services we are to provide Indian Wells Valley Groundwater Authority (Authority) as of and for the year ended December 31, 2022.

Audit Scope and Objectives

We will audit the business-type activities and each major fund of the Authority, as of December 31, 2022 and for the year then ended and the related notes, which collectively comprise the Authority's basic financial statements as listed in the table of contents of the financial statements.

The objectives of our audit are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with auditing standards generally accepted in the United States of America (GAAS) and, if applicable, in accordance with *Government Auditing Standards*, and/or any state or regulatory audit requirements will always detect a material misstatement when it exists.

Misstatements, including omissions, can arise from fraud or error and are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

Accounting principles generally accepted in the United States of America, (U.S. GAAP,) as promulgated by the Governmental Accounting Standards Board (GASB) require that certain required supplementary information (RSI) such as management's discussion and analysis be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the GASB, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context.

As part of our engagement, we will apply certain limited procedures to the required supplementary information (RSI) in accordance with auditing standards generally accepted in the United States of America, (U.S. GAAS). These limited procedures will consist primarily of inquiries of management regarding their methods of measurement and presentation, and comparing the information for consistency with management's responses to our inquiries. We will not express an opinion or provide any form of assurance on the RSI. The following RSI is required by U.S. GAAP. This RSI will be subjected to certain limited procedures but will not be audited:

1. Management's Discussion and Analysis

We will also provide a report (that does not include an opinion) on internal control related to the financial statements and compliance with the provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a material effect on the financial statements as required by *Government Auditing Standards*. The report on internal control and on compliance and other matters will include a paragraph that states (1) that the purpose of the report is solely to describe the scope of testing of internal control and compliance, and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control on compliance, and (2) that the report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. The paragraph will also state that the report is not suitable for any other purpose. If during our audit we become aware that the Authority is subject to an audit requirement that is not encompassed in the terms of this engagement, we will communicate to management and those charged with governance that an audit in accordance with U.S. generally accepted auditing standards and the standards for financial audits contained in *Government Auditing Standards* may not satisfy the relevant legal, regulatory, or contractual requirements.

Auditor Responsibilities

We will conduct our audit in accordance with GAAS and in accordance with *Government Auditing Standards*. As part of an audit in accordance with GAAS and in accordance with *Government Auditing Standards*, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

1. Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

2. Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Authority's internal control. However, we will communicate to you in writing concerning any significant deficiencies or material weaknesses in internal control relevant to the audit of the financial statements that we have identified during the audit.

3. Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

4. Conclude, based on the audit evidence obtained, whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Authority's ability to continue as a going concern for a reasonable period of time.

Because of the inherent limitations of an audit, together with the inherent limitations of internal control, an unavoidable risk that some material misstatements may not be detected exists, even though the audit is properly planned and performed in accordance with GAAS and in accordance with *Government Auditing Standards*.

Our responsibility as auditors is limited to the period covered by our audit and does not extend to any other periods.

Compliance with Laws and Regulations

As previously discussed, as part of obtaining reasonable assurance about whether the basic financial statements are free of material misstatement, we will perform tests of the Authority's compliance with the provisions of applicable laws, regulations, contracts, and agreements. However, the objective of our audit will not be to provide an opinion on overall compliance and we will not express such an opinion.

Management Responsibilities

Our audit will be conducted on the basis that management acknowledge and understand that they have responsibility:

a) For the preparation and fair presentation of the basic financial statements in accordance with accounting principles generally accepted in the United States of America;
b) For the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of basic financial statements that are free from material misstatement, whether due to error, fraudulent financial reporting, misappropriation of assets, or violations of laws, governmental regulations, grant agreements, or contractual agreements; and
c) To provide us with:
    i. Access to all information of which management is aware that is relevant to the preparation and fair presentation of the basic financial statements such as records, documentation, and other matters;
    ii. Additional information that we may request from management for the purpose of the audit;
    iii. Unrestricted access to persons within the Authority from whom we determine it necessary to obtain audit evidence.
    iv. A written acknowledgement of all the documents that management expects to issue that will be included in the annual report and the planned timing and method of issuance of that annual report; and
    v. A final version of the annual report (including all the documents that, together, comprise the annual report) in a timely manner prior to the date of the auditor's report.
d) For including the auditor's report in any document containing basic financial statements that indicates that such basic financial statements have been audited by us;
e) For identifying and ensuring that the Authority complies with the laws and regulations applicable to its activities;
f) For adjusting the basic financial statements to correct material misstatements and confirming to us in the management representation letter that the effects of any uncorrected misstatements aggregated by us during the current engagement and pertaining to the current year period(s) under audit are immaterial, both individually and in the aggregate, to the basic financial statements as a whole; and
g) For acceptance of nonattest services, including identifying the proper party to oversee nonattest work;
h) For maintaining adequate records, selecting and applying accounting principles, and safeguarding assets;
i) For informing us of any known or suspected fraud affecting the Authority involving management, employees with significant role in internal control and others where fraud could have a material effect on the financials; and
j) For the accuracy and completeness of all information provided.

With regard to the supplementary information referred to above, you acknowledge and understand your responsibility:

a) for the preparation of the supplementary information in accordance with the applicable criteria;
b) to provide us with the appropriate written representations regarding supplementary information;
c) to include our report on the supplementary information in any document that contains the supplementary information and that indicates that we have reported on such supplementary information; and
d) to present the supplementary information with the audited basic financial statements, or if the supplementary information will not be presented with the audited basic financial statements, to make the audited basic financial statements readily available to the intended users of the supplementary information no later than the date of issuance by you of the supplementary information and our report thereon.

As part of our audit process, we will request from management, written confirmation concerning representations made to us in connection with the audit.

Nonattest Services

With respect to any nonattest services we perform,

At the end of the year, we agree to perform the following:

a) Propose adjusting or correcting journal entries detected during the audit, if applicable, to be reviewed and approved by the Authority's management.
b) Word process the financial statements using information provided by management.

We will not assume management responsibilities on behalf of the Authority. However, we will provide advice and recommendations to assist management of the Authority in performing its responsibilities.

The Authority's management is responsible for:

a) making all management decisions and performing all management functions;
b) assigning a competent individual to oversee the services;
c) evaluating the adequacy of the services performed;
d) evaluating and accepting responsibility for the results of the services performed; and
e) establishing and maintaining internal controls, including monitoring ongoing activities.

Our responsibilities and limitations of the nonattest services are as follows:

a) We will perform the services in accordance with applicable professional standards
b) The nonattest services are limited to the services previously outlined. Our firm, in its sole professional judgment, reserves the right to refuse to do any procedure or take any action that could be construed as making management decisions or assuming management responsibilities, including determining account coding and approving journal entries. Our firm will advise the Authority with regard to tax positions taken in the preparation of the tax return, but the Authority must make all decisions with regard to those matters.

Reporting

We will issue a written report upon completion of our audit of the Authority's basic financial statements. Our report will be addressed to the Board of Directors of the Authority. Circumstances may arise in which our report may differ from its expected form and content based on the results of our audit. Depending on the nature of these circumstances, it may be necessary for us to modify our opinions, add an emphasis-of-matter or other-matter paragraph(s) to our auditor's report, or if necessary, withdraw from the engagement. If our opinions on the basic financial statements are other than unmodified, we will discuss the reasons with you in advance. If, for any reason, we are unable to complete the audit or are unable to form or have not formed opinions, we may decline to express opinions or to issue a report as a result of this engagement.

In accordance with the requirements of Government Auditing Standards, we will also issue a written report describing the scope of our testing over internal control over financial reporting and over compliance with laws, regulations, and provisions of grants and contracts, including the results of that testing. However, providing an opinion on internal control and compliance will not be an objective of the audit and, therefore, no such opinion will be expressed.

Preparation of State Controller Report

Our Responsibilities

The objective of our engagement is to prepare the annual Financial Transactions Report (FTR) in accordance with the California State Controller's Office Instructions based on information provided by you. We will conduct our engagement in accordance with Statements on Standards for Accounting and Review Services (SSARSs) promulgated by the Accounting and Review Services Committee of the AICPA and comply with the AICPA's

Code of Professional Conduct, including the ethical principles of integrity, objectivity, professional competence, and due care.

We are not required to, and will not, verify the accuracy or completeness of the information you will provide to us for the engagement or otherwise gather evidence for the purpose of expressing an opinion or a conclusion. Accordingly, we will not express an opinion or a conclusion or provide any assurance on the FTR.

Our engagement cannot be relied upon to identify or disclose any FTR misstatements, including those caused by fraud or error, or to identify or disclose any wrongdoing within the Authority or noncompliance with laws and regulations.

Management Responsibilities

The engagement to be performed is conducted on the basis that management acknowledges and understands that our role is to prepare the FTR in accordance with the State Controller's Office Instructions. Management has the following overall responsibilities that are fundamental to our undertaking the engagement to prepare your FTR in accordance with SSARSs:

a) The selection of accounting principles generally accepted in the United States of America as the financial reporting framework to be applied in the preparation of the financial statements
b) The design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error
c) The prevention and detection of fraud
d) To ensure that the Authority complies with the laws and regulations applicable to its activities
e) The accuracy and completeness of the records, documents, explanations, and other information, including significant judgments, you provide to us for the engagement to prepare financial statements
f) To provide us with:
    i. Documentation, and other related information that is relevant to the preparation and presentation of the financial statements,
    ii. Additional information that may be requested for the purpose of the preparation of the financial statements, and
    iii. Unrestricted access to persons of whom we determine necessary to communicate.

As part of our engagement, we will issue a disclaimer that will state that the FTR were not subjected to an audit, review, or compilation engagement by us and, accordingly, we do not express an opinion, a conclusion, nor provide any assurance on them.

Engagement Fees

Our fixed fees for the services previously outlined will be as follows:

Financial Statements and Auditor Reports	$18,000
Preparation of the State Controller's Report	500
Total	**$18,500**

If significant changes occur in the Authority's audit requirements with the implementation of new Governmental Accounting Standards Board (GASB) Standards, Government Auditing Standards or the Audit and Accounting Guide for State and Local Governments issued by the AICPA for attest and/or nonattest services, this may render additional services needed which may increase the above noted fixed fee.

Our invoices for these fees will be rendered each month as work progresses and are payable on presentation. In accordance with our firm policies, work may be suspended if the Authority's account becomes 60 days or more overdue and may not be resumed until the Authority's account is paid in full. If we elect to terminate our services for nonpayment, our engagement will be deemed to have been completed upon written notification of termination, even if we have not completed our report. The Authority will be obligated to compensate us for all time expended and to reimburse us for all out-of-pocket costs through the date of termination. The above fee is based on anticipated cooperation from Authority personnel and the assumption that unexpected circumstances will not be encountered during the audit. If significant additional time is necessary, we will discuss it with management and arrive at a new fee estimate before we incur the additional costs.

Additionally, our fees are dependent on the availability, quality, and completeness of the Authority's records and, where applicable, upon the Authority's personnel providing the level of assistance identified in the "prepared by client" request list distributed at the end of our planning work (e.g., Authority employees preparing confirmations and schedules we request, locating documents selected by us for testing, etc.).

We will schedule the engagement based in part on deadlines, working conditions, and the availability of Authority key personnel. We will plan the engagement based on the assumption that Authority personnel will cooperate and provide assistance by performing tasks such as preparing requested schedules, retrieving supporting documents, and preparing confirmations. If, for whatever reason, Authority personnel are unavailable to provide the necessary assistance in a timely manner, it may substantially increase the work we have to do to complete the engagement within the established deadlines, resulting in an increase in fees over our original fee estimate.

If circumstances occur related to the condition of Authority records, the availability of sufficient, appropriate audit evidence, or the existence of a significant risk of material misstatement of the financial statements caused by error, fraudulent financial reporting, or misappropriation of assets, which in our professional judgment prevent us from completing the audit or forming an opinion on the financial statements, we retain the right to take any course of action permitted by professional standards, including declining to express an opinion or issue a report, or withdrawing from the engagement.

Should our assumptions with respect to these matters be incorrect, or should the condition of the records, degree of cooperation, or other matters beyond our reasonable control require additional commitments by us beyond those upon which our estimated fees are based, we may adjust our fees and planned completion dates. If significant additional time is necessary, we will discuss it with management and arrive at a new fee estimate as soon as reasonably practicable.

Scheduling

Scheduling of the Audit Final-Fieldwork Dates will be based on an agreeable timetable with the Authority. We ask that the Authority prepare a completed and finalized Trial Balance and General Ledger in Excel form as of the December 31, 2022 date with all Balance Sheet accounts properly reconciled in Excel or PDF form and uploaded into the Suralink Portal System by the date scheduled. Failure to complete all the above noted items by the date scheduled will result in a $1,000 extra fee charge and postponement of the audit to a later date. A 30-day notice before the initial scheduled Audit Final-Fieldwork date is required to change the date and avoid the extra $1,000 fee. However, if a December or January date is chosen for the re-scheduled Audit Final-Fieldwork date, the $1,000 fee will still apply to cover Overtime costs incurred during those months and will only guarantee the audit will be completed by January 31, 2024.

Other Engagement Matters

During the course of the engagement, we may communicate with you or your personnel via fax or e-mail, and you should be aware that communication in those mediums contains a risk of misdirected or intercepted communications.

Government Auditing Standards require that we document an assessment of the skills, knowledge, and experience of management, should we participate in any form of preparation of the basic financial statements and related schedules or disclosures as these actions are deemed a non-audit service.

Paul J Kaymark, CPA is the engagement partner responsible for supervising the engagement and signing the report.

During the course of the audit we may observe opportunities for economy in, or improved controls over, your operations. We will bring such matters to the attention of the appropriate level of management, either orally or in writing.

You agree to inform us of facts that may affect the basic financial statements of which you may become aware during the period from the date of the auditor's report to the date the financial statements are issued.

We agree to retain our audit documentation or work papers for a period of at least seven years from the date of our report.

The audit documentation for this engagement is the property of Nigro & Nigro, PC and constitutes confidential information. However, we may be requested to make certain audit documentation available to regulatory agencies pursuant to authority given to it by law or regulation, or to peer reviewers. If requested, access to such audit documentation will be provided under the supervision of Nigro & Nigro, PC's personnel. Furthermore, upon request, we may provide copies of selected audit documentation to regulatory agencies. The regulatory agencies may intend, or decide, to distribute the copies of information contained therein to others, including other governmental agencies. We will notify the Authority of any such request.

Conflict Resolution

Should any litigation or adverse action (such as audits by outside governmental agencies and/or threatened litigation, etc.), by third parties arise against the Authority or the board of directors subsequent to this engagement, which results in the subpoena of documents from Nigro & Nigro, PC and/or requires additional assistance from us to provide information, depositions or testimony, the Authority hereby agrees to compensate Nigro & Nigro, PC (at our standard hourly rates) for additional time charges and other costs (copies, travel, etc.), and to indemnify us for any attorney's fees to represent Nigro & Nigro, PC.

If any dispute arises among the parties hereto, the parties agree to first try in good faith to settle the dispute by mediation administered by the American Arbitration Association under its applicable rules for resolving professional accounting and related services disputes before resorting to litigation. The costs of any mediation proceeding shall be shared equally by all parties.

The Authority and Nigro & Nigro, PC both agree that any dispute over fees charged by the auditor to the Authority will be submitted for resolution by arbitration in accordance with the applicable rules for resolving professional accounting and related services disputes of the American Arbitration Association, except that under all circumstances the arbitrator must follow the laws of California. Such arbitration shall be binding and final. **IN AGREEING TO ARBITRATION, WE BOTH ACKNOWLEDGE THAT IN THE EVENT OF A DISPUTE OVER FEES CHARGED BY THE ACCOUNTANT, EACH OF US IS GIVING UP THE RIGHT TO HAVE THE DISPUTE DECIDED IN A COURT OF LAW BEFORE A JUDGE OR JURY AND INSTEAD WE ARE ACCEPTING THE USE OF ARBITRATION FOR RESOLUTION.** The prevailing party shall be entitled to an award of reasonable attorneys' fees and costs incurred in connection with the arbitration of the dispute in an amount to be determined by the arbitrator.

Conclusion

At the conclusion of our audit engagement, we will communicate to the Board of Directors the following significant findings from the audit:

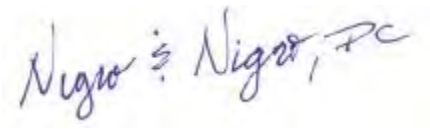
a) Our view about the qualitative aspects of the Authority's significant accounting practices;
b) Significant difficulties, if any, encountered during the audit;
c) Uncorrected misstatements, other than those we believe are trivial, if any;
d) Disagreements with management, if any;
e) Other findings or issues, if any, arising from the audit that are, in our professional judgment, significant and relevant to those charged with governance regarding their oversight of the financial reporting process;
f) Material, corrected misstatements that were brought to the attention of management as a result of our audit procedures;
g) Representations we requested from management;
h) Management's consultations with other accountants, if any; and
i) Significant issues, if any, arising from the audit that were discussed, or the subject of correspondence, with management.

Please sign and return the attached copy of this letter to indicate your acknowledgment of, and agreement with, the arrangements for our audit of the basic financial statements including our respective responsibilities.

Enclosed, as required by *Government Auditing Standards,* is a copy of the report on the most recent peer review of our firm.

We appreciate the opportunity to provide these services and believe this letter accurately summarizes the significant terms of our engagement.

Very truly yours,



Nigro & Nigro, PC

The services and arrangements described in this letter are in accordance with our understanding and are acceptable to us.

Management signature: _____

Title: _____

Date: _____

Governance signature: _____

Title: _____

Date: _____

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IWVGA ADMINISTRATIVE OFFICE

STAFF REPORT

TO: IWVGA Board Members **DATE: September 13, 2023**

FROM: IWVGA Staff

SUBJECT: Agenda Item 10 – Request from Byerly for Shallow Well Mitigation Funding

BACKGROUND

The Indian Wells Valley Groundwater Basin (Basin) has been in overdraft for several decades, resulting in a significant lowering of groundwater levels and reduction in the amount of useable groundwater in storage. Most of the wells impacted by the chronic decline in groundwater levels have been shallow wells (domestic and rural).

Under the Sustainable Groundwater Management Act (SGMA), Basin sustainability must be achieved by 2040. Groundwater levels will continue to decline until the management actions and projects in the California Department of Water Resources approved Groundwater Sustainability Plan (GSP) for the Basin are fully implemented. The GSP includes a program to help mitigate impacts to shallow wells during implementation of the GSP.

The Shallow Well Mitigation Program (Program) was approved by the Indian Wells Valley Groundwater Authority (IWVGA) Board at its February 10, 2021 meeting. The Program is implemented and managed by the Authority staff, under the direction of the Authority Board, on a "case-by-case" basis. The Program is essentially an "evaluation and potential mitigation reimbursement" process. The Program is dependent upon well owners voluntarily submitting information on their impacted wells for Authority consideration.

IWVGA has received two applications since the start of the program. One application was authorized funding of $31,821 based on the "market value" of the original well plus the incremental cost of drilling a deeper well.

Another impacted well owner recently contacted the IWVGA regarding the Program.

DISCUSSION

Mr. Byerly has contacted the IWVGA with interest in the Program and has provided some information on his well, which he says went dry. An application for assistance from the Program has not been submitted. The well is located on Welcome Avenue and was drilled in March of 2004. Figure 1, attached, shows the well location. Mr. Byerly reported that the pump was replaced and lowered a few feet and has been providing water. The cost for lowering the pump was $8,788.97, which also included a new pump, flow restrictor, and a pump saver controller. Garrison Brothers Well Services has advised Mr. Byerly that how long the lowered pump will continue to produce

water is unknow and recommended that the existing well be replaced. The estimated cost for a new well is $61,156.46. A permit for replacing the well was filed and drilling has started.

Historical groundwater level data from the area is available from Well 26S/40E-32E01, located approximately one-half mile east of Mr. Byerly's well. The groundwater level data from Well 26S/40E-32E01, shown in Figure 2, indicates historically declining groundwater levels, although there was a slight recovery in groundwater levels in 2013 and 2017. The locations of Well 26S/40E-32E01 and Mr. Byerly's well, along with contours of the depth to groundwater from the Spring of 2021 for the area, are shown in Figure 3.

IWVGA staff informed Mr. Byerly that to be consider for assistant from the Program, an application must be submitted. Staff will evaluate the application when it is submitted and report the results of the evaluation to the Board.

Figure 4 shows that Mr. Byerly's well is within the service area of the Indian Wells Valley Water District (IWVWD). Figure 4 also shows the location of the Stark Street Well, which was also recently impacted by declining groundwater levels. Staff will investigate the feasibility of the IWVWD providing water service to Mr. Byerly during evaluation of the application for shallow well mitigation for Mr. Byerly's well.

ACTION(S) REQUIRED BY THE BOARD

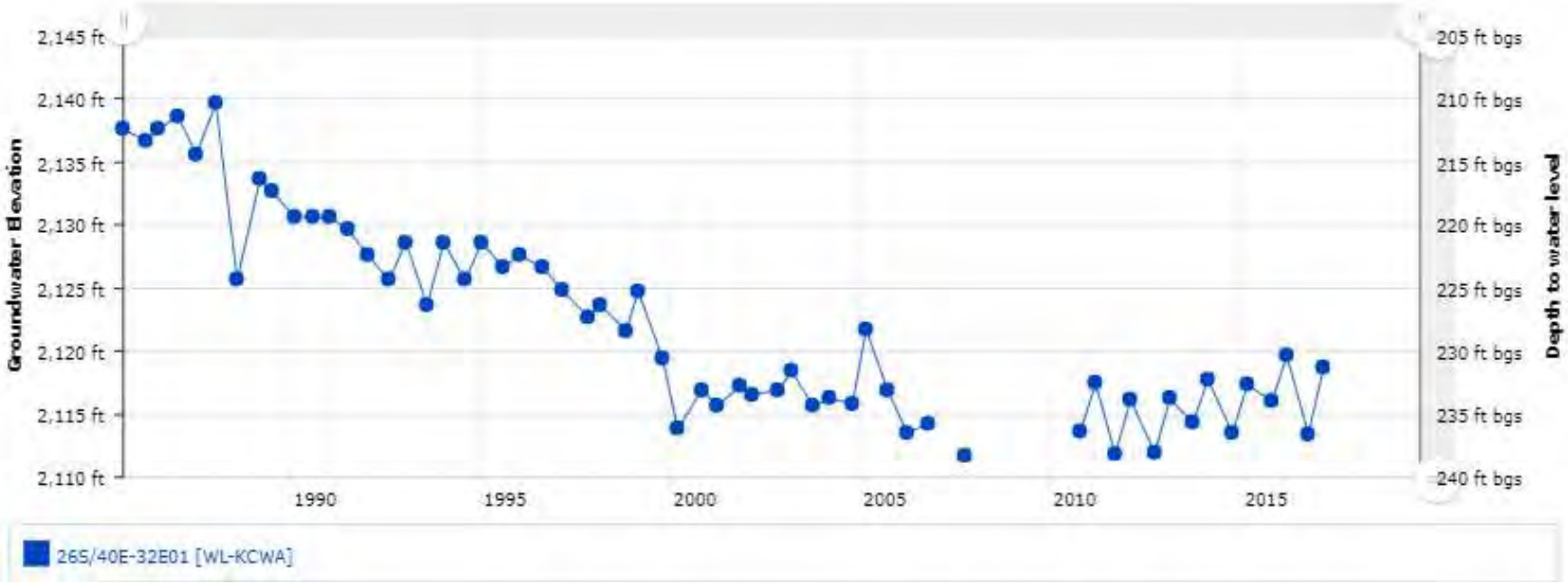
This is an informational item. No Board action is required.

STETSON ENGINEERS INC.

BYERLY WELL LOCATION

0 75 150 m

FIGURE 1

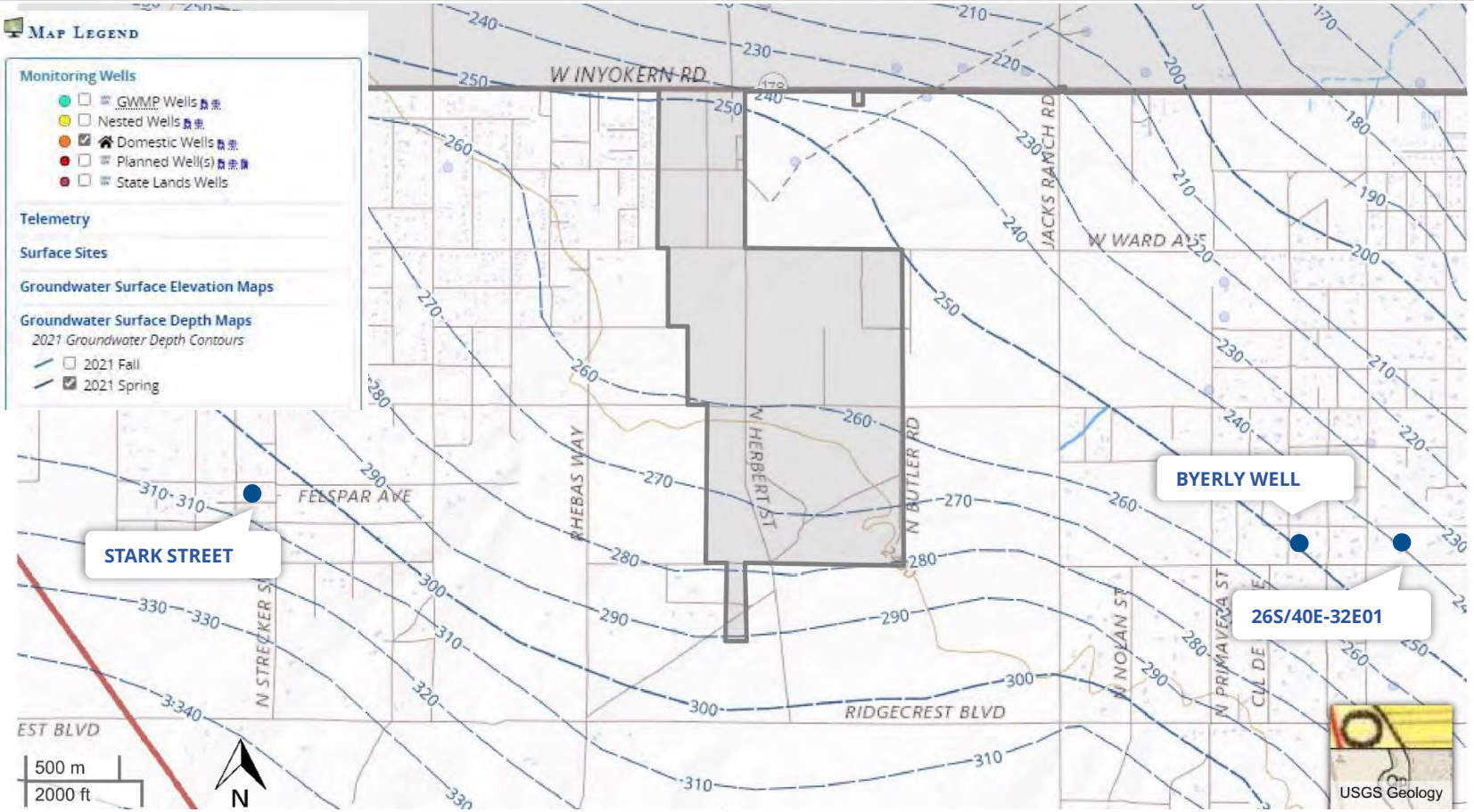


Land Surface Elevation = 2,288 feet above mean sea level.
Source: Indian Wells Valley Groundwater Authority Data Management System.

STETSON ENGINEERS INC.
Covina San Rafael Mesa, Arizona
WATER RESOURCE ENGINEERS

HYDROGRAPH FOR THE 26S/40E-32E01 WELL

FIGURE 2



Source: Indian Wells Valley Groundwater Authority Data Management System.

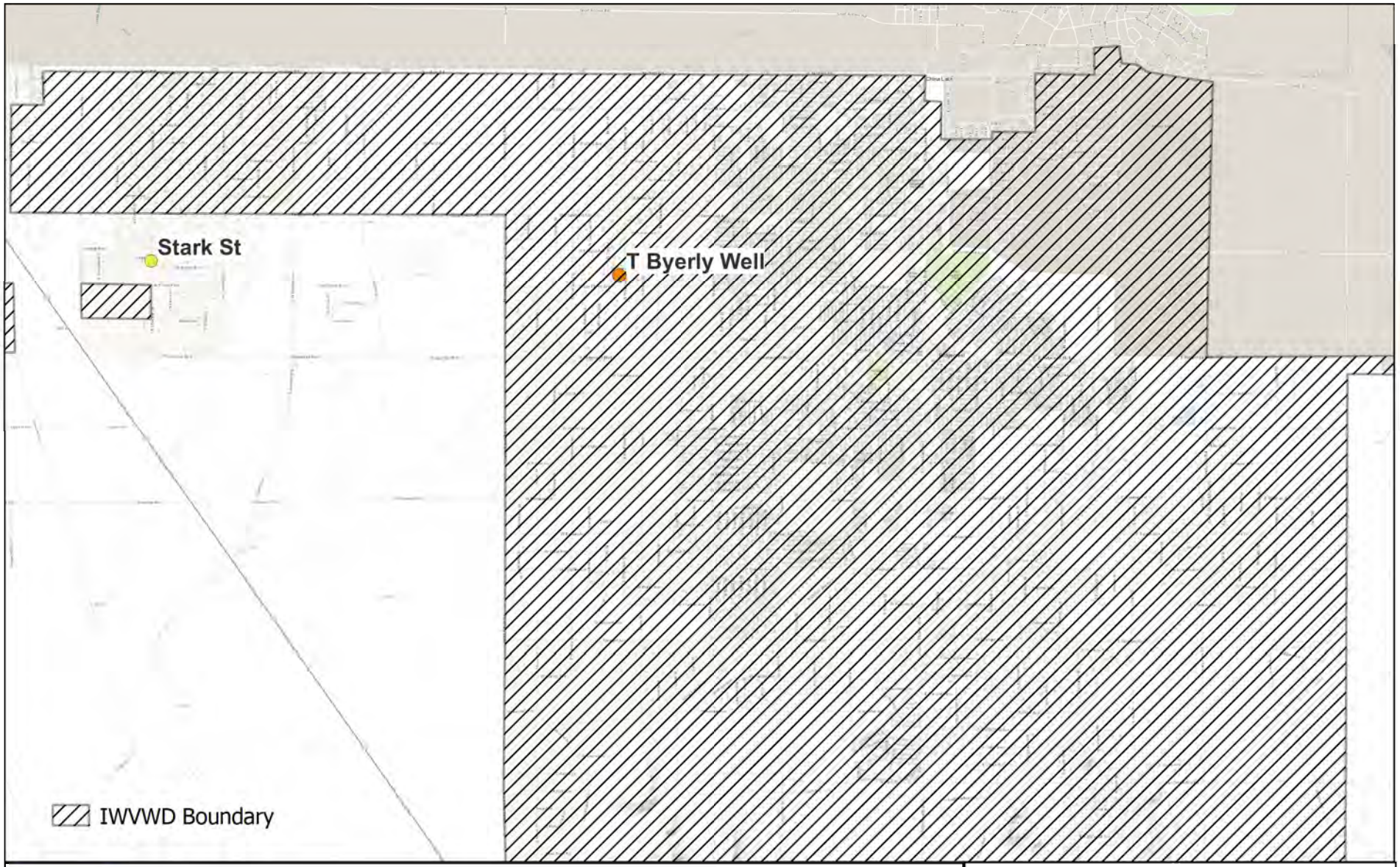
STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS

GROUNDWATER SURFACE DEPTH MAPS

FIGURE 3



STETSON ENGINEERS INC.

BYERLY WELL AND IWVWD BOUNDARY

0 1 2 km

FIGURE 4

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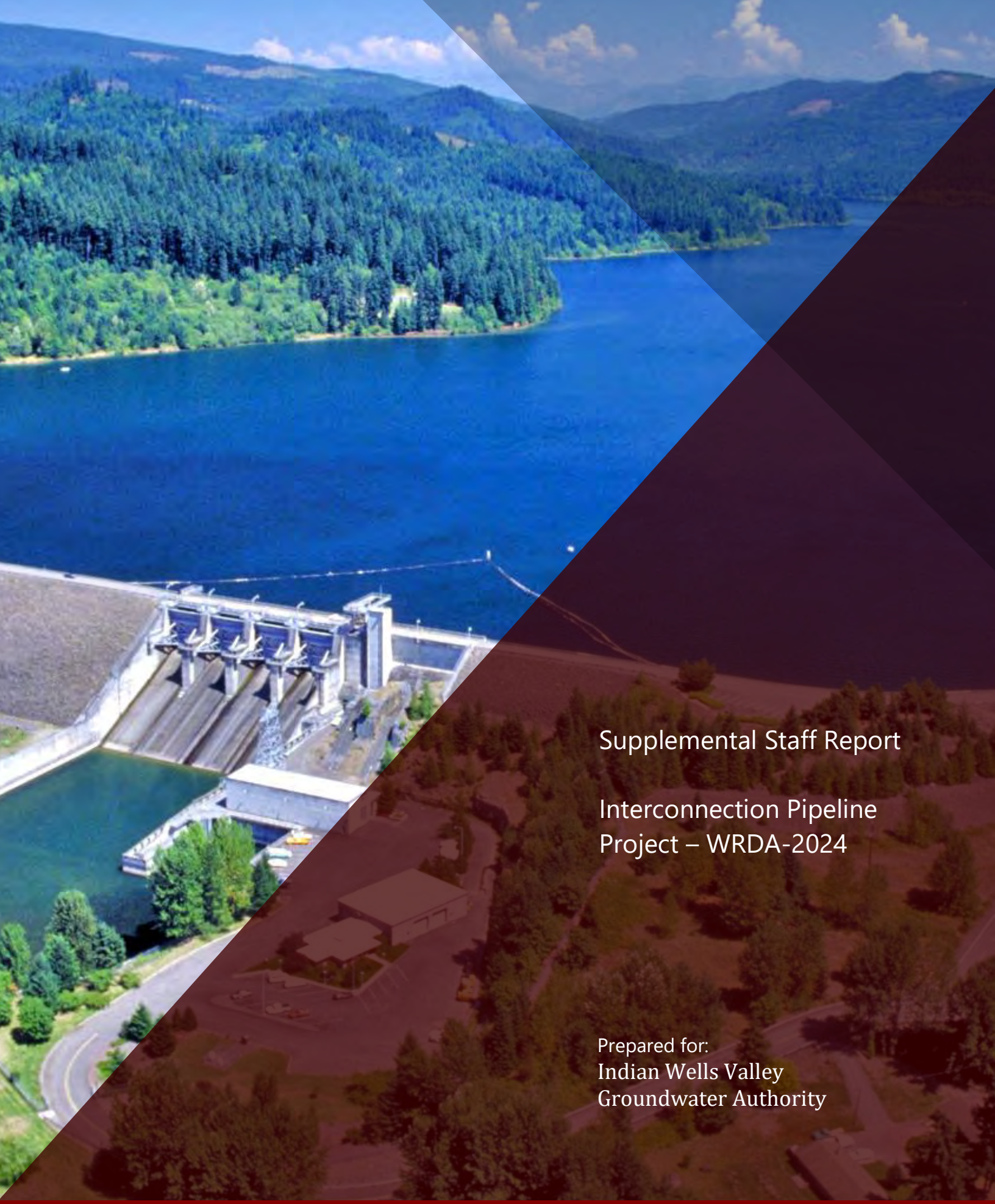


Supplemental Staff Report

Interconnection Pipeline Project – WRDA-2024

Prepared for:
Indian Wells Valley
Groundwater Authority

Glossary of Terms

Appropriation: The annual Congressional process of designating money for specific programs or projects that have been previously Authorized by Congress. It is the allowance of the Treasury to release money to the Department for spending in Authorized programs, projects, personnel, purchasing, or other requirements.

E&WD: The *Energy and Water Development Appropriations Act* – an annual appropriations bill to provide spending amounts for activities related to energy and water projects throughout the United States. Agencies within the Act's spending jurisdiction include the U.S. Army Corps of Engineers, the Department of Energy, and water projects authorized through the U.S. Bureau of Reclamation and U.S. Environmental Protection Agency.

Authorization: The specific Congressional enactment within the U.S. Code to establish, continue, or modify federal programs, and they are a prerequisite under House and Senate rules (and sometimes under statute) for the Congress to appropriate budget authority for programs.

WRDA: The *Water Resources Development Act* – a biennial act by Congress to re-authorize existing programs, establish new programs, authorize new projects, and rescind projects dealing with water resources throughout the United States. WRDA is a comprehensive legislative package that provides for the conversation and development of water and related resources. It authorizes the Secretary of the Army, through the Assistant Secretary of the Army for Civil Works, to conduct studies, construct projects, and research activities that can lead to the improvement of rivers and harbors of the United States. WRDA is strictly authorizing legislation; it does not include funding. The funding of WRDA-authorized studies and projects is provided separately through the annual Energy and Water Development appropriations process and, sometimes, through supplemental appropriations.

Continuing Resolution ("CR"): The Congressional Action to appropriate funding based upon the previous year's budget authority and amounts.

Earmark: Congressionally directed spending included within discretionary spending portions of Appropriations legislation. In the House of Representatives, earmarks are requested through the **"Community Project Funding**

Request" process. The U.S. Senate, earmarks are requested through the **"Legislatively Directed Spending Request"** process. Both processes are similar but differ in information reported through public websites.

Water Resources Project

Congress generally considers an omnibus USACE authorization bill biennially. The bill is typically titled *WRDA-FY*. Agency action on an authorization typically requires funding; that is, both an authorization and an appropriation would be needed to proceed. Most water resource project authorizations in WRDAs fall into three general categories: project studies, construction projects, and modifications to existing projects. A few provisions in WRDA bills have time-limited authorizations; therefore, some WRDA provisions may reauthorize expired or expiring authorities. Recent authorization bills include:

- America's Water Infrastructure Act of 2018 (AWIA 2018; P.L. 115-270), which included Title I, Water Resources Development Act of 2018 (WRDA-18), which focused on USACE civil works;
- Water Infrastructure Improvements for the Nation Act (WIIN; P.L. 114-322), which included Title I, Water Resources Development Act of 2016 (WRDA-16), which focused on USACE civil works; and
- Water Resources Reform and Development Act of 2014 (WRRDA-14; P.L. 113-121), which was largely, but not wholly, focused on USACE civil works.

In WRRDA-14, Congress developed processes (known as the "§7001 Process" because it refers to Section 7001 of WRRDA-14) for identifying site-specific studies and projects for authorization to overcome concerns related to Congressionally directed spending (known as "earmarks"). Congress continues to use the §7001 Process to prequalify Water Resource Projects. ***The §7001 Process is a key discussion point for IWVGA as it establishes requirements for the Interconnection Pipeline Project that are already in progress or will be completed prior to the Authority seeking Authorization for the project***.

The standard process for a Water Resources project requires **two separate** Congressional authorizations—one for studying feasibility, and a subsequent one for construction—and appropriations for both. In recent years, congressional authorization for project construction has been based on a favorable report from the Chief of Engineers (a Chief's report) and an accompanying feasibility report. For most activities, Congress requires a non-federal sponsor to share some portion of study and construction costs. For some project types, including the IWVGA Interconnection Pipeline, non-federal sponsors are responsible for operation and maintenance of the infrastructure once built.

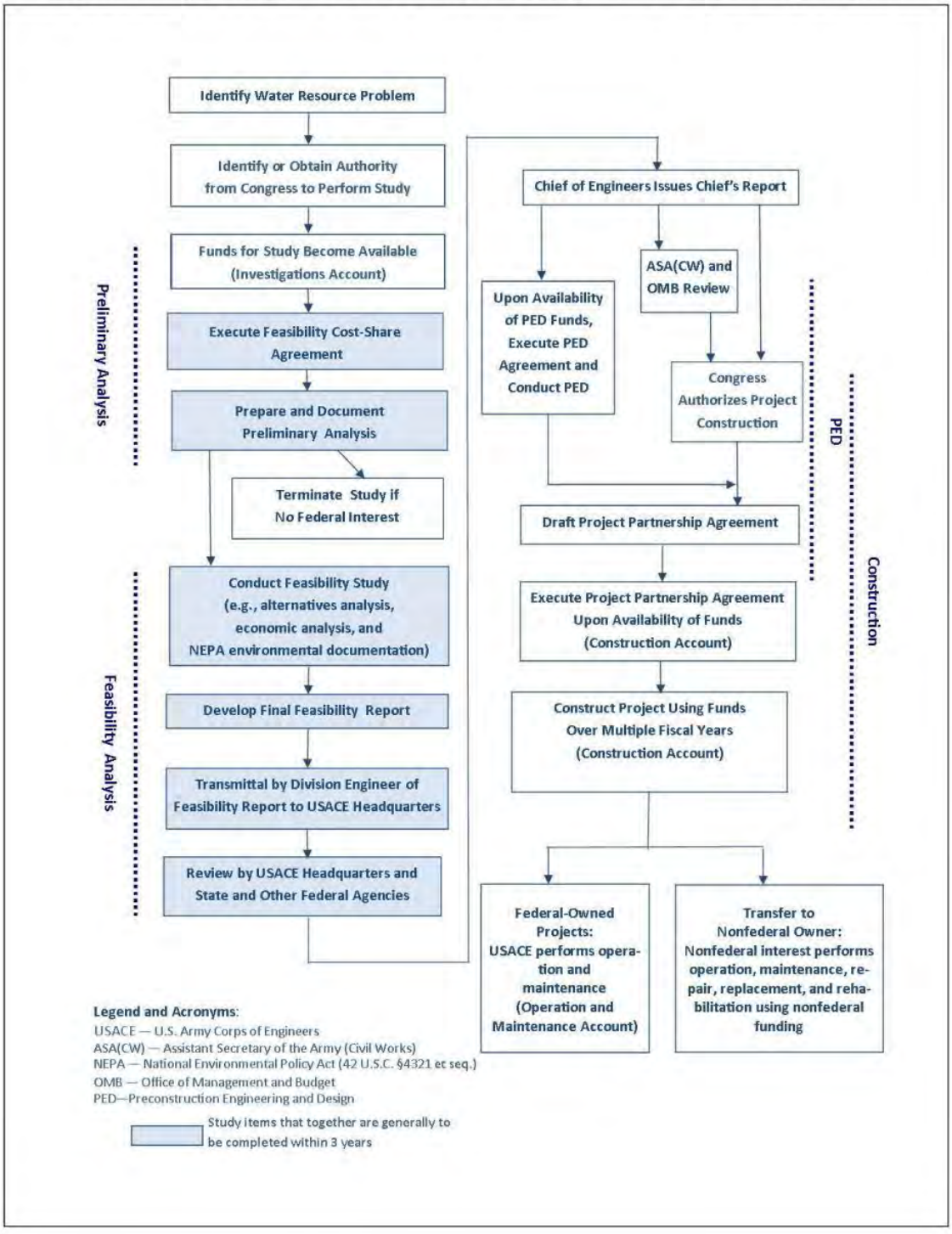
WRRDA-14 through WRDA-22 expanded the opportunities for non-federal entities to have a greater role in project development, construction, and financing. ***Known as "Alternative Project Delivery," this process will be a critical element in determining the eligibility of the Interconnection Pipeline as a Water Resource Project***. The process is outlined below:

Congressional authorization and appropriations processes are critical actions in a multistep process to deliver a Water Resource project. The process is not automatic. Appropriations are required to perform studies and construction; that is, Congressional study and construction authorizations are necessary but insufficient for USACE to proceed. The following basic steps are followed:

- Congressional study authorization is obtained in a WRDA or similar authorization legislation.
- USACE performs a feasibility study if funds are appropriated.
- Congressional construction authorization is pursued. USACE can perform preconstruction engineering and design while awaiting construction authorization if funds are appropriated.
- Congress authorizes construction in WRDA or similar authorization legislation, and USACE constructs the project, if funds are appropriated.

Major steps in the process are shown in the figure on the next page:

Figure 1. Major Steps in USACE Project Development and Delivery Process



Timeline.

The table below provides general information on the duration and federal share of costs for various phases in USACE project delivery. Project delivery often takes longer than the combined duration of each

phase shown in Table 1 because some phases require Congressional authorization before they can begin, and ***action on each step is subject to the availability of appropriations***.

Water Resources Project
Average Duration and Cost Share

	Reconnaissance Phase	Feasibility Study	Pre-Construction Phase (Planning)	Construction Phase	O&M Requirements
Average Duration[1]	8-12 months	Up to 3 years[2]	2 years	7 years[3]	Upon Completion
Federal Costs Share	0%	50%	75%	100%[4]	0%
IWVGA Cost Share	$100,000.00	50%	25%	0%	100%

Reconnaissance Phase

Continued utilization of the "Project Recon" Phase post-WRRDA-14 is in question. For most projects seeking Feasibility Study Authorization, Members of Congress still rely upon this preliminary analysis by USACE to determine the overall likelihood of feasibility study completion within the three-year period and completion of construction over the 10-year Authorization for Construction.

USACE guidelines establish that the non-federal project sponsor (IWVGA in this instance) will pay a staff cost of $100,000. However, in recent years Members of Congress seeking such preliminary analysis have sought to waive the fee requirement. This is a discretionary allowance for USACE, and staff report time is generally provided as "Technical Assistance" to the non-federal project sponsor.

[1] Generally, and historically, projects take longer than the individual steps outlined in the chart. Both the Feasibility Study and Construction Phase require Congressional Authorization and are subject to the availability of Appropriations. The average project timeline, utilizing the standard procedure, is approximately 13 years. This differs from Capitol Core's August 23rd Staff Report because IWVGA must utilize the "Alternative Project Delivery" process to qualify as a Water Resource Project.

[2] Feasibility Study Authorizations established by Congress under WRRDA-14 are statutorily set a 3-years and provide $3M to study completion. Feasibility studies are not subject to reauthorization and studies not completed within the 3-year timeframe are deauthorized pursuant to Section 549(d) requirements contained in WRRDA-14.

[3] Construction Authorizations are statutorily established for a 10-year period unless otherwise designated by the Congress. Construction Authorizations may be re-authorized but are subject to removal through the Section 549(d) process.

[4] Current law provides for up to 100% coverage of construction costs on certain projects under WRDA. The provision expires in 2026, requiring re-authorization.

Feasibility Study and "Chief's Report."

A water resource project truly starts with a feasibility study (sometimes referred to as an investigation) of the water resource issue and an evaluation of the alternatives to address the issue. The purpose of the USACE study process is to inform federal decisions on whether there is a federal interest in authorizing a USACE construction project. USACE generally requires two types of congressional action to initiate a study—study authorization and appropriations. Congress generally authorizes USACE studies in WRDA legislation.

Once a study is authorized, appropriations are sought from monies generally provided in the annual *E&WD* appropriations acts. Within USACE, projects are largely planned at the district level and approved at the division level and USACE headquarters. Early in the study process, USACE assesses the level of interest and support of non-federal entities that may be potential sponsors that share project costs and other responsibilities. USACE also investigates the nature of the water resource problem and assesses the federal government's interest. If USACE recommends proceeding and a non-federal sponsor is willing to contribute to the study, a feasibility study begins. The cost of the feasibility study (including related environmental studies) is split equally between USACE and the non-federal project sponsor. The objective of the feasibility study is to formulate and recommend solutions to the identified water resource problem. During the first few months of a feasibility study, the local USACE district formulates alternative plans, investigates engineering feasibility, conducts benefit-cost analyses, and assesses environmental impacts under the *National Environmental Policy Act*. The evaluation of USACE water resource projects is governed by the 1983 Principles and Guidelines for Water and Related Resources Implementation Studies (often referred to as the P&G) and by policy direction provided in WRDA bills and other enacted legislation. ***An important outcome of the feasibility analysis is the determination of whether the project warrants further federal investment.***

A feasibility study generally identifies a tentatively preferred plan, which typically is the plan that maximizes protecting the environment (referred to as the NED plan). The Assistant Secretary of the Army has the authority to grant an exception and recommend a plan other than the NED plan. ***In some circumstances, the non-federal sponsor may support an alternative other than the NED plan, which is known as the locally preferred plan (LPP)***. If the LPP is recommended and authorized, the non-federal entity is typically responsible for 100% of the difference in project costs (construction and operation and maintenance costs) between the LPP and USACE recommended plan. Once the final feasibility study is available, the Chief of

Engineers signs a recommendation on the project, known as the Chief's report. ***USACE submits the completed Chief's reports to the Congressional authorizing committees and transmits the reports to the Assistant Secretary of the Army for Civil Works and the Office of Management and Budget (OMB) for Administration review***. Since the mid-1990s, Congress has authorized many projects based on Chief's Reports prior to the completion of the project review by the Assistant Secretary and OMB.

The reconnaissance and requirements contained in the investigation phase up and through the Chief's Report delivery to the Authorizing Congressional Committee were developed in Section 7001 of WRRDA-14 and is known as the "§7001 Process." Because USACE develops and transmits the Chief's Report ("§7001 Report") to the OMB for inclusion in the Department's overall budget request, it does not meet the standards of Congressionally-directed spending requests ("earmarks").

For the IWVGA, the §7001 Process creates several concerns:

- Reconnaissance of the Project, likely required in order not to trigger the "earmark" rules, was completed during the development and approval of the GSP. Costs to have USACE re-study the findings of the GSP are duplicative.

- The "nature of the water resource problem," the proposed solutions, the economic feasibility of the project, the constructability of the project, and the preferred alignment contained in the GSP must be identical to the findings of the Feasibility Study.

- The Assistant Secretary must grant an exception to the NED adopting the Locally Preferred Plan.

- The Feasibility Study timeframe must be shortened in order to meet SGMA deadlines and avoid further damage to the groundwater basin.

- Information provided to USACE and the Agency's consideration of that information will be subject to the 50/50 cost-split and will therefore be duplicative.

Preconstruction Engineering and Design.

USACE preconstruction engineering and design (PED) of a project may begin after the Chief's report subject to the availability of appropriations. PED consists of finalizing the project's design, preparing construction plans and specifications, and drafting construction contracts for advertisement. USACE work on PED is subject to the availability of USACE appropriations. Once funded, the average duration of PED is two years, but the duration varies widely depending on the size and complexity of a project. PED costs are distributed between the federal and non-federal partners at a 75%/25% split.

Completion of the PED triggers the next Congressional action required in the process, the Construction Authorization. Based upon the current expected timeline, Construction Authorization would occur in *WRDA-28*.

Construction Phase, Completion and O&M.

Once the project receives congressional construction authorization, federal funds for construction are sought in the annual appropriations process. Once construction funds are available, USACE typically functions as the project manager; that is, USACE staff, rather than the non-federal project sponsor, are usually responsible for implementing construction. Although project management may be performed by USACE personnel, physical construction is contracted out to private engineering and construction contractors. When USACE manages construction, the agency typically reimburses the non-federal cost share during project construction. When construction is complete, ownership and maintenance responsibilities will transfer to IWVGA.

Until *WRDA-22*, a cost-share requirement equal to the agreement of cost-sharing in the PED phase was required. The *IIJA* modified this requirement, allowing infrastructure funding to meet 100% of certain project costs. The *IIJA* funding expires in FY2026. ***Re-authorization of the WRDA-22 provision allowing 100% coverage of construction costs will be required in WRDA-26***. If the provision is not re-authorized, the Authority's *WRDA-28* Authorization request is likely to be a cost share of 75%/25%.

Changes and Re-authorization of a Construction Authorization.

A project may undergo some changes after Authorization. If the project's features or estimated costs change significantly, additional congressional authorization may be necessary. Congressional authorization for a

significant modification typically is sought in a *WRDA*. ***Requests for such major modifications or for the study of such modifications also are solicited through the Section 7001 annual report process***. For less significant modifications, additional authorization often is not necessary. Section 902 of WRDA 1986, as amended, generally allows for increases in total project costs of up to 20% (after accounting for inflation of construction costs) without additional congressional authorization. ***USACE may require the federal/non-federal partner to equally share the additional costs to a project through a separate ("change order") agreement.***

Deauthorization and Divestiture.

Section 1302 of WRDA 2018 requires that a project authorized in WRDA 2018 be automatically deauthorized if insufficient funding has been obligated for its construction after 10 years of enactment.

A separate divestiture process is used to dispose of constructed projects or project elements and other real property interests associated with civil works projects. Some divestitures also may require explicit Congressional de-authorization. USACE divestitures historically either have been limited to projects or real property interests that no longer serve their authorized purposes or have been conducted pursuant to specific congressional direction. While Section 1301 of WRDA 2018 appears to provide a one-time opportunity for unconstructed projects to be deauthorized, there currently is no formal process.

Alternative Project Delivery

As non-federal entities have become more involved in USACE projects and their funding, they have expressed frustration with the time it takes USACE to complete studies and construction. Delayed completion of water resource projects can postpone some or all of a project's anticipated benefits. The impact of these delays varies by the type of project. Delayed completion of flood risk reduction projects may prolong a community's vulnerability. Another concern with long project delivery is the potential for an increase in project costs.

WRRDA-14 expanded the authority for non-federal entities to perform studies and construct projects (or elements of projects) that typically would have been undertaken by USACE. These statutes also provided that the costs of these non-federal-led activities are shared by the federal government largely as if USACE had performed them. That is, non-federal entities advancing water resource projects may be eligible to receive credit or reimbursement subject to the availability of federal appropriations for their investments that exceed the required non-federal share of project costs. These authorities typically require that the non-federal entity

leading the project comply with the same laws and regulations that would apply if the work were being performed by USACE. Private sector access to financing and expertise and experience with complex project management are all seen as potential advantages for delivering some types of public infrastructure. Interest has expanded recently in allowing private engagement in U.S. water resource projects.

For the Interconnection Pipeline project to meet with Water Resource Project guidelines, the project must be allowable under the Alternative Project Delivery process. The Authority must pre-seek this process in order to qualify and minimize delays/cost overruns during the project's construction.

Suggested/Sample Language of Water Resources Project Authorization.

Amdt. _____

Water Resources Development Act of 2026

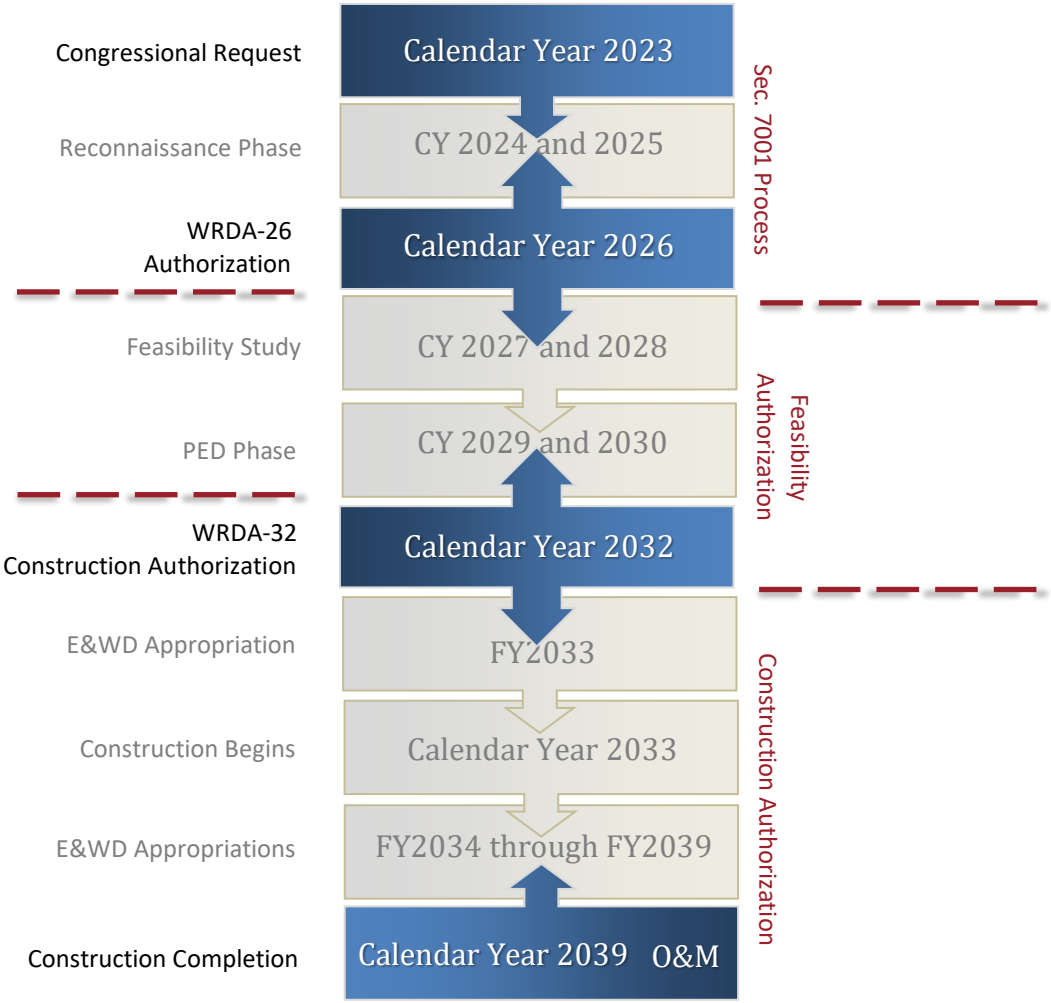
Providing authorization for a Water Resource and Sustainability Project in Kern County, California.

Section XXXX. AUTHORIZATION OF PROPOSED FEASIBILITY STUDIES

(a) New projects The Secretary is authorized to conduct a feasibility study for the following projects for water resources development and conservation and other purposes, as identified in the reports titled "Report to Congress on Future Water Resources Development" submitted to Congress pursuant to section 7001 of the Water Resources Reform and Development Act of 2014 (33 U.S.C. 2282d) or otherwise reviewed by Congress:

(#) Kern County, California for water supply including interconnection of water systems for the purposes of providing additional water supplies and drought resiliency; Indian Wells Valley Groundwater Authority, Kern County, California.

IWVGA Interconnection Pipeline Water Resources Project Timeline



Environmental Infrastructure Project

Since 1992, Congress has authorized and provided for USACE assistance with the design and construction of municipal drinking water and wastewater infrastructure projects. This assistance has included treatment facilities, such as recycling and desalination plants; distribution and collection works, such as stormwater collection and recycled water distribution; and surface water protection and development projects. This assistance is broadly labeled environmental infrastructure at USACE. Most USACE environmental infrastructure assistance is authorized for a specific geographic location (e.g., city, county, multiple counties) under Section 219 of WRDA 1992 (P.L. 102-580), as amended. However, other similar authorities, sometimes covering regions or states, exist in multiple sections of WRDAs and in selected Energy and Water Development Appropriations acts. The nature of USACE's involvement (e.g., a grant from USACE to the project owner or USACE acting as the construction project manager) and non-federal cost share vary according to the specifics of the authorization. Most USACE environmental infrastructure assistance requires cost sharing, typically designated at 75% federal and 25% non-federal; however, some of the assistance authorities are for 65% federal and 35% non-federal cost sharing.

Under Section 219, USACE performs the authorized work; for environmental infrastructure projects authorized in other provisions, USACE often can use appropriated funds to reimburse non-federal sponsors for work they perform. Since 1992, Congress has authorized USACE to contribute assistance to more than 300 of these projects and to state and regional programs, with authorizations of appropriations totaling more than $5 billion. WRRDA 2014 expanded authorizations and authorizations of appropriations for specific multi-state environmental infrastructure activities.

In WRDA-16, Congress expanded the §7001 process, allowing non-federal entities to propose modifications to existing authorities for environmental infrastructure assistance. Although no Administration has included environmental infrastructure in a USACE budget request since the first congressional authorization in 1992, Congress regularly includes USACE environmental infrastructure funds in the Appropriation bill. ***The 2016 and 2018 expansion of the §7001 process is what is causing confusion between the Speaker's Office and USACE/IWVGA representatives.*** Congress provided $50 million in FY2015, $55 million in each of FY2016 and FY2017, $70 million in FY2018, and $77 million in FY2019. These funds are part of the "additional funding" provided by Congress in enacted appropriations bills and do not typically go through the §7001 process.

After enactment of an appropriations bill, the Administration follows guidance provided in the bill and accompanying reports to direct its use of these funds on authorized environmental infrastructure assistance activities. The selected environmental infrastructure assistance activities are identified in the agency's work plan for the fiscal year, which is typically available within two months after enactment of appropriations. Recently, funds have been used to continue ongoing environmental infrastructure assistance. Because environmental infrastructure activities are not traditional USACE water resource projects, they are not subject to USACE planning process (e.g., a benefit-cost analysis and feasibility study are not performed). USACE environmental infrastructure assistance activities, however, are subject to federal laws, such as NEPA.

Why is the §7001 process both important and controversial? In 2021, legislatively-directed spending requests ("earmarks") returned in Congress. New rules and requirements were established to provide transparency to Member's requests with a formal procedure established that publishes all requests. The process of Authorizing a project under §219 and then Appropriating funding for that project in the proper fiscal year triggers the "earmark" rules. Conversely, the process under §7001 requires the Administration, through USACE, to provide a determination of the feasibility of the project prior to Congressional Authorization. The report provided by USACE is what triggers the ability of Congress to Authorize the project and "plus-up" the Agency's budget in subsequent Appropriations bills. The "earmark" rules are not triggered because the Administration reported to Congress its desire to Authorize the project through the report required by §7001. This is true of either the Water Resources Project process or the §7001 process if it was applied to the Environmental Infrastructure Projects.

The Speaker of the House has made a personal decision not to seek "earmarks." While his office would like to assist IWVGA in seeking construction of the interconnection pipeline, the use of the common §219 process (not undergoing a §7001 process) would trigger the "earmark" requirements for an Appropriations request related to the construction portion of the project. It is not clear within the House Rules if the Speaker may sponsor the Authorization of the project under WRDA but rely upon the Senators to Appropriate needed amounts in required fiscal years.

Both California Senators will sponsor "earmarks." If the Speaker declines to support sponsoring Authorization under §219, IWVGA will solely rely upon the decision of the U.S. Senators. ***Risk: Senators have Statewide priorities and concerns with a limited number of Authorization requests that can be made in WRDA***. Further, the Senate Office is essentially agreeing to a multi-year Appropriations process requiring ongoing

commitment. ***Risk: The Speaker's office is concerned that if he were allowed to sponsor the Authorization but declined to sponsor the future Appropriations, significant coordination and prioritization would be needed with the Senators for multiple years***. This scenario could also be further complicated as California's Senior Senator, Diane Feinstein, has indicated she will not run for another term which expires in 2024. As priorities change, such Appropriations may be pushed delaying the project or "stranding" the Authorization beyond the designated period. Capitol Core is attempting to mitigate this concern by seeking Authorization and Appropriation directly from the U.S. Senators thus gaining some commitment to completion of the project.

Timeline.

Environmental Infrastructure Projects are generally Authorized for a period of 10 years unless a specific time period is provided in the Congressional Authorization. It is highly unusual for Environmental Infrastructure Projects to be re-authorized, although no specific statutory prohibition exists.

Suggested/Sample Language of Environmental Infrastructure Project Authorization.

Amdt. _____

Water Resources Development Act of 2024

Providing authorization to Water Resource and Sustainability Projects in Kern County, California.

SECTION XXXX. Environmental Infrastructure.

(a) New projects Section 219(f) of the Water Resources Development Act of 1992 (106 Stat. 4835; 113 Stat. 336; 121 Stat. 1258) is amended by adding at the end the following:

"

(###) Indian Wells Valley Groundwater Basin, California $150,000,000 for water infrastructure providing water supply to the Indian Wells Valley Groundwater Authority for projects in Kern County, California.

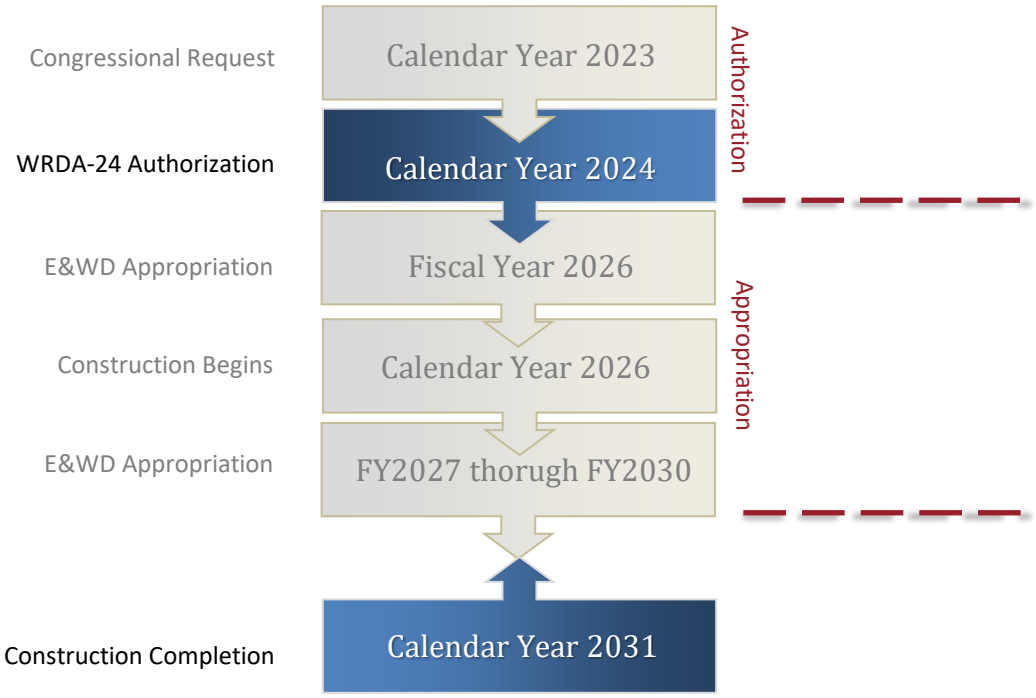
"

E&WD Process

As previously stated, an Environmental Infrastructure Project has been designated as an "earmark" program. This will require the Authority to annually seek appropriation through either the House or Senate processes. Appropriation amounts will equal the construction requirements to be completed in that particular fiscal year. ***The IWVGA Interconnection Pipeline Project will be the single largest Environmental Infrastructure Project request in program history.***

Appropriations Timeline

Timeline for USACE Environmental Infrastructure Project



Side by Side Comparison

	Water Resources Project	Environmental Infrastructure Project
Pre-Authorization Required	✓	
Reconnaissance Phase Required	?	
Feasibility Study Required	✓	
Congressional Authorization Required	✓ ✓	✓
Multi-year Appropriations Required	✓	✓
Consistency Findings with GSP	✓	
PED/Planning Stage Required	✓	
Subject to De-Authorization	✓	✓
Alternative Project Delivery Approval	✓	?
Re-Authorization Allowed	⊘ ✓	?
§7001 Process Required	✓	?
Designated as “earmark”		✓
High Risk and Subject to Project Delays	✓	✓
Authorization Period	13 years	10-years
Average Project Timeline	11-13 years	5-8 years
IWVGA Cost Share – Reconnaissance	$100,000.00	Completed
IWVGA Cost Share – Feasibility Study	50% of costs determined by USACE	Completed
IWVGA Cost Share of PED Phase	25% of costs determined by USACE	In Progress
IWVGA Cost Share of Construction Phase	$0.00 to $53 Million	~$53 Million

Authorization Year	Feasibility Study 2024-2026 Construction 2028	2024
De-Authorization and Rescission	Feasibility 2027-2028 Construction 2038	2034
First Appropriation Year	Feasibility Study FY2026/FY2027 Construction FY2028	FY2026/FY2027
First Completion Date Possible	2039	2031
Appropriations Control		✓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CORE
GROUP

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INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

IMPORTED WATER CONVEYANCE PROJECT
PRELIMINARY DESIGN REPORT

RIDGECREST, CALIFORNIA
AUGUST 2023

Prepared For:
Indian Wells Valley Groundwater Authority
100 W California Avenue, Ridgecrest, California 93555

Prepared By:
Provost & Pritchard Consulting Group
1800 30th Street #280, Bakersfield, California 93301

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Jeff Davis-Project Manager
Mike McGovern – Assistant Project Manager
Matt Kemp - QA/QC
Jeff Eklund - QA/QC

Contact:
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(661) 616-5900

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ABBREVIATIONS

ACE	US Army Corps of Engineers
AF	Acre-feet
AFY	Acre-feet per year
AVEK	Antelope Valley-East Kern Water Agency
Basin	Indian Wells Valley Groundwater Basin
BLM	US Bureau of Land Management
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CML&C	Cement Mortar Lined and Coated
CMP	Corrugated Metal Pipe
CWA	Clean Water Act
DBP	Disinfection Byproduct
DDW	State Water Resources Control Board, Department of Drinking Water
DIP	Ductile Iron Pipe
DWR	California Department of Water Resources
EOPCC	Estimate of Proposed Construction Costs
FCV	Flow control valve
GAC	Granular Activated Carbon
gpm	Gallon per minute
GPS	Global Positioning System
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HDPE	High Density Polyethylene
HDD	Horizontal Directional Drilling
kV	kilovolt
kVA	kilovolt amps
IWVGA, Authority	Indian Wells Valley Groundwater Authority
IWVWD	Indian Wells Valley Water District
LF	linear feet
MG	Million gallon
NAWS	Naval Air Weapons Station
NEPA	National Environmental Policy Act
NGS	National Geodetic Survey
NSRS	National Spatial Reference System
OSHA	Occupational Health and Safety Administration
P&P	Provost & Pritchard
PDR	Preliminary Design Report
PSIG	Pressure in pounds per square inch gauge
Project	Indian Wells Valley Groundwater Authority Imported Water Conveyance Project
PRV	Pressure reducing valve
PVC	Polyvinyl Chloride

RFP	Request for Proposals
ROE	Right of Entry
RTK	Real Time Kinematic
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SDWIS	Safe Drinking Water Information System
SEI	Soils Engineering, Inc.
SGMA	Sustainable Groundwater Management Act of 2014
Stetson	Stetson Engineers
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDH	Total Dynamic Head
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

EXECUTIVE SUMMARY

This Preliminary Design Report lays the foundation for design of a conveyance facility (pipeline, pump stations, storage tanks, and appurtenant facilities) to convey treated water from an Antelope Valley-East Kern Water Agency (AVEK) pipeline in California City to a new Terminus Tank in the vicinity of Ridgecrest. The project was originally identified in a Groundwater Sustainability Plan published by the Indian Wells Valley Groundwater Authority (Authority) in 2020 and approved by the Department of Water Resources in 2022.

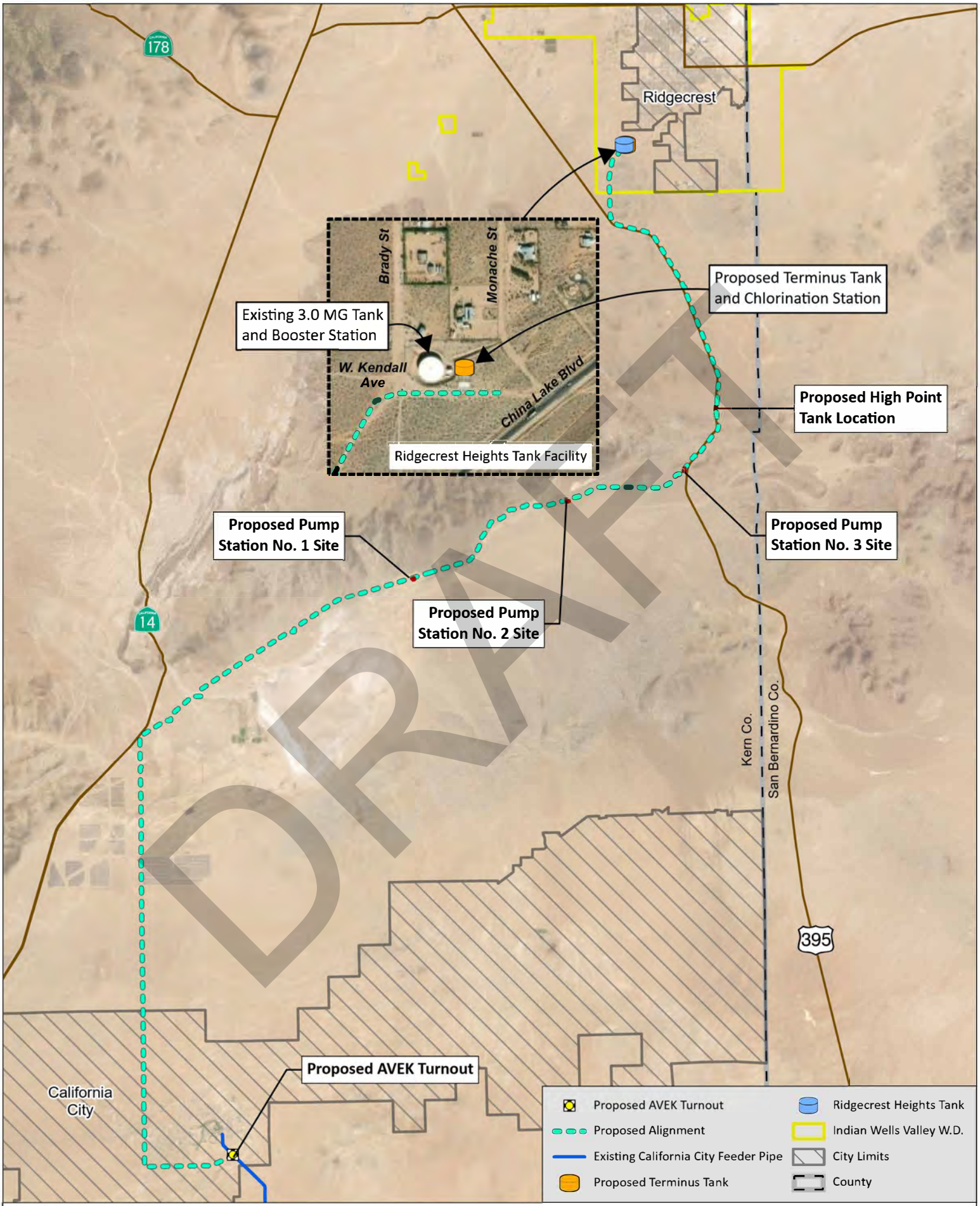
The purpose of the proposed pipeline facility is to convey imported water to the Ridgecrest area to bring sustainability to the Indian Wells Valley Groundwater Basin, which underlies parts of Inyo, Kern, and San Bernardino Counties. The water conveyed in the pipeline will be new water rights purchased by the Authority and wheeled (and possibly banked) by AVEK. Purchase of the water rights and modifications to AVEK's internal distribution system are beyond the scope of this report, which provides the basis of design for the physical facilities to be constructed.

The pipeline will be approximately 50.3 miles long and will be 24-inches in diameter up to the high point and 18-inches in diameter for the downhill segment (refer to Figure ES-1). There will be three pump stations, two of which will include 180,000-gallon forebay tanks. A 242,000-gallon regulating tank will be located at the high point in the El Paso Mountains to prevent vacuum conditions in the pipe. Upstream of the pump stations, the pipe will largely be polyvinyl chloride (PVC), while downstream of the pump stations, where pressures are higher, the pipe will be steel.

For the most part, the pipe will be located in public rights-of-way (Redwood Blvd and Neuralia Road in California City, Neuralia Road, Redrock-Randsburg Road, Garlock Road, US 395, and China Lake Blvd in Kern County). In approximately 15 locations, trenchless technology will be used to traverse major roads, a railroad, and major drainage crossings. Various trenchless techniques will be used, depending on the length and depth of each crossing.

The alignment of the proposed pipeline was identified in an alignment study published by the Authority in April 2023 that is included as APPENDIX A - ALIGNMENT STUDY to this report. This report starts with the alignment study and addresses the following:

- Minor revisions to the alignment as necessary and appropriate
- Size and material of the pipe
- Number and location of pump stations
- Pipeline hydraulics
- Water quality issues
- Identification, location, and materials of appurtenances (tanks, pressure relief valves, air and vacuum valves, line and shutoff valves, blowoffs, and other ancillary equipment)
- Constructability issues (availability of backfill material and water, laydown areas, traffic control, etc.)
- Right-of-way issues (identification of landowners, temporary and permanent easement requirements, etc.)



Indian Wells Valley GA

Figure ES-1: System Configuration

PROVOST& PRITCHARD

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- Permitting (local, federal, and state)
- Trenchless portions of the facility
- Power availability
- Geotechnical issues
- Corrosion control
- Survey
- Construction cost estimate
- Preliminary engineering drawings
- Preliminary list of specifications

In parallel with this work, Provost & Pritchard is also developing California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documentation for the project. Those processes, while critical to the project, are outside the scope of this document.

The goal of this document is to provide critical information that the design team requires to begin final design of the proposed facility. Upon approval of the document by the Authority, the design team will be able to begin work on the 30% design submittal.

This report was originally intended to include a geotechnical report and a memorandum summarizing trenchless crossings as appendices. Due to the difficulty of obtaining all permits required to allow the geotechnical engineers to gain access to drilling sites, those memoranda are not included here but will be included as part of a successor deliverable (either the 30% design submittal or the 60% design submittal).

Power availability is a major design issue. Two of the pump stations are in locations with no power source. Several technical memorandums are included as appendices to this report. One of them details this problem and includes an application to Southern California Edison for power for the two pump station locations.

This report is lengthy and provides details on many aspects of design for a large and complex infrastructure project. The intent of the report is to provide a basis of design to the Authority for its consideration. Once the Authority provides comments and input on the draft report, the final report will serve as the final basis of design. The report is voluminous in large measure to provide transparency to the Authority and other project stakeholders regarding how and why certain decisions were made and considerations given.

1 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Upon passage of the Sustainable Groundwater Management Act of 2014 (SGMA or Act) by the California legislature, and subsequent signing by then-Governor Jerry Brown, public agencies throughout California had to begin implementation of the Act by first forming a Groundwater Sustainability Agency (GSA) for their local groundwater basin, and then adopting a Groundwater Sustainability Plan (GSP) for that basin, identifying actions that would ensure the basin's sustainable management within 20 years.

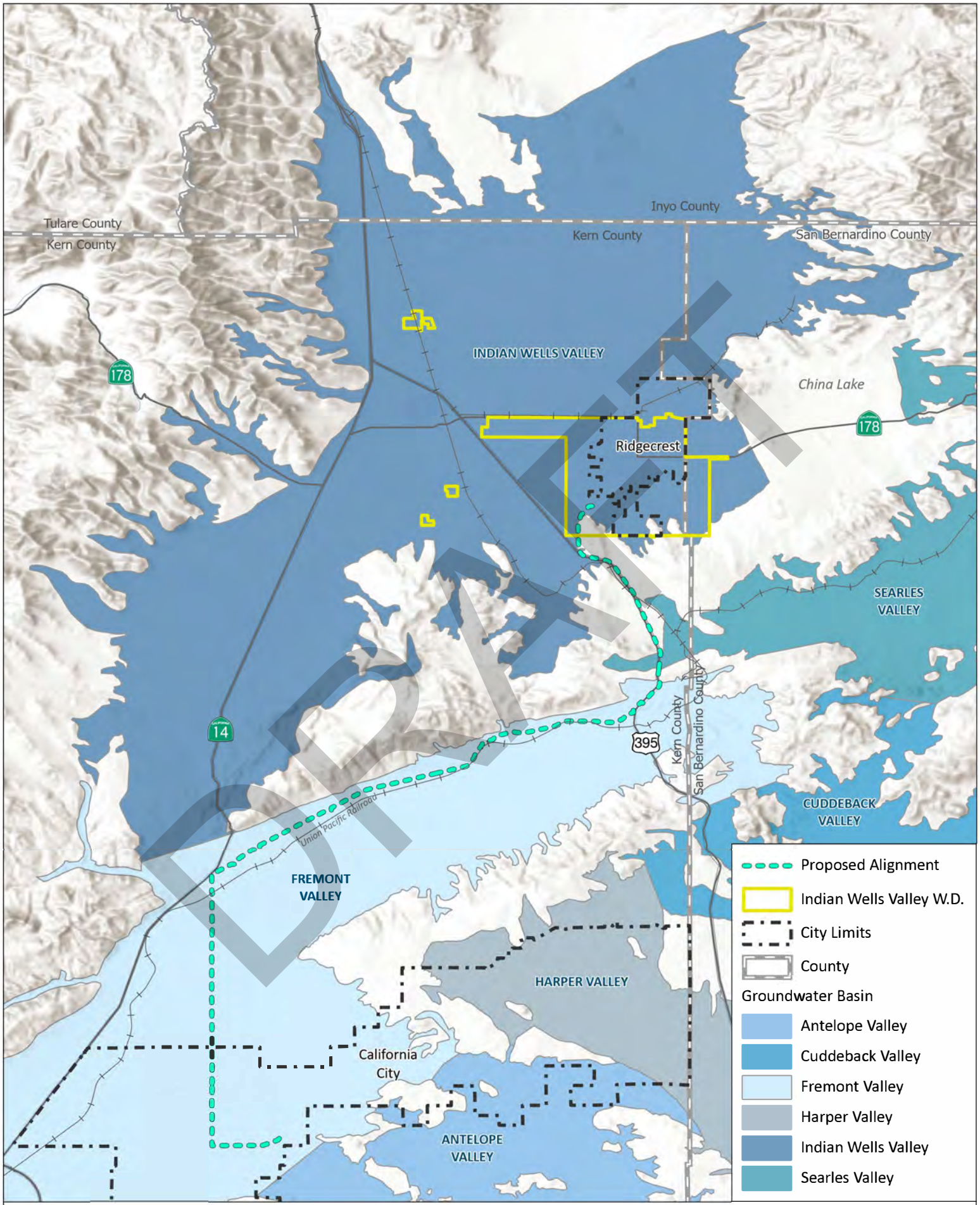
The Indian Wells Valley Groundwater Basin (Basin) is a severely overdrafted basin and thus a GSP was required for the Basin under SGMA. In 2016, through a Joint Exercise of Powers Agreement, the City of Ridgecrest, the Indian Wells Valley Water District (IWVWD), and the Counties of San Bernardino, Inyo, and Kern, formed the Indian Wells Valley Groundwater Authority (IWVGA or the Authority), the GSA for the Basin. Figure 1-1 is a map of the Basin as identified by the California Department of Water Resources (DWR).

In August 2017, the Authority contracted with Stetson Engineers (Stetson) to be the Authority's Water Resources Manager and to develop a GSP for the Basin. The GSP was published in February 2020 and formally approved by DWR in January 2022.

The GSP called for the procurement of surface water rights and the construction of an imported water pipeline to convey treated water to Ridgecrest in order to balance the water budget of the Basin. The imported water pipeline was to connect to the AVEK's system in the vicinity of California City, to convey treated water to the Ridgecrest area, and to connect the pipe to the IWVWD's treated water distribution system.

In August 2022, IWVGA contracted with Provost & Pritchard Consulting Group (P&P) to prepare an alignment study that would identify the three best alignments for the imported water pipeline, use a set of weighted screening criteria to identify the preferred alignment, and to identify the AVEK tie-in point and the IWVWD connection point, among other tasks. In December 2022, the IWVGA Board of Directors approved the Central Alignment as defined in that alignment study as the preferred alignment, and shortly after issued three Requests for Proposals (RFP's)—one for design services for the pipeline, one for environmental services, and one for right-of-way (ROW) acquisition services. The alignment study is included as APPENDIX A - ALIGNMENT STUDY to this PDR.

In February 2023, IWVGA contracted with P&P to design the imported water pipeline and to develop the appropriate CEQA and NEPA environmental documentation for the project. The Authority also contracted with OPC Services (since renamed Transystems) to provide ROW services for the pipeline and appurtenant pump stations.



Indian Wells Valley GA

Figure 1-1: Groundwater Basins

PROVOST& PRITCHARD

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This preliminary design report (PDR) is the first major deliverable associated with the design services contract. The purpose of this PDR is to set forth the key assumptions and recommendations that will be incorporated into the final design of the pipeline and appurtenant facilities. It will serve as the basis of design and will also provide the Authority and the Water Resources Manager with an opportunity to review the assumptions and recommendations and to either approve or revise them.

1.2 SUMMARY OF SCOPE OF WORK FOR PDR

The RFP issued by the IWVGA in December 2022 included a detailed scope of services summarized here for brevity. The minimum scope of work included the following tasks:

- Gather all necessary information from other entities and coordinate, as needed, with these agencies, including but not limited to Bureau of Land Management (BLM), California Department of Fish and Wildlife (CDFW), California Department of Transportation (Caltrans), California City, Kern County, and Southern California Edison (SCE).
- Coordinate with environmental and ROW consultants as needed and appropriate.
- Survey the alignment.
- Research utilities along the alignment and coordinate, as needed, with public and private utility providers.
- Provide appropriate geotechnical services.
- Obtain all required permits.
- Provide a construction schedule and cost estimate for the project. The schedule shall indicate 60% design submittal by March 2024 and design completion by March 31, 2025.
- Prepare preliminary design drawings and list of specifications.

In our proposal, the P&P team included a number of technical memos as appendices to the PDR. In addition to being included in their entirety as appendices, they are each summarized below in Sections 2.2 through 2.5. These include a technical memo on preliminary system hydraulics (APPENDIX B - PRELIMINARY SYSTEM HYDRAULICS AND TRANSIENT ANALYSIS TECHNICAL MEMO), a technical memo on pipe optimization (APPENDIX C - PIPE OPTIMIZATION AND REFINEMENT TECHNICAL MEMO), and a technical memo on power availability and coordination with SCE (APPENDIX D - POWER AVAILABILITY & SCE COORDINATION TECHNICAL MEMO).

It was originally our intent to include a geotechnical report as part of this PDR. However, the process of geotechnical data gathering (borings and test pits) was delayed on Federal land by the NEPA process. This report is expected to be included as part of the 60% design submittal. This will not impact the overall project schedule.

1.3 REPORT ORGANIZATION

This report is organized into 11 sections, in addition to an Executive Summary. The first three sections are introductory in nature. Sections 4 through 10 deal with basic design components and represent the heart of this document. Section 11 includes a list of references and a bibliography to provide the sources of information and data that were used in developing the PDR.

Section 1, Introduction and Background, discusses the need for the project and summarizes earlier work completed by the IWVGA. Section 2, Previous Work, summarizes the alignment study that this PDR is based on, as well as the technical memos that were generated coincident with the production of this PDR. Section 3, Overall Project Description, includes the purpose of the project, a general description of the project hydraulics, a summary of the project configuration, and a description of the water supply component of the project.

The design portions of the document begin with Section 4, Pipeline Design. This is the most significant component of design, as it includes issues related to hydraulics, right of way, pipe materials, appurtenances, the receiving tank, corrosion protection, permits, overall design criteria, and trenchless construction. Section 5, Pump Stations, discusses the location and phasing configuration of the three proposed pump stations. Section 6, Pressure Reduction, describes the process required to reduce pressure in the pipeline at various points to reduce the overall project cost. Section 7, Water Quality, discusses the issues associated with taking treated water that will at times be surface water and pumping it 50 miles, and integrating the water into a treated drinking water distribution system that is obtained completely from the groundwater. Section 8, Field Investigations, summarizes field work and results related to survey, ROW research, geotechnical investigations, utility research, and recommendations for potholing. Section 9, Construction Considerations, discusses issues such as laydown and contractor work areas, availability of water and backfill during construction, traffic control, construction packaging and phasing, and a construction schedule. Section 10 includes preliminary plans, specifications, and a cost estimate.

Section 11, as noted above, is a bibliography and list of references. A series of appendices, including the alignment study and four technical memos, complete the PDR.

1.4 PROJECT TEAM

Provost & Pritchard is the lead designer but is part of a team that includes a number of other consultants. Bennett Trenchless, from Sacramento, is designing the trenchless crossings. Soils Engineering (SEI), from Bakersfield, is the geotechnical engineering consultant. STANTEC is the lead designer for the pump stations, with staff from several offices. Dahl Consultants is providing quality control and quality assurance, especially on the pump stations and system hydraulics. RF Yeager, based in San Diego, is providing corrosion protection design.

Within the Provost & Pritchard team, Jeff Eklund, PE, from the Bakersfield office is the Principal-in-Charge. Jeff Davis, PE, and Mike McGovern, PE are the project managers, with Mr. McGovern managing the design team and Mr. Davis managing relations with outside entities, including IWVGA. Matt Kemp, PE, has provided quality control, quality assurance, and guidance for this entire document. Other key personnel are as follows:

- Pipeline design—Mike McGovern, Jeane Hill, Adam Ojeda
- Permits—Stuart Patteson, Tonia Holmes, Mike McGovern
- Pipeline design criteria— Mike Day, Jeane Hill
- Appurtenances—Mike Day, Jeane Hill, Jordan Muell
- Tanks—Dave Lollis, Alex Gong
- Pressure reduction—Mike Day, Adam Wunderlich, Jordan Muell
- Water quality—Alex Gong
- Field survey—Tim Odom, Phil Melcher
- Right of way information—Mike McGovern, Tonia Holmes, Adam Ojeda
- Utility information—Adam Ojeda, Tonia Holmes
- Potholing recommendations—Adam Ojeda, Tonia Holmes
- Construction considerations—Mike McGovern, Adam Ojeda
- Preliminary plans—Nic Lowell
- Specifications—Jeane Hill, Mike McGovern
- Preliminary cost estimate—Rick Darnley, Mike McGovern, Adam Wunderlich
- Construction schedule- Stuart Patteson, Mike McGovern
- Pipeline hydraulics—Mike Georgalas, Fletcher McKenzie, Joe Long (Stantec)
- Pump station layout—Timur Ayvaz, Joe Long (Stantec)

2 PREVIOUS WORK

This section summarizes the prior studies and technical memoranda leading up to this Preliminary Design Report, including the Alignment Study, the System Hydraulics and Transient Analysis Technical Memo, the Pipe Optimization Memo, and the Power Availability and SCE Coordination Memo.

2.1 ALIGNMENT STUDY

An alignment study published in April 2023 identified the basic alignment of the proposed imported water pipeline, along with the location of four pump stations, and recommended an approximate pipe diameter (20- to 24-inches). The alignment study also identified required permits for the project, various locations where trenchless technology may be required, property owners along the alignment, basic geotechnical features along the alignment, and various issues that would need to be resolved during the design process—such as determining pipe materials, number and type of line valves, volume of the receiving tank, more detailed utility research and ROW information, etc.

This alignment study, which may be found on the Authority's website at https://iwvga.org/, and which is included as APPENDIX A - ALIGNMENT STUDY to this PDR, included a number of appendices that described various issues that are incorporated into and discussed in more detail in this PDR. These issues include the design flow of the pipeline, the specific starting and delivery points, the need for a receiving tank at the delivery point, and the hydraulics of AVEK's system, which sets constraints on the proposed facility.

This PDR refines some of the findings in the alignment study, such as the number and location of pump stations, actual pipe diameter, design and maximum flows in the pipeline in various phases, and the alignment, which has been revised slightly from the alignment study, primarily due to ROW issues.

This PDR in essence picks up where the alignment study left off, and provides the foundation for future design submittals, including 30%, 60%, 90%, and 100% design submittals.

2.2 SYSTEM HYDRAULICS AND TRANSIENT ANALYSIS TECHNICAL MEMO

A hydraulic analysis for the proposed pipeline and pumping systems was prepared to evaluate the hydraulic and transient conditions for the Project. The hydraulic analysis included the evaluation of pump station locations, pipe sizing, servicing strategy, and transient mitigation requirements. The pipeline is proposed to connect to the California City Feeder turnout owned and operated by the AVEK. The turnout is located in California City near the intersection of California City Boulevard at Redwood Boulevard and will serve as the point of beginning for the proposed pipeline alignment as shown below in Figure 2-1.

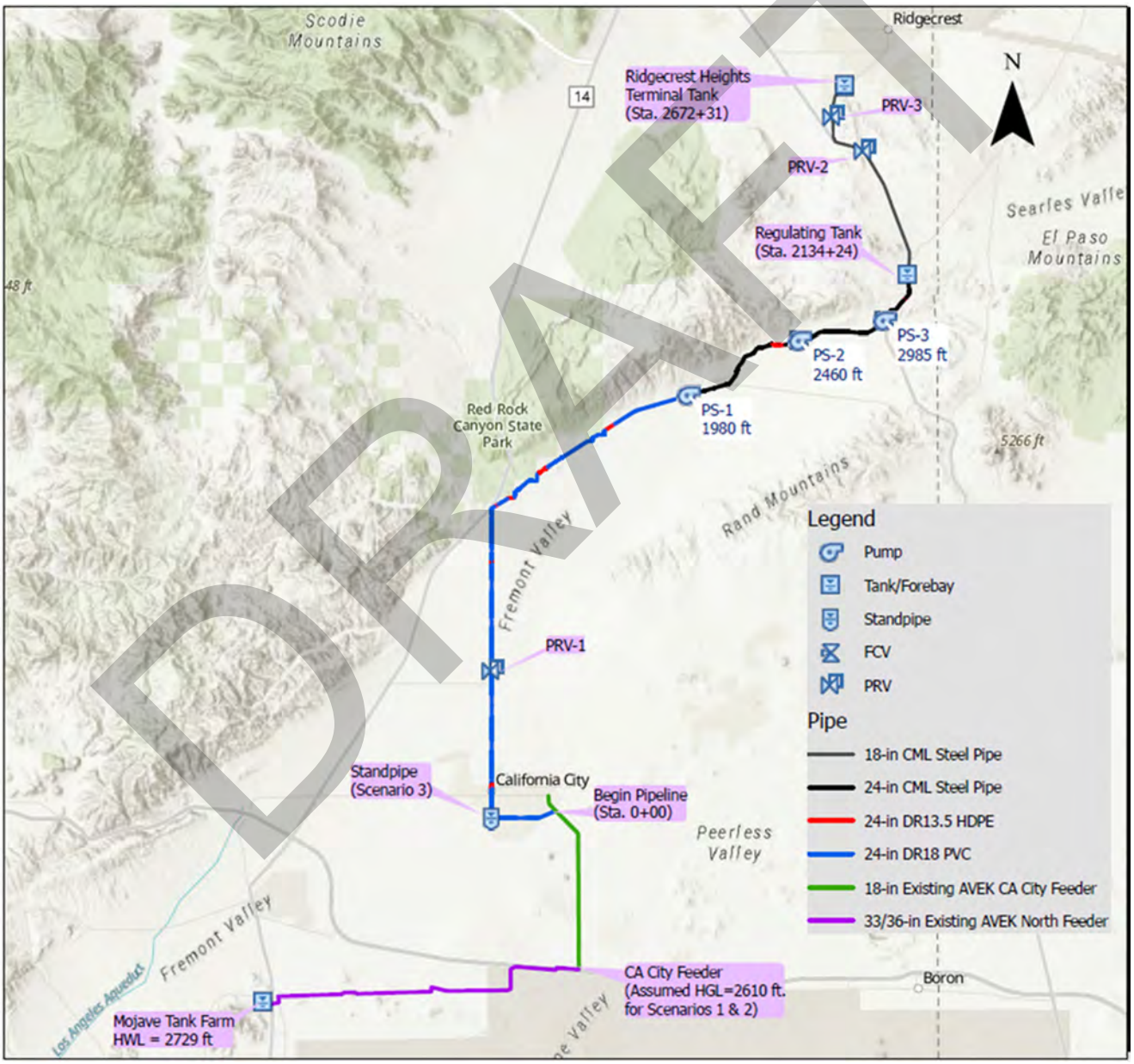


Figure 2-1: Hydraulic Model Layout

Pump Station 1 (PS-1) is located approximately 27.6 miles downstream of the connection point with the California Feeder. The location of PS-1 was selected as far downstream from the connection point along the alignment as possible to take advantage of the gravity pressure head from the Mojave Tank Farm, such that the maximum future design flow of 14.3 cubic feet per second (cfs) or 6,418 gallons per minute (gpm) could be conveyed with positive suction head at the pump station. PS-1 was envisioned as a booster pump station so that during periods of low flow, the available suction head could be used to decrease the pumping head required compared to a pump station with a forebay.

Pump stations 2 and 3 were located with the goal of having the same pumps at each facility by evenly splitting up the total dynamic head required between the two stations, as well as maintaining a normal operating pressure from 25 psig (pressure in pounds per square inch gauge) up to 275 psig, which was set by the design team to be able to use pressure class 300 pipe with a margin of 25 psi. It is envisioned that PS-2 and PS-3 will have hydraulic breaks to avoid complications associated with multiple booster pumping stations in series, and therefore these pump stations were assumed to have forebays. The anticipated phasing of the project is shown below in Table 2-1.

Table 2-1: Project Phasing Summary

Phase	Period	Flow Rate
1	0 to 5 years	0 to 6.5 cfs (0 to 2,917 gpm)
2	5 to 15 years	6.5 to 10.8 cfs (2,917 to 4,847 gpm)
3	15 years at build-out	10.8 to 14.3 cfs (4,847 to 6,418 gpm)

Three flow scenarios were evaluated looking at the maximum flow rate for each Phase. Pipeline sizing for the pumped portion of the system (e.g., up to the Regulating Tank) was based on keeping velocities around 5 ft/s and keeping the headloss gradient below 3 feet per 1000 feet of pipe length. A Pressure Reducing Valve (PRV) was introduced into the hydraulic system upstream of PS-1 to maintain pressure below 200 psi within suction pipeline. The maximum design flow capacity of 14.3 cfs was derived by maximizing the flow resulting in a headloss gradient of 3 feet per 1000 feet within the pumped portion of the pipeline.

The gravity portion of the proposed pipeline system downstream of the Regulating Tank allows for gravity flow from the highpoint to the Terminus Tank located in Ridgecrest Heights. The velocity in the 18-inch gravity pipe ranges from 4.1 ft/s at 6.5 cfs up to 9 ft/s at 14.3 cfs and was considered acceptable given the available head. The gravity portion pipeline is envisioned to be controlled by two PRV and/or a hydro turbine station as well as a flow control valve (FCV) at the Terminus Tank.

The maximum steady state pressure within the pipeline system is up to 160 psig on the suction pipeline to PS-1, and the maximum pressure in the discharge pipelines up to the Regulating Tank

is approximately 265 psig. A summary of the steady state pressures and pump station total dynamic head (TDH) required is summarized in Table 2-2.

Table 2-2: Pump Station Hydraulic Summary

Scenario	Q (cfs)	PS-1 Suction Pressure (psig)	PS-1 Discharge Pressure (psig)	PS-1 TDH (ft)	PS-2 Discharge Pressure (psig)	PS-2 TDH (ft)	PS-3 Discharge Pressure (psig)	PS-3 TDH (ft)
1	6.50	132	225	215	241	551	245	561
2	10.80	74	243	390	252	577	252	577
3	14.30	8	263	590	265	607	260	595

Scenario 1 modeled the current capacity of 6.5 cfs within the existing 18-inch California City Feeder, assuming no California City demand. Scenario 2 assumed a California City demand of 3.1 cfs and upstream improvements consisting of approximately 40,000 ft of 24-inch pipeline parallel to the existing 18-inch California City Feeder. Scenario 3 evaluated the potential future flow, which also requires upstream improvements, and therefore a standpipe was assumed at the high point in California City with a grade of 2,500 ft. The hydraulic grade lines for the three flow scenarios are shown below in Figure 2-2.

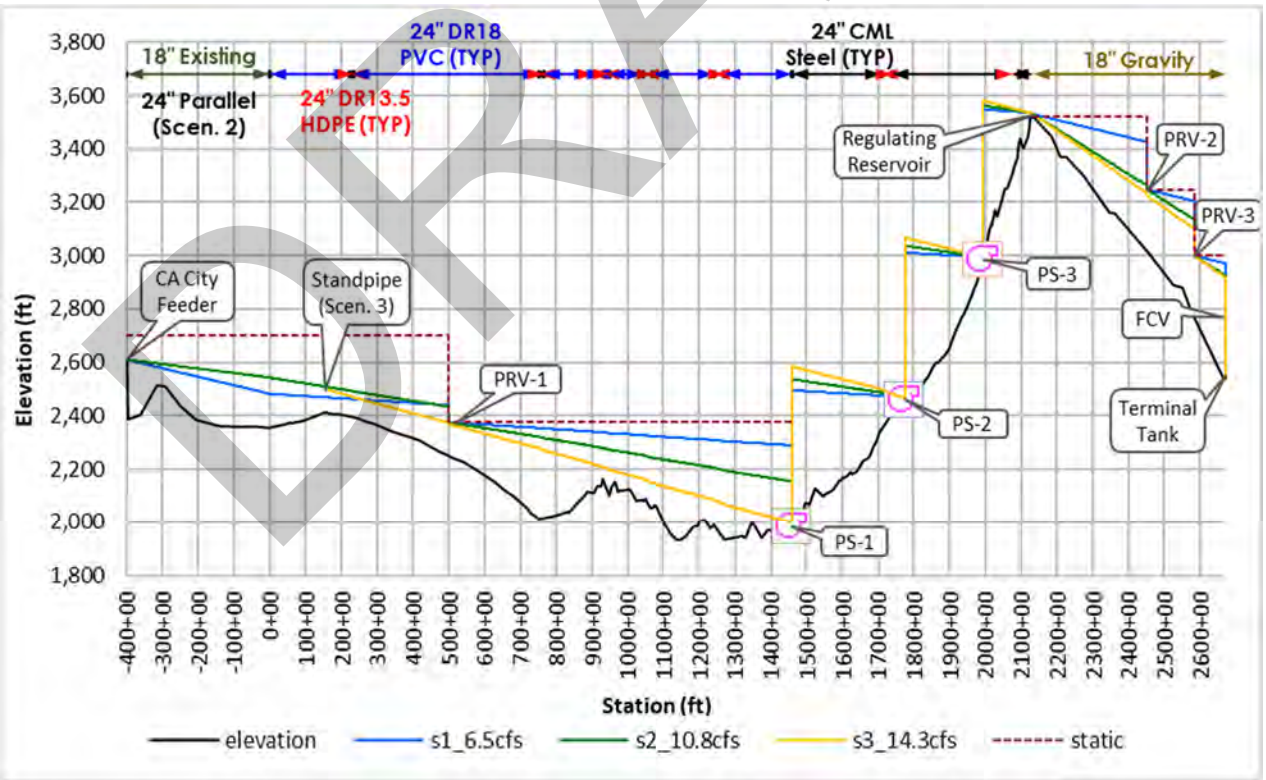


Figure 2-2: Pipeline System Hydraulic Grade Lines for Three Flow Scenarios

The transient model indicated that with the initial flow of 6.5 cfs and no mitigation, a power failure (pump trip) results in full vacuum pressure (-12.6 psig) and water column separation within the pipeline, which was considered unacceptable. Air chambers were then modeled for transient mitigation and found to limit the minimum pressure to approximately half of full vacuum pressure (-6 psig), which was considered acceptable for an occasional surge event, such as a power failure. A summary of the transient minimum and maximum pressures, as well as initial air chamber sizes is shown in Table 2-3. The transient analysis assumptions and results will be confirmed during the final design.

Table 2-3: Hydraulic Transient Results Summary

Scenario	Alternative	HT-1 SUC Vol. (gal)	HT-1 DIS Vol. (gal)	HT-2 DIS Vol (gal)	HT-3 DIS Vol (gal)	Total Air Chamber Volume (gal)	Maximum Transient Pressure (Suction) [psig]	Minimum Transient Pressure (Discharge) [psig]	Maximum Transient Pressure (Discharge) [psig]
1	6.5 cfs with Air Chambers	3,500	1,500	1,000	1,500	7,500	238	-5	400
2	10.8 cfs with Air Chambers	5,500	2,500	1,500	2,500	12,000	251	-6	370
3	14.3 cfs with Air Chambers	8,000	3,800	2,000	3,000	16,800	280	-5	408

Based on the model results in this report, the Provost & Pritchard team recommends the following:

- Install PS-1 as a booster pump station (no upstream forebay) to take advantage of the available operating head from the Mojave Tank Farm under low flow conditions.
- Utilize forebays at PS-2 and PS-3 for hydraulic breaks in the system at these locations.
- Utilize a Regulating Tank at the high point in the pipeline (Station 2134+24 in Figure 2-2) for a hydraulic break in the system and flow by gravity from this Regulating Tank to the proposed Terminus Tank at the Ridgecrest Heights Tank Facility.
- Utilize 24-inch pipe size for the pumped segment of the pipeline and 18-inch for the gravity flow segment from the Regulating Tank to the Ridgecrest Heights Terminus Tank.
- Consider air chambers at the suction and discharge of PS-1, as well as at the discharge of PS-2 and PS-3 to avoid full vacuum conditions resulting from a pump trip.

A detailed hydraulic analysis is presented in APPENDIX B - PRELIMINARY SYSTEM HYDRAULICS AND TRANSIENT ANALYSIS TECHNICAL MEMO of this report.

2.3 PIPE OPTIMIZATION AND REFINEMENT TECHNICAL MEMO

An analysis of options for pipe size and material was performed that recommends final pipe sizes that represents an optimized approach that considers both capital and long-term power costs. A Technical memorandum summarizing the analysis is included as APPENDIX C - PIPE OPTIMIZATION AND REFINEMENT TECHNICAL MEMO. Two fundamental options emerged during the analysis. Alternative One (24-inch Option) would have a maximum 24-inch diameter nominal pipe size upstream of the regulating tank at the peak elevation of the system and a maximum 18-inch diameter nominal pipe size downstream of the regulating tank. This alternative would require three pump stations in series. Alternative Two (20-inch Option) would have a maximum 20-inch diameter nominal pipe size upstream of the regulating tank and a maximum 18-inch diameter nominal pipe size after the regulating tank. This alternative would require four pump stations in series. Both options would employ cement mortar-lined and coated (CML&C) steel pipe in segments with the highest pressures and PVC pipe in segments with lower pressures.

The optimization analysis compared life cycle costs for the two alternatives and the 24-inch alternative emerged as having the lowest life cycle costs. The life cycle costs factored initial capital costs that IWVGA may need to finance after obtaining grants plus operation and maintenance costs. Power costs will be the largest component of the operation and maintenance costs. SCE power rates were used in the analysis and assumed pump operations maximized off-peak power use as rates are punitive for on-peak and mid-peak pumping. **Table 2-4** lists the pipe and pump station quantities for 20-inch diameter versus 24-inch diameter and **Table 2-5** summarizes the present value for each alternative.

Table 2-4: Pipe and Pump Station Quantities

Item	Alternative 1 24-inch Pipeline Quantity	Alternative 2 20-inch Pipeline Quantity
C900 DR18 PVC	142,332 (24”)	51,554 (20”)
CML&C Steel (250 psi)	67,022 (24”)	157,800 (20”)
24” HDPE Pipe	3,700	3,700
18” CML&C Steel (250 psi)	53,658	53,658
Pump Station	3	4

Table 2-5: Present Value Summary for the Alternatives

Present Value Items	Alternative 1 24-inch Pipeline	Alternative 2 20-inch Pipeline
IWVGA Capital Cost Share	$121,455,000	$128,625,000
Power Cost	$56,531,000	$73,125,000
OM&R Cost	$21,042,000	$24,556,000
Total Present Value	**$199,028,000**	**$226,306,000**

2.4 POWER AVAILABILITY AND SCE COORDINATION TECHNICAL MEMO

The proposed Project is located in an area where minimal existing power facilities are available, and therefore a new electric power transmission line may be required. As such, a draft Method of Service Application for SCE has been prepared in order to start the evaluation process and preliminary design of the transmission power services required for the project. SCE will take the lead in the development of the Method of Service study to identify the additional power facilities required to serve this project. In communications with the SCE Service Planner, they are evaluating if the project will require a new transmission system or if a portion of the project can be served as part of a local distribution system. Currently there is a 33 kVA (kilovolt-amps) transmission power alignment that parallels a portion of the project along Garlock Road to the intersection with Redrock Randsburg Road. Depending on the existing load on the 33kVA system, SCE will determine the approach in the expansion of required facilities.

The following is a summary of the power requirements associated with each pump station to meet the operational needs of the project:

Table 2-6: Pump Station Power Requirements

Operation Description PS-1

Description of Equipment	Horsepower	Voltage	Starter	kW
3 each Low Flow Pumps	150 hp	480V	VFD	44.7
4 each High Flow Pumps	350 hp	480V	VFD	186.0
1 each Air Compressor	20 hp	220V	Direct	100.0
Lighting	NA	220V	N/A	24.0
Cooling	16.5hp	220V	Direct	12.3
Ancillary Loads	N/A	120V	Direct	100.0

Operation Description PS-2

Description of Equipment	Horsepower	Voltage	Starter	kW
3 each Low Flow Pumps	200 hp	480V	VFD	140.0
4 each High Flow Pumps	350 hp	480V	VFD	186.0
1 each Air Compressor	20 hp	220V	Direct	100.0
Lighting	NA	220V	N/A	24.0
Cooling	16.5hp	220V	Direct	12.3
Ancillary Loads	N/A	120V	Direct	100.0

Operation Description PS-3

Description of Equipment	Horsepower	Voltage	Starter	kW
3 each Low Flow Pumps	200 hp	480V	VFD	140.0
4 each High Flow Pumps	350 hp	480V	VFD	186.0
1 each Air Compressor	20 hp	220V	Direct	100.0
Lighting	NA	220V	N/A	24.0
Cooling	16.5hp	220V	Direct	12.3
Ancillary Loads	N/A	120V	Direct	100.0

The Regulating Basin will require one 200-amp lighting and service panel.

No motor actuated valves will be included in the design. Small solenoid valves will be included to provide air control to the surge tanks for each pumping station. Small solenoid valves have been included as part of the ancillary loads associated with each pump station.

In the event of a power outage, an uninterruptable power system (UPS) will be provided to operate the solenoid valves associated with the surge tanks to mitigate an over pressure or vacuum condition along with maintaining power to the Supervisory Control and Data Acquisition (SCADA) and programmable logic controller (PLC) located at each site. No backup power is anticipated for the pump stations as the pipeline is not considered as a critical infrastructure system.

Each project site will require a SCE transformer and meter to make the appropriate voltage drop from either 12kV or 33kV to 480-volt in order to power the pumping facilities.

The Power Requirements and SCE Method of Service Study Technical Memorandum is provided in APPENDIX D - POWER AVAILABILITY & SCE COORDINATION TECHNICAL MEMO.

2.5 PIPE CROSSING TECHNICAL MEMO

The technical memorandum for the pipe crossings will be submitted after the completion of the soil borings and soils testing and analysis for the borings and test pits on BLM land and within Cal Trans ROW. This is expected to occur between the 30% and 60% design submittals. A list of crossings is included in APPENDIX E - LIST OF PIPE CROSSINGS and will be replaced with a technical memorandum when completed.

3 OVERALL PROJECT DESCRIPTION

This section includes the purpose of the project, a general description of the project hydraulics, a summary of the project configuration, and a description of the water supply component of the project.

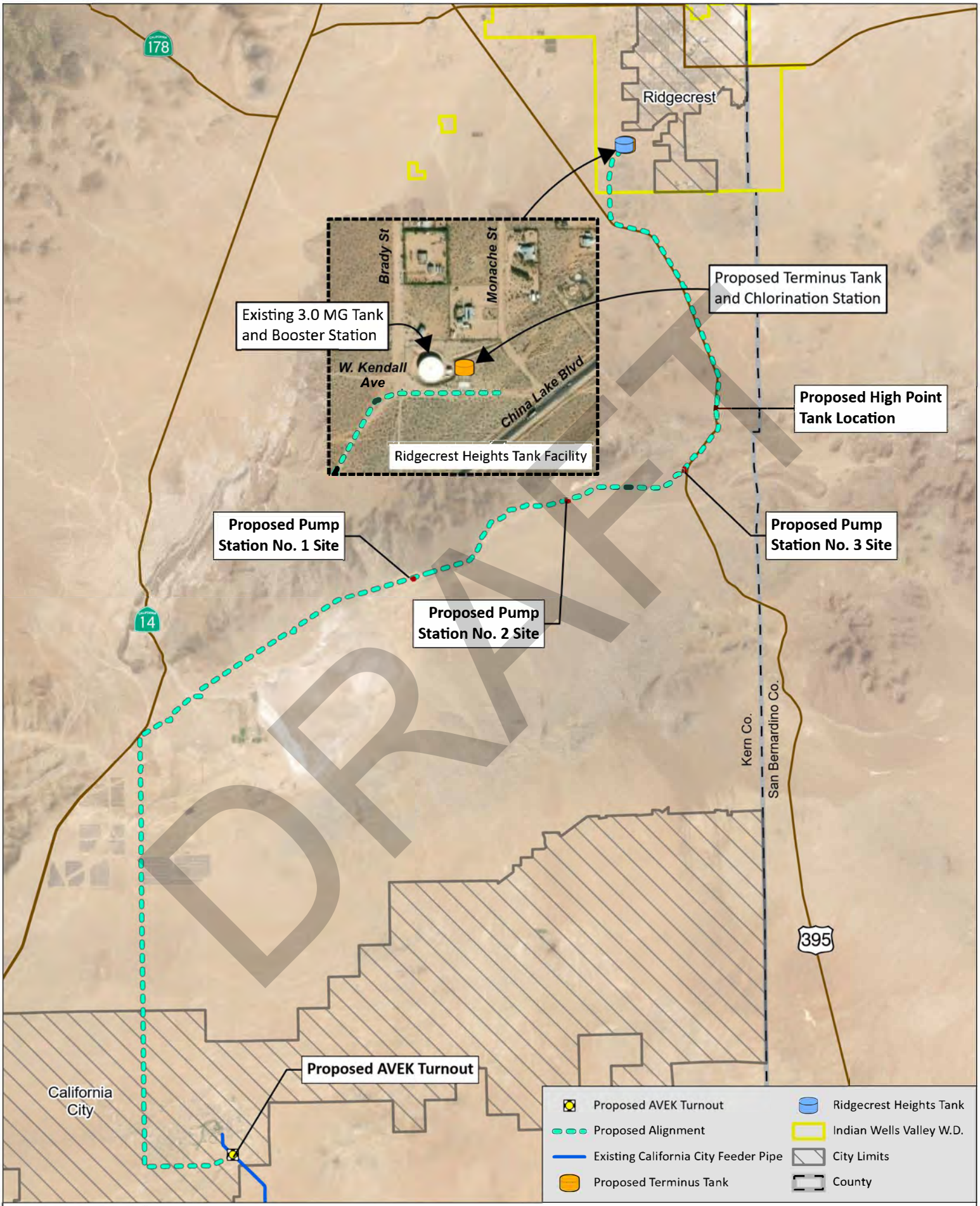
3.1 PROJECT DESCRIPTION

The IWVGA's proposed Imported Water Conveyance Project (Project) consists of up to a 24-inch diameter, 50.3-mile imported water pipeline that starts at a new connection on AVEK's California City Feeder in California City and generally proceeds northeast to the IWVWD's Ridgecrest Heights Tank in Ridgecrest, California, Kern County. Three booster pump stations are necessary to pump the water over the El Paso Mountains located between California City and Ridgecrest. The pipeline will terminate at a new welded steel Terminus Tank at IWVWD's Ridgecrest Heights tank facility. Approximately 20.6 miles of pipeline would traverse land owned and managed by BLM. Figure 3-1 is a map that shows the proposed facilities and relevant boundaries and landmarks.

The Project is necessary to comply with SGMA, which requires the groundwater in the Indian Wells Valley Basin to be sustainably managed. The Basin is located east of the southern Sierra Nevada Range in California with an area of approximately 382,000 acres underlying portions of Inyo, Kern, and San Bernardino Counties. The Basin is identified by the DWR as a critically overdrafted basin. The Basin serves as the sole source of potable water supply for residents and other water users; there are currently no imported water supply sources available to water users in the Basin (refer to Figure 1-1).

The goal of the Project is to bring up to 6,431 acre-ft per year (AFY) of imported water into the Basin by 2070 by making it available to IWVWD for domestic uses and thus allowing IWVWD to reduce its use of domestic wells in its system and base load its system with this new water supply. The proposed pipeline facility will be used to convey water from other sources through AVEK's mainline feeder system to the Basin. The goal is to reduce groundwater production in the Basin to achieve sustainable water supplies, to preserve the character of the community, to preserve the quality of life of those residing in the Basin, and to sustain the mission of the China Lake Naval Air Weapons Station (NAWS).

The design of the project will be completed by March of 2025. If funding for the project is rapidly obtained, the earliest that the project could be bid is late 2025. Project construction is assumed to take place in mid-2026 to be completed by 2030.



Indian Wells Valley GA

Figure 3-1: Proposed Facilities

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3.2 PROJECT ALIGNMENT

The pipeline route follows Redwood Blvd, Neuralia Road, Redrock Randsburg Road, Garlock Road, U.S. Highway 395, and China Lake Boulevard. For much of the alignment along Redwood Boulevard and Neuralia Road, the pipeline will be constructed in either the California City Road ROW or Kern County road -ROW. Work may require some additional temporary construction easements with private landowners for laydown of materials and stockpiling of backfill materials. The pipeline will remain within the Neuralia Road right-of-way to avoid existing solar farm parcels and the parcels owned by the Honda Corporation for the Honda Test Track, north of the city limits of California City.

The pipeline alignment commences from a new turnout on AVEK's existing California City Feeder in the southwest portion of the developed area of California City, near the intersection of Redwood Boulevard and California City Boulevard. The route then heads West on Redwood Boulevard for 3.8 miles before turning north and following Neuralia Road for approximately 13.9 miles. The pipeline will either be under the northbound shoulder of Neuralia Road or under the northbound lane when paralleling the existing buried electrical conductors from the adjacent solar farms.

The alignment then heads in a northeasterly direction in the Redrock-Randsburg Road ROW. The alignment continues within the ROW of Redrock Randsburg Road, a two-lane paved road with shoulders, for approximately 12.3 miles before branching off to Garlock Road, also a two-lane road with shoulders. Continuing within the right-of-way of Garlock ROW another 8.0 miles, the grade steadily increases from an elevation of 2,115 feet at the start of Garlock Road to the terminus of Garlock Road at U.S. Highway 395 at an elevation of 2,987 feet. While in Redrock-Randsburg Road, the alignment takes three brief detours out of the road right-of-way to avoid encroachment into Red Rock Canyon State Park. These short detours will require acquisition of permanent right-of-way from private landowners.

The grade steadily increases for another 2.4 miles from an elevation of 2,987 feet to a maximum elevation of 3,514 feet, 0.5 miles south of the Searles Station Road before descending towards Ridgecrest. After crossing under U.S Highway 395 (Hwy 395) the pipeline parallels Hwy 395 approximately 225 feet east of the centerline of the road to Searles Station Cut-off Road, continuing approximately 225 feet east of the centerline of Hwy 395. The alignment continues in a northwesterly direction, paralleling to the east of an existing SCE 12 kilovolt (kV) sub-transmission overhead power line and maintenance road for approximately 7.1 miles before crossing under China Lake Boulevard. The SCE unpaved road is located just inside of the highway ROW. The alignment follows this access road that generally parallels the alignment of Hwy 395 and the SCE maintenance road until it reaches China Lake Blvd (Hwy 395 Business), approximately 7.1 miles.

The route continues in a northerly direction alongside the ROW for China Lake Boulevard for approximately 2.8 miles before turning easterly on West Kendall Avenue. Continuing east on West

Kendall Avenue for approximately 0.2 miles, the pipeline terminates just east of the existing 3.0-million-gallon (MG) Ridgecrest Heights tank for a future connection to a proposed Terminus Tank.

Up to three (3) booster pump stations in series and a regulating tank would be required to pump water over the highpoint elevation of 3,514 feet in the El Paso Mountains along Hwy 395. Booster Pump Station No. 1 (at Mile 27.1 of the alignment) is located along Redrock Randsburg Road, east of Koehn Dry Lake on a privately-owned parcel. Booster Station No. 2 (at Mile 33.1 of the alignment) is located approximately 4 miles east of the split of Redrock Randsburg Road and Garlock Road on BLM land. Booster Pump Station No. 3 (at Mile 37.5 of the alignment) is located on BLM land, immediately west of the intersection of Garlock Road and Hwy 395.

There is an existing SCE 33kV transmission line along Neuralia Road, north of California City, that continues to the east on the northerly side of Redrock Randsburg Road before splitting in a southeasterly direction that parallels Redrock Randsburg Road into the community of Randsburg. East of the Redrock Randsburg Road - Garlock Road fork there are no existing Southern California Edison (SCE) sub-transmission or distribution power lines available along the alignment until a 12kV overhead line that parallels Hwy 395 heading north from the intersection of Hwy 395 and Searles Station Road. The lack of existing sub-transmission and distribution power lines adjacent to two of the three booster pump stations and the potential lack of available capacity in the adjacent existing sub-transmission and distributions lines near the remaining booster pump station will require IWVGA to work with SCE to construct the necessary power facilities. This will include transmission lines and substations to power two and potentially up to three of the booster pump stations.

The proposed pipeline would have a maximum size of approximately 24 inches in diameter and would consist of both CML&C welded steel pipe and PVC pipe. PVC pipe will be utilized in locations where lower pressures are maintained. For the most part, construction of the pipeline would require open trench excavation. Road/rail crossings and drainage crossing locations would utilize trenchless methods such as auger boring, open-shield pipe jacking, horizontal directional drilling (HDD), and/or micro-tunneling. Up to eight (8) trenchless crossings will use the HDD method to install a high-density polyethylene (HDPE) pipe to cross under a drainage crossing or creek. The seven (7) remaining trenchless crossings apply to road/railway crossings and will use auger boring or open-shield pipe jacking method to install a steel casing to house the water pipeline.

3.3 PURPOSE OF PROJECT

The purpose of this Project is to enable the Authority to comply with SGMA by providing the conveyance facilities required to import surface water into the Basin, thereby balancing the Basin's water budget and placing it on a long-term sustainable footing.

Acquisition of the surface water rights and conveyance of the water to and through AVEK's system are not part of this project for design purposes but are required for the overall implementation of this Project for CEQA purposes. The Authority will accomplish those via other actions.

The water conveyed through the proposed pipeline and appurtenant facilities will balance the Basin by providing treated water that can be introduced into the IWVWD's distribution system, thus allowing IWVWD to shut off wells and base load its system with the imported water. Shutting off wells will lead to reduced production from the Basin on an annual basis, thus bringing the total Basin production in line with the Basin safe yield of 7,650 AFY.

Since the purpose of the project is to balance the Basin on a long-term basis, the facility itself should not be considered a lifeline facility. As discussed in the next section, the pipeline and pump stations are being designed to convey the maximum annual volume of 6,431 AFY over a period of ten months at design flow (10.8 cfs) or eight months at peak flow (14.3 cfs). Thus, the downtime of the facility for any short period of time is not critical to water supply in the Basin; however, it will be desired to ensure that the facility is operational to maximize capacity and obtain available water supplies to improve the long-term management of the Basin.

3.4 WATER SUPPLY

The alignment study for the proposed project included a technical memorandum (Technical Memorandum 2 - Attachment 2 of APPENDIX A - ALIGNMENT STUDY), that detailed current and projected water demands within the Basin under various scenarios. It is this technical memorandum, dated November 18, 2022, that provides the basis for the water demands used to size the pipeline and pump stations described in this PDR.

That memorandum projected water demands throughout the Basin through 2070. The year 2070 was selected due to the 50-year planning period required in SGMA. The original GSP was published in 2020; thus 2070 represents the end of the planning period. It was assumed in this technical memorandum that the Ridgecrest area would be at ultimate build-out by that date, and thus water demands would not likely increase beyond that year.

Based on the technical memorandum, the expected demand for imported water for the Basin in 2070 is 6,431 acre-feet. This is the average annual amount that would need to be imported to make the basin sustainable. Since the Authority is planning on purchasing surface water rights that are subject to annual hydrology and precipitation, it is likely that in some years, less than 6,431 acre-feet would be available. Shortages in dry years would have to be made up by importing more water in wetter years, when it is available. This was part of the basis for designing the pipe and pump stations for an ultimate peak capacity of 14.3 cfs.

At the design capacity of 10.8 cfs, the full 6,431 AF could be pumped in ten months, leaving up to two months for system repair, maintenance, and downtime. At the peak capacity of 14.3 cfs, up to 8,300 AF of water could be imported in ten months, or up to 9,100 AF in eleven months. This capacity should enable the system to keep the Basin balanced on a long-term basis consisting of intermittent wet and dry years. This capacity would also allow off-peak pumping (pumps running 19 hours per day to minimize pumping during 5 pm to 9 pm peak and mid-peak period, while pumping the same volume as 10.8 cfs for 24 hours with a safety margin).

Note that, since this facility will tie in to AVEK's system, it is critical that AVEK's system have the capacity to treat and convey up to 14.3 cfs. The California City Feeder, as noted above, has a capacity of 6.5 cfs. Thus, additional upstream infrastructure would need to be constructed by AVEK at some point in the future to allow water delivery above 6.5 cfs. AVEK's North Feeder would also likely have to increase in capacity, either by paralleling it or by adding a pump station. In addition, construction of this facility may require AVEK to augment capacity in its Rosamond Treatment Plant or, as an alternative, to construct additional recovery wells to augment the flows exiting the plant. IWVGA is currently holding discussions with AVEK on these issues.

The larger issue from a water supply standpoint is that the water conveyed through the proposed pipe will in some years be treated surface water, while the existing IWVWD distribution system is 100% groundwater. This leads to potential water quality and regulatory issues which are addressed in this report. The pipeline, pump stations, and Terminus Tank are all

designed to deal with these issues in order to provide drinking water that meets all federal and state drinking water standards regardless of the character of the source water.

3.5 GENERAL SYSTEM CONFIGURATION

The proposed project is designed to meet demand requirements over a 40-year period (from 2030 to 2070). During that period, demands will gradually increase, and thus the system will be required to convey more water. The pump stations are designed to be phased in over time, with additional pumps being added as demand grows.

The fundamental components of the system are as follows:

- A turnout structure from the 18-inch diameter California City Feeder. This structure will comply with AVEK standards for a redundant dual turnout which includes parallel pipes each with a shutoff valve, a check valve, and a flow meter.
- 50.3 miles of pipe, generally 24-inch pipe up to the peak of the El Paso Mountains and 18-inch pipe from that point to the Terminus Tank. To reduce costs of the project we are recommending the pipe upstream of the pump stations, where pressures are lower, be PVC, and downstream of the pump stations, where pressures are higher, be CML&C steel.
- Three pump stations, two of which will include a 180,000-gallon forebay tank. The first pump station, Pump Station No. 1, will not include a forebay tank in order to take advantage of the hydraulic head available from AVEK's system. The forebay tanks also provide buffer storage for smoother pump station operations. At Pump Station No. 2 a chlorine feed system is included to boost the chlorine residual, if needed.
- A 242,000-gallon welded steel regulating tank near the peak elevation in the El Paso Mountains. The purpose of this tank is to protect the pipe from pulling a vacuum, which is possible under certain conditions. The tank will ensure that the pipe is always filled with water, thus precluding the possibility of a vacuum. This tank also provides buffer storage for smoother pump station and hydroelectric operations.
- A 1,000,000-gallon welded steel Terminus Tank at IWVWD's Ridgecrest Heights tank site. The purpose of this tank is to serve as a buffer before the imported water enters the IWVWD distribution system. This tank allows for the addition of chemicals for treatment if needed. These chemicals could include chlorine or a pH adjustment.
- A SCADA system to enable remote operation and monitoring of the pump stations and flow rate.
- PRVs to reduce the pressure on long downhill pipe reaches including within California City and after the peak elevation in the El Paso Mountains in order to protect the pipe from high pressures.
- An FCV that also provides pressure reduction with a parallel hydroelectric generator at the Ridgecrest Heights Tank. The flow control valve helps to regulate system flow to an operator set target rate. Pressure in the pipeline at the Ridgecrest Heights Tank site is sufficient so that a hydroelectric generator can be used to reduce pressure and recover energy there. The PRV would only be used for flows that exceed the capacity of the generator and/or times when the generator needs to be out of service for emergency maintenance. emergency maintenance.

Portions of the pipe will be constructed using trenchless technologies—that is, pipe installed without the traditional open-cut pipe trench. These technologies will include bore-and-jack steel casing construction, horizontal directional drilling, and/or microtunneling. These segments of the pipe will generally be where there is a crossing of some sort—a railroad, a major highway, or a wide wash—where an open trench is not feasible.

The system also includes various appurtenances—flowmeters, segmenting line valves, air/vacuum relief valves, blowoffs, and pressure relief valves, water sampling stations, and surge protection equipment as recommended by the forthcoming surge analysis.

The system is generally governed by the hydraulics of AVEK's system and the natural topography, and the facilities are designed to both accommodate and to stay within the boundaries of those system hydraulics. Since the California City Feeder will have to be replaced or supplemented with a parallel line in the future, the system is designed to accommodate either a gravity or pumped system for this future parallel line. The system hydraulics were discussed in detail in Section 2.2.

4 PIPELINE DESIGN

This section discusses the Project's pipelines and tanks, including recommended pipeline alignment changes, permit requirements, design criteria, materials and appurtenance selection, corrosion protection, and trenchless construction.

4.1 ALIGNMENT

During the completion of the Alignment Study (Technical Memorandum No. 8), P&P staff identified several potential modifications to the Central Alignment and recommended they be considered in the final design. As our team has gathered additional information about existing utilities along the alignment, we have adjusted the alignment to navigate through potential conflicts with existing utilities or other impediments. The goal has been to place the alignment within unimproved shoulders and medians as much as possible. However, as we investigated potential conflicts, it has been determined that the alignment must reside within existing paved roadways within California City, unincorporated Kern County, and adjacent to existing private conservation banks and CDFW ecological preserves.

As part of our preliminary design tasks, our team performed a more in-depth hydraulic analysis of the pump station and pipeline system to refine the number and locations of pump stations required along the alignment (refer to the Hydraulic Systems TM in APPENDIX B - PRELIMINARY SYSTEM HYDRAULICS AND TRANSIENT ANALYSIS TECHNICAL MEMO). To assist with our CAD production of the preliminary design drawings, we split the alignment into five reaches. The pipeline plan drawings are provided in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS – Preliminary Design Drawings. The plan views show the proposed pipeline alignment while the profile views show the ground surface profile along the centerline of the pipeline alignment. Pipeline profiles will be developed for the 30% design submittal after the proposed alignments presented herein are approved. The horizontal scale of the plan and profile drawings within the limits of California City (Reach 1) is 1”=50’ to adequately depict the existing utilities in the developed area. The horizontal scale is 1”=100’ for the remainder of the alignment. The following sections provide general alignment information for each of the five reaches.

California City Section -Reach 1

The imported water pipeline will commence near the intersection of California City Boulevard and Redwood Boulevard from the existing California City Feeder. The turnout off the existing 18-inch diameter California City Feeder will be located on a private parcel, to be purchased by the IWVGA, so the vaults for the control valves and the flow meters are outside of the existing road ROW. The pipeline alignment will commence from the turnout site into the unpaved shoulder on the north side of the Redwood Boulevard ROW. The alignment will go across driveways that extend beyond the private parcel to the edge of pavement, but for the majority of the alignment along this reach the pipeline will be in the unpaved shoulder of the road and a frontage road. In front of California City Middle School and Hacienda Elementary School, the alignment will continue west in an unpaved shoulder between Redwood Boulevard and the frontage road to the north, avoiding a short pedestrian path that extends from the eastern edge of California City Middle School to approximately 800’ east of the school. West of the two schools, the alignment will stay in the unpaved shoulder between Redwood Boulevard and the frontage road. As it

approaches the intersection with Neuralia Road, the alignment will navigate around the existing California City domestic well and an aerial SCE electrical line located on the northeast corner of the intersection. It will enter the paved roadway approximately 450 feet from the intersection of Redwood Boulevard and Neuralia Road and turn 90 degrees to continue northward along Neuralia Road approximately 20 feet from the Neuralia Road Centerline.

As the alignment continues northerly up Neuralia Road, the alignment will transition from the paved roadway to reside within the unpaved median that separates the north and south bound lanes of Neuralia Road. This alignment will be sustained for one mile to the intersection of Neuralia Road and California City Boulevard.

At this intersection, the alignment will enter the paved roadway to provide approximately 10 feet of separation from an existing water line that is known to occupy the unimproved median that separates north and south bound lanes of Neuralia Road north of California City Boulevard. From this point, the alignment will be approximately 20 feet east of the Neuralia Road Centerline while maintaining 10 feet of separation from the existing water line in the median. This alignment will continue for ½ mile to the intersection of Poppy Boulevard where the existing domestic water line is no longer in conflict with the proposed alignment.

From the intersection of Poppy Boulevard, the alignment will remain 20 feet from the Neuralia Road centerline. After approximately 640 feet north of Poppy Boulevard, the proposed alignment will leave the paved roadway after which point it will reside within the unimproved eastern shoulder of Neuralia Road through the remainder of the California City Limits which terminate at Washburne Avenue. This amounts to a total of 3.5 miles of pipe.

With one exception, the entirety of the California City portion of the pipeline is planned to be an open cut trench. The one exception will likely be a jacked and bored casing under the Yerbe Rusche Creek along Neuralia Road between Walpole Avenue and Heather Avenue. Currently, our design shows an open-cut trench across California City Boulevard, somewhat paralleling the existing California City 12-inch potable water line across the intersection. The pot-holing effort to be performed by IWVGA's contractor between the preliminary design report and the 60% design submittal will confirm if this intersection can be open-cut with steel plates placed over the open trench overnight or if it must be jacked and bored.

Neuralia Road Section – Reach 2

(½ mile north of Lindbergh Boulevard to Redrock-Randsburg Road)

Once the alignment exits the limits of California City at Washburn Boulevard, the utility concerns that presented themselves while in California City are removed. Most of the municipal utilities seem to terminate at Lindbergh Boulevard which is a full 2.5 miles south of Washburn Boulevard.

From this point running northward, it is known that there is a SCE 33kV overhead line along the western shoulder of Neuralia at the approximate County ROW line as well as an underground Frontier telecommunications line along the eastern shoulder that also is supposed to be aligned approximately along the ROW line. The SCE line switches from the west side of Neuralia Road to the east side near the existing solar farms at the south-west corner of the Honda Test Track. The alignment will have to maintain a minimum of 10 feet of horizontal clearance from the overhead lines and there is no known separation requirement from the telecommunication line.

The existence of the SCE and Frontier lines are not necessarily hindrances to locating the alignment within one of the shoulders of Neuralia which has a minimum ROW of 60 feet in width and a paved road that is variable but approximately 24 feet in width. This provides approximately 18 feet of unimproved shoulder for the east and west sides of the road which should allow enough room for the alignment to be located within the shoulder. However, in recent years, two private solar farms have been constructed in this area, and there are now two such farms that occupy multiple parcels along Neuralia from Washburn to the Honda Test Track for 5 miles. The two farms are known as the Springbok Farm, which is located immediately south of the Honda Test Track at a distance of one mile, and the Eland Solar Farm, which is located in multiple non-contiguous parcels along both shoulders of Neuralia for approximately 3 miles centered at the intersection of Neuralia and Phillips Road.

P&P contacted the private developers for both solar farms and learned there are solar facilities present along both the east and west shoulders beginning at Phillips Road running north to Harriet Avenue for two full miles. After receiving plans from the Eland Developer (SOLV Energy), P&P learned that both shoulders are believed to be unavailable for this alignment. The alignment is proposed to reside within the paved roadway for two miles and will require more coordination with the County regarding an encroachment permit, traffic control, safety, etc.

It should also be noted that each of the solar farms has multiple trenchless crossings that run from the east to the west shoulder of Neuralia Road. Each crossing is known to have a significant number of high voltage conductors, and the exact elevation is not known with complete accuracy at this time. Potholing will be recommended for each of these four known crossings as outlined in the Recommendations for Potholing section of this report.

It is believed the alignment can be relocated back to the unimproved shoulder once it reaches the north-western corner of the Eland Solar Farm, at the intersection of Neuralia Road and Harriet Avenue. This condition will remain in place for about 4.8 miles until the alignment reaches Cantil Road.

At the intersection of Neuralia Road and Cantil Road, the alignment will turn east into the unpaved south shoulder of Cantil Road to a receiving pit located on the northwest parcel of the Honda Test Track for the jack and bore segment under Cantil Road and Union Pacific Railroad (UPRR). The trenchless crossing will be perpendicular to Cantil Road and UPRR. The bore pit will be on a private parcel to the north of the UPRR ROW. The alignment will then continue

approximately 17 feet from the centerline of the road in the unpaved shoulder of Neuralia Road to Redrock Randsburg Road.

The pipeline will follow along the existing grade of Neuralia Road, which has a gentle slope towards the base of the El Paso Mountains from Redwood Boulevard to Redrock Randsburg Road.

The alignment will turn east from Neuralia Road onto the southerly unpaved shoulder of Redrock Randsburg Road. The alignment will be approximately 25 feet from the centerline of the road in the unpaved south shoulder. The alignment will shift slightly to the south to accommodate the bore pit and receiving pit for the 24-inch HDPE pipe horizontal directional drilling for up to 4 major drainage crossings. Along this reach, there are two locations, one between Stations 2616+00 and 2636+00 and one between Stations 2685+00 and 2713+00 west of Cantil Road, where the alignment jogs to the south of Redrock Randsburg Road in private and BLM-owned parcels to avoid Cal Parks parcels before turning back east and continuing in the unpaved shoulder of Redrock Randsburg Road.

Cantil Road and other less traveled Kern County Roads will be crossed perpendicularly in an open trench, closing ½ of the road at a time. This was discussed and agreed to during P&P's meeting with Kern County Public Work's staff in May 2023.

Redrock Randsburg Road Section – Reach 3

The less traveled paved Kern County Roads in this reach, Saltsdale Road, will be crossed perpendicularly in an open cut trench with steel traffic plates installed overnight as required. The West Mojave Conservation Bank to the north and south of Redrock Randsburg Road between Stations 3045+00 and 3073+00 (refer to Plan and Profile Sheet C302 through C304) will confine the alignment to area between the edge of pavement and the fence line of the conservation bank and the temporary staging of equipment and material would be confined to the eastbound lane of Redrock Randsburg Road. Along this reach, there are two locations, one between Stations 3150+25 and 3157+75 and one between Stations 3178+00 and 3194+00, where the alignment jogs to the south of Redrock Randsburg Road in private and BLM-owned parcels to avoid Cal Parks parcels before turning back east and continuing in the unpaved shoulder of Redrock Randsburg Road.

Pump Station No. 1 will be located immediately south of Redrock Randsburg Road near Mile 27 or Station 3419+78 (refer to Plan and Profile Sheet C318 and the Pump Station Site Plan on Sheet PS301).

Between Stations 3427+00 to 4008+00, approximately 1.5 miles west of the intersection of Redrock Randsburg Road and Garlock Road, 0.6 miles east of the intersection, the pipeline will be constructed in the road and construction activities constrained to the disturbed shoulder

within the Kern County road ROW outside the fenced boundary of the CDFW Fremont Valley Ecological Preserve (refer to Plan and Profile Sheets C318 and C319).

The grade of this reach continues to decrease from Redrock Randsburg Road to Koehn Dry Lakebed before gradually increasing to the intersection of Redrock Randsburg Road and Garlock Road.

Garlock Road and Highway 395 Corridor - Reach 4

Garlock Road Section

This reach begins near Mesquite Canyon Road and continues on Redrock Randsburg Road. At the intersection of Redrock Randsburg Road and Garlock Road, the alignment may need to cross Redrock Randsburg Road perpendicularly in a trenchless jack and bore as the road splits off to the southeast towards the town of Randsburg. We will propose an alternative to the County that does not require a trenchless crossing.

East of the intersection of Redrock Randsburg Road and Garlock Road, along Garlock Road, the pipe alignment will remain in the eastbound lane of Garlock Road with construction activities confined to Kern County Road ROW for another 0.7 miles, outside the fenced boundary of the CDFW Fremont Valley Ecological Preserve. Continuing easterly towards the old town of Garlock, the pipe alignment will be 25 feet off the centerline of the road in the unpaved shoulder. At the town of Garlock, the pipe alignment will jog into the road from Station 4108+75 to 4110+75, approximately 10 feet from the centerline of Garlock Road to avoid an existing building on the south side of the road, close to the shoulder. The alignment will continue along the unpaved shoulder, 25 feet from the centerline of the road to Pump Station No. 2. Along this reach, there are up to 3 major drainage crossings that will be considered for trenchless horizontal directional drilling with 24-inch HDPE pipe.

Pump Station No. 2 is located at approximately Mile 33.1 or Station 4287+56 of the alignment (see Plan and Profile Sheet C412 or Pump Station Site Plan Sheet PS401).

The alignment inside the Garlock Road ROW will traverse critical desert tortoise habit approximately 2.3 miles northeasterly of the town of Garlock for approximately 1.4 miles.

The alignment will continue 25 feet from the centerline of Garlock Road to Pump Station No. 3 located on the northerly side of Garlock Road, just east of Highway 395 (see Plan and Profile Sheet C421 or Site Plan Sheet PS406). Continuing within the Road ROW for another 8.0 miles, the grade steadily increases from an elevation of 2,115 feet at the start of Garlock Road to the terminus of Garlock Road at Highway 395 at an elevation of 2,987 feet. The pipe alignment will cross perpendicular to Garlock Road with a bore and jack , passing alongside the easterly boundary of the pumping station.

Highway 395 Corridor to China Lake Boulevard Section

The pipe alignment will continue in a northeasterly direction near the toe of the hills west of Highway 395 for approximately 0.5 miles before crossing a drainage that will be considered for trenchless horizontal directional drilling. The alignment will continue another 800 feet before turning in a southeasterly direction to cross to the east side of Highway 395 perpendicularly. The Caltrans ROW width for Highway 395 in this reach is 400 feet. The pipeline will be jack and bored across the highway with a bore pit and receiving pit set approximately 25 feet outside of the ROW. The pipeline will follow the alignment of the road and be offset 225 feet from the centerline of Highway 395. In this reach, the alignment is constrained to the west by the boundary of the Cal Trans alignment right-of-way and to east of BLM's Spangler Hills OHV (Off-Highway Vehicles) area, with a 100-foot corridor between these two boundaries. The pipeline ROW along this alignment leads to a 190,000-gallon regulating tank at the highpoint of Highway 395 over the El Paso Mountains at an elevation of approximately 3,514 feet.

China Lake Boulevard to Ridgecrest Heights Tank Facility Section – Reach 5

The pipe alignment will continue to be offset 225 feet to the east from the centerline of Highway 395, crossing Searles Station Cut-off Road perpendicularly in a bore and jack crossing. The alignment continues in a northwesterly direction 25 feet from the easterly Caltrans right-of-way boundary, paralleling an existing SCE ROW road for a sub-transmission overhead power line located within the Cal Trans right-of-way. It will follow the downward grade towards China Lake Boulevard ROW for approximately 7.1 miles before crossing China Lake Boulevard (Highway 395 business).

The pipe alignment will cross to the westerly side of China Lake Boulevard in a jack and bore crossing approximately 865 feet north of the intersection of Highway 395, Brown Road, and China Lake Boulevard; approximately 275 feet north of the Cal Trans ROW at that intersection. The pipeline will continue in a northerly direction, 25 feet west of the centerline of China Lake Boulevard, inside the Kern County road ROW for approximately 7 miles. The existing grade is decreasing towards the IWVWD Ridgecrest Heights Tank Facility. Most of the underlying land in this reach is owned by BLM, but there are also private landowners adjacent to the road ROW. The alignment ROW has several dirt driveways serving the private residential homes to the west but will remain in the Kern County road ROW. Approximately 2,300 feet southwest of the Ridgecrest Heights Tank Facility, the pipe alignment will branch off the unpaved shoulder of China Lake Boulevard and continue northerly on Kendall Avenue, an unpaved road. The pipeline will be constructed in Kendall Avenue to the new terminus tank at IWVWD's Ridgecrest Heights Tank Facility.

4.2 REQUIRED PERMITS AND AGREEMENTS

The pipeline alignment passes through multiple jurisdictions and environmentally sensitive areas. Each of the jurisdictions and permitting agencies were contacted to determine their anticipated environmental, design phase, and construction phase permitting requirements for the project. Those requirements are described in more detail below and summarized in Table 4-1.

Table 4-1 - List of Permits and Agreements

Permitting Agency	Type of Permit/ Agreement	Est. Timeline of Permit Approval	Contact Person for Permitting Agency	Notes
Environmental-Related Permits				
Bureau of Land Management	Special Use Permit	18 months	Thomas Bickauskas	Includes coordination time to encroach on BLM land during design and for construction
Cal Dept of Fish and Wildlife	1600 permit-Lake and Streambed Alteration Agreement	6 months	Shari Heitkotter	Compliance with Water Quality Certification and Section 404 Permit regulations.
Cal Dept of Fish and Wildlife	California Endangered Species Act Incidental Take Permit	12-14 months	Shari Heitkotter	Needed if there is "take" of habitat or species
East Kern APCD	California Emissions Esitmator Model for CEQA	Comes with CEQA document	TBD	To model potential air pollutants generated during construction activities
Regional Water Board 401 Cert	Section 401 Permit	<1 month		Waters of the State
US Army Corps of Engineers 404 NWP	Section 404 Permit	<1 month	TBD	Waters of the US; Aquatic Delineation Required for USACE Section 404 NWP 58 may be required.
US Fish and Wildlife Service	Federal Endangered Species Act Consultation	14 months	TBD	Needed if there is "take" of habitat or species
Design-Related Permits				
City of California City	Encroachment permit	Unknown	Joe Barrigan, Public Works Director	To obtain permission for borings and potholing in ROW.
CalOSHA Mining and Tunneling	Gas Classification	Unknown	TBD	Required for each trenchless crossing during final design.
Cal Trans	Encroachment permit	4-6 months	Mark Reistetter	To utilize road right of way for pipeline crossings and new access road encroachments
Kern County Public Works	Building and Grading permits	Not applicable - Exempt	Not applicable - Exempt	Exempt per Government Code Section 53091
Kern County Roads	Encroachment permit	4 weeks(estimated)	Ivan Castaneda	To obtain permission for borings and potholing in ROW.
SWRCB Division of Drinking Water	Consultation and Domestic Water Supply permit	4- 6 months	Jesse Dhaliwal, Tehachapi District at Bakersfield Office	To confirm requirements for maintaining water quality.
RWQCB (Lahontan Region)	General Construction Permit (SWPPP)	Typically <3 months	TBD	To control project site run-off, duration includes preparation of SWPPP.
RWQCB (Lahontan Region)	Report of Waste Discharge	Typically <3 months	TBD	To permit discharges of water to land
Construction-Related Permits				
Cal Parks	Special Use Permit*	3-4 years	N/A	The current alignment skirts around the park boundaries.
Kern County Roads	Encroachment permit	8 weeks	Ivan Castaneda	To utilize road right of way
City of California City	Encroachment permit	8-12 weeks	TBD	To utilize road right of way
City of Ridgecrest	Encroachment permit**	8-12 weeks	TBD	To utilize road right of way
Southern California Edison	Encroachment permit	6 months(estimated)	TBD	Would include review of plans by Cal ISO for crossing major high voltage transmission line crossings.
Agreements				
AVEK	Wheeling Agreement, Connection Agreement, and Storage Agreement	Unknown	Matt Knudson, General Manager	To cover responsibilities for system improvements to wheel water from the SWP through AVEK's system
City of California City	Franchise agreement	Unknown	Joe Barrigan, Public Works Director	To obtain permission for permanent facility in ROW.
City of California City	Reimbursement agreement	Unknown	Joe Barrigan, Public Works Director	To reimburse the City for cost associated with providing utility information, plan checking, and inspections
To Be Determined	Operation and Maintenance Agreement	Unknown	TBD	To cover responsibilities for IWVGA system operation and maintenance and related costs
Kern County Public Works	License agreement	Unknown	Tim Garrison	To obain permission for permanent facility in ROW.
Kern County Public Works	Reimbursement agreement	Unknown	Tim Garrison	To reimburse the County for cost associated with plan checking and inspections
Kern County Roads	License agreement	Unknown	Tim Garrison	To obtain permission for permanent facility in ROW.
SCE	Consent agreement	6 months(estimated)	TBD	Would include review of plans by Cal ISO for crossing major high voltage transmission line crossings.
Union Pacific Railroad	Crossing Agreement	6-8 months	TBD	To utilize railroad right of way

* May be avoided if alignment is modified

**At this time, we believe that all field investigations for the design and all construction activities will be outside the city limits of Ridgecrest.

Environmental Permits - NEPA and CEQA

There are several state and federal environmental regulatory requirements that have been initiated at the beginning of the Authority's preliminary design work. To facilitate a timely geotechnical investigation required for the pipeline design, P&P staff has prepared and submitted a categorical exclusion for NEPA and categorical exemption for compliance with CEQA. The pipeline alignment will traverse approximately 20 miles of BLM land. To obtain a Special Use Permit from BLM to perform the soils investigation on lands in its jurisdiction, P&P staff prepared an SF-299 form and a proposed Plan of Development. The SF-299 Form and the proposed Plan of Development are currently being reviewed by BLM. This initiated the process of BLM becoming the Federal Lead Agency for the project.

As the Federal Lead Agency for the NEPA process, P&P's staff will be working under BLM to prepare the NEPA document for the project. BLM will coordinate with the other federal regulatory agencies, such as the United States Fish and Wildlife Service (USFWS) Section 7 consultation for sensitive species and US Army Corps of Engineers (USACE).

A portion of the alignment, primarily along Redrock Randsburg Road and Garlock Road, crosses several drainage channels. P&P's environmental group performed a Section 106 consultation with the USACE, the Lahontan regional office of the State Water Resources Control Board (SWRCB) Regional Water Quality Control Board (RWQCB), and CDFW. USACE has agreed to provide a waiver letter stating that a Clean Water Act Section 404 permit per the Clean Water Act (CWA) will not be required for this project. Similarly, the RWQCB also will provide a Waste Discharge Requirement waiver letter for waters of the State. Some of the drainage crossings not under federal jurisdiction may fall under the jurisdiction of the SWRCB, RWQCB, and/or CDFW. The SWRCB has provided a waiver letter stating a Section 401 permit will not be required. CDFW and has requested that P&P prepare and submit a Lake and Streambed Alteration Permit application and it will provide an official if it can waive this permit requirement for the drainage crossings as well as desert wash jurisdiction. CDFW will also require notification under Section 1600 of the Fish and Game Code for the California Endangered Species Act (CESA) for sensitive species. In addition, the Authority's CEQA/NEPA consultant will need to perform an in-depth cultural survey of the alignment and consultation to provide information to BLM for Section 106 and with tribal consultation resources.

A group of qualified biologists will be required conduct a pre-activity clearance survey at each active construction site each day at each site and remain onsite to oversee all vegetation clearing and ground disturbing activities conducted within suitable habitat of protected species for avoidance and protection of listed species. If a protected species is observed within the Project area the biologist will stop work and allow the species to leave the site of its own volition or contact the appropriate regulatory agency (BLM, and CDFW and/or USFWS) for guidance on how

to proceed. The contractors will be required to install and maintain desert tortoise exclusion fences along the construction corridors and areas where deemed necessary by the regulatory agencies. Mitigation measures for pipe trenches and excavations for other facilities will need to be implemented at the end of day to prevent wildlife from falling in and becoming trapped or injured. The environmental mitigation measures required will have a significant cost impact to the overall project.

P&P environmental staff is also recommending that construction hours for construction activities should be limited to a half hour after sunrise through a half hour before sunset to reduce daylight hours to avoid potential impacts to wildlife movement corridors. This may slow the contractor's progress, especially during the winter months. Delays due to the presence of sensitive species could have a significant impact on a particular construction site.

Permits During Design Phase

Prior to construction and during the design phase, several local, county and state permits will need to be obtained, including encroachment permits, franchise and/or license agreements. The following permits will need to be obtained by the IWVGA and where applicable the end user, IWVWD:

SWRCB Division of Drinking Water (DDW)

DDW will require the imported water delivered to the IWVWD distribution system to be permitted as a surface water source. IWVWD will have to obtain a Domestic Water Supply permit before the imported water can be put into its water system.

Kern County Road Encroachment Permit

Nearly half of the pipeline alignment will be within the road ROW of Neuralia Road, Redrock Randsburg Road, Garlock Road, and China Lake Boulevard. Encroachment permits will be required for obtaining permission to complete soil borings and utility potholing within the road ROW. Additional permits will be required to construct the pipeline within the ROW. As the owner, IWVGA will be responsible for obtaining the encroachment permit and the Contractor(s) will be responsible for obtaining a rider. Typically, Kern County requires an asphalt concrete pavement t-patch that extends 12 inches either side of trench wall and a 0.15' grind and overlay for full lane width for all parallel pipeline construction within the pavement.

Caltrans Encroachment Permit

The trenchless jack and bore across the 400-foot-wide ROW for Highway 395 will require a Caltrans encroachment permit. Caltrans does not grant permanent easements on its highway; therefore, the encroachment permit will serve as a permanent record for IWVGA and Caltrans of this crossing. There will also need to be encroachment permits for access roads from the regulating tank at the high point along Highway 395. Permits will also be needed for access roads spaced along the alignment along the Highway 395 corridor to provide the operations and

maintenance staff periodic accessibility to the pipeline alignment and access to the new road located outside of the Caltrans right-of-way. The spacing for these access ways off Highway 395 will be determined after further consultation with Caltrans and BLM.

California (Cal) Occupational Safety and Health Administration (OSHA) Mining and Tunneling Gas Classification

For the trenchless jack and bore crossings, a Cal OSHA Mining and Tunneling Gas Classification will need to be acquired during final design. Cal OSHA requires that pipe-jacking operations (30-inch diameter and over) must obtain a Classification of environmental hazards from the Mining and Tunneling Unit prior to bidding the project.

SWRCB Stormwater Pollution Prevention Plan (SWPPP)

A SWPPP will need to be prepared to obtain a General Construction Permit (GCP) with the SWRCB to be covered by the state's current Construction General Permit Order. Due to the magnitude of the project and the potential number of construction contracts for the project, it is recommended a draft of the SWPPP(s) be prepared ahead of the bidding process by the IWVGA. This would reduce the time the Contractor would have to spend after the project is awarded to prepare a SWPPP and submit it. The Contractor would finalize the draft SWPPP(s) in coordination with the owner and engineer. The owner's Legally Responsible Person (LRP) will submit the permit registration documents. The Contractor will be responsible for implementing the required Best Management Practices (BMPs) described in the SWPPP.

Lahontan Regional Water Quality Control Board – Report of Waste Discharge

The Contractor will need to fill out a SWRCB Form 200 (Application/Report of Waste Discharge) for the discharge of water during hydrotesting and chlorination of the pipeline. This will require coordination with BLM or the private landowners at proposed points of discharge. This permit would also be required if a repair on the pipeline requires a portion of the line to be drained and discharged over land. This should be a low threat discharge permit through the General Order 2003-0003-DWQ.

Kern County Public Works

- **Building Permit –** Per Government Code Section 53091, building ordinances of the county do not apply to the construction of facilities for the production, generation, storage, treatment, or transmission of water or electrical energy by a local agency so the buildings and tanks in this project should not require a building permit. More discussions with the Authority will be needed related to this item.
- **Grading Permit –** See Building Permit discussion above.

UPRR

A Pipeline Crossing Agreement will be required by UPRR to cross under the railroad just east of the intersection of Neuralia Road and Cantil Road. There is another crossing under an inactive

UPRR railroad embankment east of Highway 395. BLM has actively been working on converting some unused railroad ROW in the Ridgecrest area in a BLM program called "Rails to Trails" where unused railroad ROW is converted to walking paths. Further discussion between BLM and UPRR is needed to determine if the reach at this second crossing would be a candidate for this program.

Permits During Construction Phase

The following permits will have to be obtained by the Contractor(s) or the Contractor(s) will need to be added as a rider to the permit obtained by IVWGA:

SWRCB - SWPPP

See previous discussion.

Caltrans Encroachment Permit

The Contractor will be required to be added as a rider to the permit obtained by IWVGA.

Kern County Road Encroachment Permit

See previous discussion.

California City Encroachment Permit

The Contractor will be required to obtain a road encroachment permit from the California City Public Works Department for work in Redwood Boulevard and Neuralia Road, from Redwood Boulevard to the northern city limit at Washburn Blvd. The permits will be required for completing soil borings, utility potholing, and pipeline construction. For pipeline trench resurfacing, California City typically requires an asphalt concrete pavement t-patch that extends 6 inches either side of trench wall for all parallel pipeline construction within the pavement.

CalOSHA

- *Mining and Tunneling*
  The Contractor will be required to report plans for pipe-jacking operations or horizontal directional drilling operations (30" diameter and over) to the Cal OSHA Mining and Tunneling Division prior to beginning the project. The Contractor will be responsible for obtaining the construction encroachment and crossing permits as the permit leader.
- *Trenching and Shoring Permit*
  The Contractor will be responsible for maintaining an Annual Trenching and Shoring Permit for the duration of the contract.

Agreements Required Prior to Construction

AVEK

At this time, it appears that IWVGA will require a number of agreements with AVEK. One would be a wheeling agreement. This wheeling agreement may include conditions under which AVEK would have to augment its distribution system with new or upgraded facilities as IWVGA's demands increase, and who would pay for such facility improvements. Another agreement would be needed to connect to AVEK's system and to take deliveries from AVEK, even though Ridgecrest is not in AVEK's service area. A third would be a possible storage agreement, whereby IWVGA could bank some or all of its water in AVEK's service area in a given year under certain circumstances, then withdraw it as requested. These agreements could be consolidated into a single agreement or two agreements if desired.

IWVWD

The operator of the proposed facilities has not yet been determined. However, since it ties into the IWVWD system, and IWVWD already has a permit from the DDW, IWVWD could possbily be the operator, with IWVGA being the owner. This would require an agreement between the two entities as to who will operate and perform routine maintenance and major maintenance, as well as who will pay for it and how costs will be recorded, reported, invoiced, and paid. As an alternative, AVEK could operate the proposed facility, in which case this operation and maintenance agreement would be with AVEK instead of IWVWD. A third option would be for the Authority to operate the proposed facilities.

Kern County Public Works

The Kern County Public Works Department will need a license agreement with IWVGA and a reimbursement agreement when the plans are advanced to a 90% level. P&P staff have prepared a license agreement application with the County and will be working with County staff to develop a license agreement that will allow for the Authority to operate and maintain the conveyance system facilities that are located within the Kern County ROW in perpetuity. The reimbursement agreement will cover the reimbursement for plan checking the contract plans and for inspection time during the construction phase. Kern County staff drafts the license agreement and reimbursement agreement and the IWVGA project team will review and provide comments before it is finalized and executed.

California City

The California City Public Works Department will need a franchise agreement with IWVGA and a reimbursement agreement. P&P staff will be working with City staff to develop a franchise agreement that will allow for the Authority to operate and maintain the conveyance system facilities that are located within the California City ROW in perpetuity. The reimbursement agreement will describe terms for the City to get reimbursed for staff time and time spent by its engineering and planning consultants to provide existing utility information, review the design plans, and provide inspection time during the construction phase.

SCE

A Consent Agreement will be required to cross underneath SCE's high voltage transmission lines that cross over Garlock Road. A Consent Agreement is a type of access agreement, right-of-entry, and permission to install the pipeline and any related equipment within the existing SCE right-of-way. Although the permanent location of the pipeline is intended to be placed in the Kern County Garlock Road (public) right-of-way, some of the work effort to construct the pipeline will take place on adjacent private property within a Temporary Construction Easement.

One other SCE crossing, located at approximately mile 19.3, may also need to be included in the Consent Agreement. That location is also on private property. The decision whether this crossing needs to be included in the Consent Agreement will be based on a formal review and determination by SCE that this crossing meets the criteria. A formal review requires complete property and title data and a final set of plans.

All other crossings along the alignment appear to be exempt from a Consent Agreement or any other SCE requirement since they are within the public right-of-way or do not meet SCE land use requirements for crossings.

4.3 DESIGN CRITERIA

Water for the project comes from AVEK's Rosamond Water Treatment Plant via its Mojave Tank Farm and is delivered by gravity through AVEK's North Feeder pipeline to its California City Feeder pipeline. The assumed capacity of AVEK's 18-inch California City Feeder is 6.5 cfs (2,917 gpm). This assumed capacity is based on a hydraulic profile of the line supplied by AVEK and is set as the initial project design flow rate. P&P recognizes that the full 6.5 cfs will not be available to IWVGA when California City takes deliveries from this feeder. However, for design purposes, it is convenient to use this number as the initial design flow.

Future improvements to AVEK's existing infrastructure would add the capacity needed to supply the project's imported water requirement of 6,431 AFY. Spread over 10 months per year of project operation, this results in an ultimate annual design flow rate of 10.8 cfs (4,847 gpm). Assuming a typical maximum head loss gradient of 3 feet per 1,000 feet of pipeline, the maximum peak capacity of the proposed 24" pipeline is determined to be 14.3 cfs (6,418 gpm).

The pipeline system has been designed for the peak capacity of up to 14.3 cfs (6,418 gpm). This capacity allows for off-peak pumping to be maximized, greatly reducing power costs.

Table 4-2: Project Flow Rates

Project Phase	Capacity, cfs	Annual Operation Period, months per year	Annual Deliveries, AFY	gpm
Initial Flow	6.5	10	3,870	2,917
Ultimate Flow	10.8	10	6,431	4,847
Maximum Peak Capacity	14.3	10	8,515	6,418

The pipeline is segregated hydraulically into five segments – California City Feeder Turnout to PS1 Suction, PS1 Discharge to PS2 Tank/Forebay, PS2 Discharge to PS3 Tank/Forebay, PS3 Discharge to Regulating Tank, and Regulating Tank to Ridgecrest Heights Terminus Tank.

The pipe from the California City Feeder Turnout to PS1 Suction is designed for a static (no flow) pressure of slightly less than 200 psi that occurs through gravity from AVEK's Mojave Tank Farm. The design takes advantage of the available head in that portion of the system.

The pipe between PS-2 and PS-3 and the Regulating Tank is designed for normal operating pressure below 275 psig, which was set by the design team as the maximum operating pressure just downstream of the pump stations so pressure class 300 pipe can be used with an operating margin of 25 psi below the pressure class rating.

Downstream of the regulating tank at the high point of the project, the pipe will be 18" in diameter that flows by gravity to the Terminus Tank and will be controlled by PRVs and/or

hydroelectric turbine stations. The maximum sustained pressure in the pipe downstream of the regulating tank will occur when there is no flow. A pressure class of 300 was selected in this section to withstand static and transient flow conditions.

Table 4-3: Pipeline Design Criteria

Reach	Pipe Size (in)	Length (mi)	Capacity (cfs)	Velocity (fps)	Pipe Material	Pressure Class	Headloss Gradient
California City Feeder Turnout to PS1 Suction	24	27.6	14.3	4.6	PVC	235 (DR18)	3'/1000'
PS1 Discharge to PS2 Tank/Forebay	24	6.0	14.3	4.6	CML&C WSP	300	3'/1000'
PS2 Discharge to PS3 Tank/Forebay	24	4.1	14.3	4.6	CML&C WSP	300	3'/1000'
PS3 Discharge to Regulating Tank	24	2.7	14.3	4.6	CML&C WSP	300	3'/1000'
Regulating Tank to Ridgecrest Heights Tank	18	10.2	14.3	8.1	CML&C WSP	300	14'/1000'

Notes: in = inches; mi = miles; cfs = cubic feet per second; fps = feet per second

Typical depth of cover will be 4'-0" minimum. Depth will increase at road, utility, creek, railroad and drainage crossings, exceeding 25 feet of depth in some cases.

4.4 PIPE MATERIALS

Pipeline material will vary for each reach and will be dependent on the internal pressures of that reach. Generally, ANSI/AWWA C900 PVC Pipe will be used for reaches less than 235 psi and ANSI/AWWA C200 CML&C Steel Pipe will be used for reaches greater than 235 psi. ANSI/AWWA C906 HDPE Solid Wall Pipe will be used where horizontal directional drilling is required to cross under a drainage channel or creek. All materials in contact with potable water shall be certified to the requirements of NSF/ANSI 61. Generally, pipeline materials and classes have been selected based on internal pressures because pipe burial depths are mostly expected to be relatively shallow versus depths where external loads from deep cover governs pipe design. However, certain special cases with deep cover will need to be reviewed for possible localized changes in pipe class in later stages of design following the guidelines presented in the ANSI/AWWA Pipe Design Manuals.

Alternative pipeline materials including PVC, steel (with various coatings), ductile iron (DIP), and high-density polyethylene (HDPE) were considered. DIP was not selected for the main line installation because it has not performed well for other IWVWD's facilities in the area and IWVGA asked that it be removed from consideration. PVC was found to be the most economical for static or operating pressures of 235 psi or less. Cement mortar lined and coated steel (CML&C Steel) pipe was found to be the most economical for static or operating pressures above 200 psi. HDPE was not selected for the main line installation due to the high pressures; the wall thickness would be upwards of 3 inches reducing the internal diameter to 18 inches or less which would create significant friction losses and increased energy usage. However, HDPE pipe was selected for installation within pipe casings because the fused joints with no protrusions are preferred by trenchless technology contractors. The service life of all pipes selected is expected to be at least 40 years. Following are characteristics of pipe and fittings selected for the project:

- ANSI/AWWA C900 PVC Pipe (<235 psi)
    - Manufactured in accordance with the latest edition of ANSI/AWWA C900 and AWWA Manual M23 PVC Pipe – Design and Installation Guidelines
    - DR18 – 235 psi class
    - 20 feet laying length
    - C = 150; n=0.009
    - Angular deflection at the joint is 1.5 degrees
    - Maximum Deflection and Ovality Limit of 7.5% for deflection/deformation of pipe in calculations for external loads and allowance during construction.
    - Installed and tested in accordance with the latest revision of ANSI/AWWA C605
    - Fittings
        - Ductile Iron compact restrained mechanical joint fittings per ANSI/AWWA C153/A21.53
            - Rated for working pressure of 350 psi plus surge allowance of an additional 100 psi
            - Mechanical joint bells, plain ends, and accessories shall conform to ANSI/AWWA C111/A21.11.

- Asphaltic outside coating
- Cement-mortar lining per ANSI/AWWA C104/A21.4
- Mechanical joint restraint coupling
    - Shall be of the type that utilizes the follower gland and shall consist of several individual lug bolts with gripping mechanism that prevents the joints from pulling apart.
    - Glands shall be ductile iron conforming to ASTM A536,
    - Dimensions shall be compatible to be used with standard ductile iron mechanical joint fittings for C900 PVC pipe.
    - Maximum allowable joint deflection is 5 degrees.
    - EBAA Iron 2000PV MEGALUG or similar
- Fittings will be wrapped with polyethylene encasement per ANSI/AWWA C105 and secured with plastic adhesive tape.

- Thrust Blocking required at fittings and in-line valves (a restraining harness design can be considered as an alternative).
- Flanged fittings per ANSI/AWWA C110/A21.10
    - Restrained flange coupling adapters compatible with PVC C900 pipe, such as EBAA Iron Megaflange Series 2100, will be used when joining flanged fittings with PVC pipe
- All bolts, tie rods, and T-bolts used to secure flanges, fittings, and couplings located underground or submerged in liquid shall be Type 304 or 316 stainless steel per ASTM A320 or ASTM A193. Nuts shall be 304 or 316 stainless steel per ASTM A194 and washers shall be ASTM F436 Type 3
- Insulating flange sets consisting of insulating gaskets, sleeves, and washers shall be provided where joining pipe and/or fittings of dissimilar metals

- ANSI/AWWA C200 Steel Pipe with ANSI/AWWA C205 Cement-Mortar Lining and Coating (>=235 psi)
    - Manufactured in accordance with the latest edition of ANSI/AWWA C200 and ANSI/AWWA Manual M11 Steel Pipe Design Guidelines
    - Steel pipe's lower weight and smaller outside diameter than other types of pipe such as HDPE and concrete cylinder pipe not only reduce transportation and handling costs but minimize excavation and backfill. Pipe sections as long as 60 feet minimize the number of field joints and reduce installation costs.
    - Steel pipe is adequate for the rated working pressure plus an additional surge allowance of 50% of the working pressure.
    - Maximum Deflection and Ovality Limit of 2.0% for deflection/deformation of pipe in calculations for external loads and allowance during construction.
    - Cement-Mortar Lining and Coating per ANSI/AWWA C205
        - C = 140; n = 0.012
    - Complete joints with a cement-mortar diaper per ANSI/AWWA C205
    - Installed and tested in accordance with the latest revision of ANSI/AWWA C604
    - Unrestrained Joints

- O-ring joints for straight runs
    - O-ring gasket seated in a rolled groove on the spigot end of the pipe is compressed for a watertight seal when it is inserted into the bell end of the adjoining pipe.
    - Economical, non-welded method of joining buried steel water pipe
    - Quick installation with no welding time
    - Non-rigid joints accommodate differential ground settlement after pipeline installation
    - Joint flexibility allows angular deflection for long-radius curves and minor field alignment changes
    - Formed integrally into the pipe cylinder, the joint has strength equal to that of the pipe itself
    - Bonded to assure electrical continuity

- Restrained Joints
    - Bell-and-Spigot Lap Weld Joints where thrust loads or pipe movement must be overcome, such as at bends, reducers, surges, or valves
        - Single-Lap Welded per ANSI/AWWA C206
        - Restrained joints provide thrust resistance for buried pipe with working pressures in excess of 400 psi.
        - The joints can withstand designed and unexpected surges associated with high-pressure pipelines.
        - Joint pull of 2 degrees plus 5-degree miter cuts to the bell end allows up to 7 degrees of deflection per joint, ideal for eliminating elbows, laying pipe on a radius, or adjusting for profile changes.
        - Welded outside perimeter only
        - Easy assembly and fit-up in the field
    - Butt-Strap Joints at field closures
        - Welded outside perimeters only
- Other Joints in Consideration for Traversing Faulted Areas
    - InfraShield Seismic Resilient Joint System by Northwest Pipe Company
        - ANSI/AWWA Manual M11 and ANSI/AWWA C200
        - Builds on Lap-Welded Bell and Spigot Joint Design by adding a small projection in the steel pipe wall that effectively transfers tensile and compression forces associated with seismic events.
        - Patent-pending
        - Coating – polyurethane, liquid epoxy, or cement mortar over tape
        - Lining – cement mortar, liquid epoxy, or polyurethane (cement mortar lining may be compromised after an event. Polyurethane may provide fewer post-event implications)
        - Allows movement at the projection rather than at the joint
        - Can withstand multiple shocks and after events
        - Repair locations are easy to identify

- No special training or tools, no manufacturer's representative needed on-site
- Tested multiple hazards at their yard in Adelanto, CA
- Numerous technical papers – UESI Pipelines Conference
- Complies with Buy America requirements, if required for state and federal funding sources.

  - Fittings and Specials
    - ANSI/AWWA C208
  - Flanges
    - Steel slip-on per ANSI/AWWA C207
    - Comply with bolt pattern on adjoining flange
    - All bolts, tie rods, and T-bolts used to secure flanges, fittings, and couplings located underground or submerged in liquid shall be Type 304 or 316 stainless steel per ASTM A320 or ASTM A193. Nuts shall be 304 or 316 stainless steel per ASTM A194 and washers shall be ASTM F436 Type 3
    - Insulating flange sets consisting of insulating gaskets, sleeves, and washers shall be provided where joining pipe and/or fittings of dissimilar metals
  - Grooved End Fittings
    - To reduce the labor required to install flanged fittings, a grooved end type fitting will be considered as an alternative
    - More research during the next phase of design will help us determine where these types of fittings could be used appropriately in the system.

- ANSI/AWWA C906 HDPE Solid Wall Pipe (HDD trenchless crossings)
  - Manufactured in accordance with the latest edition of the ANSI/AWWA C906
  - DR9 - 250 psi rated and DR11 – 200 psi rated
  - 40/50 feet laying length
  - DIPS – Ductile Iron Outside Diameter Pressure Pipe
    - C = 150; n = 0.009
    - Average I.D. for 24-inch DR9 is 19.722 inches and for DR11 is 20.829 inches
    - Average O.D. is 25.800 inches
  - IPS – Iron Pipe Size Pressure Pipe
    - C = 150; n = 0.009
    - Average I.D. for 24-inch DR9 is 18.346 inches and for DR11 is 19.374 inches
    - Average O.D. is 24.000 inches
  - Maximum Deflection and Ovality Limit of 4% for DR9, 5% for DR11 deflection/deformation of pipe in calculations for external loads and allowance during construction.

- Hydrostatic Pressure Testing of Water Main
  - In accordance with ANSI/AWWA Standard for the specified Pipe Material

- Disinfection of Water Main
    - In accordance with ANSI/AWWA C651 – Disinfecting Water Mains
    - Disinfecting chemicals shall be NSF/ANSI 60 certified for use in potable water
    - Flushing of chlorinated water from the main shall follow the procedures described in ANSI/AWWA C655 – Field Dechlorination

4.5 APPURTENANCES

AVEK Turnout

A turnout structure from the 18-inch diameter California City Feeder will be designed to comply with AVEK standards for a redundant dual turnout, which includes parallel pipes, each having a shutoff valve, check valve, and flowmeter. The check valves will each be housed in an 8'x10' underground bottomless pre-cast concrete vault. The flow meters will each be housed in a 6'x8' underground bottomless pre-cast concrete vault. Grooved end couplings will be located inside the vaults adjacent to the check valves and meters to facilitate removal for repair or replacement. The bottomless vaults will sit on a gravel base for leveling and drainage and will be equipped with hinged double access covers with HS-20 vehicle load rating. AVEK will be responsible for all piping to the isolation valve downstream of the meter. Beyond that point, IWVGA will be responsible for all facilities. The delineation of ownership is shown on the AVEK Turnout Detail drawing (refer to Sheet D11). A 15' wide access easement on each side of the turnout will be provided to give AVEK the ability to access the facilities in case of a change in property ownership. No fencing or lighting is planned.

The specific products to be used, including features and assembly information, are based on AVEK preference and listed below. Product cut sheets are included in APPENDIX F – PRODUCT SHEET CUTS See ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS – Preliminary Design Drawings, Sheet D11 for the proposed Turnout detail.

- Butterfly Valves –
  - AVEK Standard Details 3.01 and 3.02
  - Mueller Lineseal valves
    - Pressure class to match pipe
    - Flanged
  - 2" AWWA square operating nut with valve position indicators manufactured by Trumbull Manufacturing
  - Galvanized or stainless steel valve stem extensions that terminate 6" below grade
  - Valve support pad per Detail 3.01
  - C900 DR14 PVC valve riser and Christy G-05 Valve Box marked "AVEK" in reinforced concrete collar set 2" above grade in unimproved areas
  - Buried flanges and flange bolts shall be wrapped with wax tape
  - Valves will be wrapped with polyethylene encasement per AWWA C105 and secured with plastic adhesive tape
  - Valve position sensors and transmitters to SCADA system with or without remote actuators will be an optional feature to review during later design stages.
- Check Valves –
  - CLA-VAL Model 81-02
    - Drip-tight shut-off
    - No-slam operation

    - Maximum flow based on pipeline velocity of 6 fps (can be equipped with pressure relief valve or surge control valve if velocities exceed 6 fps)
    - Valve position would not be connected to SCADA
- Flowmeters –
    - ABB Aquamaster4 Magnetic Flow Meters
    - Battery-operated or Power Meter Pedestal
    - Flowmeter remote reading kit to match AVEK requirements
    - SCADA with readouts for flow through meters and upstream/downstream pressures
    - Coordination with AVEK's SCADA programmer will be required.
    - SCE service will be required for SCADA; SCE service will be in AVEK's name, but coordinated by IWVGA
- Sample Stations –
    - AVEK Standard Details 4.08 and 4.09
    - 1" stainless steel pipe, ball valve, and fittings
    - 6" diameter x 36" tall Schedule 40 galvanized steel pipe enclosure with locking lid on reinforced concrete collar

Transmission Main Appurtenances

This section provides recommendations for transmission main appurtenances including line valves, air valves, blowoff and pressure relief valve stations, flow meters, access manholes, and cathodic test stations.

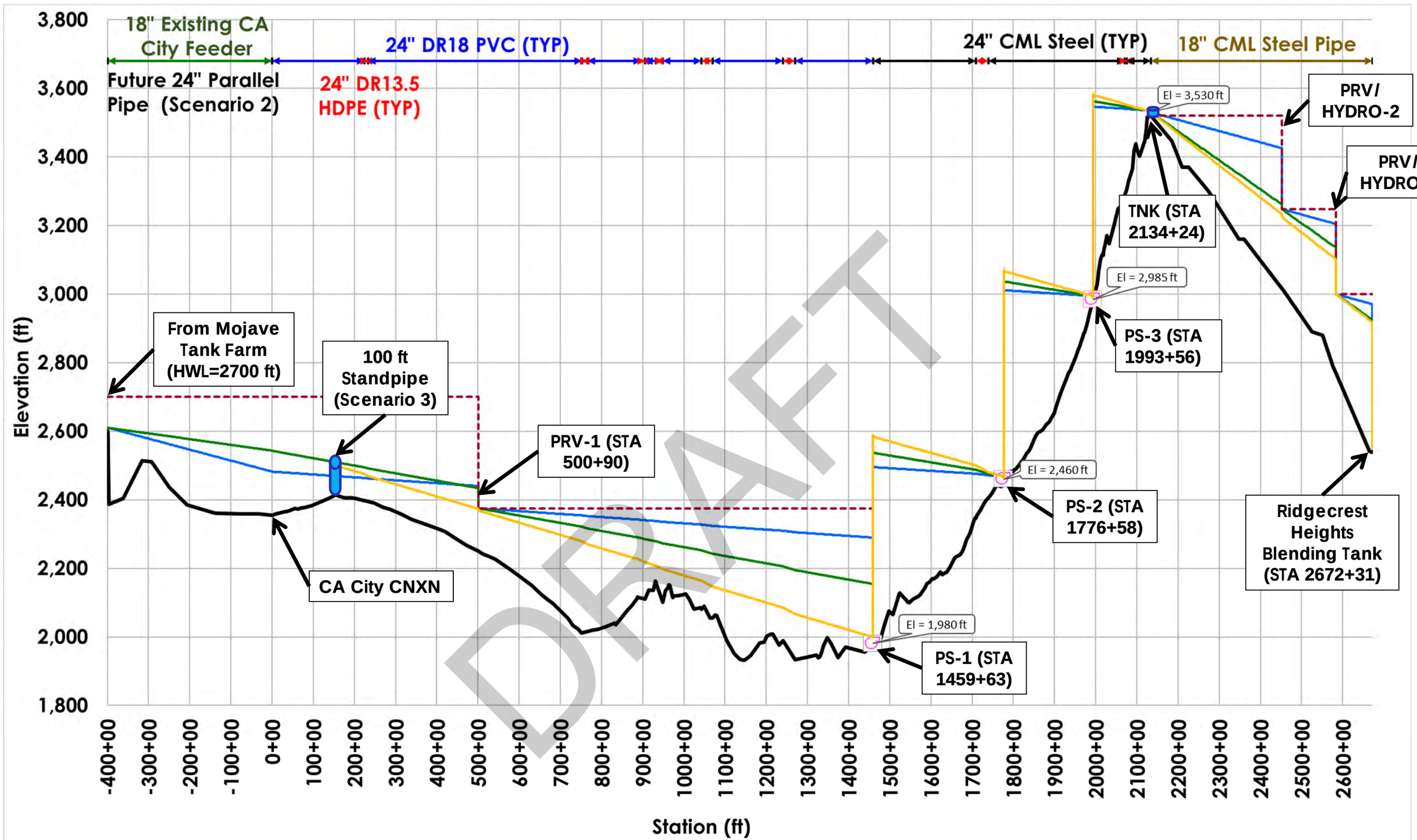
Line Valves

Typically, main line valves are spaced to allow a reasonable amount of time for draining pipe and doing maintenance or repair work during a single day shutdown period, which in this case would be one isolation valve every mile. However, due to the length of this pipeline, and since one mile spacing would create onerous and unnecessary operation and maintenance requirements for the operators to exercise the valves, a more reasonable approach to reduce the number of main line valves is proposed. The main criteria were shifted to place the valves at locations which would prevent major damage in a catastrophic failure, and to facilitate maintenance. At least twelve (12) locations have been identified as follows and are shown on **Figure 4-1**.

1. *AVEK turnout on California City Feeder*
2. *California City location in Reach 1 near the canal crossing and/or California City Boulevard crossing.*
3. *High side of UPRR crossing so the pipeline drains out when the valve is closed.*
4. *PRV-1 – PRV assembly will have isolation valves that can be used for isolating the pipeline upstream from downstream of the PRV assembly.*
5. *PS-1 Discharge – An isolation valve on the discharge side of Pump Station 1 will allow separation of the pump station check valves and pumps from the uphill pipeline run for*

pipeline draining and pump station servicing. A review of the need for an isolation valve on the suction side of the pump station will be needed during later stages of design.

6. *High side of Garlock Road crossing at Redrock Randsburg Road so the pipeline drains out when the valve is closed.*
7. *PS-2 Discharge & Tank/Forebay Inlet– An isolation valve on the discharge side of Pump Station 2 will allow separation of the pump station check valves and pumps from the uphill pipeline run for servicing. An isolation valve on the tank/forebay inlet is also needed to isolate the tank from the pipeline below it.*
8. *PS-3 Discharge & Tank/Forebay Inlet, or high side of Highway 395 crossing so the pipeline drains out when the valve is closed – An isolation valve on the discharge side of Pump Station 2 (or high side of Highway 395 will allow for pipeline draining and separation of the pump station check valves and pumps from the uphill pipeline run for servicing. An isolation valve on the tank/forebay inlet is also needed to isolate the tank from the pipeline below it.*
9. *Regulating Tank– Isolation valves on both sides of the regulating tank will allow for pipeline draining and isolation of tank for inspections and maintenance.*
10. *PRV-2 assembly will have isolation valves that can be used for isolating the pipeline upstream from the pipeline downstream for pipeline draining and PRV servicing.*
11. *PRV/Hydro-3 assembly will have isolation valves that can be used for isolating the pipeline upstream from the pipeline downstream – Isolation valves on both sides of the PRV/Hydro-3 assembly allow pipeline draining and PRV/hydro servicing.*
12. *Upstream of FCV/Hydro/Tanks at Ridgecrest Heights Tank site FCV/Hydro assembly will have isolation valves that can be used for isolating the pipeline upstream from the pipeline downstream – Isolation valves on both sides of the FCV/Hydro assembly allow pipeline draining, tank inspections and maintenance, and FCV/hydro servicing.*



Stantec

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Head Legend:

- Pipeline Elev.
- HGL (6.5 cfs)
- HGL (10.8 cfs)
- HGL (14.3 cfs)
- HGL (Static)

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Client/Project
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **4-1**

Title Main Line Valve Location

The specific products to be used for line valves, including features and assembly information, are based on IWVWD preference and listed below.

- Dezurik Butterfly Valves per IWVWD preference, Short Body – a product cut sheet is included in Appendix F.
- AWWA C504 Class 250B
- ANSI B16.1 Class 250 Flanges or ANSI/AWWA C111/A21.11 Mechanical Joint Ends
- Epoxy coated interior and exterior per ANSI/AWWA C504
- Actuators – 2-inch operating nut with extension
    - Stem shall turn counterclockwise to open
    - Actuator gearing shall be reviewed and specified during subsequent design stages including refined transient/surge analysis to reduce potential for overly rapid valve closure
- Direct buried with IWVWD Standard P-11 (or P-11A) Valve Box and PVC Extension Sleeve over actuator
- Buried flanges and flange bolts shall be wrapped with wax tape.
- Valves will be wrapped with polyethylene encasement per ANSI/AWWA C105 and secured with plastic adhesive tape.

Air Valves

Air Release Valves release air from the pipeline after it is filled and in operation, but do not have the ability to release air during pipeline filling, nor do they protect the pipeline from excessive vacuum. Air/Vacuum Valves release air during pipeline filling and admit air to protect the pipeline from excessive vacuum but can't release air when the pipeline is in operation. Combination valves have the capabilities of both Air Release Valves and Air/Vacuum Valves. Due to this diversity in function, Combination Air Valves are the type of valve selected for use on the Project.

Two guidance documents – Valmatic's Whitepaper "Theory, Application, and Sizing of Air Valves" and AWWA's Manual M51 "Air Valves: Air Release, Air/Vacuum, and Combination Second Edition" – were used to guide the selection of locations, spacing, and sizing of valves.

Valves will be required at high points in the pipeline and locations where the pipeline slope changes (decrease in upslope or increase in downslope). In some cases, the pipeline depth and grade will be adjusted to eliminate some highpoints or slope changes. Long pipeline runs also have valves intermittently, whether horizontal, on long ascents, or long descents. The maximum spacings between valves are set at the maximum length allowed in the guidance documents (2,500 feet) on these long runs. Grade control during pipeline installation will be essential to avoid creating localized high spots and slope increases. To accomplish this pipeline profiles on the plan and profile drawings shall have pipe inverts and slopes shown. Contractors will be required to control pipe inverts and slopes during pipeline installation to match the plans' grades and slopes within the following tolerance: The maximum allowable departure from grade shall

not exceed 0.1 foot. Where departures occur, the rate of return to the established grade shall not exceed 10 percent of the pipe diameter per foot of length.

Valve sizes were determined by performing calculations for vacuum protection during pipeline draining and in case of sudden pipeline breaks, for expelling air during line filling, and for continuous release of air during pipeline operations. Vacuum protection calculations assumed air flows through the valves would be below sonic velocities (for hearing protection) and established the required large orifice diameter to allow air entrance equal to the maximum water flow by gravity that would occur in the pipeline toward the nearest low point where an open blowoff or a break in the pipeline was assumed to occur. Since maximum gravity flow in a pipe occurs when the flow depth is 90% of the internal diameter, Manning's equation was utilized and adapted to represent the 90% full flow geometry. Calculations for the large orifice size needed to allow line filling assumed the pipeline would be filled with one of the smallest pumps at the nearest pump station and that the valve would need to expel an equivalent amount of air. In most cases, vacuum protection established the required minimum large orifice size. Calculations for the required small orifice size for air release during pipeline operations established the minimum diameter for the small orifice on Combination Air Valves. Combination valves were then selected to have large and small orifice sizes as large or larger than the required diameters. Bermad's Engineer's Air Vent Guide also recommends vacuum relief valves on downsloping side(s) of isolation valves plus continuous acting air vents after pressure reducing valves and other specialty valves. This guidance will be utilized to revise and update air vent and vacuum relief locations and sizing calculations during subsequent design stages.

Air valves will be partially buried in circular concrete or tape wrapped, galvanized, or painted steel valve enclosures that have air holes near the top. Top elevations of the enclosures will be set above flood elevations. Tight sealing hatches will mitigate dust and sand accumulation. The number and diameter of air holes will be designed to provide sufficient area to pass the maximum air flow required by each air vent. Air and Vacuum Valves will be placed along the alignment using the criteria described above. The proposed locations will be provided in the 30% design submittal after the alignments have been approved and the corresponding profiles are created.

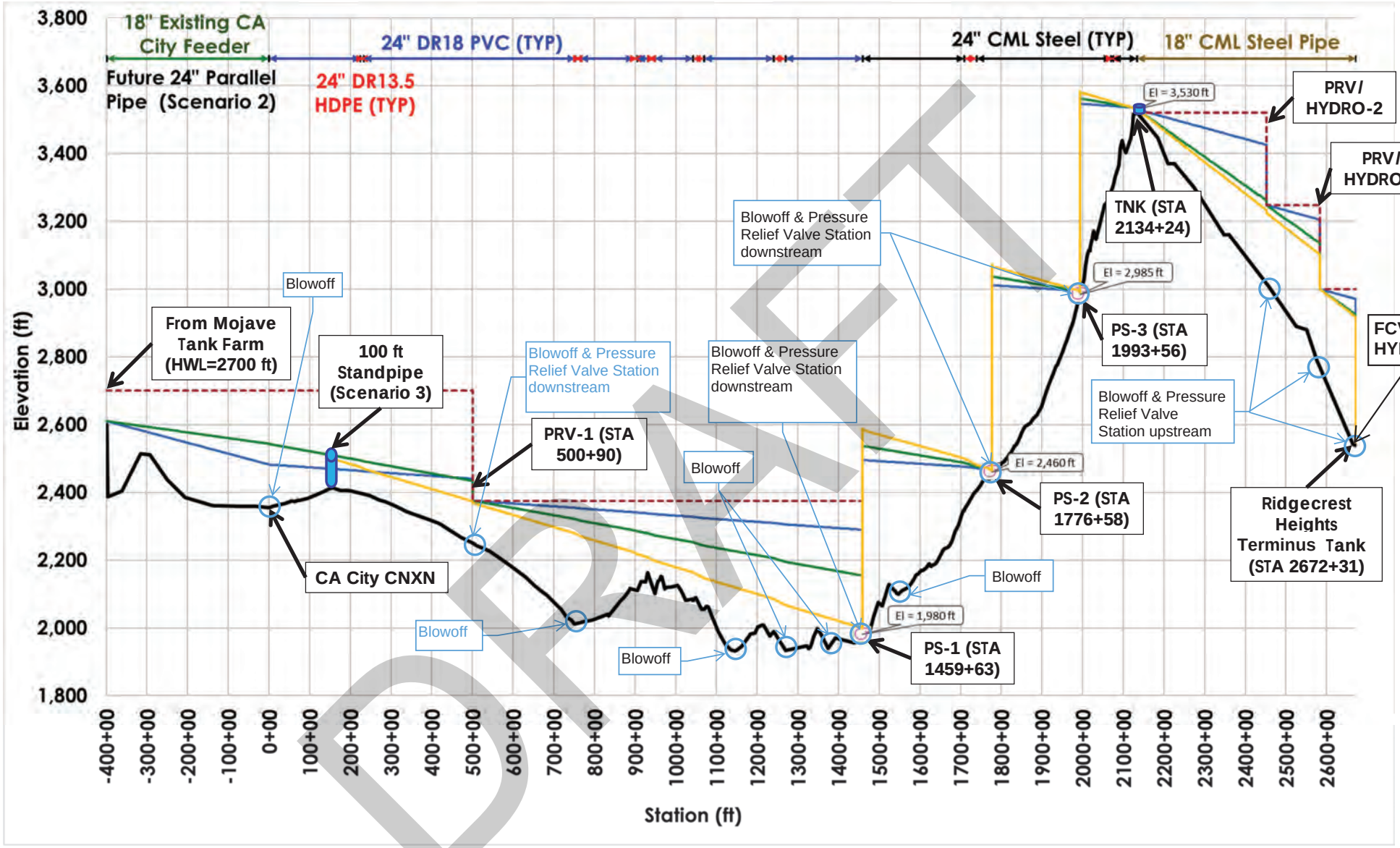
The specific products to be used for Air Valves and Slow Closing and/or Throttling Devices, including features and assembly information, are based on AVEK and IWVWD preferences and listed below.

- APCO (Dezurik) Series 140 C Standard Combination Valves – a product cut sheet is included in Appendix F.
- James Jones bronze double-strap service saddle and corporation stop per IWVWD Standard Detail P-17 (valves smaller than 6").
- Tee connection with isolation ball valves – James Jones or Mueller (valves 6" and larger)
    - Bronze threaded gate valve with extra heavy handwheel per IWVWD's ARV detail (P-15)

- Off-setting and valve enclosure detail per Sheet D5 in ATTACHMENT 1 – *PRELIMINARY DESIGN DRAWINGS* – Preliminary Design Drawings.
- Air valves that cannot be located directly over the pipeline for practical reasons (to avoid being hit by vehicles for example) will be offset on a pipe with diameter matching the air vent size on a continuous minimum slope of 2% away from the pipeline.
- Final transient flow analysis will need to include an analysis of whether air and vacuum valves selected during this stage of design are sufficient and whether any of the valves require the addition of slow closing or throttling devices for surge or vacuum protection.

Blowoff and Pressure Relief Valve Stations

Blowoff and Pressure Relief Valve stations will be located at low points on the pipeline to facilitate pipeline draining and because pressures are the highest at those locations. At some low points only a blowoff will be located because a pressure relief valve at another location that is lower in elevation will provide pressure relief in that pipeline reach. Blowoff and Pressure Relief Valve stations are also located upstream and downstream of Pump Station 1 and downstream of Pump Stations 2 and 3 within the fence enclosures to protect the pipeline from mistakes in pump operations that may cause pressures higher than pipe pressure ratings and to facilitate draining of pipelines upslope of the pumps. Blowoff and pressure relief valve discharges will be directed to the overflow retention basin. Blowoff and Pressure Relief Valve stations are also located upstream of PRV stations and the Ridgecrest Heights FCV/Hydro. These facilitate draining of pipelines upslope of those locations and over-pressure conditions that might result from mistakes in operations or malfunction of PRVs or hydroelectric units. Figure 4-2 below shows the preliminary locations and the Preliminary Design Drawings in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS show the details.



Head Legend:

- Pipeline Elev.
- HGL (6.5 cfs)
- HGL (10.8 cfs)
- HGL (14.3 cfs)
- HGL (Static)
- Blowoff & Pressure Relief Valve Station

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Figure No. **4-2**

Title Blowoff and Pressure Relief Valve Stations

Blowoff and Pressure Relief Valve stations will be installed on mainline tees. The preliminary design for Blowoffs will be 6-inch diameter gate valves with standard valve boxes.

The preliminary design for Pressure Relief Valves will be 12-inch Model 52-03 CLA-VAL globe valves with flanged connections, with surge anticipation feature, and will be used on pump station discharge lines. The Model 50-01 valve will be used at specified locations on the rest of the pipeline. Product cutsheets are included in Appendix F. The surge anticipator feature may be used at other locations depending on the transient analysis. A typical Blowoff and Pressure Relief Valve assembly is shown on Sheet D502 of the Preliminary Design Drawings (ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS) as offsetting the blowoffs and pressure relief valves together from the pipeline on a tee. The need for offsetting will be reviewed on a case-by-case basis during later phases of design. The Blowoff and Pressure Relief Valve stations will include the following features:

- Flanged full-sized tee outlet on steel watermain or mechanical joint by flanged ductile iron tee on PVC watermain with flanged ductile iron reducer.
- Flanged isolation gate valve for pipe sizes less than 12-inch diameter per IWVWD Standard Drawing P-9 or flanged isolation butterfly valve for pipe sizes 12-inch diameter and greater per IWVWD Standard Drawing P-10.
- Buried flanges and flange bolts shall be wrapped with wax tape and polyethylene encasement per ANSI/AWWA C105.
- CML&C Steel or Ductile Iron Pipe to Blowoff Riser in 24”x36” Concrete Utility Vault with H20 Traffic Rated Lid.
- Pressure Relief Valves will be installed in 8’x8’ underground bottomless pre-cast concrete vault. The bottomless vaults will sit on a gravel base for leveling and drainage and will be equipped with hinged double access covers with HS-20 vehicle load rating.
- Grooved end couplings will be located inside the vaults adjacent to the pressure relief valves to facilitate removal for repair or replacement.
- Energy dissipation will be placed at blowoff pipe outlets where necessary to reduce erosion potential.
- In some cases only the blowoff is needed and the Pressure Relief Valve and its fittings are deleted.

Flow Meters

Flow Meters for measuring outflow from each pump station will consist of the following features and will be designed to comply with IWVWD preference:

- Krohne Electromagnetic Waterflux 3100 Flow Meters – a product cut sheet is included in Appendix F.
- Upstream or Downstream straight runs of pipe are not required due to the special flow sensor design.

- Flow meters will be installed in a 6'x6' underground bottomless pre-cast concrete vault. The bottomless vaults will sit on a gravel base for leveling and drainage and will be equipped with hinged double access covers with HS-20 vehicle load rating.
- Grooved end couplings will be located inside the vaults adjacent to the meters to facilitate removal for repair or replacement.
- The flow meters will be tied into the electrical power and SCADA system at each pump station.
- See ATTACHMENT 1 – *PRELIMINARY DESIGN DRAWINGS* - Preliminary Design Drawings, Sheet D06.

Access Manholes

- Access manholes for future camera inspection of pipeline
- Access manholes will be placed adjacent to line valves
- Some access manholes may be placed at high points in the alignment so they can be equipped with air valves.
- See ATTACHMENT 1 – *PRELIMINARY DESIGN DRAWINGS* – Preliminary Design Drawings, Sheet D09

Cathodic Test Stations

- Cathodic test stations will be placed at strategic locations along the alignment to monitor corrosion potential. A general discussion of corrosion potential is provided in Section 4.7. Cathodic protection measures will be explored further in later phases of design.

Pipeline Markers

- Water main Markers will be placed along the alignment at all changes in horizontal direction and every 400 feet and at buried and partially buried appurtenances such as mainline valves, air valves, blowoffs, and access manholes; see ATTACHMENT 1 – *PRELIMINARY DESIGN DRAWINGS* – Preliminary Design Drawings, Sheet D06.
- No. 10 solid 12 AWG copper tracer wire with Type TW insulation will be attached to the top of the PVC mainline in a continuous electrical line throughout the length of the pipe for use in located buried pipe. Tracer wire will be brought to the service at all valves, air valves, blowoffs, and other appurtenances and wrapped around cast iron valve boxes and/or tied together to a No. 5 rebar cast in a concrete utility line marker.
- Blue metallic locating tape marked "CAUTION – WATER LINE BELOW" will be placed 24" below Finished Grade to alert excavation equipment operators to buried pipe below.

4.6 TANKS

The Regulating Tank at the high point is proposed to be 40 feet in diameter and at least 28 feet high with a volume of 242,000 gallons. The tank height will need to be verified based on the required freeboard for operations and seismic design criteria (3 feet has been assumed currently). The tank is considered a Risk Category 2 in that it is not the sole source of potable water or fire protection water serving the end user. The steel water tank shall either be of welded steel construction conforming to the current AWWA Standard D100 or of bolted steel construction conforming to the current AWWA Standard D103. A geotechnical report at the tank site is pending which will provide guidance for tank foundation design and construction. Features of the proposed Tank shall include:

- A separate 18-inch tank top inlet pipe with butterfly isolation valve and a force balanced expansion joint (EBAA Iron Force Balanced Flex-Tend or equal) if required.
- A separate 18-inch tank bottom outlet pipe with butterfly isolation valve and a force balanced expansion joint (EBAA Iron Force Balanced Flex-Tend or equal) if required.
- A combination overflow drain, and bottom tank drain with 18-inch storm drain pipeline to adjacent sump.
- Flush cleanout door and an additional side wall monobolt manway access hatch at ground level.
- One or more standard 24-inch center roof vents.
- Two perimeter “hook” roof vents designed to accommodate snow buildup.
- Access roof hatch with caged access ladder conforming to Cal OSHA standards.
- Half travel water level indicator gauge with thermostatically controlled heat tape.
- Water level pressure transducer, ball valve and port.
- Multiple tank water sampling ports with ball valves.
- Roof mounted solar powered SCADA system and instrumentation package.

The Ridgecrest Heights Terminus Tank is currently proposed to be 82 feet in diameter and 28 feet high with a volume of 1,000,000 gallons. The proposed volume does not include any freeboard for seismic wave requirements as determined by the tank manufacturer. The tank is considered a Risk Category 2 in that it is not the sole source of potable water or fire protection water serving the end user. The steel water tank shall either be of welded steel construction conforming to the current AWWA Standard D100 or of bolted steel construction conforming to the current AWWA Standard D103. A geotechnical report at the tank site is pending which will provide guidance for tank foundation design and construction. Features of the proposed Tank shall include:

- A separate 18-inch tank bottom inlet pipe with butterfly isolation valve and a force balanced expansion joint (EBAA Iron Force Balanced Flex-Tend or equal) if required.
- A separate 18-inch tank bottom or top outlet pipe with butterfly isolation valve and a force balanced expansion joint (EBAA Iron Force Balanced Flex-Tend or equal) if required.

- A combination overflow drain, and bottom tank drain with 18-inch storm drain pipeline to adjacent sump.
- Flush cleanout door and an additional side wall monobolt manway access hatch at ground level.
- One or more standard 24-inch center roof vent.
- Access roof hatch with caged access ladder conforming to Cal OSHA standards.
- Half travel water level indicator gauge with thermostatically-controlled heat tape.
- Water level pressure transducer, ball valve and port.
- Multiple tank water sampling ports with ball valves at 3-foot water depth, and approximately 50% and 75% water levels.
- Tank mixer

4.7 CORROSION PROTECTION

Part of RF Yeager Engineering's scope of work is to measure soil resistivity along the proposed pipeline alignment. RF Yeager Engineer will also review the project geotechnical data, such as soil sample analysis result, soil type, and ground water levels, when that data becomes available.

Soil resistivity is one common indicator in which to determine soil corrosivity. Corrosion is an electrochemical process that deteriorates a substance, or its properties, due to a reaction with its environment. In corrosive soils, the reaction of the metal to its environment is high, and metal loss occurs. Soil resistivity is not the only measure of soil corrosivity, nor is it completely sufficient, but it is a strong indicator and should be given the most weight when assessing soil corrosivity. A low soil resistivity indicates the potential for high local currents between anodic and cathodic areas on the metal surface, whereas high resistivity soils would reduce the potential for current flow between anodic and cathodic sites.

One method to determine in-situ soil resistivities is by using the Wenner 4-Pin Method. The Wenner 4-pin Method provides an average resistivity of a hemisphere of soil (essentially) whose radius is approximately equal to the pin spacing. For example, the resistivity value obtained with the pins spaced at 5 ft. apart is the average resistivity of a hemisphere of soil from the surface to a depth of 5 ft.

Resistivity data is recorded as ohm-cm. RF Yeager Engineering utilizes the following resistivity classifications related to soil aggressiveness.

Resistivity Range, Corrosivity
(ohm-cm), Classification
0 – 1,000, Very Corrosive
1,001 – 2,000, Corrosive
2,001 – 5,000, Fairly Corrosive
5,001 – 12,000, Moderately Corrosive
12,001 – 30,000, Slightly Corrosive
Above 30,000, Negligibly Corrosive

To date, RF Yeager Engineering has completed soil resistivity readings along approximately 8 miles of the alignment, starting at the southern end in California City and working north. Readings are recorded at intervals between 1,000 and 1,500 feet. At each test location, resistivity is measured at pin spacings of 20, 15, 10, 5, and 2.5 feet (i.e., 5 readings per site).

Once the field review is complete, the corrosion protection devices and mitigation will be designed. The following facilities may need protection measures: CML&C steel pipe, ductile iron pipe fittings, bored and jacked steel casings, concrete, steel water tanks, and pump station facilities.

4.8 TRENCHLESS CONSTRUCTION

The details and constraints of the trenchless techniques proposed for road, railroad, and drainage crossings are discussed in the Alignment Study (See Attachment D of APPENDIX A - ALIGNMENT STUDY). For the preliminary design submittal, trenchless crossings have been designed to a 30% level for the Yerbe Rushe Creek culvert jack and bore crossing along Neuralia Road, the Arroyo Seco Creek HDD crossing, and the jack and bore crossing of Cantil Road\UPRR, immediately east of Neuralia Road. Proposed trenchless crossings are provided in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS -Preliminary Plans, Sheets EX01, EX05, and EX07, and below showing crossings in Kern County ROW and outside of Kern County ROW, respectively. Besides the three crossings discussed in this section, preliminary designs of other critical trenchless crossings (e.g., Highway 395) will be prepared once geotechnical data is obtained for each crossing.

Yerba Rushe Creek Culvert Crossing

The trenchless crossing of the Yerbe Rushe canal is located at approximate Station 1221+70 to Station 1222+70 and lies within the northbound lanes of Neuralia Road within the existing right-of-way (See Sheet EX101 of the plans in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS). The canal is channelized into three 48-inch corrugated metal pipe (CMP) culverts to cross beneath Neuralia Road with inverts at approximately 8 feet below ground surface. Two existing water lines at unknown elevations run along Neuralia Road within the median and along the eastern edge of pavement. Existing overhead 12 kV electrical utilities cross Neuralia Road at approximate Station 1222+20 (roughly above the existing culverts) and at approximate Station 1223+30 (approximately 100 feet north of the existing culverts).

Auger boring and non-watertight shaft methods will be used to install a 36-inch steel casing to house the 24-inch carrier pipe. The carrier pipe will be installed using casing spacers and the annular space will be grouted (See Detail Sheet D01). The shaft depths will need to be approximately 20 feet deep to provide at least 6 feet of clearance beneath the existing triple 48-inch CMP culverts. The draft geotechnical boring logs indicate that the anticipated ground conditions at pipeline elevation are very dense silty sand and hard clay with the potential for seasonal groundwater associated with storm events. The soil is anticipated to exhibit firm to slow raveling behavior at tunnel horizon; the stable ground conditions indicate that the risk of over-excavation with auger boring is minimal. While the risk of settlement above the pipeline horizon is low, there is a small risk of ground movement due to shaft excavation. It is recommended that settlement monitoring point (SMP) arrays be installed above the existing water lines that run parallel to the east and west of the proposed alignment (See Sheet EX101 of the plans in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS).

The shaft locations have been chosen to be located centrally between the two existing water lines within Neuralia Road, to minimize impacts to construction from the overhead utilities, and to minimize the crossing length to reduce risk and overall construction cost and duration. The jacking shaft, located on the southern side of the crossing, is anticipated to be approximately 35 feet long by 12 feet wide; the reception shaft, located on the northern side of the crossing, is anticipated to be approximately 12 feet long by 12 feet wide. To provide adequate work area to construct the two shafts and provide adequate space for the tunneling equipment, it is recommended that the two north-bound lanes be closed from Walpole Avenue to Heather Avenue and that traffic be detoured into two-way traffic within the two southbound lanes of Neuralia Road. In addition, it is recommended that the approximately 20 feet of the shoulder that lies within the public right-of-way should also be used as work area for storage of equipment and materials.

The anticipated construction duration for this crossing (i.e., time with the detour in place) is approximately one month total. This duration includes mobilization, excavation of the shafts, mobilization of the tunneling subcontractor, installation of the casing by auger boring, installation of the carrier pipe, grouting of the annular space, connection to open-cut portions of the work, and demobilization from the site.

Arroyo Seco Creek Crossing

The trenchless crossing of the Arroyo Seco Creek culvert extends from approximate Station 2427+30 to approximate Station 2434+30 and lies within the eastern shoulder of Neuralia Road (See Sheet EX-201 in the plans). The existing easement along the eastern shoulder extends approximately 30 feet east of the edge of pavement. The existing culvert is an 18-inch CMP with invert approximately 3 feet below ground surface. An existing overhead 33kV electrical line parallels Neuralia at approximately 16 feet from the edge of pavement.

HDD installation of a 24-inch HDPE pipe is the recommended trenchless construction method for this crossing due to the anticipated length needed to cross the environmentally sensitive area surrounding Arroyo Seco Creek. The extents of the habitat where open-cut construction is not allowed is currently unknown and is dependent on input from the CDFW. The geotechnical boring logs indicate that the anticipated ground conditions are very stiff to hard clay and silt with very little indication of sand, gravel, cobble, boulder, or rock. No groundwater was encountered at time of drilling. The proposed HDD bore geometry was based on an assumption on the location of the borders of the protected area. The alignment as shown on Sheet EX201 will provide approximately 25 feet of clearance beneath the existing culvert and should minimize risk of hydrofracture in the protected habitat. Once the bore length is more precisely defined, a hydrofracture analysis will be conducted during 60% design to confirm that the risk of

inadvertent drilling fluid returns is low. Demonstrating a low risk of drilling fluid loss into the sensitive habitat will be critical to acquiring the necessary encroachment permits from CDFW.

It is our understanding that while construction operations may impact traffic to one lane with flaggers during the day, two-way traffic must be restored overnight and on weekends. To ensure that the rig will not need to be moved/remobilized every day, the entry point was selected to provide adequate work area for the anticipated size drill rig. The bore alignment runs parallel to Neuralia Road approximately 6' off the edge of pavement. The placement of the alignment was selected to maximize the available space between the overhead utilities while providing adequate space for the rig adjacent to the road. The overhead utilities require a 10-foot radial offset for construction activities near the lines; therefore, depending on the height of the power lines, there is a possibility that there may not be adequate space to operate an HDD operation safely. If that is the case, it is possible that the trenchless alignment may need to be shifted to the western side of Neuralia Road.

Approximately 8,000 to 10,000 square feet of work area is required at the rig side of the crossing to provide space for the rig, separation plant, materials, generators, drill pipe, and other ancillary support equipment. Because the available work area is a narrow area along the road, use of the space will not be ideal. Therefore, it is recommended that additional work area be provided to allow for efficient construction operations and limit the amount of equipment maneuvering in the constrained work area. On the opposite end of the crossing, the work area needed is approximately equal to the length of the HDD bore plus approximately 100 feet. The work area needs to be at least 20 feet wide to allow for pipe handling equipment to move along the pipe string as it is being fabricated. It is recommended that both areas have k-rail installed along the roadway to provide safety for the workers, equipment, and pipe materials.

Anticipated construction duration for the HDD crossing is approximately 1.5 months. This duration includes mobilization of the drill rig, pilot bore, reaming passes, swab, pipe fabrication, and pullback of the product pipe. This estimate does not include tie-ins to the open-cut portions or any site work that may be needed.

UPRR/Cantil Road Crossing

The trenchless crossing of UPRR and Cantil Road is located at approximate Station 2515+50 to 2517+75 perpendicularly crossing both Cantil Road and UPRR right-of way (See Sheet EX202 in the preliminary design plans found in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS). The railroad tracks are on a slight embankment of approximately 4 feet above the native ground surface. One existing water line parallels the proposed trenchless crossing at unknown elevation approximately 35 feet to the west of the new crossing.

Auger boring and non-watertight shaft methods will be used to install a 36-inch steel casing to house the 24-inch carrier pipe. The shaft depths will need to be approximately 20 feet deep to provide at least 16 feet of clearance beneath the tracks. The draft geotechnical boring logs indicate that the anticipated ground conditions at pipeline elevation are medium dense to dense poorly graded sand with gravel with limited fines and no groundwater observed during drilling. The ground above the pipe horizon is loose to medium dense silty sand with gravel. The soil at and above tunnel horizon is anticipated to exhibit fast raveling to running behavior which have a moderate risk of over-excavation and potentially settlement of the UPRR tracks.

The shaft locations have been chosen to be located outside of the UPRR right-of-way and to allow for a perpendicular crossing of the tracks The jacking shaft, located on the northern side of the crossing, is anticipated to be approximately 35 feet long by 12 feet wide; the reception shaft, located on the southern side of the crossing, is anticipated to be approximately 12 feet long by 12 feet wide. The northern work site was selected as the jacking shaft as there is better truck access from Neuralia and due to the presence of trees on the southern side of Cantil Road that could pose issues for crane operation near the shaft. Approximately 8,000 square ft of work area is needed at the jacking shaft and 5,000 square feet of work area is needed at the reception shaft.

The anticipated construction duration for this crossing is approximately one month total. This duration includes mobilization, excavation of the shafts, mobilization of the tunneling subcontractor, installation of the casing by auger boring, installation of the carrier pipe, grouting of the annular space, connection to open-cut portions of the work, and demobilization from the site. It should be noted that UPRR crossings often require 24-hour tunneling operations within Zone A, which is approximately 100 feet wide at the recommended pipeline elevation. Coordination with their third-party safety representative, RailPros, can add significant cost and duration to construction operations within UPRR right-of-way.

Highway 395 Crossing

The Highway 395 Crossing at approximately Station 4540+00 is another critical trenchless crossing that requires a significant design effort. Geotechnical data is required to prepare a preliminary design of the crossing. This section of the PDR will be updated once the preliminary design has been completed.

5 PUMP STATIONS

This section discusses the location and phasing of the three proposed pump stations. A discussion of the proposed SCADA system and site layout are also included.

5.1 PUMP STATION PHASING AND DESIGN

Pump Station Phasing

The Project will require the use of three pumping stations to overcome the dynamic head losses associated with pipeline friction losses and static hydraulic conditions associated with the local terrain in the area. The overall pumping system will be configured to have the three pumping stations operate in series to achieve a total hydraulic lift of approximately 1,550 feet. The spacing of the pumping stations has been selected as not to exceed a maximum pipeline pressure of 275 psi.

The pumping stations will be equipped with surge mitigation measures in the form of air/water chambers, commonly referred to as surge tanks to suppress transient pressure caused by a sudden shut-down of any one pump station caused by a power outage.

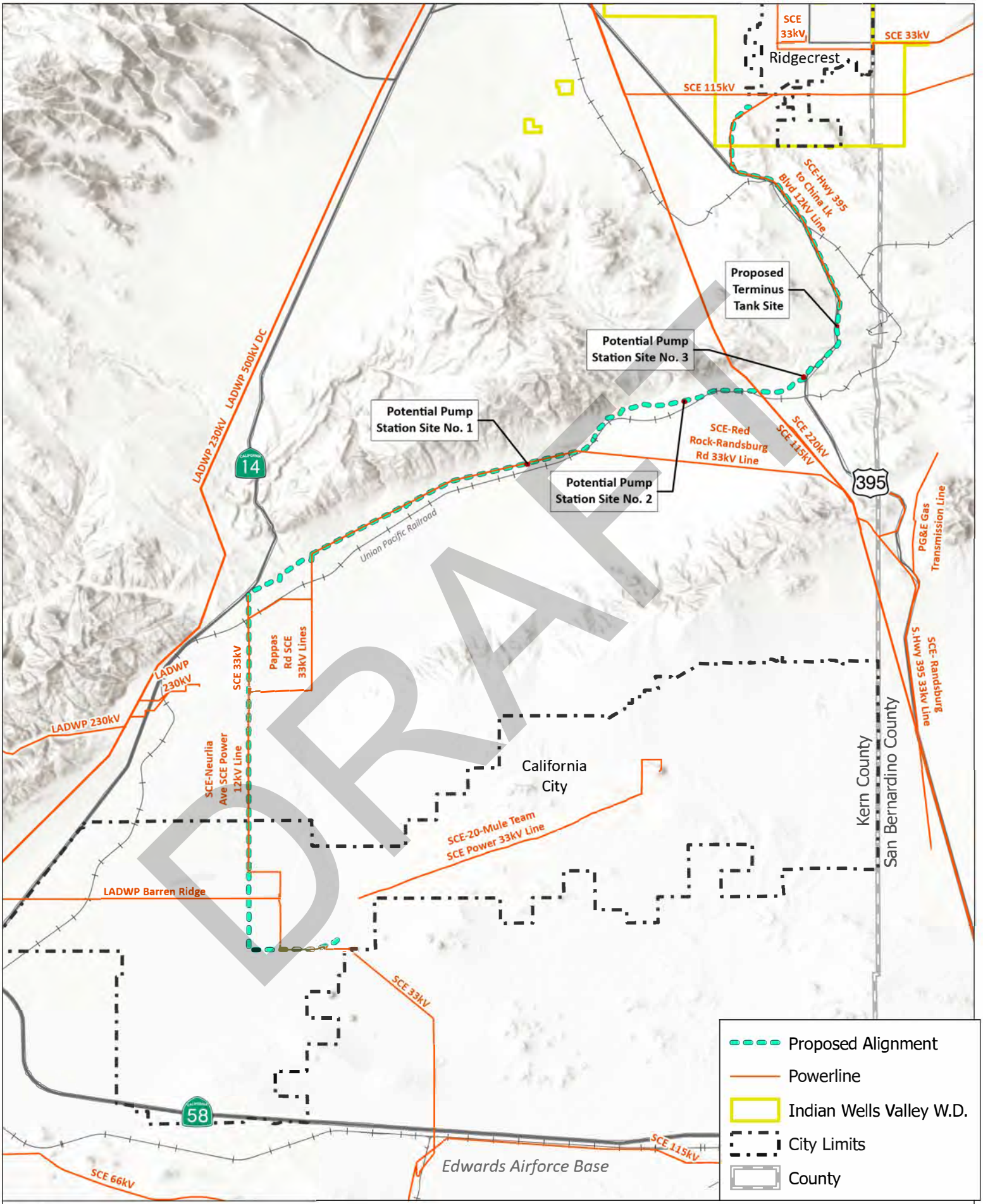
The overall development of the project is planned to be phased based on water rights availability. The phasing of the project is anticipated as follows:

Table 5-1: Project Phasing

Phase	Approximate Period	Flow Rate
1	0 to 5 years	0 to 6.5 cfs (0 to 2,917 gpm)
2	5 to 15 years	6.5 to 10.8 cfs (2,917 to 4,847 gpm)
3	15 years at build-out	10.8 to 14.3 cfs (4,847 to 6,418 gpm)

Each pump station will be constructed to accommodate the initial flows with provisions to expand the pumping capacity through the addition of pumps as additional flow requirements are realized and additional water rights are secured. Each pump station will ultimately have seven (7) pumps with the initial phase of the project incorporating three pumps each having the capacity of 900 gpm in two duty pumps and one standby pump configuration and one 1,800 gpm pump. The remaining pumps will consist of three pumps each with a capacity of 1,800 gpm in a three duty pumps and one standby pump configuration. Each pump will be controlled using a variable frequency drive for flow control. During periods when the maximum flow (6,418 gpm), the pump station will operate all four of the 1,800 gpm and the 900 gpm will be used as the standby pumps.

The proposed Project pipeline alignment and pump stations are located in an area where it appears there are either minimal or no existing electric power infrastructure (see **Figure 5-1**). Therefore, a new electrical service will need to be constructed as part of the overall project. The electrical service will be designed and installed by SCE and will be required to be fully operational prior to the commissioning of the overall conveyance system. Since the overall system is considered as a noncritical facility, no backup power generation is being considered.



Indian Wells Valley GA

Figure 5-1: Existing Electrical Infrastructure

PROVOST& PRITCHARD

Existing Hydraulic Conditions

The pipeline system will connect to the proposed California City Feeder Turnout located near the intersection of California City Boulevard and Redwood Boulevard which is owned and operated by AVEK. After the connection to the existing turnout, the proposed pipeline system will continue to the City of Ridgecrest through an approximate 50-mile pipeline system as described previously. The existing AVEK California City Feeder has a maximum flow capacity of 6.5 cfs (2,917 gpm) at a hydraulic grade line elevation of 2,610 feet msl. When flow requirements exceed the existing capacity of the California City North Feeder, greater than 6.5 cfs, additional improvements to the AVEK feeder system are anticipated.

System Description

The overall conveyance system is comprised of approximately 50-miles of pipeline including three pumping stations to overcome both dynamic head losses and topographic elevation changes along the alignment. The system static lift is equivalent to approximately 1,530 vertical feet not including dynamic head losses. In order to optimize pumping capacities and pipeline pressures, the proposed three pump stations are approximately equally spaced based on the vertical component of the terrain with a static lift ranging from 480 to 545 feet from station to station. The proposed pumping stations will have a capacity ranging from a minimum flow 448 gpm to 2,917 gpm (1 to 6.5 cfs respectively) in the first phase of the project. For future expansions, as listed in **Table 5-1**: Project Phasing, each pump station will be designed and sized to include all piping infrastructure required to accommodate additional flows less the future pumps and electrical equipment.

Pump Station Layout and Description

The following provide a generalized description of each pump station:

Pump Station No 1

Pump Station No. 1 (PS-1) is located on assessor parcel number (APN) 154-140-41 (Station 3419+78). PS-1 is located approximately 27 miles downstream from the proposed connection point on the existing California City Feeder. The following is a summary of the hydraulic conditions and equipment requirements at PS-1:

Table 5-2: PS-1 Hydraulic Operating Pressures

Phase	Peak Flow Rate	Pump Station Suction Head	Pump Station Discharge Head
1	2,917 gpm	132 psig	225 psig
2	4,847 gpm	74 psig	243 psig
3	6,418 gpm	8 psig	263 psig

Table 5-3: PS-1 Pump Requirements

	Number of Pumps	Capacity	Rated Horsepower	Driver	Model
Low Flow Pumps	3 (2 duty / 1 standby)	900 gpm	150	VFD	Flowserve FS 12EHL
High Flow Pumps	4 (3 duty / 1 standby)	1,800 gpm	300	VFD	Flowserve FS 14EMM

The following ancillary equipment will be required for the operation of Pump Station No. 1:

- Discharge Surge Mitigation Measure Air Chamber, 3,800-gallon air chamber
- Suction Surge Mitigation Measure Air Chamber, 8,000-gallon air chamber
- Air Conditioning for the MCC Room Mini-Split System, 3.5 tons
- Potable Water Convenience Taps 50 gpm at 50 psi
- Pump Room Ventilation Negative Pressure System, 7 air changes per hour.

The approximate total building footprint is 4,620 square feet and is anticipated to be typical masonry construction. All building entries will have intrusion alarms.

Pump Station No 2

Pump Station No. 2 (PS-2) is located on APN 154-170-11 (Station 4287+56). PS-2 is connected to PS-1 through a pipeline connecting to the PS-2 forebay tank with a volume of 180,000 gallons. The following is a summary of the hydraulic conditions and equipment requirements at PS-2:

Table 5-4: PS-2 Hydraulic Operating Pressures

Phase	Peak Flow Rate	Pump Station Suction Head	Pump Station Discharge Head
1	2,917 gpm	Forebay at atmosphere	241 psig
2	4,847 gpm	Forebay at atmosphere	252 psig
3	6,418 gpm	Forebay at atmosphere	265 psig

Table 5-5: PS-2 Pump Requirements

	Number of Pumps	Capacity	Rated Horsepower	Driver	Model
Low Flow Pump	3 (2 duty / 1 standby)	900 gpm	200	VFD	Flowserve FS 12EHL
High Flow Pumps	4 3 duty / 1 standby)	1,800 gpm	350	VFD	Flowserve FS 14EMM

The following ancillary equipment will be required for the operation of Pump Station No. 2:

- Discharge Surge Mitigation Measure Air Chamber, 2,000-gallon air chamber
- Suction Surge Mitigation Measure Not Applicable
- Air Conditioning for the MCC Room Mini-Split System, 3.5 tons
- Potable Water Convenience Taps 50 gpm at 50 psi
- Pump Room Ventilation Negative Pressure System, 7 air changes per hour.

The approximate total building footprint is 4,620 square feet and is anticipated to be typical masonry construction. All building entries will have intrusion alarms.

Pump Station No 3

Pump Station No. 3 (PS-3) is located on APN 154-170-11 (Station 4504+23). PS-3 is connected to PS-2 through a pipeline connecting to the PS-3 forebay tank with a volume of 180,000 gallons. The following is a summary of the hydraulic conditions and equipment requirements at PS-2:

Table 5-6: PS-3 Hydraulic Operating Pressures

Phase	Peak Flow Rate	Pump Station Suction Head	Pump Station Discharge Head
1	2,917 gpm	Forebay at atmosphere	245 psig
2	4,847 gpm	Forebay at atmosphere	252 psig
3	6,418 gpm	Forebay at atmosphere	260 psig

Table 5-7: PS-3 Pump Requirements

	Number of Pumps	Capacity	Rated Horsepower	Driver	Model
Low Flow Pump	3 (2 duty / 1 standby)	900 gpm	200	VFD	Flowserve FS 12EHL
High Flow Pumps	4 3 duty / 1 standby)	1,800 gpm	350	VFD	Flowserve FS 14EMM

The following ancillary equipment will be required for the operation of Pump Station No. 3:

- Discharge Surge Mitigation Measure Air Chamber, 3,000-gallon air chamber
- Suction Surge Mitigation Measure Not Applicable
- Air Conditioning for the MCC Room Mini-Split System, 3.5 tons
- Potable Water Convenience Taps 50 gpm at 50 psi
- Pump Room Ventilation Negative Pressure System, 7 air changes per hour.

The approximate total building footprint is 4,620 square feet and is anticipated to be typical masonry construction. All building entries will have intrusion alarms.

5.2 SYSTEM OPERATION

Tank Design Levels

The Terminus Tank will be approximately 1,000,000 gallons with a diameter of 81.5-feet and height of at least 28-feet. The water elevation will begin at 26.00-feet and end at 24.00-feet every 48-hour pumping cycle. The Regulating Tank will be 242,000 gallons with a diameter of 40-feet and height of at least 28-feet. All forebay tanks will be 180,000 gallons with a diameter of 42-feet and height of 24-feet and 4-feet of head space.

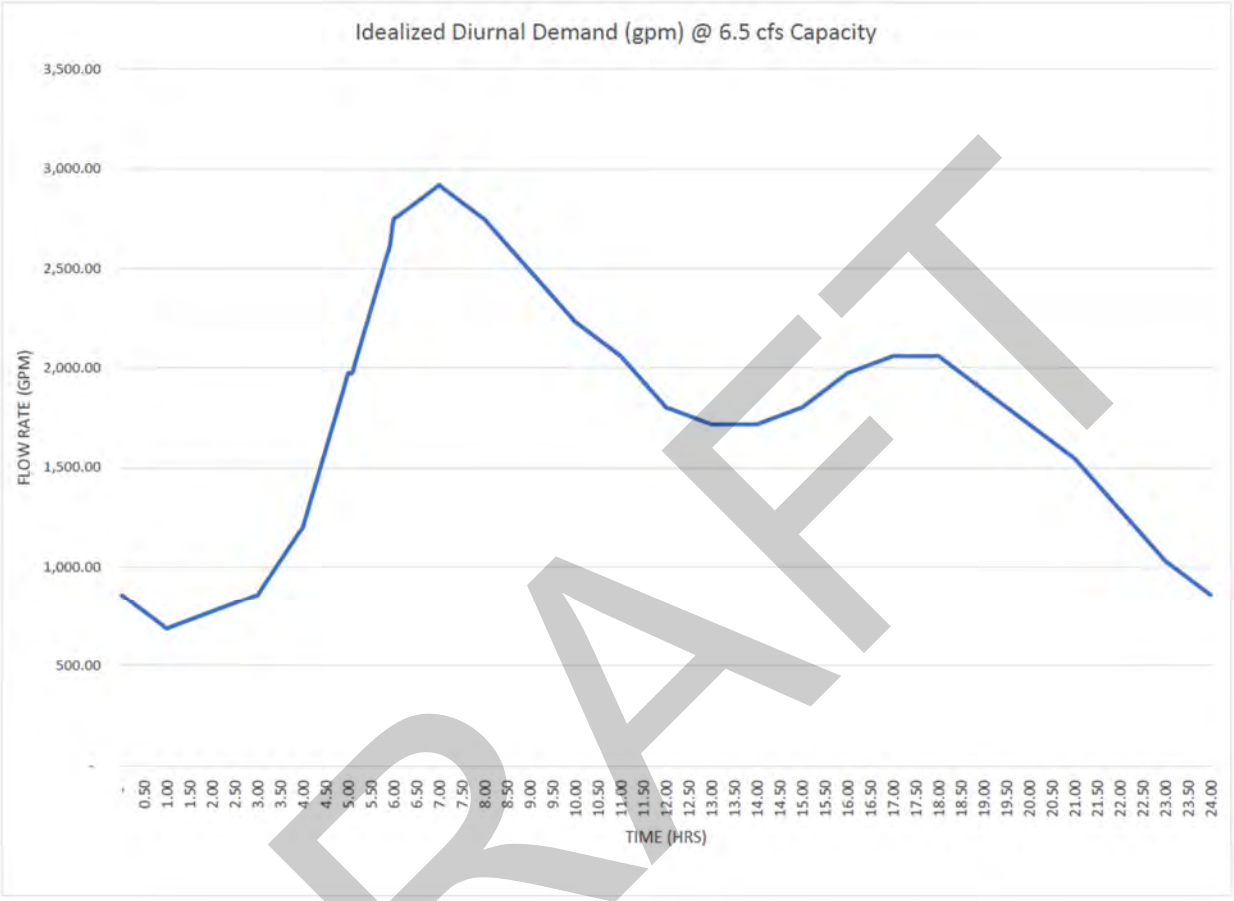
System Wide Operational Protocol

The pumping system will be based on a downstream level control initially at the Terminus Tank. As the water surface elevations in the Terminus Tank drop, flows would be drawn from the Regulating Tank to a point when a call signal is provided to PS-3. In a successive fashion, as the water surface elevation in PS-3 forebay tank is drawn down, a start signal will be forwarded to PS-2 and start drawing down the PS-2 forebay tank to a point when a start signal is provided to PS-1. Each tank will be provided with both high-level and low-level alarms as to shut down the overall pumping to avoid either a tankage spill or running the tanks dry.

The high-level alarm will be at an elevation of one foot below the top of the tanks or as decided by the design team during the refinement of the design. The low-level of the tanks will be at an elevation of four feet above the bottom of the tank to serve as dead storage and capture sediments during operations. It is assumed that all level control will be accomplished by sonic water level meter probes installed in stilling tubes inside each tank.

For the purposes of evaluating pump station cycling and operations, an idealized diurnal demand curve was developed establishing the demand at the terminus tank.

Figure 5-2: Idealized Diurnal Demand Curve



The following is the preliminary operational narrative for the pumping stations based on a level control system.

Phase 1 System Start-up –

As the water surface elevation in the Terminus Tank located at the IWVWD Ridgecrest Heights tank site reaches a 50% volume, and water volume is drawn from the Regulating Tank, and the regulating tank reaches 50% volume a start signal will be progressed to PS-3 drawing from the PS-3 forebay tankage. The pump station will start Pump No. 1 (first 900 gpm pump) and ramp to full speed. If the water surface in the Regulating Tank continues to fall, Pump No. 2 (second 900 gpm pump) approximately 5 minutes after the start of Pump No. 1, will start and ramp to full speed to a maximum capacity of 1,800 gpm. If the water surface in the Regulating Tank continues to fall, Pump No. 4 will start approximately 5 minutes after the start of Pump No. 2 and ramp to the flow rate of 2,917 gpm until such time as the Regulating Tank starts to rise. This flow will continue to the high operating level in the Regulating Tank at which all pumps will shut down.

When the forebay tank at PS-3 reaches 50% volume a start signal to PS-2 will be progressed to PS-2 drawing from its forebay tank. The pump station will start Pump No. 1 (first 900 gpm pump) and ramp to full speed. If the water surface in the forebay of PS-3 continues to fall, Pump No. 2 (second 900 gpm pump) will start and ramp to full speed to a maximum capacity of 1,800 gpm. If the water surface in the forebay tank continues to fall, Pump No. 4 will start approximately 5 minutes after the start of Pump No. 3 and ramp to the flow rate of 2,917 gpm until such time as the forebay tank of PS-2 tank starts to rise. This flow will continue to the maximum operating level in the forebay tank at PS-3 at which all pumps will shut down.

When the forebay tank at PS-2 reaches 50% volume a start signal to PS-1 will be progressed to PS-1, which draws from California Feeder Turnout. The pump station will start Pump No. 1 (first 900 gpm pump) and ramp to full speed. If the water surface in the forebay of PS-2 continues to fall, Pump No. 2 (second 900 gpm pump) will start and ramp to full speed to a maximum capacity of 1,800 gpm. If the water surface in the forebay tank continues to fall, Pump No. 4 will start approximately 5 minutes after the start of Pump No. 2 and ramp to the flow rate of 2,917 gpm until such time as the forebay tank of PS-2 tank starts to rise. Maximum capacity will continue to maximum operating level in the forebay tank at PS-2 at which all pumps will shut down.

Phase 2/3 Start-up –

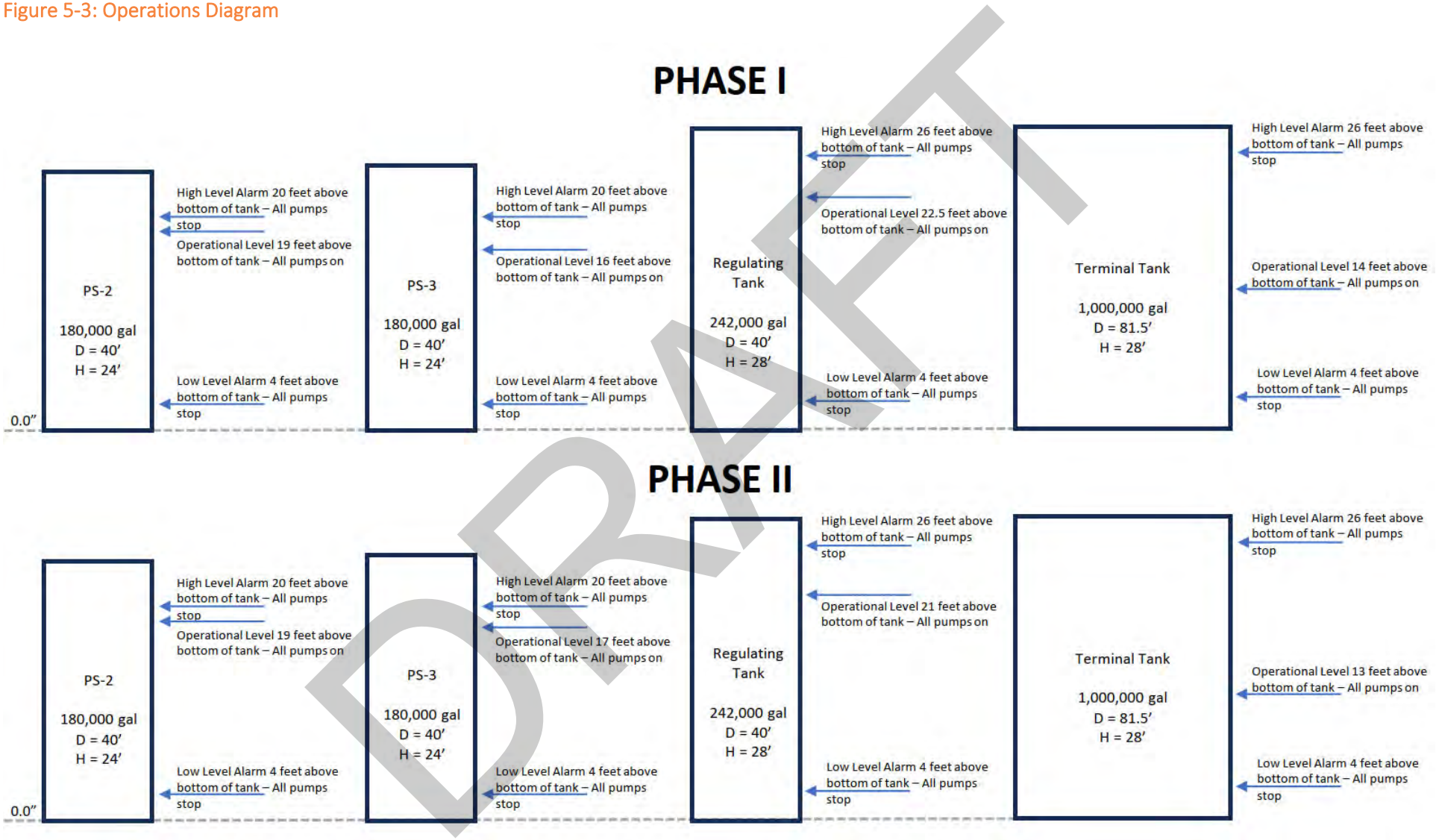
When the water surface elevation in the Terminus reaches approximately 45% total volume at water elevation of 13.00 feet, and water volume is drawn from the regulating tank, and the regulating tank reaches 75% total volume at water elevation of 21.50 feet, a start signal will be progressed to PS-3 drawing from the PS-3 forebay tankage. The pump station will start Pump No. 4 (first 1,800 gpm pump) and ramp to full speed. If the water surface in the regulating tank continues to fall, Pump No. 5 (second 1,800 gpm pump) approximately 5 minutes after the start of Pump No. 1, will start and ramp to full speed to a maximum capacity of 3,600 gpm. If the water surface in the regulating tank continues to fall, additional pumps will start in a similar manner to match the required fill rate for the Regulating Tank. Flow will continue to maximum operating level in the Terminus Tank at which all pumps will shut down.

When the forebay tank at PS-3 reaches 60% total volume at water elevation 17.00 feet, a start signal to PS-2 will be progressed, drawing from its forebay tank. The pump station will start Pump No. 4 (first 1,800 gpm pump) and ramp to full speed. If the water surface in the forebay of PS-3 continues to fall, Pump No. 5 (second 1,800 gpm pump) will start and ramp to full speed to a maximum capacity of 3,600 gpm. If the water surface in the regulating tank continues to fall, additional pumps will start in a similar manner to match the required fill rate for the forebay tank of PS-3. Flow will continue to maximum operating level in the forebay tank at PS-3 at which all pumps will shut down.

When the forebay tank at PS-2 reaches 80% total volume at water elevation of 19.00 feet, a start signal to PS-1 will be progressed, drawing from California Feeder Turnout. The pump station will start Pump No. 4 (first 1,800 gpm pump) and ramp to full speed. If the water surface in the forebay of PS-2 continues to fall, Pump No. 5 (second 1,800 gpm pump) will start and ramp to full speed to a maximum capacity of 1,800 gpm. If the water surface in the regulating tank continues to fall, additional pumps will start in a similar manner to match the required fill rate for the forebay tank of PS-2. Flow will continue to maximum operating level in the forebay tank at PS-2 at which all pumps will shut down.

The proposed operations are shown in Table 5-3.

Figure 5-3: Operations Diagram



5.3 SCADA CONTROL AND REPORTING REQUIREMENTS

The full development of the required SCADA system to be discussed with the owner/operator during the next phase of design. For purposes of the PDR, the following are the generalized reporting requirements for the remote pump stations without full-time on-site operators.

1. Pump Running
2. Pump Stop
3. High Pressure Alarm
4. Low Pressure Alarm
5. Pump Vibration Monitoring
6. Motor Temperature
7. Compressor Running
8. Compressor Stop
9. Active Line Pressure
10. Power Interrupt
11. Flow rate monitoring
12. Intrusion detection

Upon review with the owner/operator, the SCADA system will be developed based on dictated requirements. Inter-pump station communications are anticipated to be radio band. And as such, a radio communication survey will need to be completed to establish signal strength and repeater station requirements.

5.4 SITE LAYOUT

Site Grading and Drainage, Access to Pump Station

The pump stations were laid out to facilitate access for maintenance vehicles and cranes for the removal of pumps and motors. Access was first identified off the existing adjacent roadways in a manner that would allow for adequate turning radii and sight distances in accordance with County of Kern Standards.

Overflow retention ponds are included in the site to drain the tanks for maintenance and also for the discharge from pressure relief valves, if they are activated.

The sites will be encompassed with a chain-link fence and a 16-foot access gate off of the roadway.

Site lighting will be installed to provide illumination of equipment and tank areas. The majority of the site lighting will be manually operated, except for minimal lighting to assist with locating the sites at night-time.

6 PRESSURE REDUCTION

This section reviews the potential locations where pressure reduction is required to maintain system pressures compatible with the pipeline materials and pressure classes. Potential hydroelectric generation facilities are also reviewed as an option to reduce project operating costs.

6.1 PRESSURE REDUCTION REQUIREMENTS

PRV (Pressure Reducing Valve) stations, possibly with hydroelectric generators (hydros), are proposed at key locations to reduce downstream pressures within selected pipe pressure ratings. An FCV (flow control valve), possibly with a hydroelectric generator, at the Terminus Tank will also reduce pressures.

Table 6-1 shows design pressures upstream and downstream with the required reduction at locations considered for PRV stations and/or hydroelectric facilities (refer to Figure 2-1: Hydraulic Model Layout for locations). The pressure reduction is greater at flows less than 6.5 cfs, increasing until the closure of the PRV at a zero-flow condition (static head).

Table 6-1: System Pressures at PRV/FCV Locations

Flow Rate	PRV-1			PRV-2		
	Upstream	Downstream	Reduction	Upstream	Downstream	Reduction
6.5 cfs	82	54	28	101	90	11
11.4 cfs	72	54	19	94	90	4
14.3 cfs	53	51	2	28	22	5

Flow Rate	PRV-3			FCV-1		
	Upstream	Downstream	Reduction	Upstream	Downstream	Reduction
6.5 cfs	177	100	77	185	5	180
11.4 cfs	144	100	44	163	5	158
14.3 cfs	48	42	7	86	5	81

CLA-VAL model 90-01 PRVs are proposed to achieve the design pressure drop at the PRV locations. The proposed design is to have two different sizes of PRV (12" and 10") in parallel with manually operated shutoff valves upstream and downstream of each PRV, per manufacturer recommendation, to perform at a wide range of flows. The smaller PRV will meet the Phase 1 flows (0 - 6.5 cfs) alone (shutoff valves closed for the larger PRV) and the larger PRV will meet the requirements of Phase 2 flows (6.5 – 10.8 cfs) alone (shutoff valves closed for smaller PRV). Operating together (all shutoff valves open) they have capacity for the Phase 3 flows (10.8 – 14.3 cfs). To determine whether a surge control feature is needed for the PRVs, the final transient analysis will be needed.

The FCV at the Ridgecrest Heights Terminus Tank will be controlled by a level transmitter in the tank. Multiple flow settings could be selected by the operator based on the level in the tank. Although sometimes the need to add a flow meter can be avoided, a flow meter is assumed to be needed in addition to the control valve. Preliminarily, a CLA-VAL 131-01 Electronic Control Valve with a VC-22D Electronic Valve Controller has been assumed. This is subject to further review in future design phases along with refinement of control strategy and equipment.

6.2 HYDROELECTRIC GENERATION

Two companies (Canyon Hydro and N-Line Hydro) that specialize in hydroelectric generation on pipeline projects responded to requests to evaluate whether hydroelectric facilities might be feasible and to provide preliminary proposals for hydroelectric generation. Both ruled out PRV-1 (in California City) and PRV-2 (first PRV after the Regulating Tank) as having insufficient pressure drops to allow for cost effective hydroelectric generation. The flow control valve (FCV-1) at Ridgecrest Heights is the best candidate for hydroelectric generation, especially with the potential of using the power for the IWVWD booster pump station. PRV-3 (the second PRV after the Regulating Tank) is a possible site for hydro. A preliminary proposal from Canyon Hydro is included in **APPENDIX G** – EXAMPLE HYDO PROPOSAL.

Hydros would be installed in parallel with the flow control valve so that they can act in tandem, optimizing hydroelectric production while maintaining set downstream pressures and/or flows. Additionally, the FCV will be in operation if the hydro is taken out of service or fails. **Figure 6-1** is a picture of that type of installation by Canyon Hydro.

Figure 6-1: Example Hydroelectric Generation Station

The cost of hydros will need to be offset with grants or incentives and reduction in pump station power bills through net metering (RES-BCT Tariff) or wire feed back to PS-3. An in-depth economic evaluation of both options will be performed and a summary memo about that economic evaluation will be prepared in the next design phase. Wire feed back would likely require a step-up transformer and additional protective relays. A review of simple pay back under the RES-BCT tariff suggests that hydro at FCV-1 would take about 5 years to recoup the investment once flows are high enough to match the generator's design capacity while it would take 18 years to recoup the investment for a generator at FCV/Hydro 3 after flows match the generator capacity. The analysis for wire feed back to PS-3 is in progress. Based on a simple payback analysis, the hydro at FCV-1 is recommended. The hydro at FCV/Hydro 3 is not recommended unless grants, incentives, and funding shorten the payback period within IWVGA's desirable range.

While it may be possible to omit PRV-3 and increase pipe pressure class between PRV-3 to increase pressure and hydro production at FCV-1, Canyon Hydro ruled that out of their proposal because they don't have a generator that would match those higher-pressure conditions well. This possibility can be further reviewed with N-line Hydro or other hydroelectric companies in later stages of design.

7 WATER QUALITY

This section discusses the issues associated with taking treated water that will at times be surface water and pumping it 50 miles, and integrating the water into a treated drinking water distribution system that uses only groundwater. The section reviews the water quality concerns, recommended analysis work, and potential treatment processes for implementation.

7.1 EXISTING WATER SYSTEM DESCRIPTIONS

IWVWD's current water is provided by eleven groundwater wells. The system consists of multiple pressure zones that are served by numerous tanks and booster pump stations. The proposed terminus location of the proposed Project pipeline is the Ridgecrest Heights tank facility where there is an existing IWVWD pump station and a 3-MG storage tank, which according to IWVWD can potentially be fed by any of their wells indirectly via the water distribution system. Four of the IWVWD wells (9A, 10, 11 and 13) have historically exhibited levels of arsenic exceeding the State Drinking Water Maximum Contaminant Level (MCL), all of which are treated by arsenic filtration plants before being the groundwater is distributed to the system.

AVEK's water supply is composed of multiple sources: groundwater, groundwater under the influence of surface water, and surface water. State Water Project surface water from the California Aqueduct can either be stored in its groundwater banking facilities, or directed to the Rosamond Treatment Plant where it passes through sedimentation basins, pre-ozonation, filtration, and finally chlorination and addition of a corrosion inhibitor. Water pumped by shallow groundwater bank recovery wells considered under the influence of surface water is blended with the surface water supply upstream of the Rosamond Treatment Plant. AVEK also has deeper potable groundwater wells in the banking area that recover banked water, which is then pumped to the outlet of the Rosamond Treatment Plant to either blend with the effluent or be transferred directly into the distribution system. For purposes of this Project, the finished water is then pumped to the Mojave Tank Farm approximately 10.6 miles away, which consists of four 8-MG storage tanks and a chlorine boosting station. From the Mojave Tank Farm, water travels by gravity to several locations: in an easterly direction, 29.7 miles to the community of Boron, and in a northeasterly direction, 23.2 miles to California City, the proposed tie-in location for the Project.

7.2 WATER QUALITY CONCERNS

The presence of surface water in the AVEK system complicates the pipeline design from both a technical and regulatory perspective. Surface water tends to be higher in disinfection byproduct (DBP) precursors such as total organic carbon (TOC). AVEK chlorinates at its Rosamond Treatment Plant with no plans to switch disinfection methods. The 50-mile pipeline will initially add up to 10 to 11 days of residence time in the pipeline beyond time it already takes to travel to California City, which will increase the likelihood for excessive DBP formation. Also, DDW has confirmed that a minimum of 0.2 ppm free chlorine residual needs to be maintained in the pipeline at all times. As a result, there is a significant likelihood that chlorine boosting facilities will need to be constructed along the pipeline in order to ensure that requirement is met.

Fortunately, AVEK already employs strategies to mitigate DBP formation in its system. First, it pre-ozonates at the Rosamond Treatment Plant, which helps to breakdown organics prior to filtration and chlorination. However, with SWP water having high levels of bromide, this also introduces the potential for the formation of bromate, which is something our sampling plan will monitor. Second, it has recently added the capability to blend potable groundwater from its banking facilities with the treated surface water effluent, which should also help reduce DBP formation potential. In recent years, AVEK has avoided DBP issues largely due to these factors, in addition to being able to meet demand in low allocation years with potable groundwater sourced from its banking facilities.

7.3 WATER QUALITY ANALYSIS

Water quality data was gathered for both IWVWD and AVEK to investigate the compatibility of the proposed imported water with existing IWVWD system water. For IWVWD, all available data was pulled from the Safe Drinking Water Information System (SDWIS) provided by DDW for each of the eleven wells that provide drinking water to the system. AVEK provided water quality data for its recovery wells, ag wells, Rosamond Treatment Plant influent and effluent. Additional treatment plant effluent water quality data was obtained from SDWIS. The treatment plant effluent is expected to be the most representative sample of the future imported water, so for the compatibility analysis, the effluent minimum to maximum range of values were compared with the average values of each of IWVWD's wells for all pertinent parameters. The results can be seen in the Water Quality Data Comparison Table in APPENDIX H – WATER QUALITY TABLES.

Besides the potential DBP issues discussed in previous sections, there are no apparent impediments to blending AVEK waters with IWVWD's existing water. P&P will review this assumption through a year-long sampling study monitoring a number of geochemical water quality parameters and disinfection byproduct formation. The currently proposed sampling plan can be seen in the Water Quality Sampling Matrix in APPENDIX H – WATER QUALITY TABLES. The sampling plan includes sampling at all the IWVWD wells and sampling at several locations (Rosamond, Mojave, Boron) within the AVEK system to see how the existing water quality varies throughout the system. Testing for free chlorine, total trihalomethanes, and haloacetic acids will be performed over an extended period of time (3, 7, and 11 days after collection) to simulate the effects of added residence time on the water, particularly for those parameters that could be most affected by it.

7.4 TREATMENT PROCESSES

If the DBP issues are able to be mitigated by the existing processes employed by AVEK, then the treatment required at the Terminus Tank site in Ridgecrest should be minimal. We would recommend planning for chlorination facilities to boost chlorine residual in the imported water as necessary at the pump station(s) and at the Terminus Tank site. These would include a chemical enclosure building housing two 5-foot diameter chemical storage tanks, a duplex chemical dosing pump skid, and a chlorine analyzer panel. An emergency eye wash shower, hose bibb and hose rack should also be located near the chlorination systems. Sodium hypochlorite dosing could be flow-paced or based on the desired residual entering the Terminus Tank, depending on the preference of IWVWD. The Terminus Tank should have a separate inlet and outlet as well as an internal mixer to promote good turnover. The locations of the inlet and outlet will be based on the district's preference as well as its intended operation of the tank. If total trihalomethanes (TTHMs) are a concern based on the sampling program results, a powered tank ventilation fan may be recommended.

Granular activated carbon (GAC) was briefly explored as a potential treatment process at the pipeline terminus as well, to address and mitigate potential taste and odor that could be caused by stagnant water in the pipeline. GAC may or may not help with some taste and odor issues but would not be helpful in the case of a bacteriological event. Considering there are no taste and odor issues currently in AVEK's existing system and it is our understanding that Boron, one of the community water systems also supplied by AVEK facilities located furthest from the Rosamond Treatment Plant (40+ miles of pipeline), also does not experience taste and odor issues, it is likely premature to assume that GAC would be necessary or even beneficial at this stage of design. Additionally, GAC would dechlorinate the water which may violate the 0.2 ppm minimum chlorine residual requirement set forth by DDW. Our current recommendation is to include the design provisions and flexibility to add GAC facilities in the future if there is a need for it, but not include the actual design of GAC facilities for now.

8 FIELD INVESTIGATIONS

This section reviews the surveys conducted by the project team, right-of-way information, utility research conducted, recommendations for potholing, and geotechnical considerations.

8.1 SURVEY

Provost & Pritchard performed a control survey, topographic surveys, and a boundary survey along the entire alignment as described in the following sections.

Control Survey

A control survey was completed in December of 2022 along the project corridor, using Global Positioning System (GPS) rovers connected to HxGN Smartnet Real Time Network (RTN) to establish project control points and benchmarks and to set ground control points with aerial targets for use in the processing of an aerial survey. Existing benchmarks and survey control points published in the National Geodetic Survey (NGS) Database were prioritized and were recovered and observed along the project corridor, along with survey benchmarks and control points from other agencies that were encountered during the survey.

HxGN Smartnet consists of a network of continuously operating GPS reference stations, tied to the National Spatial Reference System (NSRS). Due to the unique geological factors affecting California, the HxGN Smartnet stations are adjusted to align with the NSRS on a bi-annual basis to avoid local errors caused by the differing positional velocities of the reference stations. At the time of the control survey, the reference frame and epoch in use by Smartnet were the NAD83(NA2011)(MYCS2) reference frame, at the 2022.750 epoch. HxGN Smartnet uses the RTCM Master Auxiliary Concept, assigning a Master reference station for each observation and using adjacent reference stations in the network for auxiliary support and for atmospheric correction. The two nearest reference stations to the project in the Smartnet system are stations CACC (in California City) and CABS (in Barstow).

A baseline was observed between NGS Station “L71 C”, PID DF4121, a Secondary Airport Control Station at the California City Airport, and California Department of Transportation Station “HPGN CA 08 06”, PID FT1611, a Cooperative Base Network Control Station, for which the observed bearing of North 57°01’54” East matches the calculated bearing between these stations per the coordinates published in the NGS database. This baseline will serve as our Basis of Bearings for this project, and NGS Station “L71 C” will serve as our principal benchmark.

The following table is provided for the survey control points and benchmarks included in the project. The Northing and Easting coordinates are NAD83, California Zone 5, US Survey Feet, as derived from the NAD83(NA2011)(MYCS2), epoch 2022.75 observations on each point. Elevations are on the NAVD88 Datum, derived using Geoid18. All values in Table 8-1 are observed, and not published by the NGS or other source.

Table 8-1 - List of Control Points and Benchmarks

P&P Pt #	Northing	Easting	Elevation	Description
1	2222632.26	6564884.33	2454.85	Smartnet Station CACC
2	2149246.12	6846531.87	2192.88	Smartnet Station CABS
3	2288579.31	6565889.28	2019.43	USCGS Station CANTIL
4	2328595.68	6621098.25	2084.59	USCGS Station Y 1158
5	2341475.50	6647626.02	2579.51	USCGS Station B 1162
6	2319800.94	6676696.83	3617.53	CADT Station HPGN CA 08 06
7	2380287.92	6655346.25	3098.79	USCGS Station K 48
8	2368508.87	6576891.73	3089.00	USGS Station 28 BIS
9	2301958.17	6575547.84	2029.00	USCGS Station P 1158
10	2332863.40	6624831.16	2159.30	USCGS Station W 48
11	2317300.51	6594907.69	1929.30	USCGS Station Z 48
12	2269275.31	6565828.25	2198.45	DOI Station 5 RLM
13	2303377.50	6578754.04	2005.38	USCGS Station N 1158
14	2311332.60	6581426.76	2022.90	Capped Rebar "QK CTRL"
15	2315271.83	6592260.90	1948.45	USCGS Station A 49
16	2382870.64	6647751.87	2997.17	USCGS Station J 48
17	2263972.48	6565830.65	2237.11	DOI Station 4 RLM
18	2285741.96	6565976.40	2022.19	USGS Station DOR 29
19	2303355.26	6571082.49	2127.09	USGS Station RAFARMER
20	2319328.38	6594210.35	1953.26	Capped Rebar "QK CTRL"
21	2329341.46	6621909.45	2107.94	Capped Rebar "QK CTRL"
22	2240140.13	6553881.51	2456.36	NGS Station L71 C
23	2376245.60	6641599.63	2909.01	USCGS Station H 48
24	2314396.50	6569476.47	2351.55	USCGS Station D 1303
25	2327174.37	6682039.33	3292.50	USCGS Station N 699
26	2414723.40	6683876.27	2420.84	USCGS/CADT Station F 689 RESET
51	2226870.40	6565991.55	2416.67	CCCSD Brass Disk "WELL NO 1"

Topographic Survey

Provost & Pritchard completed an aerial survey of the project corridor with imagery collected in December of 2022. The imagery was collected with an unmanned aerial vehicle equipped with Real Time Kinematic (RTK) GPS and a Zenmuse P1 45MP full-frame sensor. The aerial survey was processed into orthorectified imagery and a digital terrain model of sufficient accuracy to be presented with a 1-foot contour interval. Ground control points with aerial targets, set in the control survey at no more than ½-mile intervals, were integrated into the aerial survey processing.

Supplemental ground surveys, primarily using RTK GPS, were undertaken from March to May 2023 to validate the topography from the aerial survey and to locate visible evidence of existing utilities and other features within the vicinity of the proposed project alignment that may have been obscured in the aerial imagery. The ground survey data was integrated into the aerial survey data and used to refine the digital terrain model.

Boundary Survey

Provost & Pritchard completed a boundary investigation for the resolution of existing public rights-of-way and private property boundaries in the vicinity of the project alignment. Research was performed to obtain BLM Plats and Field Notes, Caltrans maps, Record of Survey maps and Plats recorded at Kern County, Kern County Surveyor's Field Notes and Monument Perpetuation Maps, Corner Records filed with the County Surveyor, and County Road maps and records from Kern County.

A field survey was performed in March and April of 2023 to recover and observe controlling monuments for the Section and Township lines and public right-of-way lines along and across the project corridor. From the framework provided by the monuments found and the available field evidence and records, a basemap was developed including the State, County, City, and Railroad rights-of-way along and across the project alignment, together with record property line locations from recorded maps and County Assessor's maps in areas where the proposed alignment crosses private properties.

In some areas along County Roads, where insufficient monumentation exists or where County Road records do not adequately or accurately represent the rights-of-way, it was necessary to use the physical centerline of the existing pavement as a monument for the resolution of the right-of-way lines.

8.2 RIGHT-OF-WAY INFORMATION

Provost & Pritchard staff has worked with IWVGA's ROW consultant, Transystems, to further develop a table with a profile of each parcel that will be either permanently impacted or temporarily impacted during construction and contact the affected property owners. The table developed during the Alignment Study contained parcel details, including assessor parcel number, owner name, address, property size, zoning, assessed land value, and whether the property is improved or not. During the preparation of this PDR, the number of the affected parcels was refined as the pipe alignment was refined and Transystems reached out to affected property owners to gain Right-Of-Entry (ROE) for biological surveys, cultural surveys, corrosion surveys and the geotechnical investigations.

Based on our conversations with a heavy construction contractor in the region, we are recommending a permanent pipeline easement width of 15 feet and a temporary construction easement width of 25 feet to maintain constructability while being sensitive to minimizing the temporary environmental impacts. The temporary construction easement beyond the existing California City road ROW and Kern County road ROW will encroach on private and public lands to maintain a 40-feet wide pipeline construction corridor. The temporary construction easements for the pipeline will extend to the boundary of the city road ROW in California City along Redwood Boulevard and Neuralia Road and to the edge of the County road ROW of Neuralia Road. The temporary construction easement will be minimized when traversing the conservation areas and areas within the sensitive tortoise habitat. We have also proposed three (3) 300X600-feet laydown and staging areas for material and equipment storage and temporary construction trailers. These laydown and staging areas will be located near the beginning of the alignment, near the intersection of Neuralia road and Redrock Randsburg Road, and adjacent to the Ridgecrest Heights Tank Facility on BLM land.

While the pipe alignment impacts residential and commercial parcels within the California City limits, the majority of parcels are on BLM land or within California City ROW and Kern County Road ROW, 20.6 miles of the 50.3 miles of the Alignment is in BLM land or road right-of-way where BLM is the underlying property owner. The alignment traverses three (3) parcels of the CDFW Fremont Valley Ecological Preserve. The Central alignment traverses or is in City or County right-of-way adjacent to twenty-nine (29) parcels owned by private owners or trusts, twenty-three (23) parcels owned by either companies or corporations, and seven (7) private conservation parcels owned by the West Mojave Conservation Bank. The alignment will be within the Kern County Road right-of-way when traversing the Fremont Valley Ecological Preserve and the West Mojave Conservation Bank. While these private and public conservation areas were accessed for biological surveys and cultural surveys, the geotechnical investigations, corrosion field analyses, and actual construction activities and permanent facilities will be confined to within the Kern County Road right-of-way to avoid encroaching on these sensitive areas. The alignment traverses thirty-four (34) parcels on BLM land as shown in APPENDIX I – ALIGNMENT PARCEL LIST, Table 8-1- Alignment Parcel Summary.

To date, Transystems has been able to obtain ROEs for forty-eight (48) parcels along the alignment, seventeen (17) property owners have been contacted and seem to be amiable to the project, but have not signed the ROE, twenty-six (26) property owners could not be located, and seven (7) property owners refused to sign the ROE. For parcels where the property owners cannot be located or the owner is non-cooperative, Transystems has been working with IWVGA to initiate the legal process of obtaining an investigative warrant with the courts to allow our CEQA/NEPA team and our sub-consultants to perform the field investigations. Transystems will initiate the legal condemnation process on behalf of the landowners that continue to be non-responsive or non-cooperative as the design is furthered and no later than October 2024 when the CEQA/NEPA documents are scheduled to be complete.

The pump station site area required is 300X300-feet, not including an aggregate base access road to the nearest paved road. Land will need to be acquired to construct the 3 pump stations that will be required. Based on the preliminary hydraulic analysis discussed in this report, 1 of the 3 pump stations will be on private land, owned by a private landowner, a company, or a trust. The remaining two pump stations will be on BLM property. For these facilities, the IWVGA will be responsible for paying to BLM an annual rental fee per acre of land required for the pumping facilities. It should be noted that above grade piping facilities will also be subject to an annual rental fee.

8.3 UTILITY RESEARCH

P&P has conducted research to obtain available information from the various utility and service providers in the area to determine where underground improvements exist as well as to understand required clearances and separations that must be maintained from each underground facility as well as those which exist above ground. Several methods were utilized to develop the list of potential utility owners in the area. One method was utilizing the contact information contained it the A formal request was sent to each utility and service provider to acknowledge whether they have facilities within the defined project area and if so to provide as much information as possible so that the presence of the improvements can be shown on the plans. Obtaining as much information as possible is extremely valuable during the design phase of a project, as it allows for modifications to be made to the alignment to avoid some utility conflicts. This also allows for the appropriate plan for inevitable conflicts such as crossings, to the greatest extent possible, so their existence does not spring up to the contractor as a differing condition, which can result in project delays and change orders.

It is important to note that not all relevant information can be obtained from all utility companies and service providers. Some are better than others at documenting the location and other information related to their assets in a given area. Even those with very detailed records can never be thought to have a completely accurate record of their assets and any depiction of utility assets on construction documents should be verified in the field, especially with regard to demolition work and trenching. See Section 8.4 for more information on recommended potholing operations.

The specific utility research for this project has been broken into five sub-regions to describe the utilities and services known to be in each area. Those sub-regions and the information obtained are as follows:

- California City
  - California City Public Works Department provided detailed AutoCAD drawings showing the presence of most City owned utilities and some of those provided by others. Those City owned utilities are as follows:
    - Water
    - Sanitary sewer
    - Storm drain
  - SCE has been contacted and typically does not review projects until project design is complete. Due to the scale of the project, SCE is reviewing alignment information prior to final design. Where the pipeline is near poles or crossing power lines on private property, a Consent Agreement Application will be required. At locations where the pipeline is within public right of way, the pipeline must be 10 feet from poles horizontally and no additional agreements are required.

  - SoCal Gas: Assets are known to exist within the project area, and some are shown in the AutoCAD files provided by the City. However, no formal response has been received from SoCal Gas at this time.
  - Phone and internet: Frontier is known to be the sole telecommunications provider in the area. A diagrammatic map was provided by them without detailed information. Efforts are being made to obtain additional information from them.
- Neuralia Road Corridor (outside of California City Limits)
  - Eland Solar Project: Discussions have occurred with SOLV Energy which is constructing the various phases of the "Eland" project. As-built plans have been provided for this ongoing project and have been incorporated into the design drawings.
  - Springbok Solar Project: As-built information has been received from the developer of the project which has been completed since 2016. The information received was fairly diagrammatic, and pothole efforts will be necessary to verify the locations of improvements.
  - SCE: There is an existing aerial SCE line that straddles the Kern County road ROW line. This line runs along the eastern shoulder of Neuralia for approximately 5 miles south of Redrock-Randsburg Road and then it changes sides of the street and runs along the ROW line along the western shoulder. There are no other known SCE assets within the Neuralia Road Corridor outside of California City.
  - Frontier: Similar to the information received within California City, Frontier also has assets withing this corridor, and the maps received were diagrammatic in nature.
- Redrock-Randsburg Rd/Garlock Road corridor
  - Few improvements have been identified to exist within this 20-mile stretch of road in a very rural area.
  - SCE: There is an existing aerial SCE line that runs along the northern County road ROW line for a portion of Redrock-Randsburg Road, and the alignment of the proposed pipeline in the southern County road ROW. The pipeline will be sufficiently separated from this SCE pole line. No other SCE assets are known to exist.
- Highway 395 Corridor (Caltrans 400' ROW)
  - The proposed alignment will be outside of the Caltrans ROW.
  - Potential utility crossings will be encountered within the one perpendicular crossing the proposed pipeline will have.
  - Fiber optic lines are thought to be in the vicinity from Hwy 395 at Garlock Road to Searles Station Road. P&P is attempting to obtain information on these lines.
  - The proposed alignment will run parallel to an existing aerial SCE electric line and fiber optic lines north of Searles Station Road. These assets will be shown on the plans and the alignment will be modified to minimize the conflicts with each.
- China Lake Boulevard Corridor
  - The only known asset in the area is an existing aerial SCE electrical line.

- Consent Agreement request needed at Tower transmission lines and private property easements (non-public ROW)
- Separate SCE agent/process for crossing SCE facilities on BLM-owned land

8.4 RECOMMENDATIONS FOR POTHOLING

It is known that there are numerous locations along the proposed alignment where existing or suspected utilities cross or otherwise encroach upon the proposed alignment. With this in mind, P&P has obtained available information from the various utility and service providers in the area as noted in Section 8.3-Utility Research of this report. While most of the utility and service providers did respond to requests for maps and information about their infrastructure in the vicinity of the project, such an effort should always be thought of as incomplete, as not all providers respond to requests and those that do respond do not always have complete and reliable maps and other information.

It is therefore recommended that additional work be performed during the design phase of the project to further identify the locations of known and suspected underground improvements, as well as their depth of cover and overall size. If done during the preliminary design phase, such an effort can help to identify conflicts with proposed improvements prior to going to construction. If found only during the construction phase, such differing conditions can expose the Authority to change orders far in excess of the cost to do the potholing during the design phase of the project. Similarly, such discoveries during the construction phase can also lead to significant time delays until such time as mitigation measures can be performed which may include the relocation of the utility, protecting the utility, or even modifying the alignment of the proposed water line.

The Authority is proposing to hire a qualified contractor with experience in conducting subterranean investigations of known or suspected underground improvements as well as the appropriate documentation of found improvements to be relayed to the design team to be incorporated into the construction drawings which could include significant modifications to the proposed alignment. The budget for this design phase potholing program cannot be estimated at this time. However, it is believed that such an effort would be at least in the tens of thousands of dollars upwards of in excess of one hundred thousand dollars. Many of the proposed potholes will involve the procurement of encroachment permits from the City, County, or other entities such as Caltrans or UPRR and may include some level of traffic and pedestrian control as well as removal of existing road and soil materials which must be stored nearby and generally replaced by the end of a single workday.

It should also be noted that it is highly advisable to include some provision for potholing during construction such that the selected pipeline contractor can investigate any additional differing conditions that may not be identified during the design phase potholing program recommended herein.

P&P has incorporated the information it has received from the various utility and service providers into the preliminary design drawings and have compared those alignments against the current proposed alignment. It is recommended that a pothole or potholes are performed at every single known or suspected crossing of the proposed pipe as well as in locations where a known underground utility is believed to be within approximately 5 feet of the proposed line as well as locations where unmapped utilities are suspected to exist. Refer to the Preliminary Design Drawings in ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS which includes symbology indicating where each currently known pothole location will be.

It should also be noted there are several locations along Neuralia Road where private companies have installed large solar farms on either side of Neuralia which have reduced the available space within the unimproved shoulders of Neuralia. With these being recent and, in some cases, active projects, mapping is known to be incomplete at this time, and P&P has worked with the developers of what are known as the "Springbok" and "Eland" solar projects. Potholing is paramount along Neuralia as it relates to these projects, and this is an area that roughly spans from Phillips Road north in excess of six miles beyond the Honda test track. This includes the need to pothole within the paved portion of Neuralia in locations where it is known the developers have installed trenchless crossings under Neuralia at various depths.

The following is a breakdown of the known utility and service crossings recommended to be potholed:

- *Domestic water: 35*
- *Natural gas: 18*
- *Underground electric: 1*
- *Sanitary sewer: 4*
- *Storm drain: 6*
- *Telecommunications: 6*
- *Solar project along Neuralia: 15*
- *Additional potholes as necessary (contingency): 10*

The numbers above are approximate at this time and are subject to modification as more information is obtained by the utility providers and private solar developers.

The numbers above are approximate at this time and are subject to modification as more information is obtained by the utility providers and private solar developers. It should also be noted that no known utility conflicts exist along Redrock-Randsburg Road, the portion of the alignment that runs parallel to the CA-395 to the terminus in Ridgecrest. No potholes are therefore recommended at this time along those reaches of the alignment. However, the potential presence of unmapped and previously unknown utilities should not be discounted entirely within these reaches. Additional recommendations for potholing will be provided if additional information is received from utility companies which would make potholing along

these reaches necessary. In the event that no additional information is received which would make this necessary, the Owner should keep in mind the possibility that the Contractor should always be ready to pothole during the project in the event that an unknown utility line is encountered.

8.5 GEOTECHNICAL CONSIDERATIONS

A total of 229 soil borings will be drilled, with 98 of them being drilled on BLM land. There are 183 borings along the pipeline alignment, 14 pump station site and tank site borings, 15 borings for jack and bore crossings, and 18 borings for HDD crossings. Borings will be approximately 8-inches in diameter and range between 15 and 100 feet deep, depending on the location. Earth materials encountered will be logged, classified in accordance with the Unified Soils Classification System, and graphically presented on Test Boring Logs. Undisturbed and bulk soil samples of representative subsurface soils will be obtained at five (5) foot intervals. Undisturbed samples will be retrieved using ASTM D1586 for granular soils and ASTM D1587 for cohesive soils. Standard Penetration Test results will be recorded for each sampling process. The borings will be drilled to proposed depths or refusal, whichever comes first. Borings will be advanced using a hollow-stem auger attached to a CME-45, CME-75, and/or CME-95 drilling wheel-based rigs. The 45, 75, and 95 indicate the maximum depth that each of the rigs can drill to. The borings for the pipe trench will be bored to approximately a 15’ depth and the jack and bore sites will be bored to a depth of approximately 40’. The borings at pump station sites, and tank sites will be between 20 feet and 50 feet deep. The largest rig, the CME-95 drilling rig will be used for the bores with depths between 50 feet and 100 feet deep, which will be at locations where a horizontal directional drilling crossing is proposed at a drainage crossing.

There will be an additional 53-test 2' wide X 8' long pits dug to a depth of 6' excavated, backfilled, and compacted with a small backhoe. Test pits are planned at the locations along the alignment where rocky conditions are likely, as determined in the desktop geotechnical study performed during the Alignment Study (See Alignment Study in APPENDIX A - ALIGNMENT STUDY).

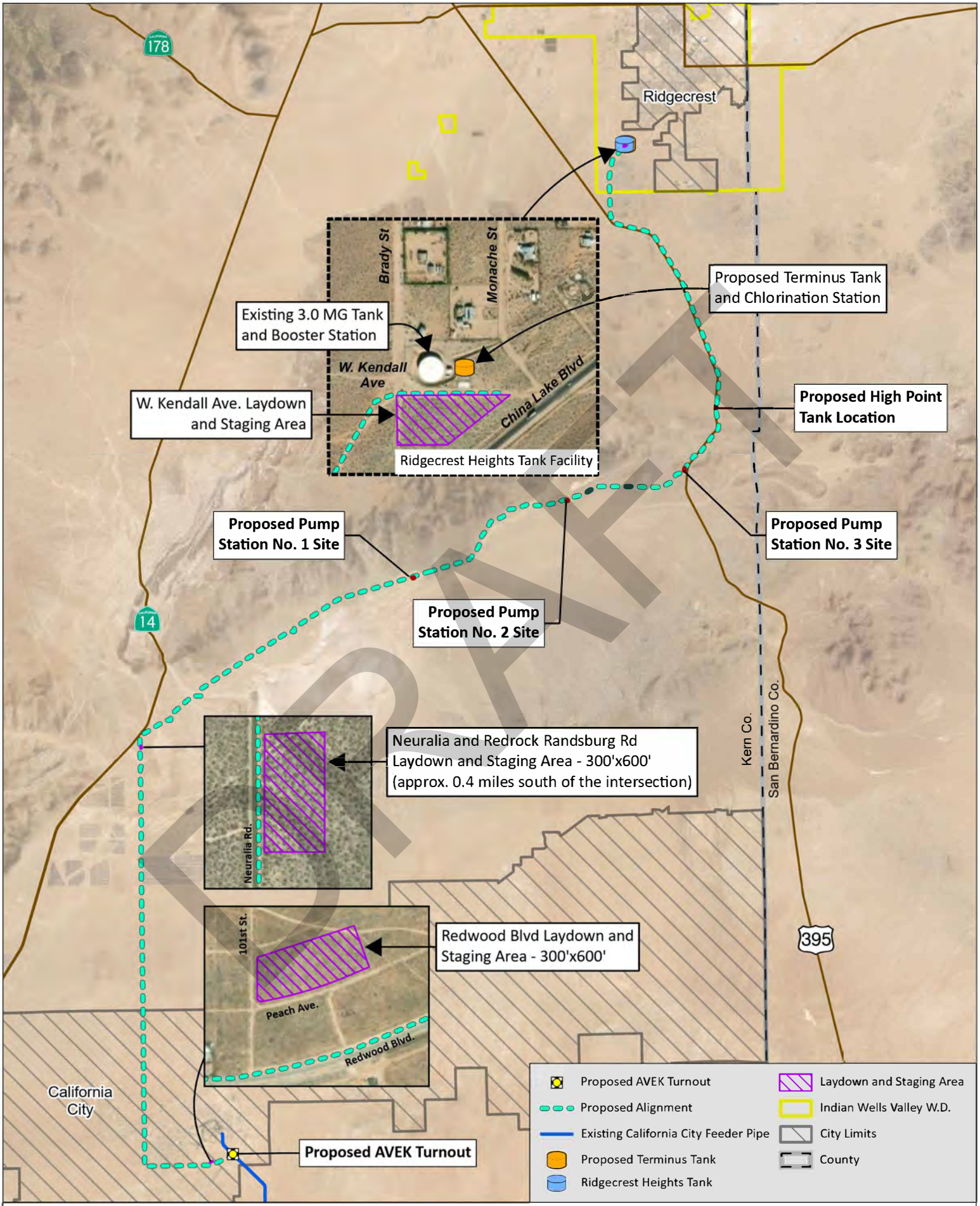
Soils Engineering Inc. performed soil borings along the alignment at locations within California City, Kern County Road ROW (where BLM is not the underlying property owner), and on private property where right of entry has been granted. A summary of borings that have been performed at the time of this report and their respective boring logs are also included APPENDIX J – SOIL BORING LOGS. The soil boring logs for locations along Neuralia Road have had consistent soils layers to the depths bored.

9 CONSTRUCTION CONSIDERATIONS

This section reviews the assumed laydown areas, traffic control considerations, construction water and material sourcing, construction contract packaging, and estimated construction schedule.

9.1 LAYDOWN AREAS AND CONTRACTOR WORK AREAS

During the initiation of the preliminary design, P&P staff met with a local contractor in Kern County about the constructability of the project and the needs for the laydown and staging areas for a project of this scale. The contractor indicated that for the pipeline work, three main 300'x600' laydown and storage areas (approximately four acres) along the alignment would be adequate. Our design staff has preliminarily placed these laydown and storage areas along the alignment in close proximity to a potential construction water source. The proposed laydown and storage areas would be located on a private parcel near the beginning of the alignment off of Redwood Boulevard, on a private parcel near Neuralia and Redrock Randsburg Road, and on BLM land, adjacent to the Ridgecrest Heights Tank Facility (see Figure 9-1).



Indian Wells Valley GA

Figure 9-1: Potential Laydown and Staging Areas

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The three main laydown areas would be used for the storage of construction equipment and materials other than the actual pipeline itself, which will be strung out along the alignment as permitted by the regulatory agencies. These areas will house temporary construction office trailers and the contractor may elect to place elevated water storage tanks inside these staging areas to provide flexibility for its construction water needs. IWVGA would secure the temporary construction easements from the two private property owners and BLM prior to going out to bid.

Each of the three pump stations will have an additional 100x150-foot laydown and storage area (just under a quarter of an acre) next to the 2.1-acre pump station site to allow for staging of materials, equipment storage, and temporary construction trailers. Two of the three pump stations are on BLM land and the third is on a private parcel. The regulating tank at the highpoint along Highway 395 has a staging area adjacent to the permanent tank site that matches the area of the permanent site.

These laydown and storage areas will be cleared of vegetation by the contractor and restored to the satisfaction of the property owner. The first of the three laydown and storage areas is located in California City and the other laydown areas are located adjacent to arterial roads and Highway 395, making them susceptible to potential theft and vandalism. It will be the contractor's responsibility to provide the necessary security measures to secure the sites.

A 15-foot-wide permanent easement and an additional 25-foot-wide temporary construction easement will be provided to the contractor where available. Reaches along the alignment where this width will be narrowed include reaches in portions of California City, reaches along Neuralia Road, adjacent to the solar farms, and reaches along Redrock Randsburg Road, adjacent to private and state ecological preserves. The 40-foot-wide construction corridor would be used for the active construction activities, temporary stockpiles of the excavated materials, and stringing out the pipe as it is received from the pipe manufacturer. The contractor will stage the pipeline along the alignment in lengths ahead of the pipe headings as allowed by the CEQA/NEPA mitigation requirements and the requirements of the Kern County Roads Department and BLM (See Sheets CS-1 thru CS-4 in the Preliminary Design Plans for typical easement widths along the alignment.)

The jack and bore operations and the HDD operations will require significant staging areas on either side of the trenchless crossings, necessitating temporary construction easements on private and public lands larger than required for the remaining reaches. A 36-inch diameter casing will require a 5,000 ft^2 staging area on the jacking shaft side and a 9,000 ft^2 on the reception side for a jack and bore operation. An HDD operation will require between 20,000 to 30,000 ft^2 on the launch side of the operation and a 20-foot wide by the length of the bore for the staging area.

9.2 TRAFFIC CONTROL

Construction locations in and across roads and highways that are public ROW including Kern County, California City, and Caltrans will require the contractor to follow the California Temporary Traffic Control Handbook (CATTCH). Traffic control necessary on private roads and driveways will be determined by the policy of the property owner. The Contractor will be responsible for preparing and submitting a traffic control plan to the City of California City, Kern County Roads Department, and Caltrans. Caltrans is responsible for the maintenance and operation of Highway 395.

9.3 CONSTRUCTION WATER AND CONSTRUCTION MATERIALS

Two construction challenges this project pose are the availability of water and construction materials such as concrete, asphalt, aggregate, and backfill material. It is important to be mindful of the fact that these common materials and resources are not as readily available in the area of the project due to the rural nature of a large portion of the pipeline, as well as the fact that the Cities of Ridgecrest and California City themselves are not very large and do not have as many materials suppliers than may exist in more populated areas. The scarce nature of these materials along the alignment has the potential to significantly escalate the cost of such materials and resources.

Construction Water

Construction water plays a significant role in any construction project as it is needed to aid in just about every heavy civil construction process from providing optimum moisture during backfill of trenches to providing required dust control for the health and safety of construction workers and the general public. In most cases, a contractor working on a non-linear construction project in an urban environment would obtain a construction water meter from the local water utility and attach it to the fire hydrant nearest to the project, and take water as needed at a rate payable to the water supplier. Such costs are generally included in the bid prices of the contractor for each line item of the project or in some cases, a project might have a special line item only for construction water.

This project requires special consideration for how water will be sourced for the project. For the portion of the project that will occur within the incorporated limits of California City, it should be assumed that the contractor will be able to utilize a traditional construction meter at the going rate from the City Water Provider. P&P has communicated with the City which has indicated it would be able to meet such a request. The issue for the project begins at the northern-most hydrant at the intersection of Mendiburu Road and Neuralia Road. From this point northward, there are no known public water systems that are available until the Ridgecrest terminus of the project at the intersection of Kendall Avenue and South China Lake Boulevard.

The total distance of this separation between available water sources is 45 miles. This means that there is a point at about 22.5 miles between the two City limits where water would need to be imported for that long distance. P&P believes that a proactive approach to this issue is better than indicating in the plans and specifications that water procurement is the responsibility of the contractor, which could lead to some exaggerated assumptions on the part of the contractors during the bid phase.

It seems likely that the default solution will be to obtain water from California City for those areas closer to California City, and that the IWVWD itself might be the construction water supplier for those areas closer to Ridgecrest. However, P&P has done some research and has communicated with heavy civil contractors to see how this issue has been addressed in the past.

One potential solution is to identify one or more owners of private water wells between the two cities that might be willing to sell water to the contractor at a price low enough to offset the costs associated with importing water by as much as 22 miles.

In researching this, P&P has heard from contractors that this sort of an arrangement has occurred in the past when providing construction services in very rural areas, but that it will likely require a formal agreement with the private well owners which sometimes can take months to execute. It is known that there are a number of wells along the alignment or near the alignment that could be available to the project. Some wells are "domestic" in nature and service small enclaves of private homes within unincorporated Kern County. Others are "private" in that they only provide water to a single end user. The following is a list of some potential wells and their general locations which the Authority may want to solicit as to the availability of water:

- Arciero Ranches – private landowner with approximately 20 plots of land at various locations along Redrock-Randsburg Road; believed to have private wells which may be available for use.
- Rancho Seco – public well - along Neuralia Rd 2 miles south of Redrock Randsburg Road.
- Rand - public well – along Redrock Randsburg Road 3.5 miles east of intersection of Redrock Randsburg Road and Garlock Road
- Anne Avenue – domestic well – ¼ mile west of Neuralia Road and 1 mile north of Anne Avenue.
- Honda Test Track – private irrigation wells – located along Neuralia Road eight miles north of California City.

Note that the above list is not a complete account of wells in the general vicinity of the project site and is only reflective of those wells believed to be relatively close to portions of the project. There is no guarantee that all wells listed above are operational as data was sourced from a Geographic Information System database available from the California Department of Water Resources. The information available is not guaranteed to be completely accurate. Additional research is necessary to identify operational wells as well as their depth, water quality, capacity, and whether the owners and operators would be available for use on this project.

In the event that no wells listed above are available, another option might be to utilize the proposed IWVGA pipeline itself which would require the pipe to be constructed, pressurized, tested, and to be brought into service in phases that can be used during the construction of the pipe ahead of it. This is perhaps the most logistically complicated option as it would surely require an acceleration of the schedule to construct the booster pumps for the pipeline to operate.

Construction Material

Beyond the need to procure water for the project, there is also a need to find materials that can be used to backfill the pipe trench as required by the various municipalities (namely California

City and Kern County) and other construction materials such as asphalt and concrete. Various earth materials are also needed for the construction of the booster pumps along the alignment. Like the circumstances for getting water to the site, the same concerns exist for getting materials to the site by suppliers that could be a considerable distance away from the project. Unlike construction water, the locations of existing suppliers are static and cannot be moved closer to the site. In general, the project may require the importation of Class 2 aggregate base rock, sand for below the pipe, and the importation of appropriate backfill materials if the materials excavated from the trench are determined to be inappropriate to backfill the pipe with due to contamination issues or native material being such that it cannot be properly consolidated. At this time, it is not known how much, if any material might be excavated that cannot be used as backfill. This may not be known until the results of the geotechnical investigation are known, and even after the report is completed, some material might not be able to be properly classified as inappropriate until it is excavated.

In areas where the alignment is proposed to exist is within a paved roadway, asphalt concrete will also need to be imported to complete the backfill of the trench, and Portland cement concrete will also need to be imported to the booster pump locations as well as to various locations throughout the project site where miscellaneous concrete is needed for various structures. Concrete could be a potential troublesome material to source from a remote supplier as it is generally expected that the material should be placed within approximately one hour after being added to a cement mixing truck at a batch plant. It may not be feasible for a batch of concrete to be transported from more than about 30 miles away without the use of special mixes containing set retarding admixtures or perhaps for a small batch plant to be set up on site. In either case, the cost of concrete would likely escalate in excess of what might otherwise be available from a standard batch plant.

A search was conducted to identify those suppliers that are relatively close to the site which are believed to be those that will likely supply materials for the project. Due to the rural nature of portions of the project, it should be noted that there are few suppliers to utilize within a reasonable radius of both California City and Ridgecrest.

The following are the five suppliers that are believed to be within a reasonable distance to the project:

- Holiday Rock – Mojave – aggregate; concrete; asphalt
- 711 Materials – Ridgecrest – concrete; aggregate
- MRC Rock and Sand – Mojave – aggregate; sand; topsoil
    - Can also process materials on site.
- Bowman Asphalt – Ridgecrest
- Robertson's Ready Mix – Ridgecrest- concrete; aggregate

There are likely no other material suppliers within the Indian Wells Valley or California City region which can readily supply materials for the project in quantities required by the project. In the event that these suppliers have supply issues of any of the requisite materials, it may be necessary for the contractors to source materials from suppliers further away in locations such as Tehachapi and Bishop. In the event that this is necessary, it is believed that the transportation costs for the materials will be high compared to sourcing materials from the few nearby suppliers.

Another potential option may be for the Contractor to set up an onsite processing plant with rock crushers and shaker screens to potentially bring unsuitable native materials into compliance to be used as backfill materials. This approach is not uncommon along long linear projects such as this, but whether this approach is feasible is dependent on the results of the Geotechnical Investigation and may require additional and more focused consideration of areas where this approach may be feasible.

9.4 CONTRACT PACKAGING AND PHASING

The contract packaging and phasing will be dictated by the major components in the conveyance system facilities and by the funding of the project. Provost & Pritchard recommends separating the pipeline, pump stations, and storage and regulating tanks into separate construction contracts. Multiple construction contracts will require diligent coordination between the contractors and will require additional resources for construction management. A single construction contract for the entire scope of work would limit the bidding pool to a few nationwide contractors that can bond a project of this size. Breaking the work down by pipelines, pump stations, and regulating and storage tanks will broaden the pool of bidders for each component of the project and attract more pipeline, mechanical, and tank contractors in Southern California and Central California areas.

Provost & Pritchard has had discussions with a Central California pipeline contractor to get a feel for labor effort and equipment required for the expected pipeline work and to get a feel for the production rate for the different pipe laying conditions. If one contractor was to do the pipeline work for the entire alignment, it is expected that they would have four to five separate crews of seven working at once, each specializing in pipe laying on city streets, open areas, and areas where rocky conditions may be prevalent. The pipeline alignment has some inherent start and stop points that we have also shown somewhat by the way the alignment is broken down into five reaches on plan and profile sheets (refer to ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS-Preliminary Plans). The pipeline work could be split into multiple packages to assist with the timing and availability of local and state project funding. This will have to be analyzed as the design is furthered and more is known about the potential soil conditions along the route.

Bennett Trenchless Engineers recommends that the trenchless pipeline work be part of the primary pipeline contractor's work. The are several reasons to not have a separate contract for the trenchless pipeline work:

- Trenchless contractors typically do not build their own shafts.
- Trenchless contractors typically do not buy the pipe.
- Many of the trenchless contractors that would be used for this project are also likely not accustomed to being the general contractor and may be unfamiliar with all the typical administration and coordination required from a prime contractor, which could cause coordination issues with other contractors and unnecessary delays.
- Having the general pipeline and trenchless subcontractor on one team helps to facilitate timing of the work to minimize impacts to traffic.

- It allows tie-in on either side of the trenchless crossing to make use of the existing shaft structures (especially for auger boring). This eliminates the need to dig it back up for the connections to the main line upstream and downstream of the connection.
- It eliminates the potential for "finger-pointing" if there is an issue with alignment/depth on the connection points because the responsibility for remedying the issue lies on the general contractor.

The pipeline contract(s) could potentially be split as follows:

- Within approximately the Cal City Limits, including a trenchless subcontractor for the trenchless jack and bore of the Yerbe Rushe Creek culvert crossing.
- Neuralia Road/Red Rock Randsburg Road/Garlock Road, including a trenchless subcontractor for the UPRR jack and bore crossing, the jack and bores for Cantil Road, Redrock Randsburg Road, the Garlock Road crossing, and the HDD drainage crossings.
- Highway 395/China Lake Blvd, including a trenchless subcontractor for the Hwy 395 jack and bore and the China Lake Blvd jack and bore.

For the pump station work, Provost & Pritchard recommends one contract for the three pump stations and all the site civil, mechanical, electrical, and instrumentation and controls work associated with it. This will keep the pump materials and related equipment uniform between the three pump stations, and installation methods consistent, which will make it easier for operations and maintenance in the long term. IWVGA may also want to consider expanding the scope of pump stations contractor to include electrical, instrumentation, and control at the tank sites so there is one contractor doing the SCADA work for all facilities requiring it.

There are at least three options to constructing the four tanks that are required for the conveyance system:

Option 1-Pump station contractor's work includes the construction of the 180,000-gallon regulating tanks at Pump Stations No. 2 and 3. A separate construction contract is set up for the 242,000-gallon regulating tank at the high point along Highway 395 and the Terminus Tank at the IWVWD Ridgecrest Heights Tank Facility.

Option 2-A construction contract that includes the construction of all four welded steel tanks required for the project. The advantage is having a single contractor for the construction of the storage tanks, however, it may cause coordination issues and conflicts with the pump station contractor for work on the pump station site.

Option 3-The pump station contractor is responsible for the regulating tanks at Pump Stations No. 2 and Pump Station No. 3 and the pipeline contractor(s) are responsible for the tanks in the reach of their work. The advantage to this option is that the pipeline contractor would just need to subcontract to a tank fabricator and could perform all of the other site civil work that is required.

Option 3 is recommended to reduce the coordination between contractors and the potential for conflict with having more than one contractor on a relatively small pump station or tank site. In conjunction with Option 3, it is recommended that the pump station contractor be responsible for integrating controls all of the SCADA Controls for the pump stations, all of the tanks, and all control valves, pressure reducing valves, and flowmeters along the alignment.

9.5 CONSTRUCTION SCHEDULE

A preliminary construction schedule was developed to determine an overall timeline of 30 months (about two and a half years) for the project. A Gantt chart is included in APPENDIX K – CONSTRUCTION SCHEDULE. The schedule was prepared assuming the following:

- All “prior-to-construction" environmental clearance measures are in place or complete.
- All permits with Agencies Having Jurisdiction (AHJ) have been obtained.
- License Agreements with Kern County and California City have been obtained.
- A consent Agreement with SCE is executed.

The schedule is based on the pipeline contractor using three to five trenching/pipe laying crews simultaneously for most of that work. Contractors awarded the various elements of work on the project will need to have resources available for that effort. Construction schedule coordination and planning will be critical for efficiency and to avoid conflicts. There will be overlap in shared locations and common tie-ins. There may be different contractors for the pipeline, pump stations, and tank construction work since they will likely be bid as separate contracts. The P&P team will recommend that these be bid separately to facilitate construction more quickly.

Factors that could significantly affect timeline

- Permitting and Access
- Terrain and native material
- Weather
- Material availability
- Lead time on electrical and instrumentation
- Timeliness of SCE work
- Work in front of or in proximity of schools during the summer, especially pipe materials

The PDR level construction schedule was determined based on discussions including Designers, Planners, senior Construction Management staff and a Central Valley pipeline and water infrastructure contractor.

10 PRELIMINARY PLANS, LIST OF SPECIFICATIONS, AND ESTIMATE

10.1 PRELIMINARY DESIGN DRAWINGS

See ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS for Preliminary Design Plans.

10.2 PRELIMINARY DESIGN COST OPINION

P&P staff prepared a Class 3 study level Engineer's Opinion of Probable Construction Costs (EOPCC) per the Association for the Advancement of Cost Engineering (AACE), furthering the estimate that was included in the Alignment Study (refer to APPENDIX L – PRELIMINARY OPINION F PROJECT COSTS). Class 3 study level estimates have an expected accuracy range of -10% to -20% on the low range and +10% to +30% on the high range.

The estimate is based on a 24-inch pipeline up to the high point and an 18-inch pipeline downstream of the peak. The pipeline costs were developed based on recent contact with pipe manufacturers for CML&C steel pipe and PVC pipe to obtain unit prices based on the current market. P&P staff met with pipeline installation contractors in the region to discuss expected manpower and equipment needs for a project of this size and to get an understanding of some expected daily production rates of pipe laying under different laying conditions. For this estimate, pipe installation costs were increased in reaches where our geotechnical desktop study determined that rocky conditions are probable. It is assumed in rocky conditions that a portion of the native materials in trench could be processed into suitable material for the pipe trench by screening or rock crushing or a combination of the two. This will be further refined as more geotechnical testing data along the alignment becomes available. For this estimate, P&P has assumed that PVC pipe would be used from the AVEK Turnout to Pump Station No. 1, less the trenchless HDD crossings. This will be further evaluated as the design is finalized and is closer to bid. Depending on the market prices for raw materials at that time, it may be worthwhile to consider CML&C steel pipe as a bid alternative to PVC in these reaches if prices are competitive.

There are three (3) pump stations with 180,000 gallon regulating tanks at two (2) of them, a 242,000-gallon tank at the high point, three (3) pressure reduction stations, one (1) 1,000,000-gallon Terminus Tank, and one (1) in-line generator assumed. Our team also relied on recent bid canvasses with similar work to develop our costs for the pump stations and control buildings, welded steel tank construction, electrical/SCADA systems, and valves/pipe appurtenances. When necessary, we escalated the cost to 2023 dollars using the Engineering News Record (ENR) Construction Cost Index (CCI).

The costs estimated for new power infrastructure to provide power to the pump stations are based on Stantec's recent project experience with SCE to obtain power for other clients from power utility companies in California. It should be noted that there are many variables to obtaining power service for this type of project and these costs may be significantly higher once our team and SCE have conducted their studies.

The mobilization costs, miscellaneous costs, and construction cost contingencies were added to the base construction costs. Mobilization/demobilization costs were assumed to be 5.0% of the construction costs and include insurance and bonding for the contractor. Miscellaneous costs were assumed to be 1.5% of the total construction costs and included SWPPP preparation and

implementation. The contingency included in the current estimate was reduced from 30% down to 20%.

List of Assumption to Develop EOPCC

- On average, a crew can install 300 LF (linear feet) of pipe per day.
- Up to five separate crews of seven are assumed for the pipe reaches.
- The equipment a crew uses is:
    - An air compressor
    - Two excavators
    - Wheel Loader
    - Foreman, Crew, Fuel, Water, and Welder (for CML&C steel) trucks
    - A sheepsfoot roller
    - Screens and shakers to process native materials in rocky conditions.

- A crew is comprised of:
    - Excavator Foreman
    - Excavator, Loader, and Roller operators.
    - A lead Pipe Layer and three Pipe Layers
    - Welder (for CML&C steel)
- Labor rates are based on June 2023 prevailing wage rates.
- There is a 22% labor burden, 10% overhead, 1.5% bond, 1.25% liability, and 5% profit is added to material, crew and equipment costs.
- Cost to install valves is captured in pipe installation cost.
- Precast concrete vault costs are from Jensen Precast.
- Valve costs are from Cla-Val, Southwest Valve, and recent projects.
- Pump station costs are provided by Stantec and pump station site work cost are from P&P.
- Items for the AVEK Turnout include an installation percentage.
- With the exception of HDD trenchless crossing, PVC pipe will be used along the pipeline reaches until the first pump station.
- All costs are present value.

10.3 PRELIMINARY OUTLINE OF SPECIFICATIONS

The contract specifications will be in CSI-format and will consist of IWVGA Division 0 front-end documents. Special Provisions, Division 1, and Technical Specification will be prepared with the assumption that the project is built under one contract. See APPENDIX M – PRELIMINARY LIST OF SPECIFICATIONS for the Preliminary List of Specifications.

11 BIBLIOGRAPHY/REFERENCES

To be added in final draft.

APPENDICES

APPENDIX A - ALIGNMENT STUDY

APPENDIX B - PRELIMINARY SYSTEM HYDRAULICS AND TRANSIENT ANALYSIS TECHNICAL MEMO

APPENDIX C - PIPE OPTIMIZATION AND REFINEMENT TECHNICAL MEMO

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TECHNICAL MEMORANDUM

To:	Jeff Helsley, Carol Thomas-Keefer Indian Wells Valley Groundwater Authority
From:	Jeff Eklund and Mike Day
Subject:	IWVGA Imported Pipeline Optimization Memo
Date:	July 14, 2023

INTRODUCTION

This technical memorandum summarizes the analysis and recommendations for **Task 28T2- Pipe Optimizations and Refinement Technical Memorandum**. This Task includes recommendations on final pipe size and material based on an economic analysis of the proposed facilities and assumed operations. The recommended pipe size represents an optimized size that considers both capital and long-term power costs.

Based on the results of the analysis, it has been determined that the 24-inch nominal maximum size pipeline is economically superior to a 20-inch nominal maximum size pipeline. For both options there are stretches of pipe smaller than the maximum. Polyvinyl Chloride (PVC) is the recommended material where it can withstand the expected maximum pressure. Cement Mortar Lined and Coated (CML&C) welded steel pipe is the recommended material where the expected maximum pressure exceeds what PVC is capable of withstanding.

WATER DEMAND AND SUPPLY

The water demands for the Indian Wells Valley Groundwater Authority (IWVGA) were estimated in the *Imported Water Pipeline Alignment Study Task 2—Water Demands Memorandum* dated November 18, 2022. These water demand projections are based on assumptions listed in the memorandum, and the actual ramp-up in demands may deviate from the projections over time. The memorandum summarized the expected ramp-up in demands and these are duplicated in **Table 1**. Deliveries are assumed to be made ten months out of the year to allow two months for maintenance activities or if water is unavailable; the average flowrate over this ten-month period is provided in cubic feet per second (cfs).

Table 1: IWVGA Projected Demands

Year	Imported Water Demand (AFY)	10-month Avg. Flowrate (cfs)
2035	4,258	7.2
2050	5,190	8.7
2070	6,431	10.8

It is important to note that the desired water supply to meet these demands is dependent on a number of factors including the uncertainty of procuring water rights, variability of potential deliveries, ability of Antelope Valley-East Kern Water Agency (AVEK) to deliver the quantity and consistency of water, water quality considerations, and other factors. Because of these factors, the economic analysis prepared for this memorandum has multiple assumptions

regarding projected water deliveries, and these assumptions will need to be modified and updated as additional information or determinations are obtained.

PROJECT ALTERNATIVES

Based on the projected water demands, our team identified two pipeline size alternatives that would be hydraulically feasible to deliver the projected water volumes for the study period (2030 to 2070). A *Pipeline Hydraulic and Transient Analysis Technical Memorandum* (see Attachment A) has been prepared with the purpose of analyzing and summarizing the hydraulics of the proposed imported water conveyance facilities.

The first pipeline size alternative consists of a 24-inch diameter pipeline that proceeds from a new California City Feeder turnout and is routed up the El Paso Mountain range (39.8 miles) to a peak near Highway 395 and the Searles Station Cut-off (refer to Attachment A, Figure 2). The flow must be boosted in series by three separate pump stations to convey the water to a 225,000-gallon regulating reservoir at the high point (this tank would be included in both alternatives). Downstream of this tank, the water will flow by gravity through an 18-inch diameter pipeline to the Ridgecrest Heights Tank Facility (10.8 miles) where a new water storage tank would be added (assumed to be one million gallons for both alternatives). This alternative would have a potential conveyance capacity of up to 14.3 cfs with capacity dependent upon the design of the pump stations.

The second alternative consists of a 20-inch diameter pipeline from the turnout to the high point. With the lower capacity pipeline, the hydraulics of the system require four separate pump stations. This alternative would also utilize the 18-inch diameter pipeline downstream of the reservoir at the high point. This alternative would have the potential to convey up to 10.8 cfs (less than the 24" alternative).

Note that pipeline sizes greater than 24-inch diameter were determined to be economically infeasible. The Alignment Study detailed the constraints of the AVEK water delivery system including its treatment capacity and conveyance capacity through the multiple feeder pipelines. In order to convey greater flows in a larger IWVGA pipeline system, substantial upgrades would be required to multiple facilities in AVEK's system and would be excessively expensive.

The following sections describe these two alternatives in greater detail.

ALTERNATIVE 1 – 24-INCH PIPELINE

Alternative 1 models the system with a 24-inch diameter pipeline from the proposed California City Feeder turnout (Station 0+00) up to a point just past the peak of the profile (approximately Station 2134+24) and an 18-inch diameter pipeline downstream of that segment.

To meet the projected demands, the pipeline has been hydraulically modeled for three different flow conditions that encompass the range of flows planned for the system. In a given year, the actual flow rate will be based on the availability of water supplies and the capacity of AVEK to provide said water. The following flow conditions were modeled:

- 6.5 cfs – This flowrate is the capacity for the existing California City Feeder. Note that this flowrate is less than the 2035 projected demand and that flows greater than 6.5 cfs will likely require improvements to the California City Feeder.
- 10.8 cfs – This flowrate matches the 2070 10-month average demand described previously.
- 14.3 cfs – This flow rate is assumed to be the maximum flow rate based on the potential conveyance capacity of the proposed 24-inch upstream pipeline. The net additional flow of 3.5 cfs will provide some supplemental capacity to allow for operational changes or to take advantage of additional water deliveries.

Attachment A, Figure 2 shows the hydraulic grade line (HGL) profile for Alternative 1 for the three different flow conditions. Pressure Reducer Valve (PRV) and Pump Stations (PS) are shown in the figure.

The following provides a short narrative of each of the modeled flowrate scenarios:

- 6.5 cfs (blue HGL line)
    - Our understanding is that the existing 18-inch California City Feeder can provide a flowrate of 6.5 cfs to the new conveyance system at existing system pressure (52 psi). The 52-psi pressure at the new turnout was determined by a basic hydraulic analysis from AVEK's Mojave Tank Farm (Static Elevation of 2,700 feet) to new turnout (Station 0+00) via the North Feeder and the California City Feeder. Should California City also take concurrent deliveries that increase the Feeder flows above 6.5 cfs, improvements to the Feeder would be necessary. Improvements for either alternative and could include adding an AVEK Pump Station at beginning of Feeder or installing a parallel pipeline. An additional surge analysis will be required if a pump station is added to ensure the design pressure of the existing California City Feeder is not exceeded and adequate surge protection is provided.
    - With a 24-inch diameter pipe, one PRV is needed near Station 500+90 to ensure that the pressure in the pipeline stays below 200 psi (especially at flows less than 6.5 cfs).
    - The water is lifted at PS-1, PS-2, and PS-3. Discharge pressures are between 220 and 250 psi.
    - Downstream of the peak the pipe size changes to 18-inch to "burn head". This also reduces total pipe costs substantially. Two PRVs are modeled for needed pressure reduction. Provost and Pritchard will be discussing the feasibility of in-line generators in the forthcoming preliminary design report.
- 10.8 cfs (green HGL line)
    - The California City Feeder is modeled with 80 psi pressure. To meet this flow rate and pressure, the capacity of the Feeder for both alternatives could be increased either by the addition of a pump station at the beginning of or upstream of the Feeder or through a parallel pipeline. However, it is likely that a new pipeline would be required due to its age and limited flow capacity.
    - The upstream PRV will be mostly open at this flow rate.
    - The water is lifted at PS-1, PS-2, and PS-3. The discharge pressures are slightly higher than the 6.5 cfs scenario.
    - Two PRVs and a flow control valve with pressure reducing capability (FCV-1 at the Ridgecrest Heights Tank) are modeled for both alternatives downstream of the pump stations for the needed pressure reduction.
- 14.3 cfs (yellow HGL line)
    - To achieve this flow rate, improvements to the AVEK system are needed to sufficiently convey the water to the IWVGA pipeline system. A standpipe in California City has been assumed for this scenario as discussed in Attachment A.
    - The upstream PRV will be fully open at this flow rate.
    - The water is lifted over the El Paso Mountains at PS-1, PS-2, and PS-3. The discharge pressures will be slightly higher than the 10.8 cfs scenario, going slightly above 260 psi.
    - Two downstream PRVs and FCV-1 are modeled for needed pressure reduction.

For Alternative 1, the following pipeline materials are recommended based on the hydraulics of the system and the preliminary design parameters:

- Station 0+00 (California City Feeder connection) to Station 1459+63 (PS-1) – This segment has been designed to allow for 24-inch C900 DR18 PVC Pipe. Additionally, there are short segments of 24-inch DR13.5 HDPE Pipe that are used at trenchless installation locations.

- Station 1459+63 (PS-1) to Station 2134+24 (Tank at high point) – The pipelines downstream of the pump stations will be 24-inch CML&C Steel Pipe. The pressure class of the pipe will be further analyzed during preliminary design.
- Station 2134+24 (Tank at high point) to Station 2672+31 (Ridgecrest Heights Terminus Tank) – This pipeline segment will be 18-inch CML&C Steel Pipe. The pressure class of the pipe will be further analyzed during preliminary design.

ALTERNATIVE 2 – 20-INCH PIPELINE

Alternative 2 models the system with a 20-inch diameter pipeline from the proposed California City Feeder turnout (Station 0+00) up to the crest of the pipeline route (Station 2134+24) and an 18-inch diameter pipeline downstream of that segment. The same flowrate scenarios have been hydraulicly modeled for this alternative.

Attachment B shows the HGL for each of these flow rates for Alternative 2 (Alternative 1 HGLs are also shown for reference). Note that for expediency the figures for Alternative 2 HGL do not include callouts at key stations nor cover the full length to the Ridgecrest Heights Tank.

The following provides a narrative of each of the modeled flowrate scenarios:

- 6.5 cfs (green HGL line) - See Attachment B, Figure 1
    - The California City Feeder is understood to have the capability of providing this flowrate to the conveyance system at existing system pressure (52 psi) per previous discussion in Alternative 1.
    - A PRV will be necessary upstream of the pump stations along Redrock Randsburg Road and Garlock Road to ensure that the pressure in the pipeline stays within the allowable pressure class of the pipe material (especially at flows less than 6.5 cfs).
    - The water is lifted at PS-1, PS-2, PS-3, and PS-4.
    - Downstream of PS-4 the pipe size changes to 18-inch to “burn head”.
    - Downstream of the peak 18” pipe size is used to burn head and two PRVs and FCV-1 are modeled downstream of PS-4 for needed pressure reduction.

- 10.8 cfs (blue HGL line) - See Attachment B, Figure 2
    - The California City Feeder pressure must be increased under this scenario. This likely requires both a pump station and a new parallel pipeline. The pressure at the connection point would be approximately 250 psi (Station 0+00).
    - Upstream PRV will be fully open at this flow rate.
    - The water is lifted at PS-1, PS-2, PS-3, and PS-4. The discharge pressures will be higher than the 6.5 cfs scenario.
    - Downstream of the peak 18” pipeline is used to burn head and two PRVs are modeled downstream of PS-4 for needed pressure reduction.
- 14.3 cfs (red HGL line) - See Attachment B, Figure 3
    - The pressure at the California City Feeder connection would be approximately 350 psi (Station 0+00).
    - Upstream PRV will be fully open at this flow rate.
    - Downstream of the peak 18” pipeline is used to burn head and two downstream PRVs plus FCV-1 are modeled for needed pressure reduction.

For Alternative 2, the following pipeline materials are recommended based on the hydraulics of the system and the preliminary design parameters:

- Station 0+00 (California City Feeder connection) to Station 900+00 (PRV-1) – Under the higher flow scenarios, this segment would require 20-inch CML&C Steel Pipe.
- Station 900+00 (PRV-1) to Station 1459+63 (PS-1) – This segment has been designed to allow for 20-inch C900 DR18 PVC Pipe.

- Station 1459+63 (PS-1) to Station 2134+24 (Tank at high point) – The pipelines downstream of the pump stations will be 20-inch CML&C Steel Pipe. The pressure class of the pipe will be further analyzed during preliminary design.
- Station 2134+24 (Tank at high point) to Station 2672+31 (Ridgecrest Heights Terminus Tank) – This pipeline segment will be 18-inch CML&C Steel Pipe. The pressure class of the pipe will be further analyzed during preliminary design.

A summary of pipe and pump station quantities is provided in **Table 2.**

Table 2: Pipe and Pump Station Quantities

Item	Option 1 - 24" Pipeline Quantity	Option 2 - 20" Pipeline Quantity
C900 DR18 PVC	142,332	51,554
CML&C Steel (250 psi)	67,022	157,800
18" CML&C Steel (250 psi)	53,658	53,658
Pump Station	3	4

ANALYSIS

Based on the modeled results of Alternative 1 and Alternative 2, there are notable benefits of the 24-inch pipeline that should be considered in selecting the final pipeline size. Alternative 1 requires one less pump station to lift the water over the El Paso Mountains. Additionally, the pressure requirement at the connection point holds steady at 52 psi, which also eliminates the pump station that is needed to boost pressures sufficient for water to reach the first pump station at the base of the El Paso Mountains for higher flows in Alternative 2. The elimination of one pump station reduces capital, operating, and energy costs for the system. The 24-inch pipeline does have an added capital cost for the procurement and installation of larger pipe when compared to the 20-inch pipe in Alternative 2, however, the 20-inch option required more CMLC steel pipe. The capital cost and operating cost tradeoffs between these two options are reviewed in the following sections. For purposes of developing the EOPCC, costs for Alternatives 1 and 2 were reviewed for the new IWVGA imported water pipeline.

Note that during the preliminary design phase the model assumptions and results may change; examples include: maximum flow rates, pump station locations, suction and discharge pressures, PRV/Hydropower sites and setpoints, and other factors. Additionally, further coordination will be required with AVEK to review operational scenarios for the California City Feeder and upstream facilities. In particular, alternatives should be further developed together with AVEK to increase the capacity of these facilities. A long-term master plan for this portion of AVEK's service area and distribution system is recommended in order to more clearly define the hydraulic parameters of the proposed IWVGA imported water pipeline."

CAPITAL COSTS

A Class 4, study level Engineer's Opinion of Probable Construction Cost (EOPCC) per the Association for the Advancement of Cost Engineering (AACE) is currently being refined for the preferred alternative for the forthcoming Preliminary Design Report. Class 4 study level estimates have an expected accuracy range of -15% to -30% on the low range and +20% to +50% on the high range. The EOPCC was developed for the purpose of comparing cost differences between alternatives and does not include all project costs. The pipeline costs are based on recent contact with pipe manufacturers for CML&C steel pipe and PVC pipe to obtain unit prices based on the current market. Pipe installation costs were increased in reaches where our geotechnical desktop study determined rocky conditions are probable. Alternative 2 has four (4) pump stations and three (3) pressure reduction stations

assumed. Recent bid canvasses with similar work for the pump stations and control buildings, welded steel tank construction, electrical/SCADA systems, and valves/pipe appurtenances were also relied upon to develop costs. When necessary, costs were escalated to 2023 dollars using the Engineering News Record (ENR) Construction Cost Index (CCI).

The cost estimated for new power infrastructure to provide power to the pump stations is based on our team's recent project experience with obtaining power for clients from power utility companies in California. It should be noted that there are many variables to obtaining power service for this type of project and these costs may be higher once the final design is completed and SCE have conducted their studies.

The mobilization costs, miscellaneous costs, and construction cost contingencies were added to the base construction costs. Mobilization/demobilization costs were assumed to be 7.5% of the construction costs and include insurance and bonding for the contractor. Miscellaneous costs were assumed to be 1% of the total construction costs and included the environmental mitigation and storm discharge runoff mitigation required. At the level of effort for this Pipe Optimization, a 25% contingency over the base construction cost is appropriate. We estimate that total construction costs for Alternative 1 will be $218M and $224M for Alternative 2 (in 2023 dollars), not including costs for land acquisition and permanent and temporary construction easements, costs for construction administration, and various environmental and construction permitting fees that will be required and significant but similar for both alternatives. Note that costs associated with upstream AVEK facility improvements are not included in this project construction cost. Those are also significant but expected to be similar for both alternatives. Costs for these various significant items are being estimated but numbers are not yet complete. They are omitted in this analysis because they are not yet complete and do not affect the comparison between alternatives.

OPERATIONAL COSTS

OPERATIONS, MAINTENANCE, AND REPLACEMENT

The operations, maintenance, and replacement (OM&R) costs are a substantial component to the economic analysis.

The operation of the Imported Water Pipeline System would mostly be done by a SCADA system, but water system operators would be required to monitor the system, investigate alarms, trouble-shoot problems, maintain data, and periodically patrol the length of the pipeline. The operators could split their duties with operations of other systems and maintenance activities.

General maintenance of pump stations would likely be performed by operations staff, while significant repairs and replacement work would be contracted out to a pump service company. A schedule for routine maintenance should be developed based on pump, motor, controls, and other electrical equipment manufacturer's recommendations. Replacement of malfunctioning equipment would be done as needed. At a preliminary feasibility level, the suggested budget for OM&R, based on input from Stantec, is 2.5% of the capital cost of pumping equipment for annual maintenance and replacement of failing parts. It is anticipated that this budget would not be utilized as much in early years and would therefore build a reserve fund for future repairs and replacement as components age.

OM&R for the pipelines and appurtenances would include inspection, routine maintenance and exercising of various valves plus repairs/replacement of failed pipe, fittings, and valves. At a preliminary feasibility level, the recommended budget for OM&R of the pipeline facilities is 1% of the construction cost. This amount has been assumed for annual pipeline O&M and building a reserve fund for repairs/replacement.

For comparative analysis between Alternative 1 and Alternative 2 OM&R costs are expressed as percentages of initial costs of pump stations and pipelines excluding energy costs (which are estimated separately as described in the following subsection).

ENERGY

For comparison of Alternatives 1 and 2, pump stations are assumed to be powered by electricity provided by Southern California Edison (SCE). Energy costs were calculated by estimating pump station input power requirements in kilowatts (kW) at various flow rates and estimating SCE charges under Rate Schedule TOU-8, Option D Service Metered and Delivered at Voltages Below 2 KV with Critical Peak Pricing (CPP), assuming the pump stations would not run during CPP Events. CPP Events are 5-hour long service interruptions from 4 to 9 pm that SCE calls 12 to 15 times per year for power grid management.

Charges associated with TOU-8 Option D Delivered at Voltages Below 2 kV and Time of Use Periods are shown in Table 3.

Alternatives to Option D are available under Schedule TOU-8. Option E was ruled out as more expensive. The Real Time Pricing (RTP) alternative, where kilowatt-hour (kWh) charges vary hourly depending upon the temperature in downtown Los Angeles, is something to consider for the project. A very complex rate analysis would be necessary to review it. Such an effort was not deemed necessary for comparing Alternative 1 versus Alternative 2.

Table 3: SCE Energy Rate Schedule

TOU - 8, OPTION D SERVICE METERED AND DELIVERED AT VOLTAGES BELOW 2 KV

Energy Charge Option D-CPP - $/kWh

	12am-8am	8am-4pm	4pm-9pm	9pm-12am
Summer Weekdays	0.11696	0.03556	0.16862	0.11696
Summer Weekend/Holiday	0.11696	0.11696	0.15591	0.11696
Winter Weekday	0.1303	0.08476	0.13082	0.1303
Winter Weekend/Holiday	0.03578	0.08476	0.03688	0.1303

Fixed Recovery Charge	0.00047	$/kWh	
Customer Charge	345.98	$/Meter/Month	
Demand Charge	21.05	$/kW of Billing Demand/Meter/Month	
TIME RELATED			
Summer Season On-Peak	39.62	$/kW/month during On & Mid-peak	
Winter - Mid Peak	10.02	$/kW during On & mid-peak	
Power Factor Adjustment	0.52	$/kVAR	0.90 / 0.451027 / 0.4843221
CPP Event Energy Charge	0.8000	$/kWh	
On Peak Demand Credit	-8.22	$/kW/month	

Assumed PF (Power Factor)	Power Angle (Radians)	KVAR Multiplier Tan Power Angle
0.90	0.451027	0.4843221

SUMMER SEASON IS JUNE 1 TO OCTOBER 1, WINTER IS ALL OTHER MONTHS

Hours Pumped by TOU	8	8	5	3
Time of Use	**12am-8am**	**8am-4pm**	**4pm-9pm**	**9pm-12am**
Summer Weekdays	1	1	3	1
Summer Weekend/Holiday	1	1	2	1
Winter Weekday	1	0	2	1
Winter Weekend/Holiday	1	0	2	1

Super Off-Peak	0
Off-Peak	1
Mid-Peak	2
On-Peak	3

Avoiding pumping during Mid Peak and On Peak hours will be important as savings on SCE bills from doing so are estimated to be as shown in **Table 4** (includes assumption of 3% inflation in rates).

Table 4: Approximate Annual Savings

Year	Approximate Annual Savings
2030	$655,000
2035	$775,000
2050	$1,191,000
2070	$2,158,000

To accomplish this, it will be necessary to have additional water storage tanks to facilitate avoidance of pumping during Mid Peak and On Peak hours. The Ridgecrest Heights Terminus Tank at the end of the IWVGA pipeline system would have the storage available to accomplish the load shifting. However, the IWVWD may want the system to continuously pump to simplify operations.

Service voltage is another matter to be considered during project design. Options for service at voltages higher than 2 kV are available that require IWVGA to own transformers and more sophisticated and expensive electric metering equipment. The tradeoff to be considered for service at higher voltages is lower rates.

ECONOMIC ANALYSIS

Capital and O&M cost estimates and assumptions are summarized in **Table 5**.

The project is assumed to be constructed in 5 years (2028) with a goal of beginning operations in 2030. Therefore, the capital cost has been adjusted from 2023 dollars to 2028 dollars by an inflation factor of 3.4%. This inflation factor is derived from the 10-year average annual increase of the ENR CCI Index.

The amount of grant funding secured by IWVGA for the project is unknown at this time. For this analysis an assumption was made that grant funding would be limited to $150 million and the remainder would be financed by IWVGA.

Regarding financing, it was assumed IWVGA would be eligible for an Infrastructure Loan from California's Infrastructure and Economic Development Bank (California IBank, https://ibank.ca.gov/#) for capital costs that are not grant funded. Maximum loan terms are 30 years. Interest rates are substantially lower than municipal bonds or commercial bank loans. IBank sets the interest rate by a complex formula that depends on current municipal bond rates, median income and unemployment rate of the population served, and the applicant's creditworthiness. Recent loans have had an interest rate of just over 4%; for this analysis an interest rate of 4% for thirty years was assumed.

Table 5: Project Capital and O&M Costs

Capital Cost:

Item	Option 1 - 24" Pipeline Quantity	Option 1 - 24" Pipeline Cost	Option 2 - 20" Pipeline Quantity	Option 2 - 20" Pipeline Cost
Mob/Demob/Misc.	1	$ 8,871,000	1	$ 9,088,000
AVEK Turnout	1	$ 185,000	1	$ 158,000
C900 DR18 PVC Pipe	142,332	$ 49,125,000	51,554	$ 11,626,000
CML&C Steel Pipe (250 psi)	67,022	$ 47,536,000	157,800	$ 84,225,000
18" CML&C Steel Pipe (250 psi)	53,658	$ 34,300,000	53,658	$ 34,300,000
24" HDPE - Horiz. Directonal Drill	3,700	$ 5,106,000	3,700	$ 5,106,000
PRV Station	3	$ 746,000	3	$ 728,000
Flow Control Station	1	$ 170,000	1	$ 165,000
Inline Generator	1	$ 500,000	1	$ 500,000
Chlorination Stations	1	$ 100,000	1	$ 100,000
Terminus Tank	1	$ 1,500,000	1	$ 1,500,000
Pump Station	3	$ 16,843,000	4	$ 22,108,000
Distribution Powerline	1	$ 10,000,000	1	$ 10,000,000
Subtotal		$ 174,982,000		$ 179,604,000
Contingency	25%	$ 43,745,500	25%	$ 44,901,000
Total Construction Cost (2023 Dollars)		**$ 218,728,000**		**$ 224,505,000**
Engineering		*grant funded*		*grant funded*
Environmental		*grant funded*		*grant funded*
ROW Acquisition		Not Available		Not Available
Construction Mgmt	5.0%	$ 10,937,000	5.0%	$ 11,226,000
Total Capital Cost (2023 Dollars)		**$ 229,665,000**		**$ 235,731,000**
Inflation (5 yr adjustment)*	3.4%	$ 41,790,000	3.4%	$ 42,894,000
Total Capital Cost (2028 Dollars)		**$ 271,455,000**		**$ 278,625,000**
Grant Funded Portion		$ 150,000,000		$ 150,000,000
Funded by IWVGA		$ 121,455,000		$ 128,625,000
Financing:				
Interest Rate	4.0%		4.0%	
Period (years)	30		30	
Annualized Cost		$ 7,020,000		$ 7,440,000

* Assumed Construction occurs starting in 2028 and operational by 2030. Annual Inflation Factor of 3.4% is based on the 10-year average annual increase in the ENR Construction Cost Index (CCI) from 2012 to 2022.

****Costs for upgrading the California City Feeder Pipeline to provide more than 6.5 cfs capacity are not included in this comparison and are assumed to be similar for both 20" and 24" options.**

*****Engineering, environmental, permitting costs are not included in this comparison and are assumed to be similar for both 20" and 24" options.**

OM&R Cost:

(2023 dollars)

	Option 2 - 24" Pipeline		Option 1 - 20" Pipeline	
Pump Station OM&R	2.5%	of Capital Cost	2.5%	of Capital Cost
Pump Station OM&R Cost		$ 421,075		$ 552,700
Pipeline OM&R	1.0%	of Capital Cost	1.0%	of Capital Cost
Pipeline OM&R Cost		$ 366,000		$ 366,000

A summary of economic analysis spreadsheets is included in **Attachment C** that calculate annual and present worth costs of Alternative 1 and 2.

Each alternative reviewed, the economic analysis assumes initial use beginning in 2030 with delivery of 3,614 AFY and 10-month average flows of 6 cfs (within the 6.5 cfs capacity of the California City Feeder Pipeline), increasing linearly each year to match the ramp up in demands in **Table 1**. The pumping flow rate assumes that load shifting occurs to minimize the hours of pump station operation to 19 hours (if allowed by the IWVWD). For each year the power demand and energy use are accumulated for the pump stations operating. As the preliminary design proceeds, the energy projections can be revised as the pump station equipment is finalized.

Calculations of life-cycle costs for each alternative employ a discount rate (to reflect the time value of money to IWVGA), to convert cash flows that occur in future years to "Present Value" numbers that are then summed over the 40 year (2030 to 2070) assumed project life to arrive at comparable Present Values of all costs for each Alternative. Based on standard engineering economic analysis textbook guidance a 4% discount rate was selected using current interest rates for an alternative long-term investment (30-year U.S. Savings Bonds, currently 3.96%). Some federal guidance materials regarding selection of discount rates for life cycle cost analysis on federal public works projects use the same criteria but reduce the discount rate by the expected inflation rate on construction items. That was not done in this case as it over-complicates the analysis and was found to not affect the analysis results.

Note that the SCE energy costs and the OM&R costs have been adjusted to 2030 dollars. Energy costs include a differential rate that is 1% higher inflation versus other costs that use 2%. This reflects trends seen in recent years and California Public Utilities Commission projections of 3 to 3.5% annual increases in SCE rates until 2030 and higher rates after that).

The present value for the two alternatives is summarized in **Table 6**.

Table 6: Present Value Summary for the Alternatives

Present Value Items	Alternative 1 24-inch Pipeline	Alternative 2 20-inch Pipeline
IWVGA Capital Cost Share	$121,455,000	$128,625,000
Power Cost	$56,531,000	$73,125,000
OM&R Cost	$21,042,000	$24,556,000
Total Present Value	**$199,028,000**	**$226,306,000**

RECOMMENDATIONS

The initial capital costs are lower for Alternative 1 (24" maximum size pipeline) versus Alternative 2 (20" maximum size pipeline) and there are significant savings in energy and other operations and maintenance costs over the project life cycle for Alternative 1 as well. Therefore, Alternative 1 is recommended for the proposed project.

Further refinements to the operations plan and economic analysis are recommended. The following considerations may require additional analysis:

1. Water Supply – As mentioned before the water supply and deliveries in this economic analysis are based on the assumptions discussed in prior technical memorandums.
2. Pumping Operations – Additional coordination with the IWVWD will occur during preliminary design to determine the desired operation of the pump stations and the potential for load shifting.
3. AVEK Facility Improvements – Improvements to upstream AVEK facilities (parallel feeder, additional pump station) will be required for this project to meet the projected demands.
4. Grant Funding and Financing – As discussed, we have assumed $150M in grant funding will be obtained for this project. Additionally, we have made assumptions regarding potential loan terms. We request that IWVGA and its consultants provide input on potential grant funding and loan terms for the next draft of this document.

ATTACHMENT A

To:	Project File	From:	Fletcher McKenzie, PE
	Recipient's Office		Sacramento, CA Office
File:	Job No. 184032267– 2.2.1-28T1	Date:	June 28, 2023

Reference: Indian Wells Valley Groundwater Authority Imported Water Pipeline Hydraulic and Transient Analysis – Technical Memorandum

1.0 INTRODUCTION

This Technical Memorandum is for the Preliminary Hydraulics Analysis for the Indian Wells Valley Groundwater Authority (IWVGA) Imported Water Pipeline project. The purpose of the Imported Water Pipeline Project is to bring in an imported water supply to help meet the demands of their largest customer, which is Indian Wells Valley Water District (IWVWD). The pipeline is proposed to connect to the terminus of the existing Antelope Valley East Kern Water Agency, California City Feeder in California City near the intersection of Redwood Boulevard and California City Boulevard. and constructing approximately 50 miles of pipeline to a new blending tank reservoir near the existing Ridgecrest Heights Tank Facility in the to the City of Ridgecrest

The purpose of these hydraulic analyses is to provide input regarding pump station locations for the Imported Water Pipeline project, as well as evaluate both steady state and transient conditions. The steady state modeling was done to verify pipe sizes, operating pressures, and estimated pump station head requirements at different system design flow rates. The hydraulic transient analysis (HTA) was prepared to estimate transient pressures within the system due to a power failure at the pump stations and preliminarily size and locate surge mitigation equipment as needed.

The project will be phased with the anticipated flow capacities shown in **Table 1**.

Table 1: Flow Projections based on Project Phases

Project Phase	Capacity	Anticipated Period of Operations
Scenario 1: Initial Project Demand	0 to 6.5 cfs (2,917.2 gpm)	10 months of the year
Scenario 2: Ultimate Project Demand	10.8 cfs (4,847.0 gpm)	10 months of the year
Scenario 3: Maximum Pipeline Capacity	14.3 cfs (6,417.8 gpm)	10 months of the year

The water supply for the proposed project will be conveyed from the Antelope Valley-East Kern (AVEK) Rosamond Water Treatment Plant treated water supply and conveyed to the AVEK Mojave Tank Farm which then flows by gravity along the North Feeder to the California City Feeder. The Imported Water pipeline would start at the proposed California City Turnout (near Redwood Boulevard and California City Boulevard) and

traverse approximately 50.6 miles total, utilizing three (3) pump stations and a regulating tank at the high point near Highway 395 and the Searles Station Cut-off (Station 2134+24), where it will transition to gravity flow down to the Ridgecrest Heights Tank Facility. The servicing strategy is to utilize the first pump station (PS-1) as a true booster station to take advantage of the available suction head under lower flow scenarios and pumping up to pump station 2 (PS-2) and pump station 3 (PS-3), which will be hydraulically disconnected via forebays. PS-3 pumps to a regulating tank at the high point of the pipeline, and transitions to gravity flow down to the Ridgecrest Heights Tank Facility, with two PRV / Hydro turbine stations (PRV-2 and PRV-3) to control pressure. The model layout of the IWVGA Imported Water Pipeline, along with the existing AVEK North Feeder and California City Feeder pipelines is shown in **Figure 1**.

2.0 DATA COLLECTION

The following data, reports, and communications were used to assist in completing the steady state hydraulic and transient analyses, with key findings listed below each source:

- Imported Pipeline Alignment Study Tasks 1 through 3, Technical Memorandums dated November 2022, by Provost and Pritchard.
    - Mojave Tank Farm has low water level of 2,708 feet and high water level of 2,729 (normally fluctuates between 2,713-2,723 ft)
    - California City Feeder tie-in location
    - California City Feeder is 18-inch cement mortar lined (CML) steel
    - California City projected demands on California City Feeder are 2.5 cfs for 2030, 3.1 cfs for 2050, and ultimate demand is 3.7 cfs in 2070
    - Recommend not to exceed 6.5 cfs in California City Feeder with existing 18-inch pipeline
    - Indian Wells Valley Water District (IWVWD) tie-in location at Ridgecrest Tank Facility
- AVEK Record Drawings Hydraulic Grade Line of California City Feeder dated October 1980 by Boyle Engineering Corporation.
    - HGL at California City Feeder connection of 2610 ft
    - Approximate HGL at California City turnout of 2470 ft with 6.5 cfs flowing through the California Feeder
- AutoCAD file titled “Alignment_3dPoly.dwg” provided by Provost and Pritchard dated 05/15/2023
    - Imported Water Proposed Pipeline 3D Alignment
- Preliminary hydraulic grade line profile and pressure profile for Imported Water Pipeline at 6.5 cfs, 10.8 cfs, and 15 cfs titled “2023-0421 Central Mix 5-3 V3.pdf” by Provost and Pritchard, received 05/09/2023
    - For flow rates above 6.5 cfs, an appropriately sized pipeline from AVEK’s North feeder parallel to the California City Feeder would be needed.
- AVEK Turnout CAD drawing by Provost & Pritchard, titled “D11 AVEK TURNOUT.pdf”
    - Size, layout, and model of check valve (18-inch parallel Cla-Val model 81-02 check valves)
- Bentley WaterCAD model of preliminary hydraulics titled “2023-0417 IWVGA Pipeline Alternatives - Transmit.wtg”
    - Piping materials and diameters
    - PRV settings of downstream HGL of 2375 ft at PRV1, and 100 psig downstream pressure for both PRV2 and PRV3.

3.0 SERVICING STRATEGY

Pump Station 1 (PS-1) was located as far down the alignment as possible to take advantage of the gravity head from the Mojave Tank Farm, such that the maximum design flow of 14.3 cfs could be conveyed with positive suction head at the pump station. PS-1 was envisioned as a booster pump station so that during periods of low flow, the available suction head could be used to decrease the pumping head required compared to a pump station with a forebay.

Pump station 2 and 3 were located with the goal of having the same pumps at each facility by evenly splitting up the total dynamic head required between the two stations, as well as maintaining a normal operating pressure below 275 psig, which was set by the design team to be able to use pressure class 300 pipe with a safety margin of 25 psi. It is envisioned that PS-2 and PS-3 will have hydraulic breaks to avoid complications associated with multiple booster pumping stations in series, and therefore these pump stations were assumed to have forebays (ground storage tanks).

The potential future flow of 14.3 cfs will likely require additional improvements upstream of the Imported Water Pipeline project, which may include a pump station. However, evaluating improvements to AVEK's system is beyond the scope of this preliminary analysis, and therefore an approximate 100-ft tall standpipe was assumed for Scenario 3 (14.3 cfs) to hydraulically disconnect AVEK's supply system from the proposed Pump Station 1. Supply for Scenario 3 will require further coordination with AVEK and California City. For this analysis, the standpipe was located at the high point in the proposed pipeline (see **Figure 1**) to hydraulically disconnect the system from upstream conditions in case a future pump station is added to the upstream supply pipeline infrastructure. Alternatively, if a standpipe is undesirable/unfeasible due to the location (within 5 miles of the California City Municipal Airport and therefore may not meet maximum height limitations imposed by the Federal Aviation Administration [FAA]), Pump Station 1 could be converted from a booster station to a pump station with a forebay in the future to achieve a hydraulic disconnection.

The high point at station 2134+24 will have a regulating reservoir to serve as a hydraulic break, transitioning from 24-inch to 18-inch pipeline that will flow by gravity down the hill towards Ridgecrest Heights, and will be controlled either by pressure reducing valves / hydro turbine stations as well as a flow control valve at the proposed blending tank at Ridgecrest Heights Tank Facility. Two options were initially considered for the gravity portion of the pipeline, outlined below:

- Option 1 for the gravity line would be to install pressure reducing valve (PRV) and/or hydroelectric turbine stations at selected locations to limit the maximum pipeline pressure under low flow conditions.

- Option 2 would be to design the gravity pipeline for higher pressure and potentially have a single PRV or hydro turbine configuration at the Ridgecrest Heights Tank facility to avoid additional PRV stations. This hydro turbine could be used to offset the power cost to operate IWVWD's Ridgecrest Heights Booster Station and potentially other nearby IWVWD wells.

4.0 MODEL DEVELOPMENT

An initial model was developed based on a preliminary alignment from the design team for initially locating the pump stations, as described above. The IWVWD Imported Water pipeline alignment was refined and therefore the preliminary model was updated based on a 3d polyline alignment CAD drawing, which was provided by the design team. Additionally, the turnout check valves, pumps stations, tanks/forebays, and pressure regulating valves were added to the model. The model was constructed in Bentley HAMMER Connect Edition, Update 3. Transient inputs were then entered into the model such as pump and motor inertia, pipeline wave speeds, vapor pressure, etc. Pipeline materials were selected to allow for flexibility in procurement and will be updated as the design progresses. Initially, PVC was considered for the suction pipeline to PS-1, with creek crossings using HDPE for horizontal directional drilling. The hydraulic model layout of the IWVGA Import Pipeline system is shown in **Figure 1**.

5.0 HYDRAULIC ANALYSIS

The hydraulic analysis evaluated three different flow scenarios through the IWVGA Imported Water Pipeline with and without California City demands: 6.5 cfs, 10.8 cfs, and the maximum capacity of 14.3 cfs. The initial flow phase of 6.5 cfs is based on the assumed capacity of AVEK's 18-inch California City Feeder. The ultimate flow phase of 10.8 cfs was derived based on an imported water requirement of 6,431 acre-feet per year spread out over 10 months. Details on the flow rates developed can be found in the Technical Memorandum (TM) by Provost & Pritchard in the Alignment Study titled "Imported Water Pipeline Alignment Study Task 2 – Water Demands" dated November 18, 2022. The maximum capacity flow condition was derived based on typical recommendations for maximum headloss gradient of 3 ft per 1,000 ft of pipeline.

In the Alignment Study TM titled "Task 1-Determine Capacity at AVEK Pipeline Inlet" by Provost and Pritchard (November 23, 2023), it was recommended that flow in the the existing 18-inch California Feeder should not exceed 6.5 cfs, and therefore if California City took water it would reduce the available flow into the IWVGA Import Water Pipeline (e.g. if California City uses 2.5 cfs then only 4 cfs is available to the IWVGA Import Water Pipeline. Therefore, upstream improvements are likely required to flow above 6.5 cfs in the existing California City Feeder.

For Scenario 2, it was assumed that improvements would be made to the California City Feeder, with a parallel 24-inch pipeline in addition to the existing 18-inch California City Feeder. For this scenario, it was found that the total demand at California City of 3.1 cfs (1,391 gpm) could be met while also delivering 10.8 cfs (4,847 gpm) to the Ridgecrest blending tank. However, it should be noted that if the existing 18-inch California Feeder pipeline were abandoned and replaced with a single 24-inch pipeline and the California City demand is 3.1 cfs, the minimum pressure at the high point in California City (STA 153+94) would drop from approximately 41 psig with the 18-inch and 24-inch in service to 12 psig with only a single 24-inch California City Feeder pipeline, and the pump head for PS-1 would need to be increased by approximately 12 feet to account for the drop in suction pressure at PS-1 (which went from 74 psig to 69 psig). If there are no California City demands, then a single 24-inch California Feeder pipeline can deliver the full 10.8 cfs without additional pump head at PS-1.

The standpipe was chosen to avoid any control complications with PS-1 that could arise from having a future upstream pump station, such as interlocks between the two stations to prevent one pump station from turning off while the other is still pumping, etc. It is unknown what improvements (if any) AVEK will make on their Feeder lines supplying the IWVWD Imported Water Pipeline, and therefore the ultimate flow scenario of 14.3 cfs assumed the hydraulic grade available at the standpipe is approximately 2,500 ft. As the design progresses, this will need to be coordinated with AVEK to plan for flows beyond the initial design flow of 6.5 cfs.

The steady state hydraulic analysis found that the pipeline size of 24-inch for the pumped section of the pipeline was sized appropriately, with maximum head loss per thousand feet of pipe at approximately 3 feet per 1,000 ft for the ultimate design flow of 14.3 cfs, which is within typical standards for friction head loss within transmission mains of no more than 3 ft/1,000 ft. The gravity section from the Regulating Tank along the 18-inch pipe has a velocity of up to 9 ft/s with a head loss gradient of 14 ft/1,000 ft for the ultimate flow rate, however this velocity and head loss gradient was considered acceptable due to the excess head available from the Regulating Tank (El = 3,530 ft) to the Blending Tank at the Ridgecrest Heights Tank Facility (El = 2,550 ft). A summary of the hydraulic model results is shown in **Table 3**.

Table 2: IWVGA Import Water Pipeline Pump Station Hydraulic Summary

Scenario	Q (cfs)	Q (gpm)	PS-1 Suction Pressure (psig)	PS-1 Discharge Pressure (psig)	PS-1 TDH (ft)	PS-2 Discharge Pressure (psig)	PS-2 TDH (ft)	PS-3 Discharge Pressure (psig)	PS-3 TDH (ft)	NOTES
1	6.50	2,917	132	225	215	241	551	245	561	No CA City DMD
2	10.80	4,847	74	243	390	252	577	252	577	3.1 cfs CA City DMD, 18-inch and parallel 24-inch CA Feeder
3	14.30	6,418	8	263	590	265	607	260	595	HGL assumed at Standpipe of 2,500 ft (likely requiring PS on AVEK system)

The HGL profiles for the Imported Water pipeline with different flow rates are shown in **Figure 2** and the pressure along the pipeline is shown in **Figure 3**.

6.0 TRANSIENT MODEL INPUTS AND ASSUMPTIONS

Model inputs and assumptions are listed in **Table 2**.

Table 3: Model Inputs and Assumptions

Input Data and Assumptions		
1	**Pump Data**	
	a.	Pump Station 1 will be a booster station with design flows ranging from 6.5 up to 14.3 cfs and a design head ranging from 200-600 ft based on flow and upstream conditions (calculated)
	b.	Pump Stations 2 and 3 will be hydraulically disconnected with forebays, with design flows also between 6.5 to 14.3 with heads ranging from 552 - 607 ft (calculated)
	c.	Pump best efficiency point taken as 85% (assumed)
	d.	Rated Speed = 1780 revolutions per minute (RPM) [assumed]
	e.	Pump and motor inertia calculated using Bentley HAMMER software based on horsepower and speed (ranging from approximately 70 - 1,060 lbm-ft^2 total pump station inertia)
2	**Boundary Conditions**	
	a.	Mojave Tank Farm has a static hydraulic grade line (HGL) ranging from 2,708 – 2,729 ft
	b.	Connection point at AVEK's California City Feeder from the North Feeder has an HGL of 2,610 ft for Scenarios 1 & 2 (design flow rates of 6.5 cfs and 10.8 cfs, respectively)
	c.	Standpipe has a hydraulic grade of 2,500 ft for Scenario 3 (14.3 cfs design flow)
	d.	Pump Station 2 and 3 forebays have a water surface elevation 5 ft above the pump station elevation
	e.	Regulating Tank has a water surface elevation of 3,530 ft (ground surface of 3,520 ft)
	f.	Blending Tank has a water surface elevation of 2,550 ft (ground surface 2,540 ft)
3	**Pipeline Data**	
	a.	Hazen-Williams C-Factor of 130 was used for all pipes for conservatism
	b.	Wavespeed ranges from 1,640 to 3,900 ft/s for the 24-inch PVC to 24-inch Steel, respectively (calculated)
4	**Minor Fitting Loss Coefficients**	
	a.	Minor losses were added to the model based on assuming a minor loss K-factor of 1.2/mile of pipeline (assumed)
	b.	Minor losses at the pump stations and discharge tanks were added to get approximately 8-10 ft of headloss combined at the pump station and discharge tanks (assumed)
	c.	A minor loss K factor at the pressure reducing valve (PRV) stations was assumed to be 12.5. Additionally, a minor loss K factor of 4 was added to the turnout check valves as well as the terminal flow control valve (FCV)
5	**Vapor Pressure (Cavitation Pressure)**	
	a.	Vapor pressure of water at 68°F at 3,530 ft-AMSL = -12.6 psig (calculated)

Additionally, it was assumed that the check valves are hydraulically actuated, non-slam check valves at the proposed California City turnout (Cla-Val model 81-02). Finally, it was assumed that the PRVs can modulate during a transient event with a rate of 0.01% change in position per second per foot of hydraulic head, which is a value provided by Bentley Systems HAMMER software literature.

6.1 TRANSIENT PRESSURE GOALS

The preliminary maximum pressure goal for this analysis will focus on the suction pipeline to PS-1 booster pumps, which was assumed to be DR18 (235 psi) PVC for procurement flexibility to not rely on a single pipe material. Based on American Water Works Association (AWWA) Manual M23 (2022), a factor of 1.6 times the pressure class of the PVC is allowed for occasional surge events, such as a pump trip. The pump station discharge piping is planned to be steel pipe, which can be designed to accommodate the occasional transient pressures. Once the pipe materials are finalized, this maximum transient pressure goal will be re-evaluated.

- Preliminary Maximum Pressure Goal on Suction Pipeline to PS-1 = 376 psig

Typically, it is good design practice to limit the minimum occasional transient pressure within the pipeline to approximately half of the vapor pressure, or -6 psig in this case, to be conservative and avoid column separation, which is the drop to full vacuum pressure along with vapor pockets being formed in the pipeline.

- Minimum Pressure Goal on Discharge Pipelines = -6 psig.

7.0 TRANSIENT ANALYSIS

The preliminary transient analysis was done primarily to evaluate pump station locations regarding potential maximum and minimum transient pressures due to a power failure (pump trip) event. Additionally, transient mitigation equipment will be evaluated as needed.

7.1 PRELIMINARY TRANSIENT CALCULATIONS

Prior to modeling transient events in the IWVWD Imported Water Pipeline, two significant transient parameters were calculated: the 'Joukowsky' head and the critical time of the pipeline.

'Joukowsky' Head

To aid in the understanding of the expected pressure changes in the system that could be caused by a surge event, the 'Joukowsky' head was calculated for the pipeline. The 'Joukowsky' head is the initial rise or drop in head caused by an instantaneous change in the flow velocity and is determine using the following equation:

$$h = \frac{a\Delta v}{g}$$

where Δ h is the 'Joukowsky' head, a is the wave speed in feet per second, Δv is the change in velocity in feet per second, and g is the acceleration due to gravity.

For the IWVGA Imported Water Pipeline system, the 'Joukowsky' head within the 24-inch steel pipeline using a flow rate of 14.3 cfs is approximately 609 ft (264 psig). For the 18-inch steel pipeline to the Ridgecrest Heights Tank Facility, the Joukowsky head at 14.3 cfs would be 1,112 ft (482 psi).

Critical Time

The critical time is the time it takes for a pressure wave generated by a change in steady-state velocity conditions to travel from one end of the pipeline to the other and then back to the origin of the transient. It is determined by the following equation:

$$t_c = \frac{2L}{a}$$

Where t_c is the critical time, L is the length of the pipeline in feet, and a is the wave speed of the conveyed liquid in feet per second. The critical time is a significant parameter in transient analysis because a change in steady-state conditions that occurs in less than the critical time can produce a pressure change equal to the full 'Joukowsky' head. The critical time can be used when evaluating surge mitigation measures to develop an initial estimate of the time needed to accomplish a change in steady-state conditions to limit the magnitude of hydraulic transients generated by the change.

The critical time period associated with the IWVGA Imported Water Pipeline system, from the turnout off the North Feeder, along the California City Feeder and the new 24-inch PVC and HDPE pipeline to the proposed PS-1 was calculated to be approximately 220 seconds based on a length of approximately 226,150 feet (42.8 miles) and wave speeds ranging from 1,700 to 4,018 ft/s for 18-24-inch pipeline. The critical times for the pump station discharge pipelines, which are comprised of 24-inch cement mortar lined (CML) steel pipe with sections of 24-inch DR13.5 HDPE ranges from 18 seconds for PS-1 (6.0 miles to PS-2), 11 seconds for PS-2 (4.1 miles to PS-3), and 8 seconds for PS-3 (2.7 miles to Regulating Tank). Finally, the 18-inch gravity pipeline from the Regulating Tank to the Ridgecrest Heights Tank Facility is approximately 27 seconds based on a length of 10.2 miles and a wavespeed of 4,018 ft/s.

7.2 TRANSIENT SCENARIOS

The transient conditions reviewed for this analysis were a power failure resulting in a pump trip with and without surge mitigation. A pump trip was the focus of this preliminary analysis to focus on the potential worst-case condition for full vacuum pressure downstream of the pump stations, as well as upsurge on the suction side of the booster pumps in PS-1. Additionally, the pump trip scenario was the focus to evaluate preliminary sizes of surge mitigation equipment, namely air chambers. There are few options to mitigate the down surge from a power failure at a high head pump station other than air chambers. Additionally, air chambers can dampen the down surge so that the air vacuum valves can have more time to react to vacuum conditions and function properly. For these reasons, air chambers were the selected mitigation strategy.

- Scenario 1 – Pump Trip of all pump stations at design flow of 6.5 cfs
    a. Scenario 1a – No Mitigation
    b. Scenario 1b – Air Chamber Mitigation
- Scenario 2 – Pump Trip of all pump stations at design flow of 10.8 cfs
    a. Scenario 2a – No Mitigation
    b. Scenario 2b – Air Chamber Mitigation
- Scenario 3 – Pump Trip of all pump stations at design flow of 14.3 cfs
    a. Scenario 3a – No Mitigation
    b. Scenario 3b – Air Chamber Mitigation

7.3 HYDRAULIC TRANSIENT RESULTS

Scenario 1a: IWVWD Imported Water Pipeline All Pump Trip with No Transient Mitigation – Total Flow = 6.5 cfs

Scenario 1a modeled all three of the proposed pump station pumps tripping with no transient mitigation. The pump trip resulted in full vacuum conditions (-12.6 psig) at multiple locations along the pipeline. The maximum transient pressure on the suction side of Pump Station 1 was approximately 275 psig, up approximately 115 psi above the steady state pressure of 160 psig at this location. **Figure 4** shows the transient head envelope experienced along the suction pipeline from AVEK's North Feeder turnout to California City to PS-1. **Figure 5** is the HGL for the discharge lines of the three pump stations, which shows the various locations with full vacuum conditions (-12.6 psig). The occurrence of full vacuum conditions was considered unacceptable for the occasional power failure surge event, and therefore surge mitigation was evaluated for this scenario.

Scenario 1b: IWVWD Imported Water Pipeline All Pump Trip with Air Chamber Mitigation – Total Flow = 6.5 cfs

Scenario 1b modeled an air chamber on the suction and discharge side of PS-1, as well as on the discharge side of PS-2 and PS-3. At the onset of a power failure and resulting pump trip, the pressure at the suction and discharge side of a pump experience opposite reactions; with the discharge side experiencing a downsurge and the suction side experiencing an upsurge. With booster pump stations, the upsurge on the suction side can help the flow continue through the pumps station and help reduce the downsurge on the discharge side. However, once an air chamber is added into the system on the discharge side of the booster pump station to mitigate the full vacuum conditions, it will exacerbate or worsen the upsurge on the suction side because the discharge air chamber causes the pumps check valves to close rapidly (in less than one second) as the air chamber discharges water into the discharge line after the pumps lose power. Similarly, adding a suction side air chamber will absorb the upsurge on the suction side and thereby reduce the time that the flow continues through the pump station and increase the downsurge on the discharge side, compared to what would occur without air chambers.

Air chambers (a.k.a. surge tanks) were modeled using the Hydropneumatic Tank model element and the Gas Law Model Tank Calculation Model. Air chambers are American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code vessels that contain both water and air under pressure, and the compressed air acts as a cushion that can either exert or absorb pressure as required. The air chambers were modeled directly in line on the suction / discharge header of the pump stations, which was assumed based on the tanks being connected in-line or within a very short distance (e.g., less than 20 feet) to the pump header pipelines.

Combination air vacuum valves (CAVs) could also be considered and will be evaluated during detailed design. However, due to the shape of the profiles from PS-2 to PS-3 and PS-3 to the regulating tank, which are generally continuously rising without any significant intermediate high points, it is unlikely that adding CAVs would materially reduce the air chamber sizes.

Scenario 1b utilizes a 3,500 gallon air chamber at the suction side of PS-1 (with an initial air volume of 2,500 gallons and a 4-inch tank connection pipe). The discharge of PS-1 utilizes a 1,500 gallon tank (800 gallon initial air volume and 12-inch connection pipe size), PS-2 has a 1,000 gallon tank (500 gallons initial air volume, 12-inch connection size), and PS-3 has a 1,500 gallon tank (800 gallon initial air volume with 12-inch connection pipe). The surge tanks were sized based on running sensitivity analyses with various initial air volumes and surge tank connection pipe diameters. The inlet/outlet connection pipe for the suction side of PS-1 was found

to be much more effective at dampening the upsurge by throttling the inflow into the tank more than with a larger connection pipe diameter.

The suction HGL envelope for the pump trip scenario with air chambers is shown in **Figure 6** indicating the maximum head is slightly higher than without the air chambers and the discharge HGL envelope is shown in **Figure 7**, which indicates the full vacuum conditions are eliminated along the discharge profiles.

Additionally, for a sensitivity analysis, AVEK's North Feeder was included in the model all the way back to the Mojave Tank Farm with an HGL of 2,700 ft. PRV1 was also ran with and without allowing modulation during a transient event and it was found that if the PRV does not modulate during the transient and there was a no-flow condition in AVEK's North Feeder Line, the HGL could go up to 2,700 feet along the entire suction profile to PS-1 (maximum pressure of 350 psig). If it was assumed that the PRV can modulate during the transient event, then it will start closing as the pressure increases from the pump trip until it is fully closed. The model results indicate that with the PRV modulating, the maximum pressure is below 250 psig in the suction pipeline to PS-1.

Scenarios 2a, 2b, 3a, and 3b: IWVWD Imported Water Pipeline All Pump Trip – Total Flow = 10.8 through 14.3 cfs, with and without air chamber mitigation.

Scenarios 2 and 3 looked at both unmitigated pump trip events and air chamber mitigation for the system with flow rates of 10.8 cfs through the maximum capacity of 14.3 cfs. The results were similar to Scenario 1, and therefore are not presented but with the higher flows from the pump stations, the results were higher upsurge pressures on the suction side, and larger down surges on the discharge side. The pump trips with higher flows resulted in more pipe experiencing full vacuum pressure, as well as larger vapor pockets predicted by the model (up to 300 gallons), which was considered unacceptable.

Table 4 presents a summary of the transient results and air chamber sizes for Scenarios 1-3.

Table 4: Hydraulic Transient Results Summary

Scenario	Alternative	HT-1 SUC (gal)	HT-1 DIS (gal)	HT-2 (gal)	HT-3 (gal)	Total Air Chamber Volume (gal)	Maximum Suction Pressure (psig)	Minimum Discharge Pressure (psig)	Maximum Discharge Pressure (psig)
1a	6.5 cfs No Mitigation	NA	NA	NA	NA	NA	242	-12.6	650
1b	6.5 cfs with Air Chambers	3,500	1,500	1,000	1,500	7,500	238	-5	400
2a	10.8 cfs No Mitigation	NA	NA	NA	NA	NA	267	-12.6	663
2b	10.8 cfs with Air Chambers	5,500	2,500	1,500	2,500	12,000	251	-6	370
3a	14.3 cfs No Mitigation	NA	NA	NA	NA	NA	330	-12.6	603
3b	14.3 cfs with Air Chambers	8,000	3,800	2,000	3,000	16,800	280	-5	408

The maximum suction side pressure of 330 psig is less than the allowable occasional surge limit for PVC DR18 of approximately 376 psig (1.6 * design pressure of 235 psig, based on AWWA M23 [2022]), and therefore was considered acceptable. The discharge air chambers were sized to maintain a minimum transient pressure goal of approximately one half of full vacuum pressure (-6 psig) to maintain a buffer over full vacuum conditions.

8.0 SUMMARY

The purpose of this evaluation was to evaluate the hydraulic and transient conditions for the proposed IWVWD Imported Water Pipeline, including evaluating pump station siting, pipe sizing, servicing strategy, and potential transient mitigation, as needed.
The servicing strategy for the pump station was envisioned to utilize PS-1 as a booster pump station to take advantage of the available gravity head from the Mojave Tank Farm (2,700 ft operating HGL). PS-2 and PS-3 were located to have similar sized pumps at each station, and pump from forebays/ground storage tanks up to a discharge tank to hydraulically disconnect them from PS-1. The high point of the pipeline alignment near Searles will have a Regulating Tank and flow by gravity down to the blending tank at the Ridgecrest Heights Tank Facility. Similarly, for the ultimate flow of 14.3 cfs, a standpipe was assumed to hydraulically disconnect AVEK's supply pipelines from the IWVWD Imported Pipeline system due to unknown potential upgrades upstream of the proposed booster pump station PS-1.

Next, a hydraulic transient analysis (HTA) was done to evaluate minimum and maximum transient pressures, as well as come up with preliminary sizes of surge mitigation equipment, as necessary. The following sections document general conclusions and results of hydraulic modeling.

8.1 HYDRAULIC ANALYSIS RESULTS

The IWVWD system was evaluated to confirm pipe sizes and pressure classes, estimate the pump station total dynamic head, and check pipeline velocity and head losses. Stantec evaluated the pump station locations initially selected by Provost and Pritchard and agreed they were hydraulically acceptable for all the design flow scenarios. Pipeline velocities in the 24-inch line were 2.2 ft/s with a headloss gradient of 1 ft/1000 ft at the initial design flow rate of 6.5 cfs, up to nearly 5 ft/s velocity and 3 ft/ 1000 ft at the ultimate design flow rate of 14.3 cfs, which was considered acceptable. The velocity in the 18-inch gravity line from the Regulating Tank to the Blending Tank at the maximum flow condition of 14.3 cfs is approximately 9 ft/s, which was considered acceptable given that there is excess head to be dissipated with PRVs / hydro turbine stations.

From the regulating tank, the flow will be by gravity along approximately 10.2 miles of 18-inch steel pipeline down to the Ridgecrest Heights Tank Facility, which is approximately 980 ft lower in elevation than the regulating tank. The velocity in the 18-inch gravity pipe ranges from 4.1 ft/s at 6.5 cfs up to 9 ft/s at 14.3 cfs, which could either be controlled by two PRV / hydro turbine stations to keep the pressure under approximately 200 psig, as well as a flow control valve (FCV) at the blending tank. Alternatively, the pipeline could be designed for higher pressure and eliminate the two PRV / hydro stations and just have a single PRV/ hydro station at the blending tank. With a single PRV/Hydro station at the blending tank, there would be approximately 800 feet of head at 6.5 cfs, and 215 feet of head at 14.3 cfs.

The maximum steady state pressure within the IWVWD Imported Pipeline system is up to 160 psig on the suction pipeline to PS-1, and the maximum pressure in the discharge pipelines up to the Regulating tank is approximately 265 psig. Pump head ranged from 215 feet for PS-1 at 6.5 cfs up to nearly 600 feet under the ultimate flow scenario of 14.3 cfs. PS-2 and PS-3 were found to have a range in head from 550 feet under the 6.5 cfs scenario and up to 610 feet under the maximum capacity flow of 14.3 cfs scenario, with design points within 10 feet of each other for all flow scenarios. A summary of the steady state pressures and required pump station total dynamic head required is summarized in **Table 3**, above. Additionally, the initial pipe sizing was evaluated, and the pump station head required for each flow scenario was reported, as well as the normal operating pressures for the proposed piping system.

8.2 TRANSIENT ANALYSIS RESULTS

The transient results indicated that full vacuum conditions could be experienced after a pump trip event at various locations on the discharge sides of the pump stations including the formation of vapor pockets, which was considered unacceptable. Air chambers were considered the preferred transient mitigation strategy for high-head pump stations to mitigate full vacuum conditions due to pump trip events. The air chamber mitigation was found to eliminate full vacuum conditions and limit the minimum pressure to approximately half of full vacuum pressure (-6 psig), which was considered acceptable for an occasional surge event. Air chamber sizes ranged from approximately 3,500 up to 8,000 gallons on the suction side of PS-1, and the air chamber sizes for the discharge of the three pump stations ranged from 1,000 gallons up to nearly 4,000 gallons.

Additionally, the suction surge tank at PS-1 was found to limit the maximum transient pressure in the suction side of PS-1 to 330 psig, which is below the surge allowance of approximately 376 psig for DR18 PVC (working pressure rating of 235 psig times a factor of 1.6 for surge allowance). A summary of the transient minimum and maximum pressures, as well as initial air chamber sizes is shown in **Table 4**, above. The transient analysis assumptions and results should be confirmed during the final design.

9.0 RECOMMENDATIONS

Based on the model results in this report, the Provost & Pritchard team recommends the following:

- The initial pump station locations for the IWVGA Imported Water Pipeline were found to be hydraulically acceptable.
- Install PS-1 as a true booster pump station to take advantage of the available operating head from the Mojave Tank Farm under low flow conditions.
- Utilize forebays or ground storage tanks at PS-2 and PS-3 to hydraulically disconnect the system at these locations.
- Utilize a regulating tank at the high point in the pipeline (Station 2134+24) to hydraulically disconnect the system, and flow by gravity from this regulating tank to the proposed blending tank at Ridgecrest Heights Tank Facility.
- Utilize 24-inch pipe size for the pumped segment of the pipeline and 18-inch for the gravity flow segment from the regulating tank to the Ridgecrest Heights blending tank.
- Consider air chamber mitigation for the IWVWD Imported Water Pipeline system to avoid full vacuum conditions resulting from a pump trip.
- Install non-slam check valves at the pump stations.
- Combination air vacuum valves will be modeled as the profile is finalized to determine preliminary sizes and locations, as needed.

Attachment: Hydraulic and Transient Figures

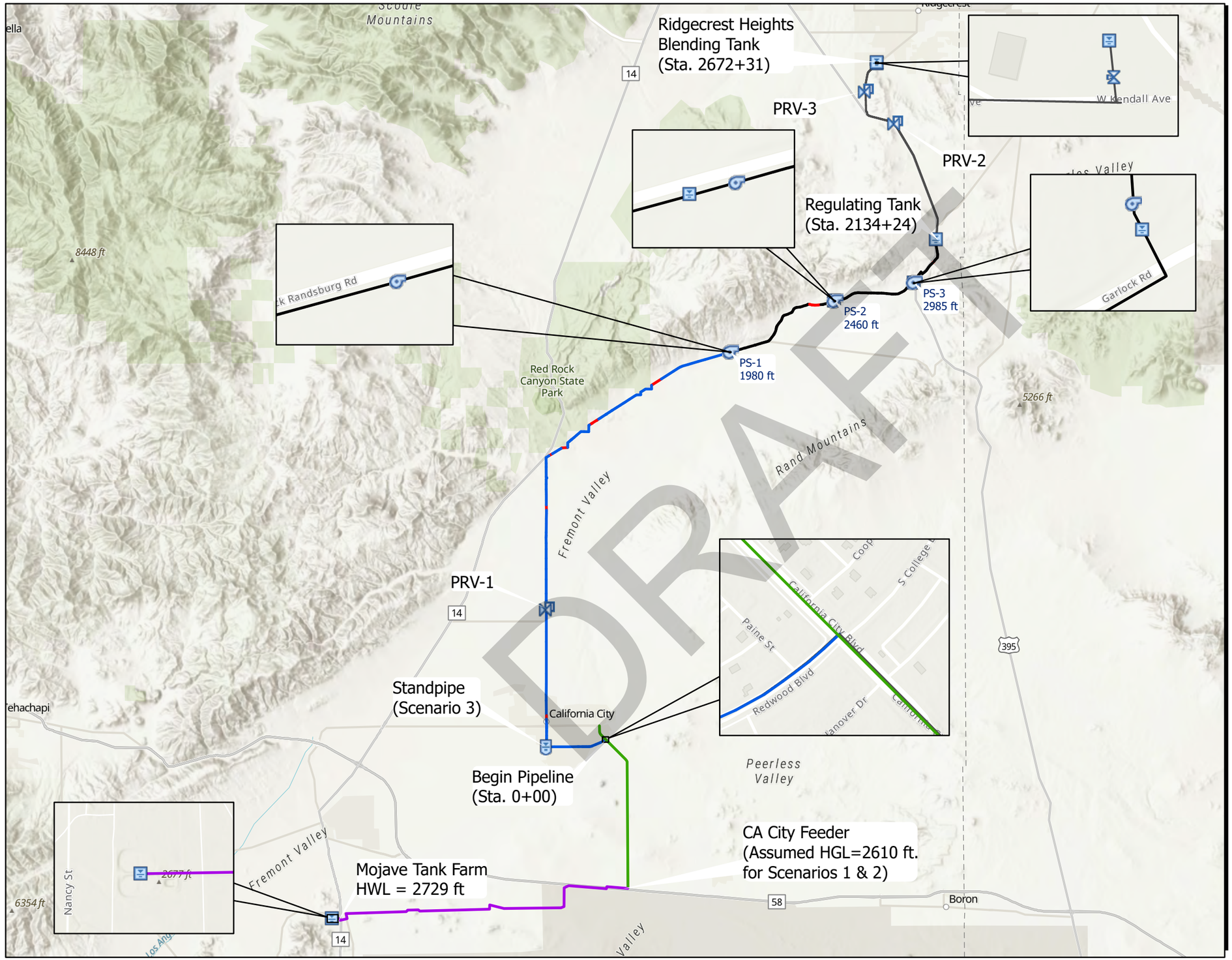


Figure No.
1

DRAFT

Title

IWVGA Hydraulics and Transient Analysis - Overall Model Layout of System

Client/Project 177311569

Client: Indian Wells Valley Groundwater Authority
Project: Hydraulics and Transient Analysis

Project Location
IWVGA
California City, CA

Prepared by FM on 2023-05-18
TR by MG on 2023-05-19
IR by JL on 2023-05-22

N

0 25,000 50,000 Feet

Scale: 1:300,000

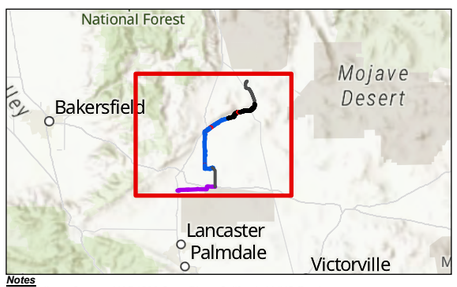
(At original document size of 11x17)

Legend

- Pump
- Tank/Forebay
- Standpipe
- FCV
- PRV

Pipe

- 18-in CML Steel Pipe
- 24-in CML Steel Pipe
- 24-in DR13.5 HDPE
- 24-in DR18 PVC
- 18-in Existing AVEK CA City Feeder
- 33/36-in Existing AVEK North Feeder



Notes
1. Coordinate System: NAD1983 State Plane California V (US Feet) NAVD88 (height) (US Feet)
2. Data Sources: Pipeline Alignment from 3d CAD Polyline
3. Background: World Topographic Map, ESRI, Garmin, Hybrid Reference Layer: ESRI

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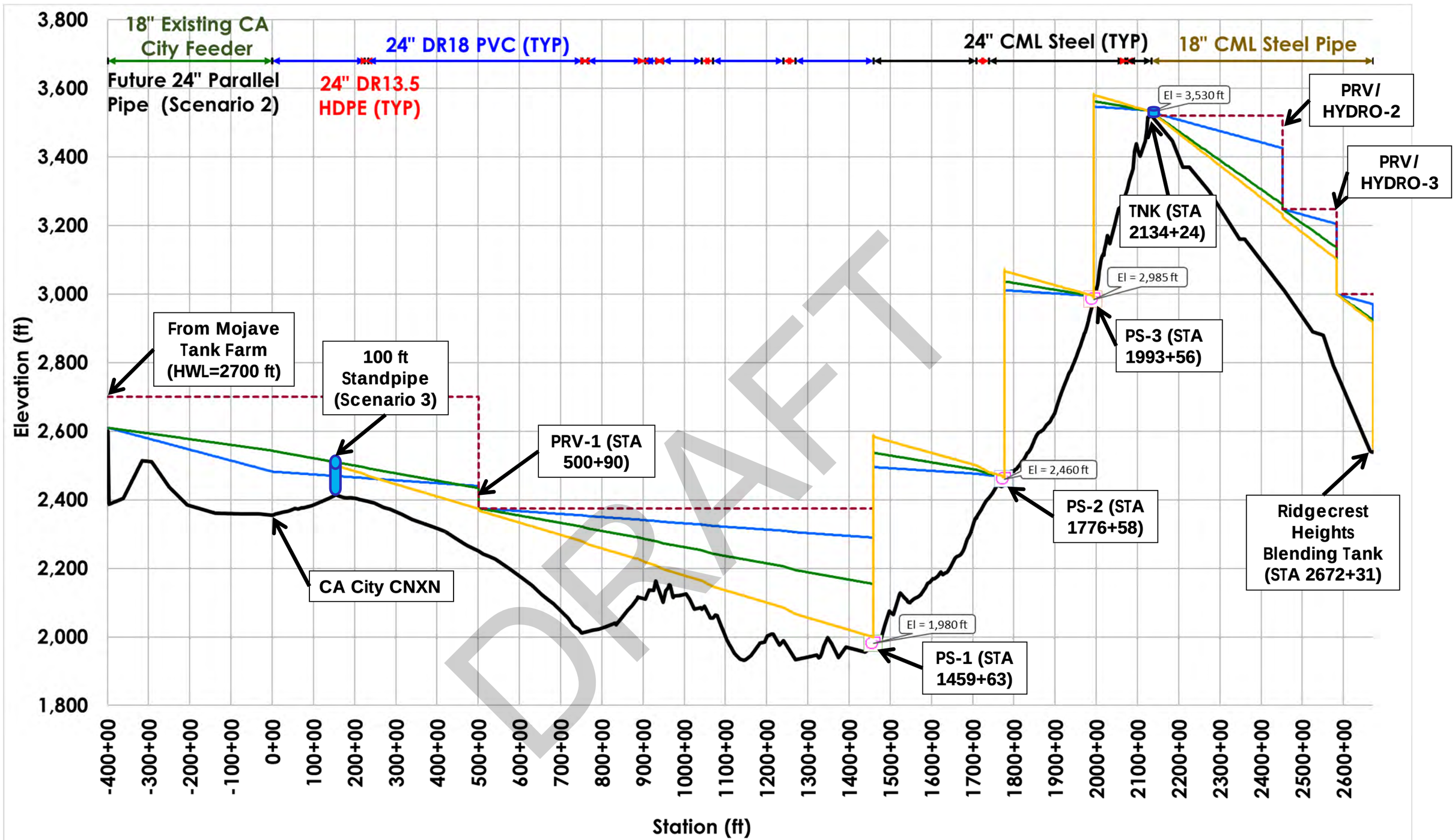
IWVGA
INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

C:\Users\FMcKenzie\Documents\IWVGA_HTAModel\WProj\WVGA_Pipeline_Alt_v1\WVGA_Pipeline_Alt_v1.aprx Revised: 2023-06-28 By: fmckenzie



Head Legend:

- Pipeline Elev.
- HGL (6.5 cfs)
- HGL (10.8 cfs)
- HGL (14.3 cfs)
- HGL (Static)

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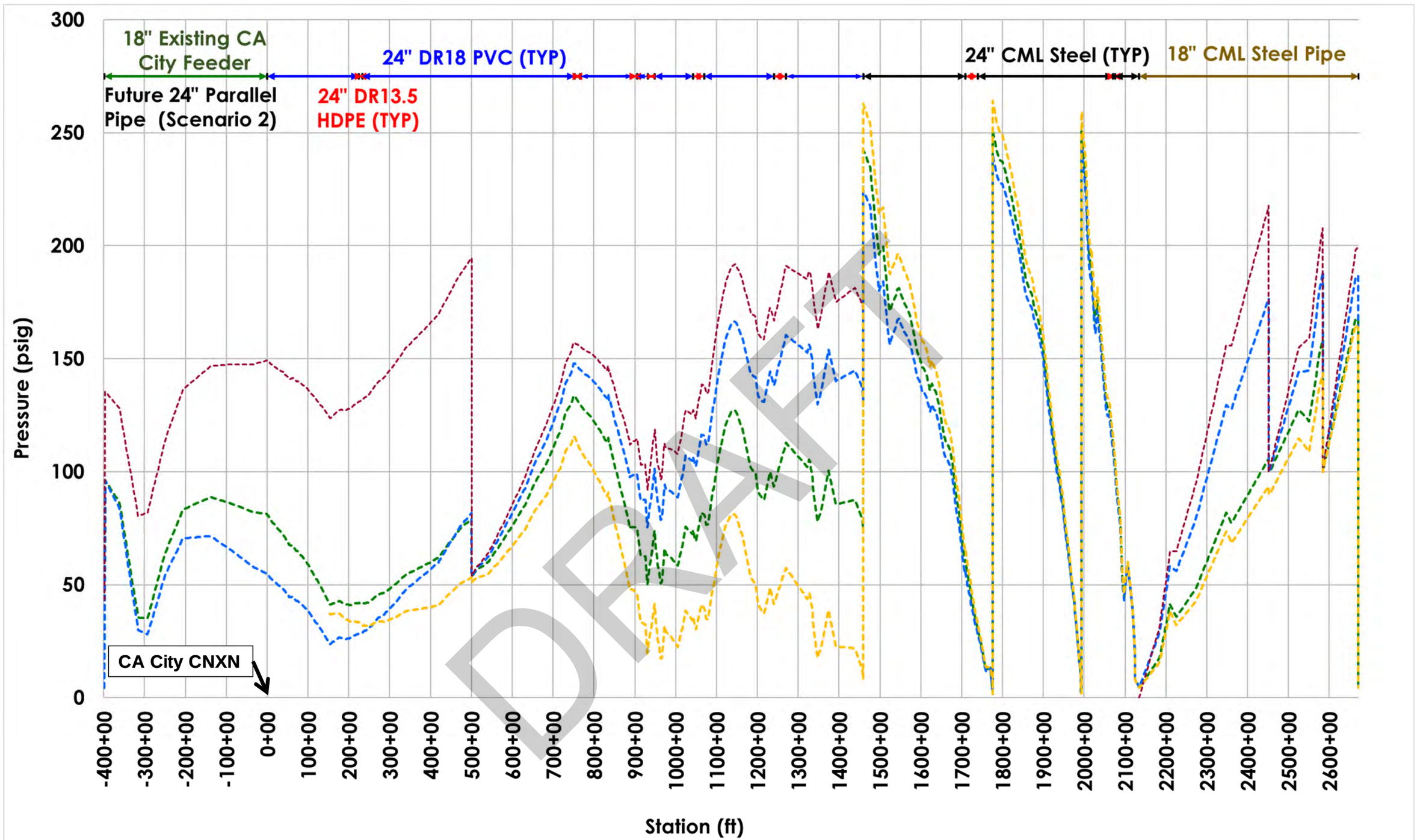
Conveyance Hydraulics and Transient Analysis

Figure No. **2**

Title Steady State HGL Results for the Three Flow Scenarios Evaluated



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Pressure Legend:

- Pressure (6.5 cfs)
- Pressure (10.8 cfs)
- Pressure (14.3 cfs)
- Pressure (Static)

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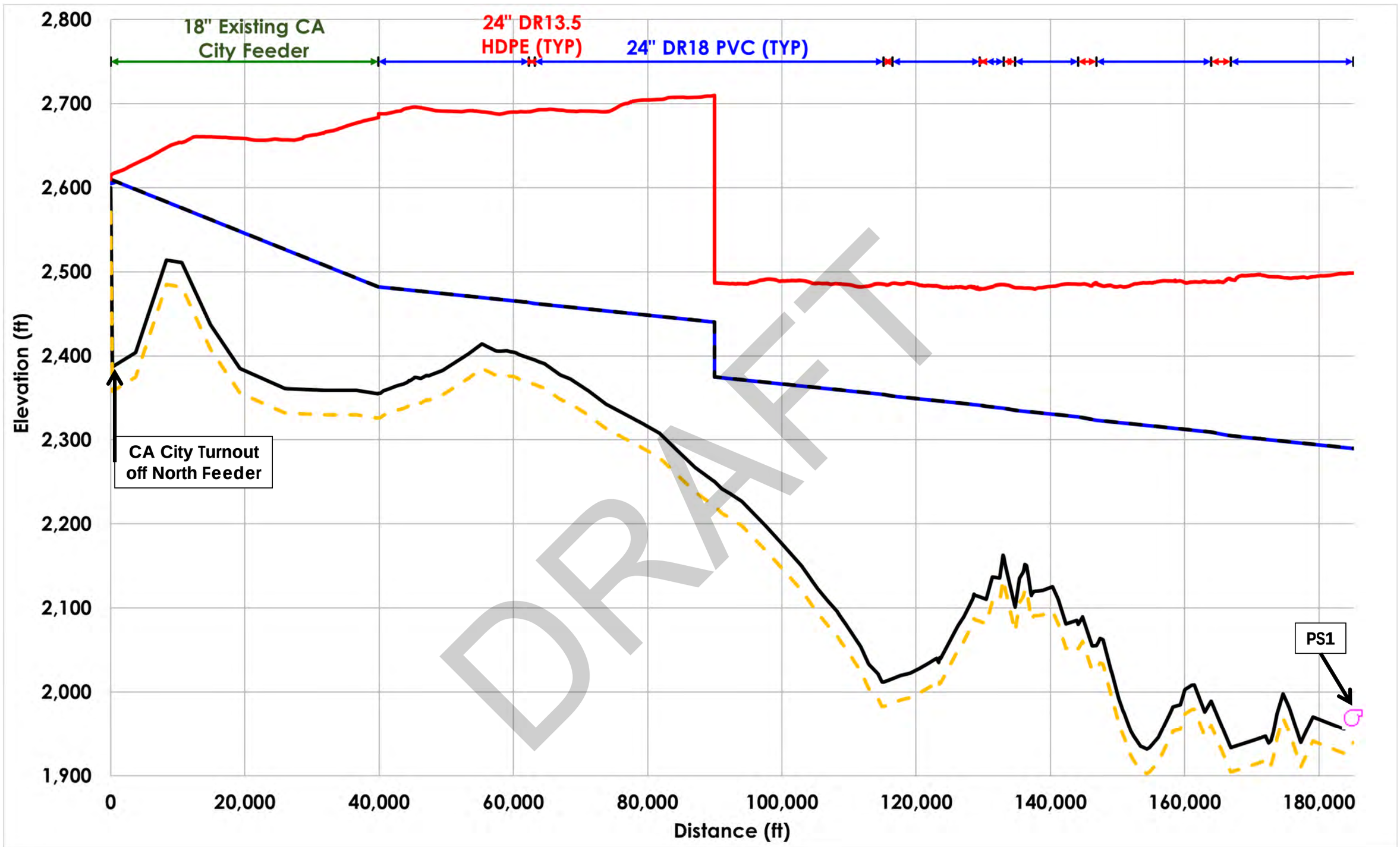
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **3**

Title Steady State Pressure Results for the Three Flow Scenarios Evaluated



LEGEND

- Pipeline Elev.
- Init. Cond. Head
- Max. Trans. Head
- Min. Trans. Head
- Vapor Head
- Pump Station
- Sub Atmospheric Conditions

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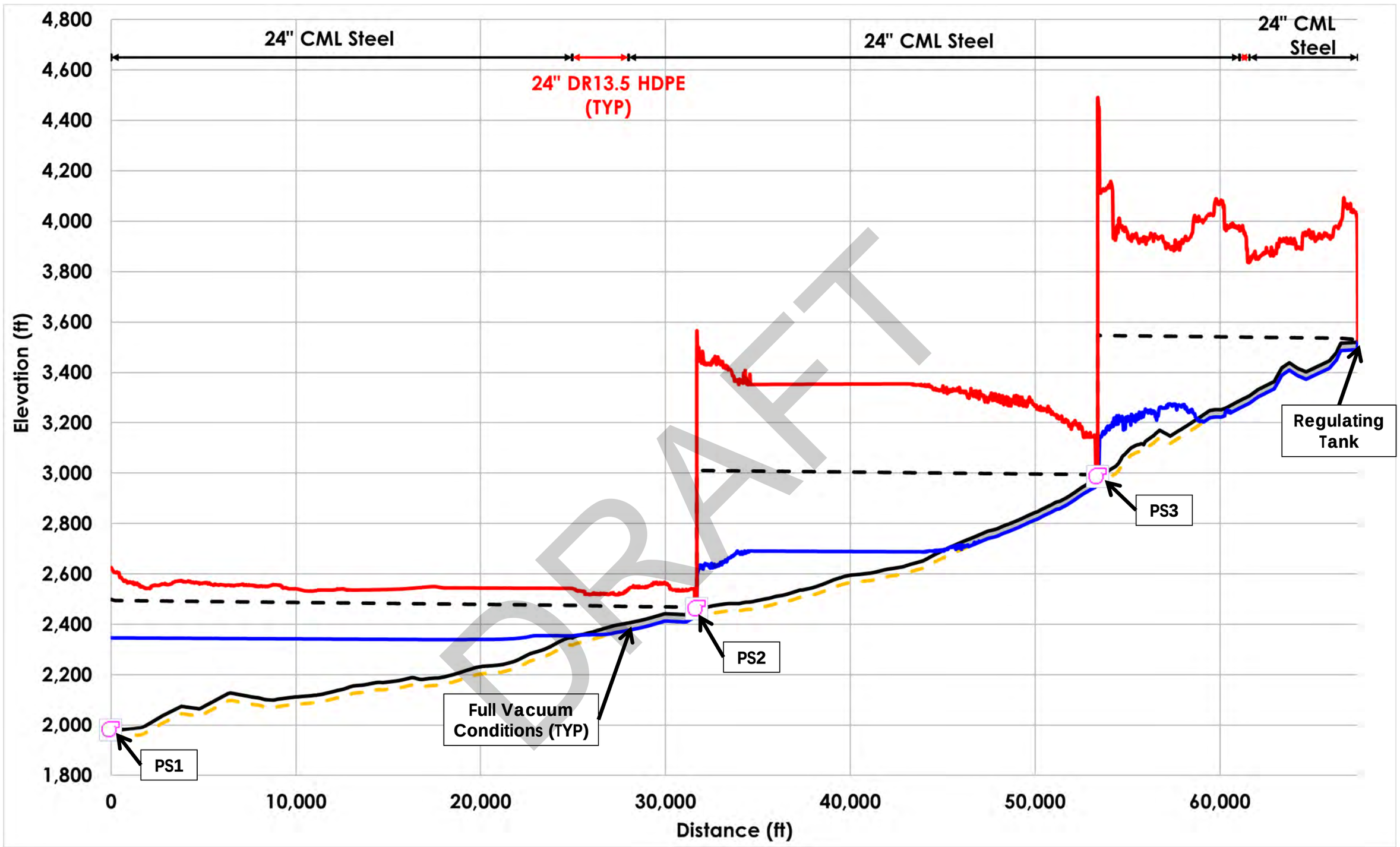
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **4**

Title Scenario 1a: Suction HGL from California City Turnout to Pump Station 1 – Pump Trip with No Mitigation



LEGEND

- Pipeline Elev.
- Init. Cond. Head
- Max. Trans. Head
- Min. Trans. Head
- Vapor Head
- Pump Station
- Sub Atmospheric Conditions

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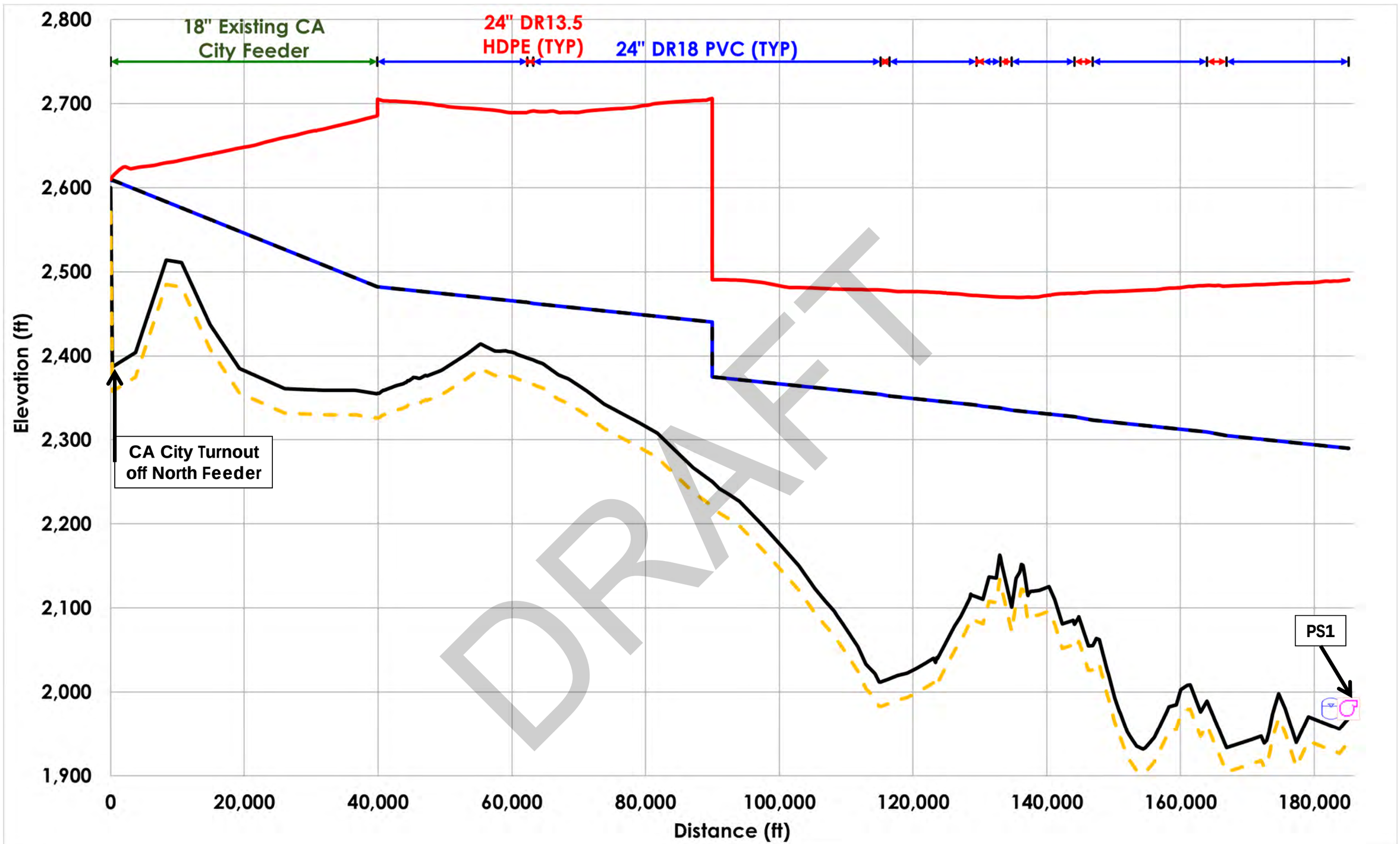
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **5**

Title Scenario 1a: Discharge HGL from Pump Station 1 to Regulating Tank – Pump Trip at all Pump Stations with No Mitigation



LEGEND

- Pipeline Elev.
- Init. Cond. Head
- Max. Trans. Head
- Min. Trans. Head
- Vapor Head
- Air Chamber
- Sub Atmospheric Conditions

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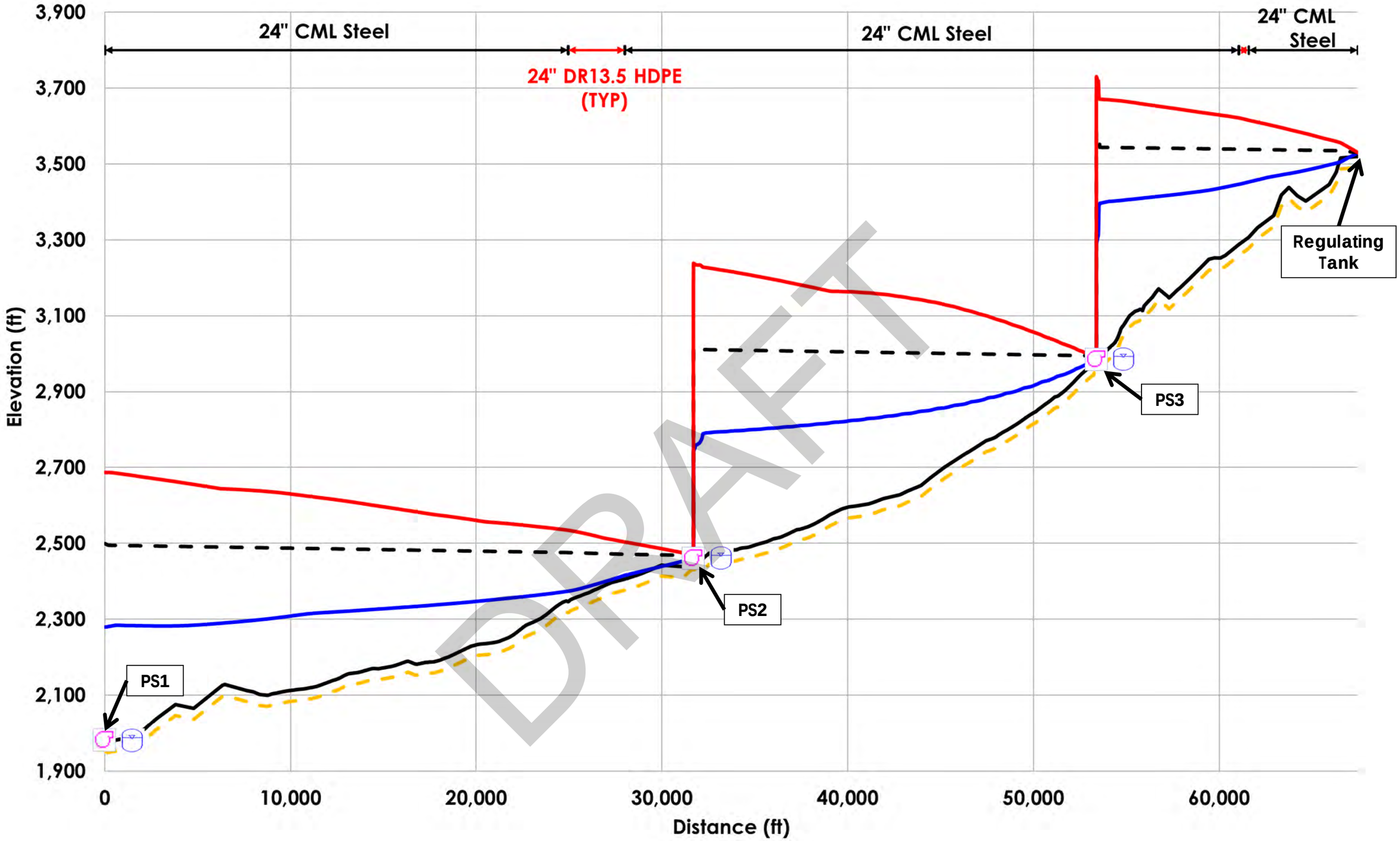
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **6**

Title Scenario 1b: Suction HGL from California City Turnout to Pump Station 1 – Pump Trip with Air Chamber



LEGEND

- Pipeline Elev.
- Init. Cond. Head
- Max. Trans. Head
- Min. Trans. Head
- Vapor Head
- Air Chamber
- Sub Atmospheric Conditions

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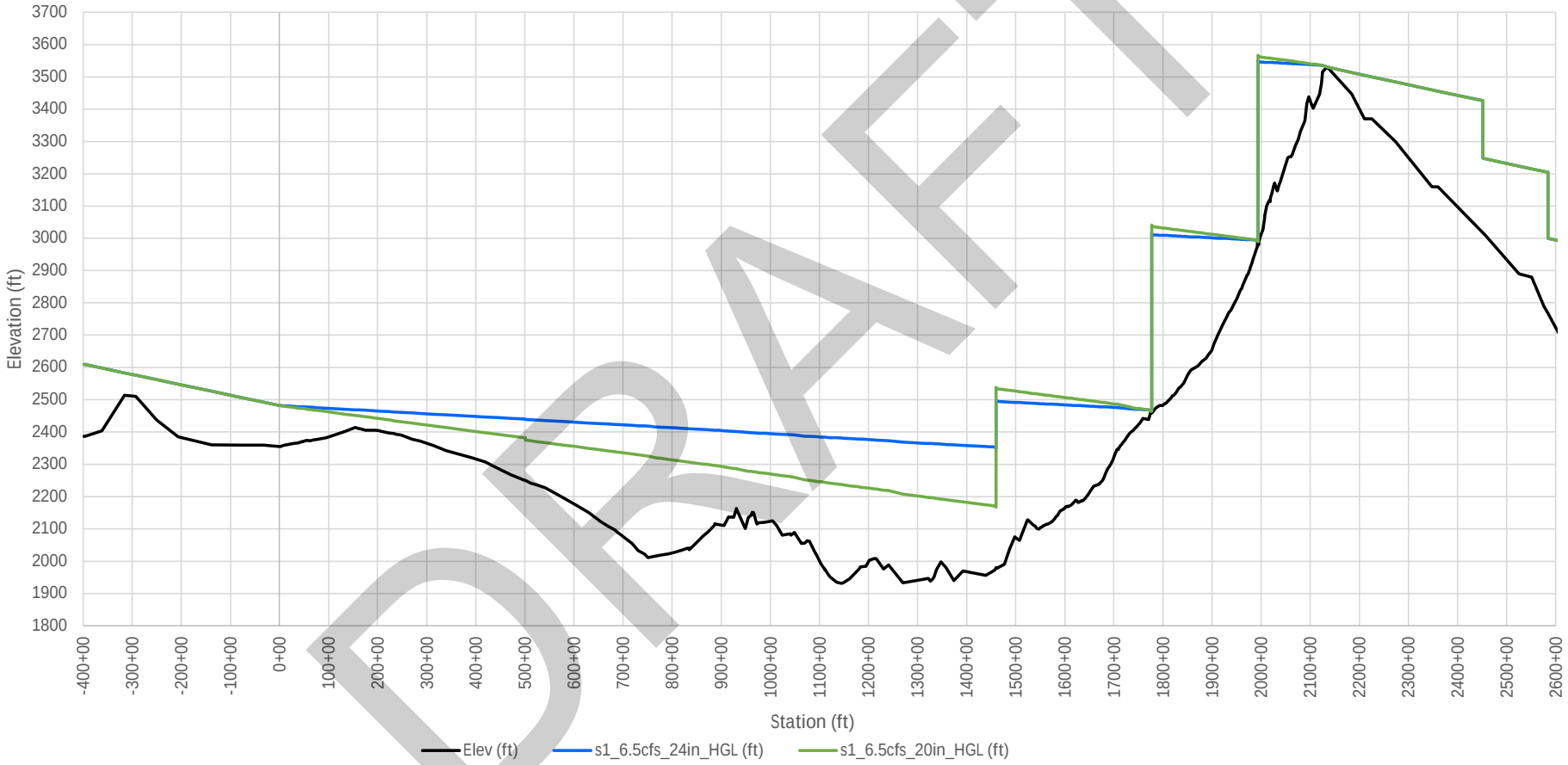
Indian Wells Valley Groundwater Authority
Conveyance Hydraulics and Transient Analysis

Figure No. **7**

Title Scenario 1b: Discharge HGL from Pump Station 1 to Regulating Tank – Pump Trip at all Pump Stations with Air Chambers

ATTACHMENT B

Figure 1: HGL Scenario 1 - 6.5 cfs



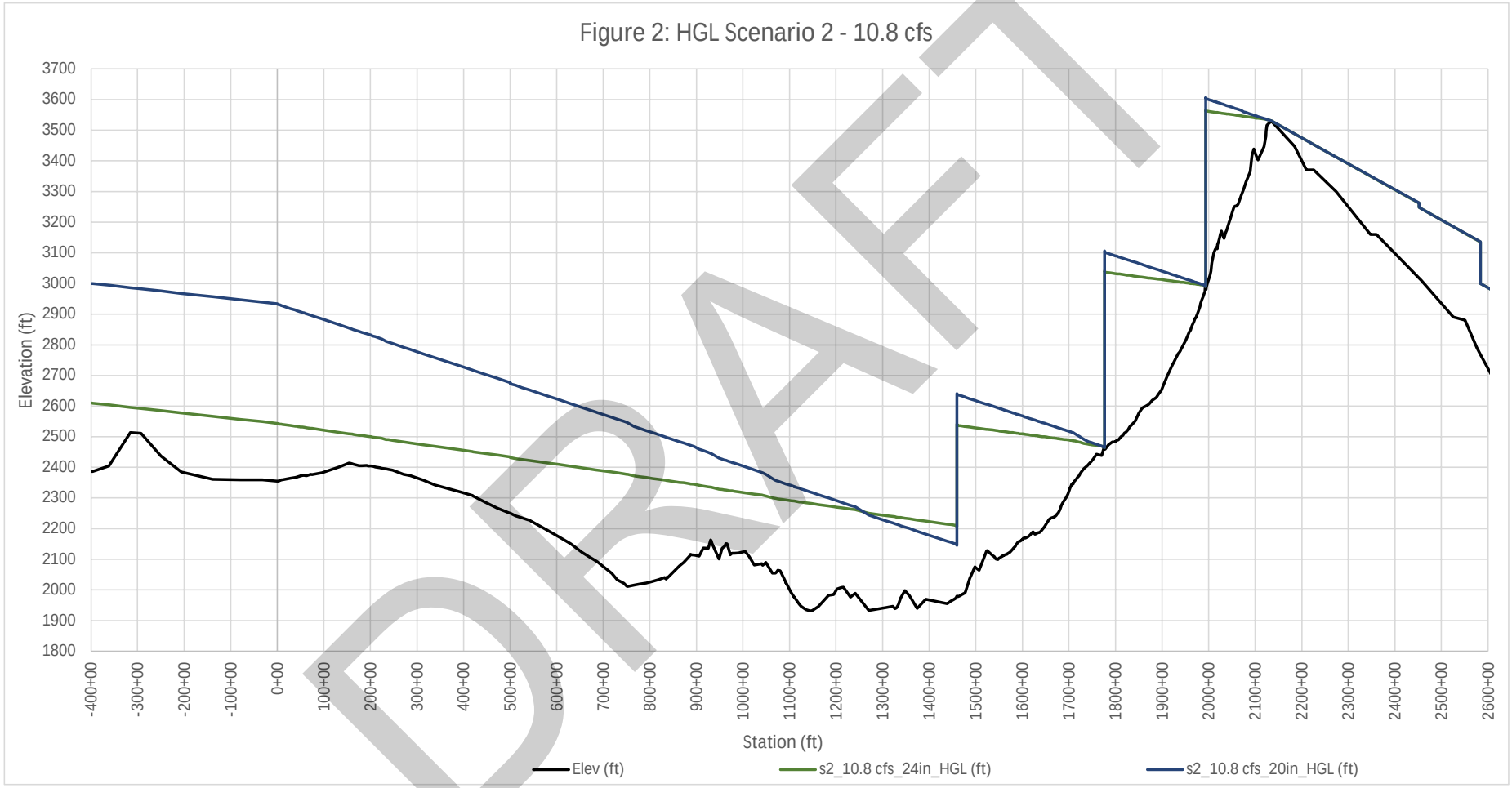
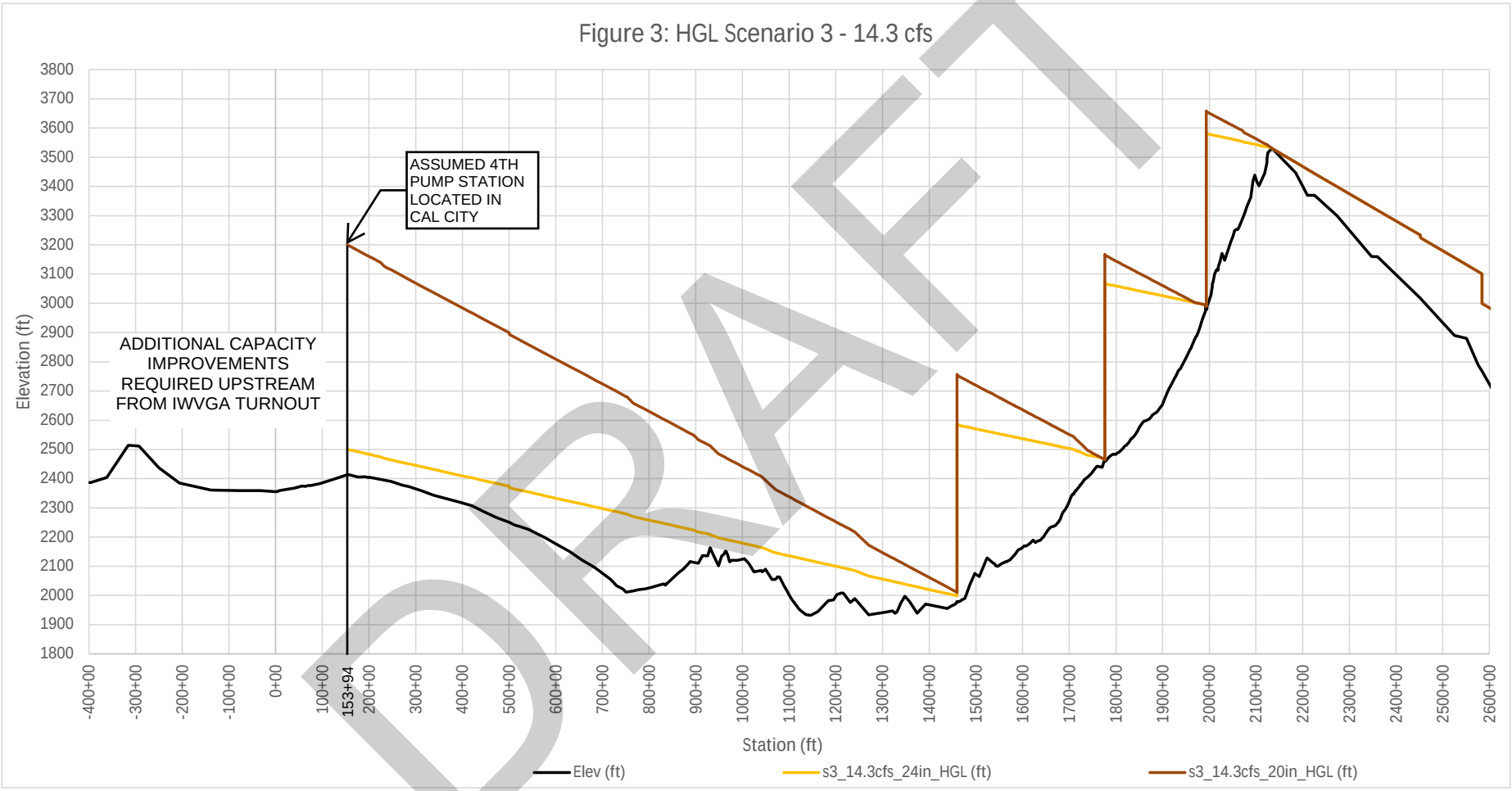


Figure 2: HGL Scenario 2 - 10.8 cfs
Elevation (ft)
3700
3600
3500
3400
3300
3200
3100
3000
2900
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
-400+00
-300+00
-200+00
-100+00
0+00
100+00
200+00
300+00
400+00
500+00
600+00
700+00
800+00
900+00
1000+00
1100+00
1200+00
1300+00
1400+00
1500+00
1600+00
1700+00
1800+00
1900+00
2000+00
2100+00
2200+00
2300+00
2400+00
2500+00
2600+00
Station (ft)
Elev (ft)
s2_10.8 cfs_24in_HGL (ft)
s2_10.8 cfs_20in_HGL (ft)

Figure 3: HGL Scenario 3 - 14.3 cfs



ATTACHMENT C

Indian Wells Valley Groundwater Authority

Economic Analysis: Alternative 1 - 24" Pipeline - Max 14.3 CFS

Pump Station Parameters:

# of P.S.	3

Phase:	Initial	Design	Max
Flow @ each P.S. (CFS):	6.5	10.8	14.3
Total Power Req. (kW):	1092	2167	3283

Off Peak : 19 hr

Power Costs: SCE TOU-8 Option D < 2kV	**2023**	**2030**
Meter Charge ($/Month)=	$345.98	$486.83
Power Demand Charge ($/kW/Month)=	$21.05	$29.62
Winter Mid-Peak Power Suppl. Charge ($/kW/Month)=	$10.02	$14.10
Off-Peak Use Rate ($/kWh)=	$0.0968	$0.1362
On-Peak Use Rate ($/kWh)=	$0.1271	$0.1789

19 pumping hours/day, all off-peak

OM&R Cost	**2023**	**2030**
Pipeline	$ 366,000	$482,000
Pump Station	$ 421,075	$554,000

Discount %: *4.00%* *Differential Escalator:* *1.0%* *1.0%* *0.0%*

Year	Annual Flow (AFY)	Avg. 10 month Flow Rate (CFS)	Pumping Flow Rate (CFS)	Pumping Days	Pumping Period (Hr/Day)	Total Power Demand (kW)	Total Energy Use (kWh)	Off-Peak Energy Use (kWh)	On-Peak Energy Use (kWh)	Discount Factor	IWVGA Capital Cost	Discounted PV	Power Demand + Meter Charge	Winter Mid-Peak Power Demand Suppl. Charge	Discounted Power Demand Charge	Off-Peak Energy Use Charge	On-Peak Energy Use Charge	Discounted Energy Use Charge	Pipeline OM&R Cost	Pump Station OM&R Cost	Discounted OM&R Cost	Discounted Total Cost
2030	3,614	6.00	8.00	304	18.00	1467	8,033,992	8,033,992	-	1.00	$ 121,455,000	$ 121,455,000	$ 539,015	$ -	$ 539,015	$1,093,834	$ -	$ 1,093,834	$ 482,000	$ 554,000	$ 1,036,000	$ 124,123,849
2031	3,743	6.21	8.00	304	18.64	1467	8,320,317	8,320,317	-	0.96		$ -	$ 544,406	$ -	$ 522,629	$1,144,146	$ -	$ 1,098,380	$ 482,000	$ 554,000	$ 994,560	$ 2,615,569
2032	3,872	6.43	9.00	304	17.14	1717	8,954,269	8,954,269	-	0.92		$ -	$ 640,456	$ -	$ 590,244	$1,243,513	$ -	$ 1,146,022	$ 482,000	$ 554,000	$ 954,778	$ 2,691,043
2033	4,000	6.64	9.00	304	17.71	1717	9,252,159	9,252,159	-	0.88		$ -	$ 646,735	$ -	$ 572,189	$1,297,479	$ -	$ 1,147,926	$ 482,000	$ 554,000	$ 916,586	$ 2,636,702
2034	4,129	6.86	9.00	304	18.28	1717	9,550,049	9,550,049	-	0.85		$ -	$ 653,014	$ -	$ 554,635	$1,352,256	$ -	$ 1,148,534	$ 482,000	$ 554,000	$ 879,923	$ 2,583,092
2035	4,258	7.07	9.00	304	18.85	1717	9,847,938	9,847,938	-	0.82		$ -	$ 659,293	$ -	$ 537,569	$1,407,844	$ -	$ 1,147,918	$ 482,000	$ 554,000	$ 844,726	$ 2,530,213
2036	4,320	7.17	10.00	304	17.22	1967	10,301,962	10,301,962	-	0.78		$ -	$ 759,787	$ -	$ 594,729	$1,486,777	$ -	$ 1,163,786	$ 482,000	$ 554,000	$ 810,937	$ 2,569,452
2037	4,382	7.28	10.00	304	17.46	1967	10,450,127	10,450,127	-	0.75		$ -	$ 766,955	$ -	$ 576,326	$1,522,388	$ -	$ 1,143,995	$ 482,000	$ 554,000	$ 778,500	$ 2,498,821
2038	4,444	7.38	10.00	304	17.71	1967	10,598,293	10,598,293	-	0.72		$ -	$ 774,123	$ -	$ 558,444	$1,558,403	$ -	$ 1,124,215	$ 482,000	$ 554,000	$ 747,360	$ 2,430,019
2039	4,507	7.48	10.00	304	17.96	1967	10,746,458	10,746,458	-	0.69		$ -	$ 781,290	$ -	$ 541,070	$1,594,821	$ -	$ 1,104,468	$ 482,000	$ 554,000	$ 717,465	$ 2,363,003
2040	4,569	7.59	10.00	304	18.21	1967	10,894,624	10,894,624	-	0.66		$ -	$ 788,458	$ -	$ 524,193	$1,631,642	$ -	$ 1,084,769	$ 482,000	$ 554,000	$ 688,767	$ 2,297,728
2041	4,631	7.69	10.00	304	18.45	1967	11,042,790	11,042,790	-	0.64		$ -	$ 795,626	$ -	$ 507,800	$1,668,867	$ -	$ 1,065,137	$ 482,000	$ 554,000	$ 661,216	$ 2,234,152
2042	4,693	7.79	10.00	304	18.70	1967	11,190,955	11,190,955	-	0.61		$ -	$ 802,794	$ -	$ 491,880	$1,706,496	$ -	$ 1,045,587	$ 482,000	$ 554,000	$ 634,767	$ 2,172,233
2043	4,755	7.90	10.00	304	18.95	1967	11,339,121	11,339,121	-	0.59		$ -	$ 809,962	$ -	$ 476,421	$1,744,528	$ -	$ 1,026,134	$ 482,000	$ 554,000	$ 609,377	$ 2,111,931
2044	4,817	8.00	11.00	304	17.45	2217	11,770,398	11,770,398	-	0.56		$ -	$ 918,455	$ -	$ 518,627	$1,826,905	$ -	$ 1,031,605	$ 482,000	$ 554,000	$ 585,002	$ 2,135,233
2045	4,879	8.10	11.00	304	17.68	2217	11,922,216	11,922,216	-	0.54		$ -	$ 926,512	$ -	$ 502,249	$1,866,701	$ -	$ 1,011,913	$ 482,000	$ 554,000	$ 561,601	$ 2,075,764
2046	4,941	8.21	11.00	304	17.90	2217	12,074,033	12,074,033	-	0.52		$ -	$ 934,569	$ -	$ 486,352	$1,906,911	$ -	$ 992,362	$ 482,000	$ 554,000	$ 539,137	$ 2,017,852
2047	5,004	8.31	11.00	304	18.13	2217	12,225,850	12,225,850	-	0.50		$ -	$ 942,625	$ -	$ 470,923	$1,947,534	$ -	$ 972,962	$ 482,000	$ 554,000	$ 517,572	$ 1,961,457
2048	5,066	8.41	11.00	304	18.35	2217	12,377,667	12,377,667	-	0.48		$ -	$ 950,682	$ -	$ 455,950	$1,988,570	$ -	$ 953,725	$ 482,000	$ 554,000	$ 496,869	$ 1,906,544
2049	5,128	8.51	11.00	304	18.58	2217	12,529,485	12,529,485	-	0.46		$ -	$ 958,738	$ -	$ 441,422	$2,030,019	$ -	$ 934,660	$ 482,000	$ 554,000	$ 476,994	$ 1,853,076
2050	5,190	8.62	11.00	304	18.80	2217	12,681,302	12,681,302	-	0.44		$ -	$ 966,795	$ -	$ 427,326	$2,071,882	$ -	$ 915,777	$ 482,000	$ 554,000	$ 457,915	$ 1,801,017
2051	5,252	8.72	11.40	304	18.36	2317	12,941,220	12,941,220	-	0.42		$ -	$ 1,017,871	$ -	$ 431,905	$2,131,968	$ -	$ 904,642	$ 482,000	$ 554,000	$ 439,598	$ 1,776,145
2052	5,314	8.82	11.40	304	18.58	2317	13,094,113	13,094,113	-	0.41		$ -	$ 1,026,283	$ -	$ 418,056	$2,174,983	$ -	$ 885,978	$ 482,000	$ 554,000	$ 422,014	$ 1,726,048
2053	5,376	8.93	11.40	304	18.79	2317	13,247,007	13,247,007	-	0.39		$ -	$ 1,034,695	$ -	$ 404,623	$2,218,415	$ -	$ 867,524	$ 482,000	$ 554,000	$ 405,133	$ 1,677,280
2054	5,438	9.03	12.00	304	18.06	2550	14,006,297	14,006,297	-	0.38		$ -	$ 1,145,518	$ -	$ 430,043	$2,364,640	$ -	$ 887,717	$ 482,000	$ 554,000	$ 388,928	$ 1,706,688
2055	5,500	9.13	12.00	304	18.27	2550	14,166,110	14,166,110	-	0.36		$ -	$ 1,154,756	$ -	$ 416,170	$2,410,908	$ -	$ 868,883	$ 482,000	$ 554,000	$ 373,371	$ 1,658,425
2056	5,562	9.24	12.00	304	18.47	2550	14,325,922	14,325,922	-	0.35		$ -	$ 1,163,994	$ -	$ 402,720	$2,457,611	$ -	$ 850,286	$ 482,000	$ 554,000	$ 358,436	$ 1,611,442
2057	5,624	9.34	12.00	304	18.68	2550	14,485,734	14,485,734	-	0.33		$ -	$ 1,173,232	$ -	$ 389,679	$2,504,749	$ -	$ 831,931	$ 482,000	$ 554,000	$ 344,099	$ 1,565,709
2058	5,686	9.44	12.00	304	18.88	2550	14,645,546	14,645,546	-	0.32		$ -	$ 1,182,470	$ -	$ 377,038	$2,552,323	$ -	$ 813,823	$ 482,000	$ 554,000	$ 330,335	$ 1,521,196
2059	5,748	9.54	13.00	304	17.62	2868	15,374,503	15,374,503	-	0.31		$ -	$ 1,337,820	$ -	$ 409,509	$2,700,293	$ -	$ 826,564	$ 482,000	$ 554,000	$ 317,121	$ 1,553,195
2060	5,811	9.65	13.00	304	17.81	2868	15,540,458	15,540,458	-	0.29			$ 1,348,191	$ -	$ 396,176	$2,750,599	$ -	$ 808,284	$ 482,000	$ 554,000	$ 304,437	$ 1,508,897
2061	5,873	9.75	13.00	304	18.00	2868	15,706,414	15,706,414	-	0.28			$ 1,358,562	$ -	$ 383,255	$2,801,356	$ -	$ 790,272	$ 482,000	$ 554,000	$ 292,259	$ 1,465,786
2062	5,935	9.85	13.00	304	18.19	2868	15,872,370	15,872,370	-	0.27			$ 1,368,932	$ -	$ 370,733	$2,852,566	$ -	$ 772,530	$ 482,000	$ 554,000	$ 280,569	$ 1,423,832
2063	5,997	9.96	13.00	304	18.38	2868	16,038,325	16,038,325	-	0.26			$ 1,379,303	$ -	$ 358,600	$2,904,228	$ -	$ 755,060	$ 482,000	$ 554,000	$ 269,346	$ 1,383,006
2064	6,059	10.06	13.00	304	18.57	2868	16,204,281	16,204,281	-	0.25			$ 1,389,674	$ -	$ 346,844	$2,956,341	$ -	$ 737,864	$ 482,000	$ 554,000	$ 258,572	$ 1,343,281
2065	6,121	10.16	13.00	304	18.76	2868	16,370,237	16,370,237	-	0.24			$ 1,400,045	$ -	$ 335,456	$3,008,907	$ -	$ 720,945	$ 482,000	$ 554,000	$ 248,229	$ 1,304,629
2066	6,183	10.27	13.00	304	18.95	2868	16,536,192	16,536,192	-	0.23			$ 1,410,415	$ -	$ 324,423	$3,061,924	$ -	$ 704,302	$ 482,000	$ 554,000	$ 238,300	$ 1,267,025
2067	6,245	10.37	14.00	304	17.78	3187	17,232,113	17,232,113	-	0.22			$ 1,575,960	$ -	$ 348,001	$3,214,246	$ -	$ 709,765	$ 482,000	$ 554,000	$ 228,768	$ 1,286,534
2068	6,307	10.47	14.00	304	17.95	3187	17,403,334	17,403,334	-	0.21			$ 1,587,463	$ -	$ 336,520	$3,269,878	$ -	$ 693,168	$ 482,000	$ 554,000	$ 219,617	$ 1,249,305
2069	6,369	10.58	14.00	304	18.13	3187	17,574,556	17,574,556	-	0.20			$ 1,598,966	$ -	$ 325,400	$3,325,977	$ -	$ 676,858	$ 482,000	$ 554,000	$ 210,833	$ 1,213,090
2070	6,431	10.68	14.00	304	18.31	3187	17,745,777	17,745,777	-	0.20			$ 1,610,470	$ -	$ 314,631	$3,382,541	$ -	$ 660,834	$ 482,000	$ 554,000	$ 202,399	$ 1,177,865
Total:	211,773										**$ 121,455,000**	**$ 121,455,000**	**$ 42,824,907**	**$ -**	**$ 18,409,775**	**$ 89,135,970**	**$ -**	**$ 38,120,938**	**$ 19,762,000**	**$ 22,714,000**	**$ 21,042,416**	**$ 199,028,129**

Indian Wells Valley Groundwater Authority

Economic Analysis: Alternative 2 - 20" Pipeline - Max 13 CFS

Pump Station Parameters:

# of P.S.	4

Phase:	Initial	Design	Max
Flow @ each P.S. (CFS):	6.5	10.8	13
Total Power Req. (kW):	1190	2797	3792

Off Peak :
19 hr

Power Costs: SCE TOU-8 Option D < 2kV	**2023**	**2030**
Meter Charge ($/Month)=	$345.98	$486.83
Power Demand Charge ($/kW/Month)=	$21.05	$29.62
Winter Mid-Peak Power Suppl. Charge ($/kW/Month)=	$10.02	$14.10
Off-Peak Use Rate ($/kWh)=	$0.0968	$0.1362
On-Peak Use Rate ($/kWh)=	$0.1271	$0.1789

19 pumping hours/day, all off-peak until 2067

OM&R Cost	**2023**	**2030**
Pipeline	$ 366,000	$482,000
Pump Station	$ 552,700	$727,000

Discount %: *4.00%* *Differential Escalator:* *1.0%* *1.0%* *0.0%*

Year	Annual Flow (AFY)	Avg. 10 month Flow Rate (CFS)	Pumping Flow Rate (CFS)	Pumping Days	Pumping Period (Hr/Day)	Total Power Demand (kW)	Total Energy Use (kWh)	Off-Peak Energy Use (kWh)	On-Peak Energy Use (kWh)	Discount Factor	IWVGA Capital Cost	Discounted PV	Power Demand + Meter Charge	Winter Mid-Peak Power Demand Suppl. Charge	Discounted Power Demand Charge	Off-Peak Energy Use Charge	On-Peak Energy Use Charge	Discounted Energy Use Charge	Pipeline OM&R Cost	Pump Station OM&R Cost	Discounted OM&R Cost	Discounted Total Cost
2030	3,614	6.00	8.00	304	18.00	1751	9,586,306	9,586,306	-	1.00	$ 128,625,000	$ 128,625,000	$ 645,619	$ -	$ 645,619	$1,305,183	$ -	$ 1,318,235	$ 482,000	$ 727,000	$ 1,209,000	$ 131,797,853
2031	3,743	6.21	8.00	304	18.64	1751	9,927,954	9,927,954	-	0.96		$ -	$ 652,075	$ -	$ 625,992	$1,365,215	$ -	$ 1,323,713	$ 482,000	$ 727,000	$ 1,160,640	$ 3,110,345
2032	3,872	6.43	9.00	304	17.14	2124	11,077,132	11,077,132	-	0.92		$ -	$ 794,015	$ -	$ 731,764	$1,538,323	$ -	$ 1,431,896	$ 482,000	$ 727,000	$ 1,114,214	$ 3,277,874
2033	4,000	6.64	9.00	304	17.71	2124	11,445,645	11,445,645	-	0.88		$ -	$ 801,799	$ -	$ 709,380	$1,605,083	$ -	$ 1,434,276	$ 482,000	$ 727,000	$ 1,069,646	$ 3,213,302
2034	4,129	6.86	9.00	304	18.28	2124	11,814,158	11,814,158	-	0.85		$ -	$ 809,583	$ -	$ 687,617	$1,672,847	$ -	$ 1,435,035	$ 482,000	$ 727,000	$ 1,026,860	$ 3,149,512
2035	4,258	7.07	9.00	304	18.85	2124	12,182,670	12,182,670	-	0.82		$ -	$ 817,368	$ -	$ 666,459	$1,741,614	$ -	$ 1,434,265	$ 482,000	$ 727,000	$ 985,786	$ 3,086,510
2036	4,320	7.17	10.00	304	17.22	2498	13,081,309	13,081,309	-	0.78		$ -	$ 965,949	$ -	$ 756,104	$1,887,892	$ -	$ 1,492,540	$ 482,000	$ 727,000	$ 946,354	$ 3,194,998
2037	4,382	7.28	10.00	304	17.46	2498	13,269,447	13,269,447	-	0.75		$ -	$ 975,062	$ -	$ 732,708	$1,933,110	$ -	$ 1,467,157	$ 482,000	$ 727,000	$ 908,500	$ 3,108,365
2038	4,444	7.38	10.00	304	17.71	2498	13,457,586	13,457,586	-	0.72		$ -	$ 984,174	$ -	$ 709,973	$1,978,841	$ -	$ 1,441,791	$ 482,000	$ 727,000	$ 872,160	$ 3,023,924
2039	4,507	7.48	10.00	304	17.96	2498	13,645,725	13,645,725	-	0.69		$ -	$ 993,287	$ -	$ 687,885	$2,025,085	$ -	$ 1,416,464	$ 482,000	$ 727,000	$ 837,274	$ 2,941,623
2040	4,569	7.59	10.00	304	18.21	2498	13,833,864	13,833,864	-	0.66		$ -	$ 1,002,400	$ -	$ 666,428	$2,071,840	$ -	$ 1,391,201	$ 482,000	$ 727,000	$ 803,783	$ 2,861,412
2041	4,631	7.69	10.00	304	18.45	2498	14,022,003	14,022,003	-	0.64		$ -	$ 1,011,513	$ -	$ 645,587	$2,119,108	$ -	$ 1,366,023	$ 482,000	$ 727,000	$ 771,631	$ 2,783,241
2042	4,693	7.79	10.00	304	18.70	2498	14,210,142	14,210,142	-	0.61		$ -	$ 1,020,625	$ -	$ 625,347	$2,166,888	$ -	$ 1,340,950	$ 482,000	$ 727,000	$ 740,766	$ 2,707,063
2043	4,755	7.90	10.00	304	18.95	2498	14,398,281	14,398,281	-	0.59		$ -	$ 1,029,738	$ -	$ 605,693	$2,215,180	$ -	$ 1,316,002	$ 482,000	$ 727,000	$ 711,135	$ 2,632,831
2044	4,817	8.00	11.00	304	17.45	2872	15,244,082	15,244,082	-	0.56		$ -	$ 1,190,274	$ -	$ 672,116	$2,366,062	$ -	$ 1,349,413	$ 482,000	$ 727,000	$ 682,690	$ 2,704,218
2045	4,879	8.10	11.00	304	17.68	2872	15,440,703	15,440,703	-	0.54		$ -	$ 1,200,715	$ -	$ 650,891	$2,417,603	$ -	$ 1,323,655	$ 482,000	$ 727,000	$ 655,382	$ 2,629,928
2046	4,941	8.21	11.00	304	17.90	2872	15,637,325	15,637,325	-	0.52		$ -	$ 1,211,156	$ -	$ 630,289	$2,469,679	$ -	$ 1,298,080	$ 482,000	$ 727,000	$ 629,167	$ 2,557,536
2047	5,004	8.31	11.00	304	18.13	2872	15,833,946	15,833,946	-	0.50		$ -	$ 1,221,597	$ -	$ 610,294	$2,522,290	$ -	$ 1,272,704	$ 482,000	$ 727,000	$ 604,000	$ 2,486,998
2048	5,066	8.41	11.00	304	18.35	2872	16,030,568	16,030,568	-	0.48		$ -	$ 1,232,038	$ -	$ 590,889	$2,575,437	$ -	$ 1,247,540	$ 482,000	$ 727,000	$ 579,840	$ 2,418,270
2049	5,128	8.51	11.00	304	18.58	2872	16,227,190	16,227,190	-	0.46		$ -	$ 1,242,479	$ -	$ 572,061	$2,629,119	$ -	$ 1,222,602	$ 482,000	$ 727,000	$ 556,647	$ 2,351,310
2050	5,190	8.62	11.00	304	18.80	2872	16,423,811	16,423,811	-	0.44		$ -	$ 1,252,920	$ -	$ 553,793	$2,683,337	$ -	$ 1,197,902	$ 482,000	$ 727,000	$ 534,381	$ 2,286,076
2051	5,252	8.72	11.40	304	18.36	3021	16,871,758	16,871,758	-	0.42		$ -	$ 1,327,649	$ -	$ 563,351	$2,779,494	$ -	$ 1,191,195	$ 482,000	$ 727,000	$ 513,006	$ 2,267,552
2052	5,314	8.82	11.40	304	18.58	3021	17,071,088	17,071,088	-	0.41		$ -	$ 1,338,621	$ -	$ 545,287	$2,835,575	$ -	$ 1,166,620	$ 482,000	$ 727,000	$ 492,485	$ 2,204,392
2053	5,376	8.93	11.40	304	18.79	3021	17,270,419	17,270,419	-	0.39		$ -	$ 1,349,593	$ -	$ 527,766	$2,892,198	$ -	$ 1,142,320	$ 482,000	$ 727,000	$ 472,786	$ 2,142,872
2054	5,438	9.03	12.00	304	18.06	3340	18,345,646	18,345,646	-	0.38		$ -	$ 1,500,926	$ -	$ 563,468	$3,097,239	$ -	$ 1,174,372	$ 482,000	$ 727,000	$ 453,875	$ 2,191,714
2055	5,500	9.13	12.00	304	18.27	3340	18,554,971	18,554,971	-	0.36		$ -	$ 1,513,031	$ -	$ 545,291	$3,157,841	$ -	$ 1,149,456	$ 482,000	$ 727,000	$ 435,720	$ 2,130,467
2056	5,562	9.24	12.00	304	18.47	3340	18,764,295	18,764,295	-	0.35		$ -	$ 1,525,135	$ -	$ 527,667	$3,219,014	$ -	$ 1,124,854	$ 482,000	$ 727,000	$ 418,291	$ 2,070,813
2057	5,624	9.34	12.00	304	18.68	3340	18,973,619	18,973,619	-	0.33		$ -	$ 1,537,239	$ -	$ 510,581	$3,280,756	$ -	$ 1,100,572	$ 482,000	$ 727,000	$ 401,559	$ 2,012,713
2058	5,686	9.44	12.00	304	18.88	3340	19,182,943	19,182,943	-	0.32		$ -	$ 1,549,343	$ -	$ 494,017	$3,343,068	$ -	$ 1,076,617	$ 482,000	$ 727,000	$ 385,497	$ 1,956,131
2059	5,748	9.54	13.00	304	17.62	3792	20,324,507	20,324,507	-	0.31		$ -	$ 1,768,805	$ -	$ 541,434	$3,569,684	$ -	$ 1,103,613	$ 482,000	$ 727,000	$ 370,077	$ 2,015,124
2060	5,811	9.65	13.00	304	17.81	3792	20,543,895	20,543,895	-	0.29			$ 1,782,516	$ -	$ 523,806	$3,636,187	$ -	$ 1,079,206	$ 482,000	$ 727,000	$ 355,274	$ 1,958,286
2061	5,873	9.75	13.00	304	18.00	3792	20,763,282	20,763,282	-	0.28			$ 1,796,228	$ -	$ 506,722	$3,703,287	$ -	$ 1,055,157	$ 482,000	$ 727,000	$ 341,063	$ 1,902,941
2062	5,935	9.85	13.00	304	18.19	3792	20,982,669	20,982,669	-	0.27			$ 1,809,940	$ -	$ 490,166	$3,770,984	$ -	$ 1,031,467	$ 482,000	$ 727,000	$ 327,420	$ 1,849,054
2063	5,997	9.96	13.00	304	18.38	3792	21,202,056	21,202,056	-	0.26			$ 1,823,651	$ -	$ 474,125	$3,839,279	$ -	$ 1,008,142	$ 482,000	$ 727,000	$ 314,324	$ 1,796,590
2064	6,059	10.06	13.00	304	18.57	3792	21,421,443	21,421,443	-	0.25			$ 1,837,363	$ -	$ 458,582	$3,908,171	$ -	$ 985,183	$ 482,000	$ 727,000	$ 301,751	$ 1,745,515
2065	6,121	10.16	13.00	304	18.76	3792	21,640,830	21,640,830	-	0.24			$ 1,851,075	$ -	$ 443,524	$3,977,660	$ -	$ 962,592	$ 482,000	$ 727,000	$ 289,681	$ 1,695,797
2066	6,183	10.27	13.00	304	18.95	3792	21,860,217	21,860,217	-	0.23			$ 1,864,786	$ -	$ 428,937	$4,047,747	$ -	$ 940,371	$ 482,000	$ 727,000	$ 278,093	$ 1,647,401
2067	6,245	10.37	13.00	304	19.14	3792	22,079,604	21,913,268	166,336	0.22			$ 1,878,498	$ 323,990	$ 486,350	$4,087,406	$ 29,753	$ 918,237	$ 482,000	$ 727,000	$ 266,970	$ 1,671,557
2068	6,307	10.47	13.00	304	19.33	3792	22,298,991	21,907,766	391,225	0.21			$ 1,892,210	$ 323,990	$ 469,803	$4,116,207	$ 69,979	$ 896,286	$ 482,000	$ 727,000	$ 256,291	$ 1,622,380
2069	6,369	10.58	13.00	304	19.52	3792	22,518,378	21,897,871	620,507	0.20			$ 1,905,921	$ 323,990	$ 453,801	$4,144,162	$ 110,991	$ 874,610	$ 482,000	$ 727,000	$ 246,039	$ 1,574,451
2070	6,431	10.68	13.00	304	19.71	3792	22,737,765	21,883,585	854,181	0.20			$ 1,919,633	$ 323,990	$ 438,328	$4,171,253	$ 152,789	$ 853,219	$ 482,000	$ 727,000	$ 236,198	$ 1,527,745
Total:	211,773										**$ 128,625,000**	**$ 128,625,000**	**$ 54,826,546**	**$ 1,295,961**	**$ 23,769,897**	**$ 114,866,947**	**$ 363,511**	**$ 49,355,533**	**$ 19,762,000**	**$ 29,807,000**	**$ 24,556,256**	**$ 226,306,685**

* A discount factor of 2.5%

APPENDIX D - POWER AVAILABILITY & SCE COORDINATION TECHNICAL MEMO

APPENDIX E - LIST OF PIPE CROSSINGS

APPENDIX F – PRODUCT SHEET CUTS

APPENDIX G – EXAMPLE HYDO PROPOSAL

APPENDIX H – WATER QUALITY TABLES

APPENDIX I – ALIGNMENT PARCEL LIST

APPENDIX J – SOIL BORING LOGS

APPENDIX K – CONSTRUCTION SCHEDULE

APPENDIX L – PRELIMINARY OPINION F PROJECT COSTS

Indian Wells Valley Groundwater Authority
Imported Water Conveyance System
Preliminary Opinion of Project Costs

(all costs are in 2023 dollars)

Item	Description	Unit	Quantity	Unit Price	Total
General					
1	Mobilization/Demobilization, Worker Protection(5.0%)	LS	1	$7,926,287	$7,926,287
2	Miscellaneous Facilities(Environmental/SWPPP Implementation (1.5%)	LS	1	$2,377,886	$2,377,886
				Subtotal	**$10,304,173**
Transmission Pipeline					
	24" C900 DR18 PVC Pipe				
3	Basic installation	LF	133,065	$340	$45,241,967
4	With restrained joints in seismic risk areas.	LF	12,069	$410	$4,948,134
5	Where rocky conditions are probable	LF	0	$440	$0
	24" CML&C Steel Pipe (250 psi)				
6	Basic installation	LF	22,284	$475	$10,584,981
7	In seismic risk areas.	LF	9,450	$570	$5,386,500
8	Where rocky conditions are probable	LF	34,994	$575	$20,121,613
	18" CML&C Steel Pipe (250 psi)				
9	Basic installation	LF	9,378	$420	$3,938,760
10	In seismic risk areas.	LF	3,400	$504	$1,713,600
11	Where rocky conditions are probable	LF	41,168	$520	$21,407,350
12	Total 24" HDPE Horiz. Directional Drilled Pipeline	LF	2,400	$1,380	$3,312,000
13	24" Bored & Jacked Steel Casing	LF	1,400	$2,500	$3,500,000
14	20" Butterfly Isolation Valve (Cl. 250 II)	EA	6	$10,100	$60,600
15	24" x 20" Reducer	EA	12	$700	$8,400
16	Bottomless Vault 6'x8'x4' w/ 2-pc lift assist	EA	12	$26,288	$315,450
17	20" High Pressure Butterfly Isolation Valve (Cl. 250B)	EA	6	$13,300	$79,800
18	24" x 20" Reducer	EA	12	$693	$8,316
19	Bottomless Vault 6'x8'x4' w/ 2-pc lift assist	EA	12	$26,288	$315,450
20	4" Combination Air/Vacuum Release Valve Assembly	EA	98	$10,000	$980,000
21	Pipeline Products Air/Vac Poly Enclosure, 24" x 36"	EA	98	$1,035	$101,430
22	Blowoff	EA	6	$7,000	$42,000
23	Blowoff & Pressure Relief Valve Station	EA	6	$27,286	$163,716
24	Trench Repaving	SF	360,000	$16	$5,760,000
25	Pipeline 4-inch Thick Agg. Base Maintenance Road	CY	2,580	$120	$309,634
				Subtotal	**$128,299,701**
Pump Stations 1 -Estimate provided by Stantec					
26	Pump Station Building/MCC Construction	SF	4,620	$200	$924,000
27	Low Flow Vertical Turbine Pumps (900 GPM)	EA	3	$125,000	$375,000
28	High Flow Vertical Turbine Pumps (1,800 GPM)	EA	4	$150,000	$600,000
29	Suction Header Assembly	EA	1	$149,521	$149,521
30	Discharge Assembly	EA	1	$200,825	$200,825
31	Surge Tank and Appurtenances (Suction)	GAL	8,000	$144	$1,152,000
32	Surge Tank and Appurtenances (Suction)	GAL	4,000	$144	$576,000
33	Site Grading	CY	15,000	$15	$225,000
34	18" Discharge Line to Transmission Line	LF	157	$381	$59,775
35	18" Mag Flow Meter	EA	1	$26,415	$26,415
36	Flow Meter Vault	EA	1	$14,424	$14,424
37	HVAC / Ventilation	LS	1	$65,000	$65,000
38	Motor Control Center	LS	7	$54,000	$378,000
38	Site Wiring	LS	1	$50,000	$50,000
39	Site Lighting	LS	1	$60,000	$60,000
39	VFD	EA	7	$100,000	$700,000
40	Utility Hookup Fee	LS	1	$50,000	$50,000
41	SCADA RTU/Radio	LS	1	$40,000	$40,000
				Subtotal	**$5,645,959**

Pump Station 2					
42	Pump Station Building/MCC Construction	SF	4,620	$200	$924,000
43	Low Flow Vertical Turbine Pumps (900 GPM)	EA	3	$125,000	$375,000
44	High Flow Vertical Turbine Pumps (1,800 GPM)	EA	4	$150,000	$600,000
45	Suction Header Assembly	EA	1	$149,521	$149,521
46	Discharge Assembly	EA	1	$200,825	$200,825
47	Surge Tank and Appurtenances (Suction)	GAL	8,000	$144	$1,152,000
48	Site Grading	CY	15,000	$15	$225,000
49	18" Discharge Header	LF	157	$381	$59,775
50	18" Mag Flow Meter	EA	1	$26,415	$26,415
51	Flow Meter Vault	EA	1	$14,424	$14,424
52	Chemical Injection Systems	EA	1	$10,000	$10,000
53	Water Storage Regulating Tank	EA	1	$452,000	$452,000
54	Building Comfort Station	EA	1	$10,000	$10,000
55	HVAC / Ventilation	LS	1	$65,000	$65,000
56	Motor Control Center	LS	7	$54,000	$378,000
57	Site Wiring	LS	1	$50,000	$50,000
58	Site Lighting	LS	1	$60,000	$60,000
59	VFD	EA	7	$100,000	$700,000
60	Utility Hookup Fee	LS	1	$50,000	$50,000
61	SCADA RTU/Radio	LS	1	$40,000	$40,000
				Subtotal	**$5,541,959**
Pump Stations 3					
62	Pump Station Building/MCC Construction	SF	4,620	$200	$924,000
63	Low Flow Vertical Turbine Pumps (900 GPM)	EA	3	$125,000	$375,000
64	High Flow Vertical Turbine Pumps (1,800 GPM)	EA	4	$150,000	$600,000
65	Suction Header Assembly	EA	1	$149,521	$149,521
66	Discharge Assembly	EA	1	$200,825	$200,825
67	Surge Tank and Appurtenances (Suction)	GAL	8,000	$144	$1,152,000
68	Site Grading	CY	28,000	$15	$420,000
69	18" Discharge Line to Transmission Line	LF	157	$381	$59,775
70	18" Mag Flow Meter	EA	1	$26,415	$26,415
71	Flow Meter Vault	EA	1	$14,424	$14,424
72	Water Storage Regulating Tank	EA	1	$452,000	$452,000
73	HVAC / Ventilation	LS	1	$65,000	$65,000
74	Motor Control Center	LS	7	$54,000	$378,000
75	Site Wiring (Outside of Building)	LS	1	$50,000	$50,000
76	Site Lighting	LS	1	$60,000	$60,000
77	VFD	EA	7	$100,000	$700,000
78	Utility Hookup Fee	LS	1	$50,000	$50,000
79	SCADA RTU/Radio	LS	1	$40,000	$40,000
				Subtotal	**$5,716,959**
AVEK Turnout					
62	24" Megaflange Series 2100	EA	1	$1,500	$1,500
63	24"x18" Steel Eccentric Reducer	EA	1	$1,069	$1,069
64	18"x18"x18" Steel Tee	EA	1	$1,275	$1,275
65	18" Butterfly Valve (250II)	EA	1	$11,550	$11,550
66	Christy G-05 Box	EA	1	$300	$300
67	18" Garlock Link Seal	EA	1	$500	$500
68	18" ABB Aquamaster Mag Meter	EA	1	$30,818	$30,818
69	18" Cla-Val Check Valve 81-02	EA	1	$80,500	$80,500
70	18" Steel 90° Bend	EA	1	$1,200	$1,200
71	18" Megaflange Series 2100	EA	1	$750	$750
72	18" Victaulic Grooved Coupling Style 31	EA	1	$375	$375
73	1" Sampling Station	EA	1	$3,000	$3,000
74	18" Eaton Pipe Support B3092-18 Eaton B3088T Stanchion and Footing	EA	8	$1,200	$9,600
75	Bottomless Vault 8'x8' w/ 4'x6' Double Leaf Access Cover	EA	1	$23,156	$23,156
76	Bottomless Vault 6'x6' w/ 4'x6' Double Leaf Access Cover	EA	1	$20,375	$20,375
				Subtotal	**$185,968**
PRV Stations					
77	PRV 1	EA	1	$147,101	$147,101
78	PRV 2	EA	1	$147,101	$147,101
79	PRV 3	EA	1	$147,101	$147,101
				Subtotal	**$441,302**
FCV Station					
80	Flow Control Valve	EA	1	$55,000	$55,000
81	Valves and Plumbing	LS	1	$10,100	$10,100
82	Bottomless Vault 8'x8' w/ 4'x6' Double Leaf Access Cover	EA	1	$27,788	$27,788
				Subtotal	**$92,888**

Regulating Tank at Highpoint Along Hwy 395					
83	242,000 Gallon Regulation Tank and Foundation	LS	242,000	$2.0	$484,000
84	Pad Grading	CY	2,100	$15.0	$31,500
				Subtotal	**$515,500**
Terminus Tank at Ridgecrest Heights Tank Facility					
85	1,000,000 Gallon Blending Tank and Foundation	Gallons	1,000,000	$2.0	$2,000,000
86	Pad Grading	CY	5,700	$15.0	$85,500
				Subtotal	**$2,085,500**
Electrical Power Line					
86	Overhead Power Line and Poles	Mile	10	$1,000,000	$10,000,000
				Subtotal	**$10,000,000**
				Total Construction Cost	**$168,830,000**
				ACEE Class 3 Contingency (20%)	**$31,706,000**
				Total Construction Cost w/ Contingency	**$200,536,000**

APPENDIX M – PRELIMINARY LIST OF SPECIFICATIONS

ATTACHMENT 1 – PRELIMINARY DESIGN DRAWINGS

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IWVGA ADMINISTRATIVE OFFICE

STAFF REPORT

TO: IWVGA Board Members **DATE: September 13, 2023**

FROM: IWVGA Staff

SUBJECT: **Agenda Item 12 – Approval of Payment to Southern California Edison for Processing Request to Cross High Voltage Transmission Lines**

BACKGROUND

On February 28, 2023, the Indian Wells Valley Groundwater Authority (IWVGA) executed a Contract Services Agreement (CSA) with Provost and Pritchard Consulting Group (P&P) for design services for the Imported Water Pipeline Project. A Sustainable Groundwater Management Act (SGMA) Implementation Grant through the California Department of Water Resources is providing $7.6 million for planning and design-level activities, including design services, for the Imported Water Pipeline Project, which will bring imported water supplies into the Indian Wells Valley Groundwater Basin through an imported water connection from Antelope Valley – East Kern Water Agency's (AVEK) California City pipeline to the Indian Wells Valley Water District water system.

The Imported Water Project includes approximately 50.3 miles of pipeline, three pump stations, two forebay tanks, and a regulating tank. P&P's Scope of Work, as described in the CSA, includes working with Southern California Edison Company (SCE) to obtain approvals for the pipeline to cross SCE property and easements and to develop new electric transmission facilities for service to the proposed pumping stations.

DISCUSSION

The pipeline alignment routes through the intersection of Redrock-Randsburg Road and Garlock Road and crosses under SCE's 200 kilovolt (kV) and 115 kV transmission lines east of the intersection. SCE requires the IWVGA to enter into a Consent Agreement for the crossing. SCE has completed a preliminary review of the Consent request and preliminary plans for the crossing and has requested payment of a processing fee of $7,500.00 to cover the cost of, including-but not limited to, the SCE's Transmission Department Business Unit technical plan review and labor costs, evaluation of SCE's land rights, and Real Properties Agent labor. This fee is based on estimated costs and is subject to change should the scope of the project change or if SCE determines an additional processing fee is required.

At the completion of the review, and receipt of an executed Consent Agreement, a final invoice will be sent by SCE to either bill or refund any difference in actual expenses from the initial estimated cost of $7,500.00.

Similar fees are expected at several other crossings where SCE is the underlying landowner.

The Request for Advance Payment and Letter from SCE are included in your Board Packet for your review.

RECOMMENDED ACTION

Staff recommends the Board approve payment of the fee for the SCE High Voltage Transmission Line Crossing Consent Agreement in the amount of $7,500.00.

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SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

August 31, 2023

INDIAN WELLS VALLEY GROUNDWATER AUTHORITY
CAROL THOMAS-KEEFER - GENERAL MANAGER
100 W. CALIFORNIA AVE
RIDGECREST, CA 93555
C/O Stuart Patteson, Provost & Pritchard Consulting

Subject: Consent Request for water pipeline crossings under SCE Transmission
Indian Wells Valley Groundwater Authority -Imported Water Conveyance System
Garlock Rd., Johnannesburg
BLM West-Kramer 220kV; Kramer-Inyokern-Randsburg #1 & 3 115kV
SCE File No. CON204238148/802305656

Dear Ms. Thomas-Keefer,

Southern California Edison Company (SCE) has completed a preliminary review of the subject Consent request and plans. This Consent will be processed on a completed cost basis. In order to commence with the Consent review by all operating departments involved, a one-time processing fee in the amount of $7,500 will be required. The fee requested will cover the cost of, including-but not limited to, the Transmission Department Business Unit (TDBU) technical plan review and labor costs; evaluation of SCE's land rights and Real Properties Agent labor.

Please note this initial estimated processing fee is based on estimated costs; SCE's work, however, is being performed on an actual cost basis. If the scope of the project changes or SCE determines an additional processing fee is required, a revised estimated billing letter will be provided to you. Upon receipt of the additional payment, the Consent review will continue.

At the completion of the review and upon receipt of the executed Consent Agreement, you will be sent a final invoice and be billed or refunded any difference covering the actual cost of the job. Any amount owed by you to SCE at the completion of the project shall be due no later than 30 days after receipt of the final invoice.

Please acknowledge your understanding of SCE's Consent process, as stated above, by signing below. Upon receipt of the processing fee, street improvement plans, grading plans, landscaping plans, and the original executed copy of this letter, the technical review of this Consent request will commence.

If your project will be delayed or canceled, please notify me immediately at 909-586-1042 or via e-mail at jennifer.farley@sce.com.

Best Regards,

Jennifer Farley
Real Estate & Facilities, Sr. Specialist
Eastern Region -Land Management
Vegetation & Land Management
Southern California Edison Company
2 Innovation Way
Pomona, CA 91768

ACKNOWLEDGEMENT OF SCE'S CONSENT PROCESS

INDIAN WELLS VALLEY GROUNDWATER AUTHORITY

By: _____ **Date:** _____

Signature

_____ _____

Print Name **Title:**

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Request For Advance Payment

Indian Wells Valley Groundwater Aut
Attn: Carol Thomas-Keefer, GM
100 W California Ave
Ridgecrest, CA 93555

Document #	7590510697
Document Date	08/29/2023
Customer #	10369884
SCE Contact	Jennifer Farley
Telephone #	909-274-1600
(RP)	

Description	Amount
Advance Payment - Consent Estimated	$7,500.00
SCE Project# : 204238148	
Consent Request 204238148 - 802305656	

If paying by check, please follow instructions on bill stub below

Instructions for wire or ACH payments:
JP Morgan Chase Bank
New York, NY
ABA#: 021000021 Acct#: 323-394434
SCE Taxpayer ID No. 95-1240335
Ref: Customer# 10369884 - Document# 7590510697 - Jennifer Farley

Failure to properly identify your customer and document number may delay your project

Please detach and return payment stub with payment

Cut Here ----------

Payment Stub **$7,500.00**

Customer 10369884
Document 7590510697
(RP)

Enter the amount you paid **$**

Make check payable to Southern California Edison.
Please include customer and document# on the check.

Indian Wells Valley Groundwater Aut
Attn: Carol Thomas-Keefer, GM
100 W California Ave
Ridgecrest, CA 93555

Southern California Edison
Attn: Accounts Receivable
PO Box 800
Rosemead, CA
91771-0001

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TO: IWVGA Board Members **DATE: September 13, 2023**

FROM: IWVGA Water Resources Manager

SUBJECT: Agenda Item 13 – WATER RESOURCES MANAGER'S REPORT

AGENDA ITEM 13a – GRANT FUNDING UPDATE

Proposition 1 Update

- Invoice #15a
  - Covers April 2022 through June 2022
  - Total requested payment after retention: **$17,532.41**
  - Status: Approved, awaiting payment
- Invoice #16a
  - Covers July 2022 through September 2022
  - Total requested payment after retention: **$21,049.59**
  - Status: Under DWR review – revisions submitted to DWR.
- Invoice #17a:
  - Covers October 2022 through December 2022
  - Total requested payment after retention: **$7,817.63**
  - Status: Under DWR review – revisions submitted to DWR.

Proposition 68 Update

- Invoice #16b
  - Covers July 2022 through September 2022
  - Total requested payment after retention: **$6,380.65**
  - Status: Approved, awaiting payment

- Invoice 17b:
  - Covers October 2022 through December 2022
  - Total requested payment after retention: **$3,062.50**
  - Status: Approved, awaiting payment

Proposition 1/68 Grant Closeout

- Retention invoices for Proposition 1 and Prop 68 in the amount of $187,678.87 and $32,941.39, respectively were submitted to DWR on February 28, 2023. The Proposition 1 retention invoice was revised on May 18 per DWR's request.

SGMA Implementation Round 1 Update

- Invoice #2
  - Covers October 2022 through December 2022
  - Total requested payment: **$ 332,985.58**
  - Status: Minor revisions requested by DWR.
- Invoice #3
  - Covers January 2023 through March 2023
  - Total requested payment: **$400,586.61**
  - Status: Under DWR review
- Invoice #4
  - Covers April 2023 to June 2023
  - Total requested payment: **$1,062,552.46**
  - Due August 29, 2023

Urban Community Drought Relief Program Update

- The IWVGA has been awarded $3,345,000 to consolidate shallow well system(s) into a public water system.
- Preliminary grant management tasks and coordination with DWR are underway.
- DWR is currently reviewing the draft grant agreement and finalizing it for signature/execution.

AGENDA ITEM 13b – GSP IMPLEMENTATION PROJECTS / MANAGEMENT ACTIONS UPDATE

Recycled Water Program

- U.S. Bureau of Reclamation Title XVI Feasibility Study
  - Board authorized Water Resource Manager to submit Title XVI Feasibility Study to U.S. Bureau of Reclamation (BOR) at the March 8, 2023 Board Meeting
    - BOR completed review of the Feasibility Study and requested clarification on some items.
    - Water Resource Manager has submitted a response to BOR's request and a revised Feasibility Study.
    - Received confirmation from BOR for receipt of Title XVI Feasibility Study.
    - Title XVI Feasibility Study has been posted on the IWVGA website.

Imported Water Project

- Imported Water Pipeline Alignment Study
  - Submitted to DWR on July 18, 2023

- Imported Water Pipeline Design Services
  - Coordination Meetings:
    - August 28: Bi-weekly with Staff, Environmental and Right-of-Way Consultants
    - Bi-weekly meetings with BLM
      - Resubmitted SF-299 Application for BLM review

        - Ongoing coordination with State Water Resources Control Board Division of Drinking Water (DDW), Caltrans, United Pacific Rail Road, and Southern California Edison (SCE)
            - Method of Survey Study to SCE being reviewed by SCE Bishop office
            - Coordinating Consent Agreement for transmission crossings along Garlock Road and an Encroachment Agreement with SCE for crossing all lines 33 Kilovolt (kV) and less.
                - Provided Staff with Consent Request to cross under the 200 kilovolt (kV) and 115 kV transmission lines east of the Redrock-Randsburg Road and Garlock Road intersection
            - Held meeting with SCE regarding land and real estate
            - Pending receival of United States Army Corps of Engineers (USACE) and State Water Resources Control Board (SWRCB) waiver letters
            - Drafting California Department of Fish and Wildlife Lake and Streambed Alternation Agreement (LSA)
            - Received Cal Trans permits for geotechnical borings
        - IWVWD has suspended coordination with the design consultant and has not allowed access to the tank site for geotechnical borings or access for collection of water quality samples to allow evaluation introducing water from AVEK into the IWVWD water system.
    - Continuing soils borings in California City and Kern County right-of-way
        - Need to restake geotechnical boring sites along Redrock Randsburg Road due to Hurricane Hilary
        - Coordinating with Kern County Roads Department on updates of repairing severe damage to Redrock Randsburg Road form Hurricane Hilary
    - Continuing utility research and trenchless crossing identification
    - Staff is reviewing Sub-Regional Power Availability and Coordination with SCE Technical Memorandum
    - Staff is reviewing Pipe Optimizations and Refinements Technical Memorandum
    - Staff is reviewing draft Preliminary Design Report
        - The draft Preliminary Design Report is included in the Board package
    - Board approved the Application and Agreement for Use of Kern County Right-of-Way for the installation, maintenance, inspection, etc. of the imported water pipeline within County Right-of-Way along Neuralia Road, Redrock Randsburg Road, Garlock Road and China Lake Boulevard
    - Board approved the Reimbursement Agreement with California City for reimbursement of costs of plan review, permit processing, and agreement development needed for approval of construction and permitting
    - Board approved the change in Scope of Work and a Contract Sum increase of $120,051.00 for the Contract Services Agreement which includes:
        - Additional work, requested by AVEK, to develop descriptions and maps for alternative connections points to AVEK's system being evaluated by AVEK
        - Additional work, requested by BLM, for surveying to stake the locations of proposed geotechnical field work
        - Additional water quality sampling and testing required for treated surface water delivered by AVEK through AVEK's California City Feeder

- Next Steps:
  - Start geotechnical borings in BLM land after cultural survey are completed
  - Start collecting water quality samples of groundwater and surface water at AVEK's Rosamond Treatment Plant for compatibility of into the system in September
  - Finalize Sub-Regional Power Availability and Coordination with SCE, Pipe Optimizations and Refinements, and Preliminary System Hydraulics Technical Memorandum
  - Next Milestones
    - Finalize Preliminary Design Report
    - Provide 30% Design Submittal by November 2023

- Imported Water Pipeline Environmental Services
  - Coordination Meetings
    - August 28: Bi-weekly coordination meetings with Staff, Design and Right-of-Way Consultants
    - Biweekly meetings with BLM
    - Continuing coordination with the California Department of Fish and Wildlife, United States Army Corps of Engineers, and State Water Resources Control Boards
  - Continue aquatic delineations
  - Commenced cultural surveys on BLM land, to be followed by geotechnical surveys
  - Finalizing the draft Wildlife Survey Report and Rare Plant Survey
  - Finalized the Administrative Draft Initial Study/Mitigated Negative Declaration
  - Finalizing the draft Biological Evaluation/Biological Assessment and Energy Impact Assessment Technical Studies
  - Staff is reviewing the Noise & Groundborne Vibration Impact Analysis and Air Quality & Greenhouse Gas Impact Analysis Technical Studies
  - Held Public Scoping Meetings:
    - In the City of Ridgecrest
      - Date: Wednesday, August 23rd, 2023
      - Time: 5:30 P.M. to 7:00 P.M.
      - Place: Kerr McGee Community Center. Located at 100 W California Avenue, Ridgecrest, CA 93555
    - In California City
      - Date: Thursday, August 24, 2023
      - Time: 5:30 P.M. to 7:00 P.M.
      - Place: Kern County Library - California City Branch. Located at 9507 California City Blvd, California City, CA 93505
    - Extended the Comment Period for the Notice of Preparation by 2 weeks, starting on September 6, after receiving a request for an extension from the Center of Biodiversity
  - Board approved the change in Scope of Work and a Contract Sum increase of $58,876.00 for the Contract Services Agreement which includes:
    - Additional coordination meetings with Staff due to additional alternatives being added to the CEQA scoping meeting
    - Biological monitoring during geotechnical borings required by the BLM
    - Additional technical study requested by BLM for transects along corridor outside of recommended guidelines

        - Additional public outreach and scoping meeting efforts needed as a result of five (5) additional alternatives added to the draft Alternatives Analysis
        - Updating maps and descriptions within the CEQA/NEPA documents due to changes in alignment for the purpose of avoiding existing utilities or other impediments
        - Work already done on the separation of the planned joint CEQA/NEPA document, requested by BLM
    - Next Steps:
        - Begin geotechnical and biological monitoring on BLM lands
        - Finalize draft Alternatives Analysis, Environmental Impact Report, and BLM Environmental Assessment
        - Next Milestones:
            - Finalize NEPA compliance for geotechnical borings and environmental surveys/ studies within BLM property
            - Conduct technical analyses/ Special Studies within BLM land by November 2023

- Imported Water Pipeline Right-of-Way Services
    - Coordination Meetings:
        - August 28: Bi-weekly coordination meetings with Staff, Design and Environmental Consultants
    - Obtained 50 Right-of-Entry agreements from property owners for 48 parcels along the alignment to allow performance of biological/technical studies and geotechnical borings
    - Coordinating with California Fish and Wildlife regarding County Right of Way
    - Board approved the change in Scope of Work and a Contract Sum increase of $290,005.00 for the Contract Services Agreement (CSA) which includes updates on the scope and budget proposed by OPC prior to completion of the Alignment Study
    - Next Steps:
        - Continue obtaining Rights of Entry from property owners along the pipeline alignment to allow performance of biological/technical studies and geotechnical borings
    - Next Milestone:
        - Provide a Right of Way Acquisition Plan by June 2024

- Submittals to DWR
    - Preliminary Design Report due November 1, 2023
    - Documentation of Research due January 1, 2024

- US Army Corps of Engineers Planning Assistance to States (PAS) Program
    - Staff provided an updated proposed list of project scope, tasks, and deliverables for Army Corps review
        - Next Steps:
            - Meet with Army Corps to finalize project scope and execute agreement

Shallow Well Mitigation Program

- Current Applications
  - Stark Street Mutual Water Company
    - Finalizing reimbursement payment process with Self-Help
  - Terry Byerly Well
    - Initial inquiry for mitigation assistance.
    - Coordinating with applicant on application process

Preview of 5 Year Update Schedule

- Staff will provide a brief preview of the Update Schedule

Schedule for 2023 Annual Report

- November 20, 2023: Provide Complete Review Draft to GA Staff, the TAC, and the Board
- December 13, 2023: Presentation of Review Draft to the Board
- February 14, 2023: Presentation of Revised Draft to the Board with TAC, and Board comments incorporated
- March 13, 2024: Final Annual Report Completed
- April 1, 2024: Submittal to DWR

AGENDA ITEM 13c – MISCELLANEOUS ITEMS

Data Collection and Monitoring

August 15-17: Additional groundwater level monitoring and datalogger download for wet year conditions (DWR supplemental monitoring) and LADWP emergency releases.

September 11-15: Wellhead and gage maintenance. Survey of a subset of GWMP wells.

GSP Model Configuration Management Plan (CMP)

- Continued discussions with DRI and WRM regarding model updates
- Bi-weekly discussions w.r.t. model development

Aug 25 TMG mtg to discuss 1) model revisions, (2) clay extents using AEM data and well logs, and (3) initial recharge distribution

Sept 5 DRI/WRM call to discuss historical calibration pumping reported data, 2020 GSP Model pumping estimates by well, plan to estimate data gaps

CMP Timeline

2023: Development of historical and baseline data assumptions using reported pumping
September - planned review of model revisions and calibration
EOY Model Sensitivity/Uncertainty, and Baseline for 5-Year GSP Report

2024: Modeling Scenarios for 5-Year GSP Report

Subflow from Rose Valley to IWV

Sept 13th Follow up Navy w.r.t. Navy/Coso FY 2024 project funding

September Continued processing of BLM permit for alternative RVS monitoring well site.
Cultural Review for BLM permitting of RVS-2 monitoring

LADWP Emergency Releases

Emergency releases re-started August 25th at Freeman Gates and August 30th at Sage Canyon

ACTION(S) REQUIRED BY THE BOARD

There are no actions required by the Board.

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Client Memorandum

To:	Carol Thomas-Keefer, General Manager Indian Wells Valley Groundwater Authority
From:	Jeff Simonetti, SVP Capitol Core Group
cc:	Steve Johnson, Stetson Engineers Michael W. McKinney, President Capitol Core Group Todd Tatum, SCA Capitol Core Group
Date:	September 13, 2023
Subject:	Project Update Memorandum – August/early September 2023 Activities

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The following will provide activities and updates for the months of August and early September 2023.

Task 1: Imported Water Supplies

IWVGA met with the leadership at the Antelope Valley – East Kern Water Agency to continue discussions related to the imported water pipeline and the wheeling of water through their facilities to the Indian Wells Valley. The team at Stetson/Provost & Pritchard are also working collaboratively with the AVEK team to further the engineering and modeling studies for the interconnection project. We also continued discussions with water rights sellers on providing water rights to the Indian Wells Basin.

Task 2: Interconnection Pipeline Project

Updated Report – *Water Resources Development Act of 2024*

See separate action item.

Task 3: Water Recycling Plant

No project updates since August 23, 2023.

Task 4: Wastewater Treatment Plant

No project updates since August 23, 2023.

Task 5: Other Projects Supporting the GSP

OTHER FEDERAL LEGISLATIVE UPDATES:

Congress has returned to Session. No updates since August 23, 2023.

STATE LEGISLATIVE UPDATES:

Updated Report/Direction Requested – AB 444 (Addis): California Defense Community Infrastructure Act

AB 444 was held in the Senate Committee on Appropriations. While Senators did not object to the policy or the grant program created by the bill, concerns from Senate Leadership and the Governor's office concerning the program's creation without funding caused the bill to remain on the Suspense File. The California Defense Community Infrastructure program effectively dies until proponents can successfully seek appropriation for the grant.

In 2023, IWVGA and the City of Ridgecrest opted to lead the lobbying efforts concerning the Cal-DCIP effort. Those efforts netted nearly unanimous support for the enactment of the grant program. Direction is requested from IWVGA and the City to continue that lobbying effort in 2024 to seek an appropriation and allow either AB 444 or another legislative vehicle to move forward.

Updated Report – AB 560 (Bennett): Groundwater Adjudications

AB 560 was made into a "two-year" bill and remains pending in the Senate Committee on Appropriations. This means that consideration of the bill will carry forward into 2024, as AB 560 has met all legislative deadline requirements. The legislature has until September 2024 to continue consideration of AB 560.

Updated Report – AB 779 (Wilson): Groundwater Adjudications

AB 779 was discharged from the Suspense File and favorably reported by the Senate Committee on Appropriations. AB 779 is pending on the Senate Floor for a final vote.

Updated Report – AB 1205 (Bauer-Kahan): Water Purchase, Sale, Lease, and Transfer from Agriculture Properties – Study Bill

AB 1205 was discharged from the Suspense File and favorably reported by the Senate Committee on Appropriations. AB 1205 is pending on the Senate Floor for a final vote.

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