

**AGENDA
GROUNDWATER BANKING JOINT POWERS AUTHORITY
BOARD OF DIRECTORS**



August 03, 2021

Due to COVID-19, this meeting will be conducted as a teleconference pursuant to the provisions of the Governor's Executive Orders N-25-20 and N-29-20, which suspend certain requirements of the Ralph M. Brown Act. Members of the public may not attend this meeting in person.

Participation by members of the Board of Directors will be from remote locations. Public access and participation will only be available telephonically/electronically.

To virtually attend the meeting and to be able to view any presentations or additional materials provided at the meeting, please join online using the link and information below:

Via Web: <https://zoom.us/j/83815086560>
Meeting Number (Access Code): 838 1508 6560
Meeting Password: 982590
Telephone Dial In: (669) 900-6833

As courtesy to the other participants, please mute your phone when you are not speaking.

PLEASE NOTE: Participants joining the meeting will be placed into the lobby when the Board enters closed session. Participants who remain in the "lobby" will automatically be returned to the open session of the Board once the closed session has concluded. Participants who join the meeting while the Board is in closed session will be placed in the waiting room. When the Board has returned to open session, the participants will be automatically added to the meeting.

CALL TO ORDER 1:30 p.m.

ROLL CALL Directors Pierucci, Selvidge, Reinhart, Swan

**PUBLIC COMMENT
NOTICE**

If you wish to address the Board of Directors on any item, please submit a request to speak via the "chat" feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing mmisuraca@rrbwsd.com before 5:00 pm. on July 29, 2021.

ALL VOTES SHALL BE TAKEN BY A ROLL CALL VOTE

1. COMMUNICATIONS TO THE BOARD

- a) Written:
- b) Oral:

2. ITEMS RECEIVED TOO LATE TO BE AGENDIZED

3. CONSENT ITEMS

- a) Regular Meeting Minutes May 3, 2021
- b) Special Meeting Minutes July 16, 2021

4. SJPA ADMINISTRATIVE AND FINANCIAL REPORT

- a) Year-end Financial Review (Cheryl)
- b) Consideration of 2nd Quarter Cash Call (Cheryl)
- c) Consideration of 2nd Cash Call for Land Acquisition (Dan)
- d) Consideration of Resolution Authorizing WSIP Grant Funding Transfer (Fiona)

5. KERN FAN GROUNDWATER STORAGE PROJECT

- a) Consideration of Technical Memos 8-11 (Dan/Curtis)
- b) Request Proposals Update (Dan)
- c) Coordination of Alignment Update (Dan)
- d) Property Acquisition Update (Rob/Dan)

6. GENERAL MANAGER'S REPORT

- a) Post Covid Executive Order Board Meeting Format Changes (Doug)
- b) DWR Update (Fiona)
- c) Water Commission Update (Fiona)

7. OTHER BUSINESS

Pursuant to Government Code Section 54954.2, members of the Board of Directors or staff may ask questions for clarification, make brief announcements, and make brief reports on his/her own activities. The Board or a Board member may provide a reference to staff or other resources for factual information, request staff to report back at a subsequent meeting concerning any matter, or

direct staff to place a matter of business on a future agenda. Such matters may be brought up under the General Manager's Report or Directors' Comments.

8. CLOSED SESSION

a) CLOSED SESSION CONFERENCE WITH REAL PROPERTY
NEGOTIATORS – Pursuant to Government Code Section 54956.8:

Property: Parcels 103-110-02; 103-110-04; 103-110-09; 103-120-14; 103-120-15; 103-120-16; 103-120-17; 103-130-01; 103-130-03; 103-130-05; 103-130-07; 103-140-02; 103-140-05; 103-140-06; 103-140-12; 103-140-15; 103-140-16; 103-140-17; 103-140-18; 103-140-19; 103-180-01; 103-180-05; 103-180-07; 103-190-13; 103-190-14; 103-200-23; 103-200-25; 103-200-26; 103-200-27; 103-200-28; 103-200-29; 103-270-07; 104-270-01,06; 104-260-09,15; 104-280-08,29,30,31,32,33, 34,35; 104-260-08; 104-270-28; 104-291-07; 104-240-31,22,30; 104-250-20,21; 104-280-01,02,07,19,24,25,27; 104-240-18; 104-292-09; 103-170-09,12,14,15 25-32; 160-010-66, 71; 104-280-18 and possible others all in County of Kern

Agency negotiators: Dan Bartel

Negotiating parties: Various parties and Groundwater Banking Joint Powers Authority

Under negotiation: Price and Terms of Payment

- a) CLOSED SESSION – Conference with Legal Counsel - Pending Litigation Government Code Section 54956.9(d)(1)
- a. City of Bakersfield .v. GBJPA et al. KCSC Case No. BCV-21-100221-GP
 - b. KCWA v. GBJPA et al. KCSC Case No. BCV-21-100223-GP

9. OPEN SESSION

General Counsel may announce any reportable actions taken during Closed Session.

10. ADJOURN

Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Board in connection with a matter subject to discussion or consideration at an open meeting of the Board are available for public inspection by contacting Megan Misuraca at mmisuraca@rrbwsd.com. If such

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writings are distributed to members of the Board less than 72 hours prior to the meeting, they will be available to the public at the same time as they are distributed to Board Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically during the meeting.

Accommodations: Upon request, the Authority will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at the meeting. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to mmisuraca@rrbwsc.com. Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

DECLARATION OF POSTING: I, Megan Misuraca, declare under penalty of perjury, that I am employed by the Rosedale-Rio Bravo Water Storage District and I posted the foregoing Agenda at the District Office on or before July 29, 2021. I, Kristine Swan, declare under penalty of perjury, that I am employed by the Irvine Ranch Water District and I posted the foregoing Agenda at the District Office on or before July 29, 2021.

**BOARD OF DIRECTORS
GROUNDWATER BANKING JOINT POWERS AUTHORITY
MINUTES OF THE REGULAR BOARD MEETING**

May 03, 2021
9:00 A.M.

Note: This meeting was conducted by teleconference pursuant to and in conformance with Executive Order N-29-20 relating to public meetings during the State of Emergency that was declared as a result of COVID-19

DIRECTORS AND ALTERNATES PRESENT

Roy Pierucci
Jason Selvidge
Peer Swan
Doug Reinhart

DIRECTORS ABSENT

OTHERS PRESENT

Doug Gosling- JPA Legal Counsel
Dan Bartel- RRBWSD
Megan Misuraca- RRBWSD
Cheryl Clary- IRWD
Eileen Lin- IRWD
Fiona Sanchez- IRWD
Robert Jacobson- IRWD
Paul Cook- IRWD
Paul Weghorst- IRWD
Dan Raytis- RRBWSD
Ray Bennett- IRWD
Mike Ming- Alliance Ag Services, LLC
Curtis Skaggs- Dee Jaspar & Associates
May Geng- IRWD
Sophia Phuong- IRWD
William Zeiders- Zeiders Consulting

CALL TO ORDER

President Pierucci called the meeting to order at approximately 2:00 PM.

PUBLIC COMMENT NOTICE

There were no public comments.

1. COMMUNICATIONS TO THE BOARD

- a). Written: None
- b). Oral: None.

2. ITEMS RECEIVED TOO LATE TO BE AGENDIZED

None.

3. CONSENT ITEMS

- a) Regular Board Meeting Minutes - February 1, 2021
- b) Special Board Meeting Minutes – April 8, 2021
- c) Consideration and Possible Action of Shared Services Agreement
- d) Consideration and Possible Action of Professional Services Agreement
- e) Consideration and Possible Action of Approval of Auditors
- f) Consideration and Possible Action of Reconciliation through 12/31/2020
- g) Consideration and Possible Action of Investment Policy
- h) Consideration and Possible Action of Technical Memos 4, 5 & 7
- i) Consideration and Possible Action of Technical Services Proposal

A motion was made by Director Selvidge with a second by Director Reinhart to adopt the Consent Items. A roll call vote was taken and the motion unanimously passed.

4. FINANCE AND ADMINISTRATIVE REPORT

- a) Consideration and Possible Action of Conflict-of-Interest Policy- Mr. Gosling reviewed the proposed Conflict-of-Interest Code and Resolution No. 2021-01 for the Groundwater Banking Joint Powers Authority with the Board. A motion was made by Director Swan with a second by Director Selvidge to approve proposed Resolution No. 2021-01 to give notice to adopt the Conflict-of-Interest Code and provide for the comment period. A roll call vote was taken and the motion unanimously passed.
- b) Consideration and Possible Action of 2021/22 Budget- Ms. Clary walked through the proposed 2021-2022 Groundwater Banking JPA budget noting the large increase related to land acquisition and beginning construction costs. A motion was made by Director Swan with a second by Director Selvidge to approve the FY 2021/2022 proposed budget. The motion was unanimously passed.
- c) Consideration and Possible Action of Amendment No. 2 to Bylaws- Mr. Bartel reviewed proposed Amendment No. 2 to the Bylaws of the Groundwater Banking Joint Powers Authority to dissolve standing committee meetings for a more efficient operation. A motion was made by Director Swan with a second by Director Reinhart to approve Amendment No. 2 to the Bylaws of the Groundwater Banking Joint Powers Authority. A roll call vote was taken and the motion unanimously passed.
- d) Consideration and Possible Action of Insurance Coverage- Mr. Jacobson briefed the Board on staff's efforts in obtaining proposals for insurance coverage and bonding. A motion was made by Director Swan with a second by Director Selvidge to approve the general liability insurance policy with ACWA-JPIA subject to ACWA membership approval, the appointment of Director Swan as the representative for ACWA-JPIA with Director Pierucci as the alternate and bonding coverage with Hartford. The motion unanimously passed.

5. ENGINEERING REPORT

- a) Engineering Report-
 - i. Consideration and Possible Action of Technical Memo 6- Mr. Skaggs of Dee Jaspar and Associates walked through a detailed presentation on Technical Memo No. 6 outlining the various conveyance and turnout alternatives. A motion was made by Director Selvidge with a second by Director Reinhart to receive and file Technical Memo No. 6. The motion unanimously passed.

6. GENERAL MANAGERS REPORT

- a) Key Agreements with DWR and CDFW Update – Ms. Sanchez briefed the Board on the latest efforts in obtaining the agreements with DWR and CDFW.
- b) Grant Funding Update- Ms. Sanchez briefed the Board on recent Grant Funding efforts including the most recent STREAM Act funding.
- c) Property Acquisition Update- Mr. Bartel directed the Board to the Property Access Agreement provided in the Board packet and gave a brief report on the property acquisition process.

7. OTHER BUSINESS

None

8. CLOSED SESSION

At 3:36 p.m. Director Pierucci announced the Board would enter closed session related to Property Negotiation items in 8a. The Board reconvened to open session at 4:11 p.m.

9. OPEN SESSION

Mr. Gosling announced staff was directed on item 8a and there were no other reportable actions taken during closed.

10. ADJOURN

Upon a motion by Director Selvidge and a second by Director Reinhart, the meeting was adjourned at 4:12 p.m.

ATTEST:



Authority Secretary

**BOARD OF DIRECTORS
GROUNDWATER BANKING JOINT POWERS AUTHORITY
MINUTES OF THE SPECIAL BOARD MEETING**

July 16, 2021
8:30 A.M.

Note: This meeting was conducted by teleconference pursuant to and in conformance with Executive Order N-29-20 relating to public meetings during the State of Emergency that was declared as a result of COVID-19

DIRECTORS AND ALTERNATES PRESENT

Roy Pierucci
Gary Unruh (Alternate)
Peer Swan
Doug Reinhart

DIRECTORS ABSENT

Jason Selvidge

OTHERS PRESENT

Doug Gosling- JPA Legal Counsel
Dan Bartel- RRBWSD
Megan Misuraca- RRBWSD
Cheryl Clary- IRWD
Eileen Lin- IRWD
Fiona Sanchez- IRWD
Robert Jacobson- IRWD
Paul Weghorst- IRWD
Dan Raytis- RRBWSD

CALL TO ORDER

President Pierucci called the meeting to order at approximately 8:30 AM.

PUBLIC COMMENT NOTICE

There were no public comments.

1. COMMUNICATIONS TO THE BOARD

- a). Written: None
- b). Oral: None.

2. ITEMS RECEIVED TOO LATE TO BE AGENDIZED

None.

3. CONSENT ITEMS

None.

4. FINANCE AND ADMINISTRATIVE REPORT

- a) Consideration of Cash Call- Ms. Clary briefed the Board on the cash call process noting cash calls for property acquisition would be separate from the budgeted quarterly cash calls. Mr. Bartel reviewed

the property acquisition process and negotiating parameters previously approved by the Board and noted staff anticipates proceeding with escrow on three properties within a month which require deposits and due diligence. A motion was made by Director Reinhart with a second by Director Swan to approve a cash call in the amount of \$450,000 per entity for a total of \$900,000. A roll call vote was taken and the motion unanimously passed.

- b) Report and Possible Action on Adoption of Conflict-of-Interest- Mr. Reinhart briefed the Board on Resolution 2021-02 Adopting a Conflict-of-Interest Code. A motion was made by Director Swan with a second by Director Unruh to approve the Conflict-of-Interest code and adopt Resolution 2021-02. A roll call vote was taken and the motion unanimously passed.

5. ENGINEERING REPORT

None.

6. GENERAL MANAGERS REPORT

None.

7. OTHER BUSINESS

Director Pierucci announced the need to move the regularly scheduled August 2, 2021 due conflict in schedule for multiple Board members. Staff was directed to re-schedule the meeting.

8. CLOSED SESSION

At 8:38 a.m. Director Pierucci announced the Board would enter closed session. The Board reconvened to open session at 9:20 a.m.

9. OPEN SESSION

Mr. Gosling announced staff was directed on item 8a and there were no other reportable actions taken during closed.

10. ADJOURN

Director Pierucci adjourned the meeting at 9:21 a.m.

ATTEST:



Authority Secretary

August 3, 2021
Prepared by: May Geng / Sophia Phuong
Reviewed by: Cheryl Clary
Agenda Item: 4a

FY 2020-21 Actual to Budget Results (Unaudited)

DISCUSSION:

The quarterly unaudited actual to budget results for the year-ended June 30, 2021 is attached as Exhibit "A". The report separates capital and operating expenditures.

The twelve-month year to date total expenditures were \$1.002 million compared to a budget of \$1.236 million. Actual expenditures were \$234 thousand or 19% under budget. This is primarily due to lower expenditures than budgeted for engineering project planning and design partially offset by unbudgeted costs incurred for property pre-acquisition work. Exhibit "A" provides additional comments.

RECOMMENDATION:

Receive and File.

LIST OF EXHIBITS:

Exhibit "A" – FY 2020-21 Actual to Budget Results (Unaudited)

Exhibit A
Groundwater Banking Joint Powers Authority
Unaudited Actual to Budget Report
Fiscal Year 2020-21

Task / Account	Task / Account Name	Unaudited Actual 6/30/21	Budget 6/30/21	Budget (Over) /Under	Budget Variance %	Approved FY2020-21 Budget	Unaudited Actual - Inception to 6/30/21	FY2020-21 Budget Variance Comment
Kern Fan Groundwater Capital Project								
1.0	Engineering - Planning and Design Staff	\$144,368	\$209,753	\$65,385	31%	\$209,753	\$334,383	GM transition
1.1	Grant Administration and Reporting	5,173	1,639	(3,534)	-216%	1,639	7,733	
1.15	CWC and USBR Feasibility Studies	45,947	12,940	(33,007)	-255%	12,940	137,593	Staff Time related to Federal Grant
1.16	JPA Administration	54,789	101,169	46,380	46%	101,169	64,364	GM transition/ offset by operating expense down below
1.4	Supplemental Environmental Impact Report	17,633	7,785	(9,848)	-126%	7,785	22,500	
1.5	Agreements with State Agencies	2,697		(2,697)	-100%		2,697	
1.8	Property Pre-Acquisition Work and Geophysical Study (1)	64,701		(64,701)	-100%		64,701	Geotech survey and other pre-acquisition work
2.0	Accounting and Financial Reporting	22,371	22,127	(244)	-1%	22,127	24,938	
3.0	Engineering Design - Outside	31,936	180,000	148,064	82%	180,000	31,936	Deferred to FY 2021-22
6.0	Legal JPA	74,478	61,500	(12,978)	-21%	61,500	134,683	
900.0	Preliminary Design Report and Feasibility Report	94,561	181,590	87,029	48%	181,590	367,606	Feasibility report for CWC deferred to 1st Q FY 2021-22
906.0	Development of Agreement with FWS		10,000	10,000	100%	10,000	11,420	
908.0	Development of Agreement with DWR	44,359	20,000	(24,359)	-122%	20,000	166,089	Modeling related to USBR grant application
910.0	Due Diligence to Purchase Land	3,080		(3,080)	-100%		3,080	
914.0	Permanent Easements		15,000	15,000	100%	15,000		
918.0	Environmental	342,139	382,197	40,058	10%	382,197	385,927	Consulting related to Environmental Impact Report
922.0	Permitting		15,000	15,000	100%	15,000		
928.0	PG&E Service		15,000	15,000	100%	15,000		
	Capital Project Total	948,232	1,235,700	287,468	23%	1,235,700	1,759,650	
Operating Expense								
699112	Supplies	409		(409)	-100%		409	
699134	Administration/Management	43,950		(43,950)	-100%		43,950	Offset by JPA Administration above
699135	Audit	5,000		(5,000)	-100%		5,000	
699136	Bank Charges	678		(678)	-100%		678	
699137	Insurance	3,249		(3,249)	-100%		3,249	
699139	Membership	281		(281)	-100%		281	
	Operating Expense Total	53,567	0	(53,567)	-100%	0	53,567	
Total		\$1,001,799	\$1,235,700	\$233,901	19%	\$1,235,700	\$1,813,217	

Note:

(1) Actual amounts included labor and consultants charges.

August 3, 2021
Prepared by: Sophia Phuong
Reviewed by: Cheryl Clary
Agenda Item: 4b

GBJPA FY2021-22 Q2 Cash Call

DISCUSSION:

Cash calls are needed to fund future capital and operating expenditures of the GBJPA. Each individual agency (RRB and IRWD) is responsible for funding 50 percent of the cash call to be deposited into the GBJPA bank account. It is anticipated the GBJPA will be requesting regular quarterly cash calls based on quarterly spending projections from the fiscal year Board approved budget.

For the second quarter of FY2021-2022, staff is requesting a cash call of \$420,000. Details supporting the \$420,000 cash call are attached on Exhibit "A". Each partner will be requested to fund \$210,000 into the GBJPA bank account during the second quarter of FY2021-2022. The individual agencies will be invoiced for their share when needed.

The quarterly cash calls exclude any funding for land acquisitions which will be requested with separate calls as needed.

RECOMMENDATION:

That the Board approve of the second quarter cash call in the total amount of \$420,000 or \$210,000 for each agency.

LIST OF EXHIBITS:

Exhibit "A" – GBJPA Approved FY2021-22 Budget by Quarter

Exhibit A
Groundwater Banking Joint Powers Authority
Approved Budget FY2021-22

Task	Task Name	FY2021-22 Budget				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
1.0	Engineering - Planning & Design Staff	27,262	27,264	27,264	27,264	109,054
1.1	Grant Administration and Reporting	1,178	1,178	1,178	1,178	4,712
1.2	CWC and USBR Feasibility Studies	8,591	8,593	8,593	8,593	34,370
1.2	JPA Administration	27,337	27,339	27,339	27,339	109,354
1.4	Supplemental Environmental Impact Report	22,487	22,487	22,487	22,487	89,948
1.5	Agreements with State Agencies	13,054	13,055	13,055	13,055	52,219
1.8	Property Pre-Acquisition Work and Geophysical Study	21,890	21,894	21,894	21,894	87,572
3.0	Engineering Design - Consultants	214,423	55,000	1,787,788	1,736,100	3,793,310
3.1	Engineering Design - Staff	0	0	0	0	0
4.0	Engineering CA&I - Outside	0	35,625	47,500	186,375	269,500
4.1	Engineering CA&I - Staff	0	0	0	0	0
5.0	Construction	0	0	2,569,869	6,135,080	8,704,949
5.1	Land	9,657,500	9,657,500	1,875,000	1,875,000	23,065,000

Task	Task Name	FY2021-22 Budget				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
6.0	Legal JPA	65,318	70,318	20,318	40,818	196,772
900.0	Preliminary Design Report and Feasibility	0	0	0	0	0
906.0	Development of Agreement with FWS	0	0	10,000	0	10,000
908.0	Development of Agreement with DWR	10,000	10,000	0	0	20,000
914.0	Permanent Easements	0	0	0	0	0
916.0	Habitat Credit Purchase	0	0	2,400,000	0	2,400,000
918.0	Environmental	0	0	0	0	0
922.0	Permitting	0	0	0	195,000	195,000
928.0	PG&E Service	0	0	150,000	156,250	306,250
930.0	Bid Phase	0	0	37,500	37,500	75,000
Total Capital		\$10,069,040	\$9,950,253	\$9,019,785	\$10,483,933	\$39,523,010
	Contract Labor	30,460	30,461	30,461	30,618	122,000
	Administration	1,750	6,750	1,750	3,100	13,350
Total Operating		\$32,210	\$37,211	\$32,211	\$33,718	\$135,350
Total Budget		\$10,101,250	\$9,987,464	\$9,051,996	\$10,517,651	\$39,658,360
5.0	Construction	0	0	(2,569,869)	(6,135,080)	(8,704,949)
5.1	Land	(9,600,000)	(9,600,000)	(1,875,000)	(1,875,000)	(23,065,000)

Task	Task Name	FY2021-22 Budget				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Unadjusted Cash Call		\$501,250	\$387,464	\$4,607,127	\$2,507,571	\$7,888,411
	Year End Accruals FY2020	65,009				
	Operating Expense Adjustment	(32,210)	32,210			
Cash Call		\$534,049	\$419,674			
Cash Call (Rounded)		\$534,000	\$420,000			

Property Acquisition Cash Call

DISCUSSION:

On April 3, 2021 the JPA Board authorized a property acquisition process and on May 3, 2021 provided negotiating parameters on certain properties.

3. Review of Due Diligence Findings (*Lead: GBA Project Committee*):
 - Following the due diligence investigation of a property, staff will provide report of findings for Committee review. The report will include:
 - Recharge suitability for water banking;
 - Findings from consultant's Phase I and other related studies;
 - Title constraints/considerations; and
 - Other relevant due diligence information.
 - Based on its review, the Committee may:
 - Recommend that the Board approve the proposed purchase;
 - Recommend that the Board terminate the proposed purchase;
 - Forward consideration of the proposed purchase to the Board without a recommendation; or,
 - Provide a recommendation to modify the purchase price and/or terms.
4. Final Approval of Land Purchases (*GBA Board*):
 - Based on Committee's review and recommendation, staff will provide a summary of its report of findings for Board review and consideration of final approval (or disapproval/modification of price/terms) prior to completion of any land purchase. The report will include:
 - A summary of the property description and deal terms;
 - Recharge suitability for the project;
 - Findings from consultant's Phase I and other related studies;
 - Title constraints/considerations; and
 - Other relevant due diligence information.

Accordingly, staff has been negotiating on several target properties and is preparing Purchase and Sale Agreements in consultation with legal counsel. On July 16, 2021 The JPA Board authorized a cash call in the amount of \$900,000 for deposits and due diligence on three properties. The JPA has opened escrow on one property and may do so on 1-2 more over the next few months. Property acquisition cash calls are separate than regular routine budgeted operations and planning cash calls.

RECOMMENDATION:

Authorize the Treasurer to make a cash call to IRWD and RRBWSD for a total of \$5,000,000 or \$2,500,000 each.

Transfer of the Proposition 1 Water Storage Investment Funding
to the Groundwater Banking Joint Powers Authority

DISCUSSION:

In August 2017, the Rosedale-Rio Bravo Water Storage District (Rosedale) and Irvine Ranch Water District (IRWD) jointly submitted an application for Proposition 1 Water Storage Investment Program (WSIP) funding for the Kern Fan Groundwater Storage Project (Kern Fan Project) to the California Water Commission (CWC). In July 2018, the CWC conditionally awarded \$67.5 million in funding to the Kern Fan Project; this was increased by the CWC to \$87.8 million in January 2021 when additional WSIP funding became available. Following the initial conditional funding award, Rosedale and IRWD jointly formed the Groundwater Banking Joint Powers Authority (GBJPA) to plan, design, construct, operate and implement the Kern Fan Project. In order to facilitate this, the CWC application and conditional WSIP funding award needs to be transferred by agreement from Rosedale and IRWD to the GBJPA., and the transfer approved by the CWC.

Background:

The Kern Fan Project will construct a regional water bank in the Kern Fan Sub-Basin to recharge and store up to 100,000 acre-feet of surface water during wet periods that would otherwise be lost to the ocean. The project provides multiple benefits, including water supply reliability to Rosedale and IRWD, as well as public ecosystem benefits in the Delta and the creation of intermittent wetlands during recharge periods. Rosedale and IRWD jointly submitted an application for WSIP funding for the Kern Fan Project. Initially, the CWC conditionally awarded the project \$68.7 million based on the project's public benefits and available WSIP funding. Additional WSIP funding became available in late 2020, and the CWC increased the conditional funding award for the Kern Fan Project in January 2021 to \$87.8 million based on its maximum eligible funding associated with the expected public benefits. To remain eligible for the conditional funding, WSIP applicants must demonstrate compliance with the following requirements by January 1, 2022:

:

- Completion of a Draft EIR
- Demonstration of funding commitments for 75% of the non-public project costs
- Completion of a Feasibility Report

The Kern Fan Project is scheduled to present compliance with these requirements at the November 2021 meeting of the CWC. In 2020, Rosedale and IRWD jointly formed the GBJPA for the purpose of developing and implementing the Kern Fan Project. In order for the GBJPA to be the beneficiary of the WSIP funding, Rosedale and IRWD need to formally transfer the WSIP application and conditional funding award to the

GBJPA and receive approval of the transfer from the CWC. It would facilitate the next step in the funding eligibility process with the CWC if the application were formally transferred prior to the November 2021 CWC Meeting. To that end, staff and legal counsel have prepared Resolution 2021-03 provided as Exhibit "A" that would authorize the GBJPA to assume the status of Applicant for the WSIP funding for the Kern Fan Project. An agreement between the GBJPA, Rosedale and IRWD to transfer the WSIP application and funding to the GBJPA is provided as Exhibit "B".

RECOMMENDATION:

That the Board adopt Resolution 2021-03 authorizing the GBJPA to assume the status of Applicant for the Water Storage Investment Program Funding for the Kern Fan Groundwater Storage Project, authorize execution of the Agreement Regarding Transfer of Applicant Status For Proposition 1 Water Storage Investment Program Funding between IRWD, Rosedale and the GBJPA subject to non-substantive changes, and authorize staff to request the approval of the California Water Commission for the transfer of the application to the GBJPA..

LIST OF EXHIBITS:

Exhibit "A" – Resolution 2021-03

Exhibit "B" – Agreement Regarding Transfer Status for WSIP Funding Between IRWD, Rosedale and the GBJPA

RESOLUTION NO. 2021-03

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE
GROUNDWATER BANKING JOINT POWERS
AUTHORITY AUTHORIZING THE AUTHORITY TO
ASSUME THE STATUS OF APPLICANT FOR FUNDING
UNDER THE STATE OF CALIFORNIA WATER STORAGE
INVESTMENT PROGRAM (WSIP) AND TO TAKE ALL
ACTIONS NECESSARY TO RECEIVE FUNDING UNDER
SUCH PROGRAMS**

WHEREAS, the Groundwater Banking Joint Powers Authority (“GBJPA” or “Authority”) was established to primarily implement the Kern Fan Groundwater Storage Project (“Project”) located within the boundaries of the Rosedale Rio-Bravo Water Storage District in Kern County. It is a joint powers authority comprised of Irvine Ranch Water District (“IRWD”) and Rosedale Rio-Bravo Water Storage District (“RRB”);

WHEREAS, through the project, the Parties seek to develop a regional water bank in the Kern County Groundwater Sub-basin of the San Joaquin Valley Groundwater Basin in Kern County;

WHEREAS, IRWD and RRB filed an application with the California Water Commission under the Water Storage Investment Program (“WSIP”) established pursuant to Proposition 1, the Water Quality, Supply and Infrastructure Improvement Act of 2014, for funding of the Project;

WHEREAS, both RRB and IRWD entered into an agreement on July 1, 2020 to establish a joint powers authority to pursue and develop the Kern Fan Groundwater Storage Project—the joint powers authority is now fully formed and functioning and thus IRWD and RRB move to transfer the status to the GBJPA;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Authority that they will perform the necessary functions required to be the applicant to the California Water Commission to obtain the WSIP funding pursuant to Title 23, Division 7, Chapter 1 of the California Code of Regulations, and to enter into an agreement to transfer the status and receive funding for the Project.

BE IT FURTHER RESOLVED, that the General Manager of GBJPA, or designee, is hereby authorized and directed to prepare, including but not limited to, the necessary data, conduct investigations, file such application, execute a funding agreement and any amendments thereto, and sign invoices to facilitate the funding and obligations with the California Water Commission.

ADOPTED, SIGNED AND APPROVED by the Authority, August 3, 2021, by the following vote:

AYES: P. Swan, J. Selvidge, R. Pierucci, & D. Rienhart

NOES:

ABSENT:

ABSTAIN:

I HEREBY CERTIFY that the foregoing is the resolution of the Board of Directors of the Groundwater Banking Joint Powers Authority.

ATTEST:

Board President

Authority Secretary

Agreement Regarding Transfer of Applicant Status

For

Proposition 1 Water Storage Investment Program Funding

This Agreement Regarding Transfer of Applicant Status for Proposition 1 WSIP Funding (“**Agreement**”) is between the IRVINE RANCH WATER DISTRICT, a California water district, (“IRWD”), ROSEDALE RIO BRAVO WATER STORAGE DISTRICT, a California water storage district, (“RRB”) and GROUNDWATER BANKING JOINT POWERS AUTHORITY, a California joint powers authority (“GBJPA”); and is effective as of _____, 2021 (“**Effective Date**”). IRWD, RRB and GBJPA are sometimes collectively referred to as the “Parties” or individually referred to as a “Party.”

Recitals

- A. WHEREAS, Rosedale-Rio Brave Water Storage District (“RRB”) is a public agency organized in accordance with the California Water Storage District Law (Division 14, commencing with §39000 of the California Water Code) for the purpose of acquiring, storing, distributing, and replenishing water supplies within its boundaries in Kern County, California.
- B. WHEREAS, Irvine Ranch Water District (“IRWD”) is a public agency organized in accordance with the California Water District Law (Division 13, commencing with §34000 of the California Water Code) to provide water services and certain other services. IRWD's powers and purposes include the acquisition within or outside the district in the State of all necessary property, water, and water rights for the production, storage, transmission, and distribution of water for irrigation, domestic, industrial, and municipal purposes and to provide and sell such water at wholesale and retail to customers within its boundaries in Orange County, California.
- C. WHEREAS, both RRB and IRWD entered into an agreement on July 1, 2020 to establish a joint powers authority to pursue and develop the Kern Fan Groundwater Storage Project (“Project”).
- D. WHEREAS, through the Project, the Parties seek to develop a regional water bank in the Kern County Groundwater Sub-basin of the San Joaquin Valley Groundwater Basin in Kern County. The Project would recharge and store up to 100,000 acre-feet of water during periods when surface water is abundant.
- E. WHEREAS, IRWD and RRB filed an application with the California Water Commission (“Commission”) under the Water Storage Investment Program (“WSIP”) established pursuant to Proposition 1, the Water Quality, Supply and Infrastructure Improvement Act of 2014, for funding of the Project.

- F. The Commission has granted a maximum conditional WSIP eligibility determination of \$87,801,500 to IRWD and RRB for the Project.
- G. WHEREAS, following the conditional funding award, IRWD and RRB jointly formed the GBJPA to plan, design, construct, operate and otherwise implement the Kern Fan Groundwater Storage Project.
- H. Now, that the GBJPA is fully formed and functioning, IRWD and RRB are transferring and assigning various contract rights to the GBJPA to pursue the Project.
- I. Thus, now comes IRWD and RRB transfers the WSIP applicant status and all related application documents and materials to GBJPA; and IRWD and RRB are willing to transfer such applicant status and materials.

The parties agree as follows:

- 1. **COOPERATION IN TRANSFER OF WSIP APPLICATION.** IRWD and RRB will cooperatively perform such acts, and make, execute, and deliver such documents as may be reasonably necessary or required by the California Water Commission, to transfer the WSIP applicant status for the Project to GBJPA. All costs for the incurred for the production of documents or other materials will be the responsibility of GBJPA.
- 2. **COMMISSION APPROVAL.** This agreement is predicated on the Commission's approval of the Application transfer, and if such approval is not granted after good faith, reasonable efforts of the parties to comply with the terms of this Agreement, the Agreement may be terminated by either party in accordance with Section 5.
- 3. **RECITALS.** The Recitals to this Agreement are fully incorporated into and are integral parts of this Agreement.
- 4. **TERM OF AGREEMENT.** The term of this Agreement will remain in full force and effect until terminated as provided in Section 5, below.
- 5. **TERMINATION.**
 - a. This Agreement may be terminated at any time by mutual written consent of the Parties.
 - b. This Agreement may be terminated by either party if the Commission does not grant approval of the Application transfer after good faith, reasonable efforts to obtain such transfer approval within six months of the Effective Date.

- c. This Agreement may be terminated by GBJPA if it ceases to pursue or elects not to receive any of the WSIP funding for which IRWD and RRB applied.
6. **INDEMNIFICATION.** Subsequent to the effective date of transfer of the WSIP application by the Commission, if at all, (“**Transfer Date**”), GBJPA accepts all liabilities and responsibilities associated with the WSIP application occurring after the Transfer Date and agrees to indemnify and defend IRWD and RRB, its successors, and assigns against any claims made against IRWD and RRB arising out of the WSIP application or this Agreement after the Transfer date. IRWD and RRB accept all liabilities and responsibilities associated with the WSIP application occurring prior to the Transfer Date and agrees to indemnify and defend GBJPA, its successors, and assigns against any claims made against GBJPA arising out of the WSIP application prior to the Transfer Date. Each Party’s obligations under this section will survive the expiration or earlier termination of this Agreement until action against the indemnified parties for the matter indemnified is fully and finally barred by the applicable statute of limitations or statute of repose. This section will survive any termination of Agreement affected after the Transfer Date.
7. **ATTORNEY’S FEES AND COSTS.** If any action at law or in equity is necessary to enforce or interpret the terms of this Agreement, the prevailing party will be entitled to reasonable attorneys’ fees and costs in addition to any other relief to which such party may be entitled.
8. **SEVERABILITY.** This Agreement is subject to all applicable laws and regulations. If any provision of this Agreement is found by any court or other legal authority, or is agreed by the parties to be, in conflict with any code or regulation governing its subject matter, only the conflicting provision shall be considered null and void. If the effect of nullifying any conflicting provision is such that a material benefit of the Agreement to either party is lost, the Agreement may be terminated at the option of the affected party. In all other cases the remainder of the Agreement will continue in full force and effect.
9. **FURTHER ASSURANCES:** Each Party agrees to execute any additional documents and perform any further acts that may be reasonably required to effect the purposes of this Agreement.
10. **CONSTRUCTION:** This Agreement reflects the contributions of all undersigned parties and accordingly the provisions of Civil Code section 1654 will not apply to address and interpret any alleged uncertainty or ambiguity.
11. **HEADINGS:** Section headings are provided for organizational purposes only and do not in any manner affect the scope, meaning or intent of the provisions under the headings.

12. **NO THIRD-PARTY BENEFICIARIES INTENDED:** Unless specifically set forth, the Parties to this Agreement do not intend to provide any other party with any benefit or enforceable legal or equitable right or remedy.

13. **WAIVERS:** The failure to either Party to insist on strict compliance with any provision of this Agreement shall not be considered a waiver of any right to do so, whether for that breach or any subsequent breach. The acceptance by either party of either performance or payment shall not be considered to be a waiver of any preceding breach of the Agreement by the other party.

THE UNDERSIGNED AUTHORIZED REPRESENTATIVES of the parties have executed this Agreement as of the effective date set forth above.

IRVINE RANCH WATER DISTRICT

By: _____

Date: _____

Name: _____

Title: _____

ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT

By: _____

Date: _____

Name: _____

Title: _____

GROUNDWATER BANKING JOINT POWERS AUTHORITY

By: _____

Date: _____

Name: _____

Title: _____



849 Allen Road
Bakersfield CA 93314

Phone: (661)589-6045
Fax: (661) 589-1867

Dan Bartel
Authority Manager

July 29, 2021

VIA EMAIL & US MAIL

Mr. Joseph Yun
Executive Officer
California Water Commission
P.O. Box 942836
Sacramento, California 94236-0001
joseph.yun@water.ca.gov

Re: Groundwater Banking Joint Powers Authority

WSIP Funding Applicant Status and Request Transfer
Irvine Ranch Water District/Rosedale-Rio Bravo Water Storage District

Dear Mr. Yun:

On behalf of the Groundwater Banking Joint Powers Authority, we are writing to provide notice and invite discussion on a request to transfer the application for WSIP funding from Irvine Ranch Water District (IRWD) and Rosedale-Rio Bravo Water Storage District (RRB) to a newly formed entity—the Groundwater Banking Joint Powers Authority (GBJPA) in Kern County.

Please allow this letter to provide formal notice to the California Water Commission that both IRWD and RRB have formed the GBJPA to facilitate the goals of their WSIP funding and application and thus now desire to transfer the WSIP application to the GBJPA. It is the request of both IRWD, RRB and GBJPA that the Commission consider and grant authorization for the intended transfer.

In so doing, IRWD and RRB grant the release and the responsibility and assign the WSIP funding and related application to GBJPA. An executed Transfer Agreement negotiated by RRB and IRWD has been adopted by the GBJPA. The Agreement, the Resolution and joint powers agreement is attached for your file and consideration.

July 29, 2021
Page | 2
CWC-Transfer

We appreciate your consideration and approval of this request so that the GBJPA may assume administration of the applicant status. Please contact Dan Bartel at dbartel@rrbwsd.com or the number listed above with any questions or comments on the next steps.

Regards,

Dan Bartel
General Manager

cc: file

Technical Memos

DISCUSSION:

The Kern Fan Project Construction Team (Ray Bennett, Curtis Skaggs, Markus Nygren, Bill Zeiders and myself) has begun weekly meetings to begin facilitation of project design and construction process. As part of the process we have developed a plan to create technical memoranda addressing various aspects of the project. The premises of the technical memoranda are to:

- Document the previously developed preliminary design work provided by Curtis Skaggs.
- Incorporate RRBWSD and IRWD design, construction, and operational experience into the design process.
- Provide a forum for agreement by the Districts on design decisions prior to hard design process.
- Perform Value Engineering as previously discussed by the Districts.
- Provide thorough project documentation for clarity of client expectation to be used for RFP and final design purposes.

Content and development priority has been established by the team. Progress to date is listed below. Technical Memoranda No. 8-11 are attached for consideration.

Priority 1

- | | |
|--|----------|
| 1. Project Phasing and Design / Contractor Selection | Approved |
| 2. Conveyance Capacity Requirements | Approved |
| 3. Pipeline Requirements | Approved |
| 4. Pump Station Requirements | Approved |

Priority 2

- | | |
|---|--------------|
| 5. Geotechnical Report | Approved |
| 6. Canal Liner and Turnout Requirements | Approved |
| 7. Well Drilling and Equipping Requirements | Approved |
| 8. ROW Acquisitions | 95% Complete |

Priority 3

- | | |
|---|--------------|
| 9. Recharge Basin Requirements | 95% Complete |
| 10. Facility Operation and SCADA Requirements | 95% Complete |
| 11. Engineer's Estimates | 95% Complete |

A detail of each document is shown on page 2.

Technical Memos

August 3, 2021

Page 2

Memo #	Title	Key Elements
1	Project Phasing and Design / Contractor Selection	Project Schedule Project Phasing (Construction Bid Packages) Design Firm Selection Contractor Selection
2	Conveyance Capacity Requirements	Recharge Pond Infiltration & filling rates In-Lieu Demands Goose Lake Channel Other Opportunities Pump Stations and reach Capacities
3	Pipeline Requirements	PVC, HDPE, Wet SpunRCP & Dry Spun RCP, Cement Mortar Lined and Coated Steel Pipe for: Aqueduct Turnout Siphon Crossings Phase II Property Turnouts West Basin Turnouts Canal Extension Well Conveyance
4	Pump Station Requirements	Pump Station Design Standard Pump Configuration Discharge pipe Sizing Special Considerations (Appurtances) Modeling Requirements Voltage Requirements Utility Interface Control Building
5	Geotechnical Report	Recharge Facility Soils Work Conveyance Soils Work Pump Station Soils Work Well Pad Soils Work
6	Canal Liner and Turnout Requirements	HDPE, Earth, Shotcrete, Concrete Pipeline Extension Option Turnout Requirements
7	Well Drilling and Equipping Requirements	Impact Analysis Well Layout Requirements Well Design Requirements Well Equipping Requirements Well Site Requirements
8	ROW Acquisitions	ROW Requirements Land Valuations Crop Valuations Phase I Assessment Title Work Land Surveying
9	Recharge Basin Requirements	Basin Layout/Orientation Levee Slopes/Design Freeboard Habitat Elements Interbasin Structures Fence Requirements
10	Facility Operaton and SCADA Requirements	Conveyane Canal / Pump Station Control Philosophy Conveyance / Pump Station Instrumentation Recovery Well Instrumentation Canal Turnout Instrumentation SCADA Platforms Radio Survey SCADA Monitoring and Control
11	Engineer's Estimates	Phase 1, Phase 2, ..., Phase N.

RECOMMENDATION:

Authorize staff to final Technical Memoranda No. 8-11 subject to revision upon acquisition of project properties.



DEE JASPAR & ASSOCIATES, INC.
CONSULTING CIVIL ENGINEERS
2730 UNICORN ROAD, BLDG A
BAKERSFIELD, CA 93308
PHONE (661) 393-4796
FAX (661) 393-4799

KERN FAN GROUNDWATER STORAGE PROJECT

TECHNICAL MEMORANDUM NO. 8
(ROW Acquisitions)

PREPARED FOR: Groundwater Banking Joint Powers Authority (GBJPA)

PREPARED BY: Curtis Skaggs, P.E.

DATE: May 11, 2021

SUBJECT: *Right of Way Acquisitions*

I. Executive Summary

This memorandum addresses the right-of-way acquisition work associated with the conveyance facility alignment and turnouts. The memorandum contents are outlined below:

II.	ROW Requirements	Page 3
III.	Methodology	Page 9
IV.	Land Valuations	Page 10
V.	Crop Valuations	Page 11
VI.	Phase I Assessment	Page 14
VII.	Title Work	Page 14
VIII.	Land Surveying	Page 14
IX.	Encroachments	Page 15

The alignment illustrated herein is preliminary. The actual alignment of the conveyance facilities will be subject to the final locations of the Phase I and Phase II properties. In addition, the project design will dictate the final widths for the project right-of-way.

For purposes of this memorandum, the term “right-of-way” is used as a generic term for the conveyance facility land. The following terms should be understood to be defined as outlined below:

- “In-Fee” is understood to be permanent right-of-way owned in fee simple by the GBJPA.

- “Permanent Easement” is understood to be an easement to the GBJPA in perpetuity for the construction, operation, and maintenance of the conveyance facility.
- “Temporary Easement” is understood to be an easement to the GBJPA that is outside of the in-fee right-of-way or the permanent easement and is for construction purposes over a limited duration of time.

In the event the conveyance facility is an open canal, this memorandum has estimated a lined canal right-of-way width of 180-ft. This equates to approximately 201 acres of permanent right-of-way. This right-of-way is recommended to be purchased “in fee” for a lined canal. The estimated value of this right-of-way is between \$4,385,280 to \$4,691,956. In addition, an approximate width of 90-ft has been estimated for temporary construction easement which equates to approximately 101 acres. The estimated value for the temporary easement is \$2,193,099 to \$2,346,529.

In the event the conveyance facility is a pipeline, this memorandum has estimated a pipeline right-of-way width of 140-ft. This equates to approximately 158 acres of permanent right-of-way. This right-of-way could be purchased “in fee” or as a permanent easement. The estimated value of this right-of-way is between \$3,411,488 to \$3,650,156. In addition, an approximate width of 50-ft has been estimated for temporary construction easement which equates to approximately 56 acres. The estimated value for the temporary easement is \$1,218,388 to \$1,303,627.

The GBJPA will negotiate with landowners for right-of-way and easements. It is anticipated that as part of the negotiations the GBJPA will provide a farmer turnout to the property owners, free of charge, within the District service area. A landowner would receive a turnout per 160 acres of land that is adjacent to and impacted by the conveyance facility. In addition to relocating existing utilities or pipelines if impacted by the new facilities, the GBJPA will also provide one 12” diameter PVC pipe crossing for the width of the in-fee right-of-way or permanent easement per 160 acres of land that is adjacent to and impacted by the conveyance facility. This 12” PVC pipe crossing can be used by the landowner for a future utility crossing if needed. Any additional landowner crossings would be under an encroachment permit application process.

The GBJPA will prepare a package for each property owner. The package will describe the project, outline what will be crossing their property, illustrate the area of property impacted, provide the monetary offer, include an eminent domain pamphlet, and provide details for meet and confer negotiations, if necessary.

The GBJPA will:

- Obtain land and crop appraisals
- Obtain preliminary title reports
- Perform a Phase I Assessment, if determined necessary
- Submit draft plats and legal descriptions for property owners to review and provide input
- Prepare offer letters with final plats and legal descriptions
- Prepare offer letters
- Negotiate Fair Market Value
- Initiate Eminent Domain/Condemnation, if determined necessary

Eminent domain will only be utilized as a last resort. Eminent Domain allows the GBJPA to take private property for a public use with just compensation. Typically, the measure of just compensation is the fair market value of the property that is taken for public use. The alignment selected for the conveyance facility shall create the least public harm or least impact to the public and property values.

It is anticipated that the engineering design firm for the conveyance facilities will provide surveying and plats to illustrate the conveyance facility alignment across each property as well as providing legal descriptions and plats for the right-of-way or easement acquisition. These plats and right-of-way documents will be prepared and submitted to the GBJPA for review and comment prior to including in the land acquisition packages. This memorandum has been prepared based upon certain data now available and under certain items based upon information and belief and thus is subject to change or amendment upon the acquisition of additional data or the change in circumstances at a future unknown date.

II. ROW Requirements

A. Land Acquisition

The GBJPA is pursuing land acquisitions for the Phase I and Phase II properties. The actual alignment of the conveyance facilities will be subject to the locations of the Phase I and Phase II properties. The alignment utilized herein is preliminary.

B. Conveyance Alignment

The conveyance alignment could be owned in fee or could be in the form of permanent easements. In the event the conveyance facilities are an open canal, it is recommended that the property ownership be in fee. The reason being that the landowner will not be able to use the land for anything in the area of the canal and the alignment will need to be fenced and secured with limited crossings and access for the property owners. Based upon the preliminary alignment, a canal with 1.5:1 side slopes, and a 180-ft right-of-way, it is estimated that the land acquisition required would be approximately 200 acres.

If the conveyance facilities consist of a pipeline, the right-of-way could be in fee or permanent easement. Permanent easement would allow the JPA to use the land for the underground pipeline and turnouts as well as access, while the landowner would retain ownership and limited use of the land. It is anticipated that the pipeline right-of-way would be maintained free and clear of crops, storage, or other structures that would preclude access along the right-of-way or make it difficult to initiate repairs to the pipeline.

The pipeline alignment would be parallel to and near property lines on the edge of crops and parcels and generally follow access roads where feasible. It is anticipated that landowners will remain responsible for maintaining existing farm roads.

This property acquisition will depend on the type of conveyance facilities constructed such as an open channel (canal) or closed conduit (pipeline) but is anticipated to range between 150 acres and 250 acres. The actual acreage will also depend on the final alignment of the facilities and the conveyance design which will dictate final right-of-way widths. Figure 2 illustrates the current preliminary alignment for the conveyance facility.

The property acquisition of the conveyance facilities will include the aqueduct turnout piping, the conveyance facilities, road crossings, pump stations, turnouts, and electrical facilities.

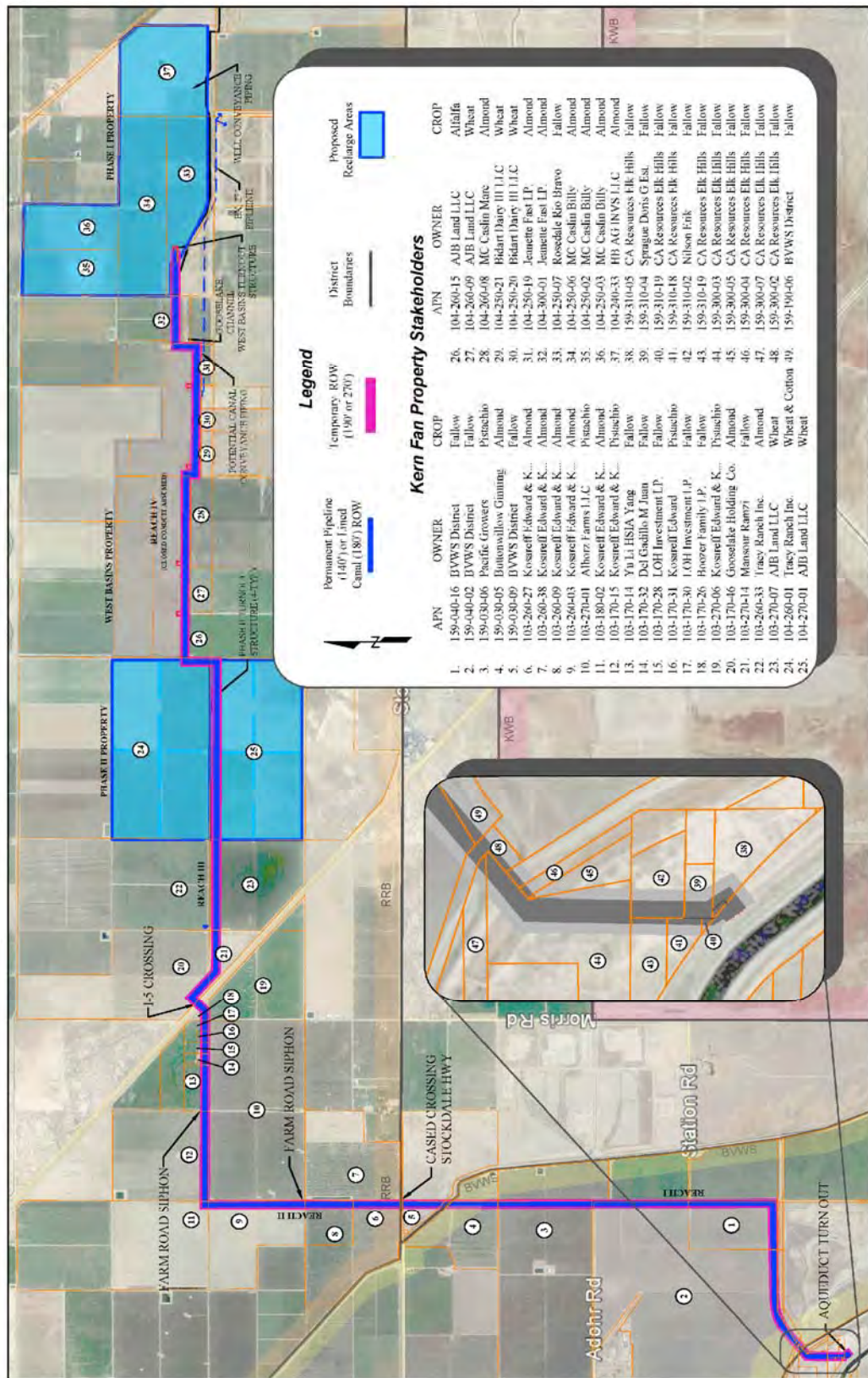


Figure 2: Preliminary Conveyance Alignment

C. Permanent Easements

As noted above, permanent easement is not recommended for the conveyance facility if it is an open canal.

The preliminary conveyance alignment is approximately 9.30 miles in length from the Aqueduct Turnout to the east end of the West Basins or approximately 49,080-ft. It is estimated that a permanent easement or in fee right-of-way of approximately 140-ft would be required to allow for repairs and maintenance of the pipeline. This equates to approximately 158 acres.

The permanent easement agreements will allow for the landowner to maintain limited use of the easement area, however it will not permit the following:

- There to be less than thirty-six (36") inches of earth cover or more than sixty (60") inches of earth cover measured vertically to the top of pipe.
- The grade of the existing ground surface above the pipeline to be changed by more than twelve (12") inches.
- Permanent crops anywhere within the easement area. The planting of crops within some of the easement area may be acceptable to the GBJPA through a subsequent encroachment permit process. However, the GBJPA would not be responsible for damage to crops or any related costs if the crop needed to be removed to maintain, repair, or replace the conveyance facilities.

The easement areas shall be kept open, clear, and free from buildings, structures, or permanent crops of any kind unless allowed for under an encroachment permit from the GBJPA. Monetary consideration will be provided for the permanent easement area and the GBJPA will compensate the landowner for the removal of any crop located within the permanent easement area.

All existing facilities impacted by the construction and installation of conveyance facilities will be restored or replaced in kind to the satisfaction of the GBJPA and the landowner.

A sample Water Pipeline Easement Agreement is attached in Appendix A.

D. Temporary Easements

Temporary easements are anticipated to be necessary for the conveyance alignment in all instances for purposes of construction.

In the event of a canal, it is estimated that an additional 90-ft temporary easement would be necessary for construction. This equates to approximately 101 acres.

In the event of a pipeline, it is estimated that an additional 50-ft temporary easement would be necessary for construction. This equates to approximately 56 acres.

The easement granted is a temporary right to enter upon the temporary easement area, to store and operate construction equipment and materials thereon, and to cross over the temporary easement area in connection with the performance of certain construction work. Monetary consideration will be provided for the temporary easement area and the GBJPA will compensate the landowner for the removal of any crop located within the temporary easement area.

Within fifteen (15) days following completion of the construction work, all construction equipment and materials will be removed from the temporary easement area and the temporary easement area restored to the condition it was in on the date and time of the execution of the agreement. The restoration work will specifically include the repair or replacement of any landscaping, structures, fences, driveways, or other improvements that were removed, damaged, or destroyed, however this does not include any crop for which consideration was previously made.

A sample Temporary Easement Agreement is attached in Appendix B.

III. Methodology

The GBJPA will negotiate with landowners for right-of-way and easements. It is anticipated that as part of the negotiations the GBJPA will provide a farmer turnout to the property owners, free of charge, within the District service area. A landowner would receive a turnout per 160 acres of land that is adjacent to and impacted by the conveyance facility. In addition to relocating existing utilities or pipelines if impacted by the new facilities, the GBJPA will also provide one 12" diameter PVC pipe crossing for the width of the in-fee right-of-way or permanent easement per 160 acres of land that is adjacent to and impacted by the conveyance facility. This 12" PVC pipe crossing can be used by the landowner for a future utility crossing if needed. Any additional landowner crossings would be under an encroachment permit application process.

The GBJPA will prepare a package for each property owner. The package will describe the project, outline what will be crossing their property, illustrate the area of property impacted, provide the monetary offer, include an eminent domain pamphlet, and provide details for meet and confer negotiations, if necessary.

The GBJPA will:

- Obtain land and crop appraisals
- Obtain preliminary title reports
- Perform a Phase I Assessment, if determined necessary
- Submit draft plats and legal descriptions for property owners to review and provide input
- Prepare offer letters with final plats and legal descriptions
- Prepare offer letters
- Negotiate Fair Market Value
- Initiate Eminent Domain/Condemnation, if determined necessary

Eminent domain will only be utilized as a last resort. Eminent Domain allows the GBJPA to take private property for a public use with just compensation. Typically, the measure of just compensation is the fair market value of the property that is taken for public use. An information pamphlet related to Eminent Domain is attached in Appendix C.

It is anticipated that the engineering design firm for the conveyance facilities will provide plats to illustrate the conveyance facility alignment across each property as well as providing legal descriptions and plats for the right-of-way or easement acquisition. These plats and right-of-way documents will be prepared and

submitted to the GBJPA for review and comment prior to including in the land acquisition packages.

It is anticipated that the engineering design firm will evaluate the specific conveyance alignment with considerations given to physical constraints, economics, and environmental issues. The engineering design firm shall refer to the Mitigation Monitoring and Reporting Program outlined in the Final Environmental Impact Report. The alignment selected for the conveyance facility shall seek to create the least public harm or least impact to the public and property values.

The GBJPA may also hire a third-party firm that specializes in land acquisitions. This firm would provide assistance in contacting property owners, negotiating with property owners, and finalizing the land acquisition paperwork.

IV. Land Valuations

Preliminary land valuation information was provided by Mike Ming with Alliance Ag Services, Inc. for cost estimating purposes.

A preliminary list of properties impacted by the conveyance alignment has been prepared and a crop valuation performed.

Acquisition of land within “white land” areas or lands without any specific proposal for District water are estimated to be \$10,000 per acre.

Acquisition of property from the Buena Vista Water Storage District is estimated between \$27,500 to \$29,000 per acre.

Acquisition of land within District boundaries will be based upon the type of crop that is planted and being farmed.

- Fallow land is estimated between \$15,000 to \$16,000 per acre.
- Wheat and Cotton are estimated between \$22,000 to \$24,000 per acre.
- Almonds are estimated between \$26,000 to \$32,000 per acre.
- Pistachios are estimated between \$48,000 to \$55,000 per acre.

The total estimated land acquisition costs for a pipeline conveyance facility with a 140-ft right-of-way is \$3,411,488 to \$3,650,156. The cost for an additional 50-ft temporary easement is \$1,218,388 to \$1,303,627.

The total estimated land acquisition costs for a lined canal conveyance facility with a 180-ft right-of-way is \$4,385,280 to \$4,691,956. The cost for an additional 90-ft temporary easement is \$2,193,099 to \$2,346,529.

V. Crop Valuations

The crop valuations vary depending on the type of crop planted. Alliance Ag Services, Inc. utilizes a model to estimate the value of the crop on a per tree or per acre basis.

However, for purposes of this memorandum approximations of crop value have been estimated based on the right-of-way area and the average crop value per acre. These estimates are illustrated in Table 1 - Pipeline Conveyance and Table 2 – Lined Canal Conveyance.

Table 1
Pipeline Conveyance Crop Valuation

Groundwater Banking Joint Powers Authority																
Kern Fan Groundwater Project																
Preliminary Right-of-Way (ROW) Crop Take Estimates																
Property Summary									AAS Crop Valuation				Permanent ROW		Temporary ROW	
No.	APN	Owner	Crop Type	Length (ft)	Permanent ROW Width (ft)	Potential Permanent ROW	Temporary ROW Width (ft)	Potential Temporary ROW	Crop Take \$/Acre	WD	ASSUMPTION	LOW	HIGH	LOW	HIGH	
38	159-310-05	CA Resources Elk Hills LLC	Fallow	100	140	0.3	50	0.1	\$ 500	\$ 600		\$ 161	\$ 193	\$ 57	\$ 69	
40	159-310-17	CA Resources Elk Hills LLC	Fallow	200	140	0.6	50	0.2	\$ 500	\$ 600		\$ 321	\$ 386	\$ 115	\$ 138	
41	159-310-18	CA Resources Elk Hills LLC	Fallow	200	140	0.6	50	0.2	\$ 500	\$ 600		\$ 321	\$ 386	\$ 115	\$ 138	
43	159-310-19	CA Resources Elk Hills LLC	Fallow	200	140	0.6	50	0.2	\$ 500	\$ 600		\$ 321	\$ 386	\$ 115	\$ 138	
44	159-300-03	CA Resources Elk Hills LLC	Fallow	1000	140	3.2	50	1.1	\$ 500	\$ 600		\$ 1,607	\$ 1,928	\$ 574	\$ 689	
47	159-300-07	CA Resources Elk Hills LLC	Fallow	100	140	0.3	50	0.1	\$ 500	\$ 600		\$ 161	\$ 193	\$ 57	\$ 69	
48	159-300-02	CA Resources Elk Hills LLC	Fallow	200	140	0.6	50	0.2	\$ 500	\$ 600		\$ 321	\$ 386	\$ 115	\$ 138	
2	159-040-02	BVWS District	Fallow	3700	140	11.9	50	4.2	\$ 27,500	\$29,000	BV	\$ 327,020	\$ 344,858	\$ 116,793	\$ 123,163	
1	159-040-16	BVWS District	Fallow	5500	140	17.7	50	6.3	\$ 27,500	\$29,000	BV	\$ 486,111	\$ 512,626	\$ 173,611	\$ 183,081	
3	159-030-06	Pacific Growers	Pistachio	2600	140	8.4	50	3.0	\$ 50,000	\$55,000	BV Median age,Prime Production	\$ 417,815	\$ 459,596	\$ 149,219	\$ 164,141	
4	159-030-05	Buttonwillow Ginning	Almond	1400	140	4.5	50	1.6	\$ 30,000	\$32,000	BV Median age,Prime Production	\$ 134,986	\$ 143,985	\$ 48,209	\$ 51,423	
5	159-030-09	BVWS District	Fallow	1200	140	3.9	50	1.4	\$ 27,500	\$29,000	BV	\$ 106,061	\$ 111,846	\$ 37,879	\$ 39,945	
6	103-260-27	Kosareff Edward & Katherine	Almond	1300	140	4.2	50	1.5	\$ 26,000	\$28,000	RRBWSO Median age,Prime Production	\$ 108,632	\$ 116,988	\$ 38,797	\$ 41,781	
8	103-260-09	Kosareff Edward & Katherine	Almond	1300	140	4.2	50	1.5	\$ 26,000	\$28,000	RRBWSO Median age,Prime Production	\$ 108,632	\$ 116,988	\$ 38,797	\$ 41,781	
9	103-260-03	Kosareff Edward & Katherine	Almond	2700	140	8.7	50	3.1	\$ 26,000	\$28,000	RRBWSO Median age,Prime Production	\$ 225,620	\$ 242,975	\$ 80,579	\$ 86,777	
11	103-180-02	Kosereff Edward & Katherine	Almond	200	140	0.6	50	0.2	\$ 26,000	\$28,000	RRBWSO Median age,Prime Production	\$ 16,713	\$ 17,998	\$ 5,969	\$ 6,428	
12	103-170-15	Kosareff Edward & Katherine	Pistachio	2700	140	8.7	50	3.1	\$ 48,000	\$50,000	RRBWSO Median age,Prime Production	\$ 416,529	\$ 433,884	\$ 148,760	\$ 154,959	
13	103-170-14	Yu Li HSIA Yang	Fallow	1300	140	4.2	50	1.5	\$ 15,000	\$16,000	RRBWSO	\$ 62,672	\$ 66,850	\$ 22,383	\$ 23,875	
14	103-170-32	Del Gadillo M Juan	Fallow	300	140	1.0	50	0.3	\$ 15,000	\$16,000	RRBWSO	\$ 14,463	\$ 15,427	\$ 5,165	\$ 5,510	
15	103-170-28	LOH Investment LP.	Fallow	300	140	1.0	50	0.3	\$ 15,000	\$16,000	RRBWSO	\$ 14,463	\$ 15,427	\$ 5,165	\$ 5,510	
16	103-170-31	Kosareff Edward	Pistachio	300	140	1.0	50	0.3	\$ 48,000	\$50,000	RRBWSO Median age,Prime Production	\$ 46,281	\$ 48,209	\$ 16,529	\$ 17,218	
17	103-170-30	LOH Investment LP.	Fallow	300	140	1.0	50	0.3	\$ 15,000	\$16,000	RRBWSO	\$ 14,463	\$ 15,427	\$ 5,165	\$ 5,510	
18	103-170-26	Boozer Family LP.	Fallow	400	140	1.3	50	0.5	\$ 15,000	\$16,000	RRBWSO	\$ 19,284	\$ 20,569	\$ 6,887	\$ 7,346	
20	103-170-46	Gooslake Holding Co.	Almond	600	140	1.9	50	0.7	\$ 30,000	\$32,000	RRBWSO Median age,Prime Production	\$ 57,851	\$ 61,708	\$ 20,661	\$ 22,039	
21	103-270-14	Mansour Ramzi	Fallow	1700	140	5.5	50	2.0	\$ 15,000	\$16,000	RRBWSO If no enviro issues	\$ 81,956	\$ 87,420	\$ 29,270	\$ 31,221	
23	103-270-07	AJB Land LLC	Wheat	2700	140	8.7	50	3.1	\$ 22,000	\$24,000	RRBWSO If no enviro issues	\$ 190,909	\$ 208,264	\$ 68,182	\$ 74,380	
24	104-260-01	Tracy Ranch Inc.	Wheat & Cotton	700	140	2.2	50	0.8	\$ 22,000	\$24,000	RRBWSO	\$ 49,495	\$ 53,994	\$ 17,677	\$ 19,284	
25	104-270-01	AJB Land LLC	Wheat	5280	140	17.0	50	6.1	\$ 22,000	\$24,000	RRBWSO	\$ 373,333	\$ 407,273	\$ 133,333	\$ 145,455	
32	104-300-01	Jeanette Fast LP.	Almond	1400	140	4.5	50	1.6	\$ 30,000	\$32,000	RRBWSO Median age,Prime Production	\$ 134,986	\$ 143,985	\$ 48,209	\$ 51,423	
		RRBWSO West Basins	Recharge Basins	9200	140	29.6	50	10.6				\$ -	\$ -	\$ -	\$ -	
		Total Length including Aqueduct Turnout Piping:		49080								\$3,411,488	\$3,650,156	\$1,218,388	\$1,303,627	
		Total Length excluding Aqueduct Turnout Piping:		47080							Mean \$/Acre	\$ 21,627	\$ 23,140	\$ 21,627	\$ 23,140	
					Total ROW Acreage:	157.7		56.3								
					Total ROW Acreage excluding RRB Property:	128.2		45.8								

Groundwater Banking Joint Powers Authority																
Kern Fan Groundwater Project																
Preliminary Right-of-Way (ROW) Crop Take Estimates																
Property Summary									AAS Crop Valuation				Permanent ROW		Temporary ROW	
No.	APN	Owner	Crop Type	Length (ft)	Permanent ROW Width (ft)	Potential Permanent ROW	Temporary ROW Width (ft)	Potential Temporary ROW	Crop Take \$/Acre	WD	ASSUMPTION	LOW	HIGH	LOW	HIGH	
38	159-310-05	CA Resources Elk Hills LLC	Fallow	100	140	0.3	90	0.2	\$ 500	\$ 600		\$ 161	\$ 193	\$ 103	\$ 124	
40	159-310-17	CA Resources Elk Hills LLC	Fallow	200	140	0.6	90	0.4	\$ 500	\$ 600		\$ 321	\$ 386	\$ 207	\$ 248	
41	159-310-18	CA Resources Elk Hills LLC	Fallow	200	140	0.6	90	0.4	\$ 500	\$ 600		\$ 321	\$ 386	\$ 207	\$ 248	
43	159-310-19	CA Resources Elk Hills LLC	Fallow	200	140	0.6	90	0.4	\$ 500	\$ 600		\$ 321	\$ 386	\$ 207	\$ 248	
44	159-300-03	CA Resources Elk Hills LLC	Fallow	1000	140	3.2	90	2.1	\$ 500	\$ 600		\$ 1,607	\$ 1,928	\$ 1,033	\$ 1,240	
47	159-300-07	CA Resources Elk Hills LLC	Fallow	100	140	0.3	90	0.2	\$ 500	\$ 600		\$ 161	\$ 193	\$ 103	\$ 124	
48	159-300-02	CA Resources Elk Hills LLC	Fallow	200	140	0.6	90	0.4	\$ 500	\$ 600		\$ 321	\$ 386	\$ 207	\$ 248	
2	159-040-02	BVWS District	Fallow	3700	180	15.3	90	7.6	\$ 27,500	\$29,000	BV	\$ 420,455	\$ 443,388	\$ 210,227	\$ 221,694	
1	159-040-16	BVWS District	Fallow	5500	180	22.7	90	11.4	\$ 27,500	\$29,000	BV	\$ 625,000	\$ 659,091	\$ 312,500	\$ 329,545	
3	159-030-06	Pacific Growers	Pistachio	2600	180	10.7	90	5.4	\$ 50,000	\$55,000	BV Median age,Prime Production	\$ 537,190	\$ 590,909	\$ 268,595	\$ 295,455	
4	159-030-05	Buttonwillow Ginning	Almond	1400	180	5.8	90	2.9	\$ 30,000	\$32,000	BV Median age,Prime Production	\$ 173,554	\$ 185,124	\$ 86,777	\$ 92,562	
5	159-030-09	BVWS District	Fallow	1200	180	5.0	90	2.5	\$ 27,500	\$29,000	BV	\$ 136,364	\$ 143,802	\$ 68,182	\$ 71,901	
6	103-260-27	Kosareff Edward & Katherine	Almond	1300	180	5.4	90	2.7	\$ 26,000	\$28,000	RRBWSD Median age,Prime Production	\$ 139,669	\$ 150,413	\$ 69,835	\$ 75,207	
8	103-260-09	Kosareff Edward & Katherine	Almond	1300	180	5.4	90	2.7	\$ 26,000	\$28,000	RRBWSD Median age,Prime Production	\$ 139,669	\$ 150,413	\$ 69,835	\$ 75,207	
9	103-260-03	Kosareff Edward & Katherine	Almond	2700	180	11.2	90	5.6	\$ 26,000	\$28,000	RRBWSD Median age,Prime Production	\$ 290,083	\$ 312,397	\$ 145,041	\$ 156,198	
11	103-180-02	Kosareff Edward & Katherine	Almond	200	180	0.8	90	0.4	\$ 26,000	\$28,000	RRBWSD Median age,Prime Production	\$ 21,488	\$ 23,140	\$ 10,744	\$ 11,570	
12	103-170-15	Kosareff Edward & Katherine	Pistachio	2700	180	11.2	90	5.6	\$ 48,000	\$50,000	RRBWSD Median age,Prime Production	\$ 535,537	\$ 557,851	\$ 267,769	\$ 278,926	
13	103-170-14	Yu Li HSIA Yang	Fallow	1300	180	5.4	90	2.7	\$ 15,000	\$16,000	RRBWSD	\$ 80,579	\$ 85,950	\$ 40,289	\$ 42,975	
14	103-170-32	Del Gadillo M Juan	Fallow	300	180	1.2	90	0.6	\$ 15,000	\$16,000	RRBWSD	\$ 18,595	\$ 19,835	\$ 9,298	\$ 9,917	
15	103-170-28	LOH Investment LP.	Fallow	300	180	1.2	90	0.6	\$ 15,000	\$16,000	RRBWSD	\$ 18,595	\$ 19,835	\$ 9,298	\$ 9,917	
16	103-170-31	Kosareff Edward	Pistachio	300	180	1.2	90	0.6	\$ 48,000	\$50,000	RRBWSD Median age,Prime Production	\$ 59,504	\$ 61,983	\$ 29,752	\$ 30,992	
17	103-170-30	LOH Investment LP.	Fallow	300	180	1.2	90	0.6	\$ 15,000	\$16,000	RRBWSD	\$ 18,595	\$ 19,835	\$ 9,298	\$ 9,917	
18	103-170-26	Boozer Family LP.	Fallow	400	180	1.7	90	0.8	\$ 15,000	\$16,000	RRBWSD	\$ 24,793	\$ 26,446	\$ 12,397	\$ 13,223	
20	103-170-46	Gooslake Holding Co.	Almond	600	180	2.5	90	1.2	\$ 30,000	\$32,000	RRBWSD Median age,Prime Production	\$ 74,380	\$ 79,339	\$ 37,190	\$ 39,669	
21	103-270-14	Mansour Ramzi	Fallow	1700	180	7.0	90	3.5	\$ 15,000	\$16,000	RRBWSD If no enviro issues	\$ 105,372	\$ 112,397	\$ 52,686	\$ 56,198	
23	103-270-07	AJB Land LLC	Wheat	2700	180	11.2	90	5.6	\$ 22,000	\$24,000	RRBWSD If no enviro issues	\$ 245,455	\$ 267,769	\$ 122,727	\$ 133,884	
24	104-260-01	Tracy Ranch Inc.	Wheat & Cotton	700	180	2.9	90	1.4	\$ 22,000	\$24,000	RRBWSD	\$ 63,636	\$ 69,421	\$ 31,818	\$ 34,711	
25	104-270-01	AJB Land LLC	Wheat	5280	180	21.8	90	10.9	\$ 22,000	\$24,000	RRBWSD	\$ 480,000	\$ 523,636	\$ 240,000	\$ 261,818	
32	104-300-01	Jeanette Fast LP.	Almond	1400	180	5.8	90	2.9	\$ 30,000	\$32,000	RRBWSD Median age,Prime Production	\$ 173,554	\$ 185,124	\$ 86,777	\$ 92,562	
		RRBWSD West Basins	Recharge Basins	9200	180	38.0	90	19.0				\$ -	\$ -	\$ -	\$ -	
		Total Length including Aqueduct Turnout Piping:		49080								\$ 4,385,280	\$ 4,691,956	\$ 2,193,099	\$ 2,346,529	
		Total Length excluding Aqueduct Turnout Piping:		47080							Mean \$/Acre	\$ 21,820	\$ 23,346	\$ 21,627	\$ 23,140	
					Total ROW Acreage:	201.0		101.4								
					Total ROW Acreage excluding RRB Property:	163.0		82.4								

Table 2
Lined Canal Conveyance Crop Valuation

VI. Phase I Assessment

A Phase I Environmental Site Assessment or Phase I ESA shall be completed on property acquisitions at the discretion of the GBJPA. The Phase I ESA is completed to research the current and historical uses of a property as part of the due diligence work during the property transaction. The intent of the report is to assess if current or historical property uses have impacted the soil or groundwater beneath the property and could pose a threat to the proposed project and land uses.

If these issues are encountered then it could present a potential liability for the GBJPA. A Phase I ESA completed prior to the closure of a real estate transaction can be used to satisfy the requirements of CERCLA's (Comprehensive Environmental Response, Compensation, and Liability Act) innocent land owner defense under All Appropriate Inquiries (AAI).

The Phase I ESA report may be completed for all types of properties including vacant land, agricultural land, and residential/commercial/industrial lands. It shall comply with ASTM E1527-13.

VII. Title Work

Title work shall be completed for any land acquisition to ensure that the title is clean when it is passed from the Seller to the Buyer. A title company will be selected by the GBJPA that will perform this work. The title company researches the title to find out if there are any liens and encumbrances against the property, issues insurance policies, facilitates closings, and files and records paperwork.

The preliminary title report shall be reviewed closely and all legal descriptions, easements, rights-of-way, or other rights on the property shall be noted and mapped by a licensed surveyor in the State of California.

VIII. Land Surveying

Property surveying shall be performed for any land acquisition to confirm the property's boundary lines and legal description. The surveying work shall be performed by a registered, licensed surveyor in the State of California. An ALTA (American Land Title Association) survey shall be provided that maps any features, utility lines, oil wells, abandoned wells, roads, fences, or structures on the property and that determines any restrictions or easements included in the property.

Property legal descriptions and plats shall be prepared by a licensed surveyor in the State of California for the rights-of-way, permanent easements, and temporary easements that are required.

IX. Encroachments

The conveyance alignment will encroach into public rights-of-way and rights-of-way owned by the government that will require encroachment permits and/or agreements. These are estimated to include:

- Aqueduct Turnout Piping – DWR Agreement and Encroachment Permit
- Adohr Road Crossing – Kern County Encroachment Permit
- Stockdale Hwy Road Crossing – Caltrans Encroachment Permit
- I-5 Freeway Road Crossing – Caltrans Encroachment Permit
- Buena Vista Water Storage District – Encroachment Permit

The design firm shall provide detailed plans for these permit applications and assist the GBJPA with the permitting process as necessary.

The design firm shall evaluate the alignment with respect to the physical encroachments that may occur on facilities such as existing structures and/or existing utilities. Consideration shall be given to known utility crossings during the title work and survey work so that these can be included in the negotiations for land acquisition or planned for during the design phase to relocate the existing utility or to design the new conveyance facility around the existing utility.

The design firm shall also evaluate the alignment with respect to the environmental encroachments that may occur and include the appropriate mitigations in the bid documents for the conveyance facilities. The conveyance facility will cross known environmental habitat between the California Aqueduct and the Buena Vista Water Storage District property. This property may be subject to mitigation credits that may be obtained from the Kern Water Bank Authority. The Mitigation Monitoring and Reporting Program outlined in the Final Environmental Impact Report shall be adhered to. Additional biological surveys or cultural resource surveys may also be required.

X. Related Work Specified Elsewhere

- A. TM 2 – Conveyance Capacity Requirements
- B. TM 3 – Pipeline Requirements
- C. TM 4 – Pump Station Requirements
- D. TM 6 – Conveyance and Turnout Requirements
- E. TM 7 – Well Drilling and Equipping Requirements
- F. TM 9 – Recharge Basin Requirements
- G. TM 11- Engineer's Estimates

Appendices

- Appendix A – Water Pipeline Easement Agreement
- Appendix B – Temporary Easement Agreement
- Appendix C – Eminent Domain – Information Pamphlet

Appendix A
Water Pipeline Easement Agreement

RECORDING REQUESTED BY AND FOR
ROSEDALE –RIO BRAVO WATER
STORAGE DISTRICT

WHEN RECORDED MAIL TO:

**ROSEDALE-RIO BRAVO WATER
STORAGE DISTRICT
P.O. Box 20820
Bakersfield, CA 93390**

[Space above this line for Recorder's Use Only]

WATER PIPELINE EASEMENT AGREEMENT

FOR VALUABLE CONSIDERATION, the receipt of which is hereby acknowledged, _____, herein called "Grantor", hereby grants to ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, herein called "Grantee", a nonexclusive permanent easement and right of way ("Easement") to lay, construct, install, enlarge, operate, use, maintain, repair, reconstruct, improve, relocate, remove and replace a single pipeline for transporting water only, together with appurtenant and necessary structures, fittings and other equipment connected therewith or related thereto (hereinafter collectively referred to as the "District facilities") in, under, over, along, and across that parcel of real property (the "Easement Area") located in the unincorporated area of the County of Kern, State of California, which is more particularly described and depicted in Exhibits A and B to this Agreement.

Said Easement shall be subject to the following terms and conditions:

1. Grantee shall bury such pipeline laid by it so that the top of the pipe shall be at least 36 inches below the surface of the ground at all points. All trenches and other excavations made by the Grantee upon the premises at any time shall be backfilled as soon as practicable and the surface of the ground restored to a contour and condition satisfactory to Grantor. Grantee shall upon request, furnish Grantor with a map showing the location of its pipeline and all appurtenant valves, fittings or other equipment.
2. Grantee shall, at all times, maintain its pipeline in a safe and sound condition of repair.
3. Grantor reserves the right to use, and permit others to use, the Easement Area for any and all purposes which do not unreasonably interfere with the uses by Grantee that are granted herein. Without limiting the generality of the foregoing, Grantor shall neither take nor permit any of the following actions without Grantee's advance written consent: (1) cause the earth cover over Grantee's pipeline to be less than thirty-six (36) inches or more than sixty (60) inches, measured vertically from the top of the pipeline; (2) add to the earth cover more than twelve (12) inches over Grantee's pipeline; (3) remove more than twelve (12) inches of earth cover from above Grantee's pipeline; or (4) plant permanent crops anywhere within the Easement Area.
4. Except as otherwise specified herein, the Easement Area shall be kept open, clear and free from buildings, structures or permanent crops of any kind. The Grantee shall have the right to clear and keep clear said Easement Area from buildings, structures and permanent crops of all kinds, and other things interfering, or threatening to interfere, with the Grantees use of said Easement Area, and the Grantee shall have the permanent right of exclusive use and possession

within the Easement Area within a distance of one foot from the outside surface of the District facilities.

5. Grantor hereby grants to Grantee the right of ingress to and egress from the above-described lands, at any time, and from time to time, without prior notice by means of any existing roads and lanes or other routes as shall occasion the least inconvenience to Grantor.

6. Grantee shall indemnify, defend and hold harmless Grantor, its officers, agents and employees against any and all liability, claims, actions, causes of action or demands whatsoever against them, or any of them, before administrative or judicial tribunals of any kind whatsoever, arising out of, connected with, or caused by Grantee, Grantee's employees, agents, independent contractors, and provisions of this easement whether or not caused in part by a party indemnified hereunder, except of Grantor's sole active negligence or willful misconduct.

7. Grantor shall have the right to inspect, at Grantee's expense, any construction undertaken hereunder and Grantee shall respond to all requests by Grantor to conform construction to the plans and specifications approved by Grantor, if any.

8. Grantor shall, at its request, have the right to approve all plans and specifications for the construction called for hereunder and all construction shall conform to said plans and specifications unless deviations therefrom have been approved by Grantor in writing.

9. Should Grantee abandon the easement at any time for any reason, Grantee shall, at Grantee's sole cost, return the Easement Area to its previous condition after removal of all equipment, appliances, improvements, pipelines, and appurtenances of every kind and description.

10. This Agreement shall be binding on and shall inure to the benefit of the heirs, executors, administrators, successors, and assigns of Grantor and Grantee.

11. This Agreement and any other documents and instruments referred to in this Agreement will constitute the entire agreement between the parties with respect to the subject matter hereof and it correctly sets forth the obligations of the parties to each other as of the date of execution. Any and all prior agreements, oral or written, promises, representations or understandings, warranties or statements, by any party or any shareholder, director, officer, employee or agent of any party not expressly set forth herein or differ in any way from the terms and provisions of this Agreement, are hereby terminated and canceled in their entirety and are of no further force or effect whatsoever.

12. Any and all notices, demands or communications required, permitted or desired to be given hereunder, pursuant to this Agreement, by any party shall be in writing and shall be deemed duly delivered (i) when personally served on the party to whom the notice is directed, or (ii) two (2) days after the date when deposited in the United States mail, postage prepaid, registered or certified with return receipt requested and addressed to the party to whom they are directed, or delivered to a

nationally recognized overnight delivery service or carrier such as Federal Express.

13. The rights granted to the parties hereunder are of a special and unique kind and character, and if there is a breach by any party of any material provision of the Agreement, the other party would not have any adequate remedy at law. It is expressly agreed that the rights of the parties hereunder may be enforced by any action for specific performance and such other equitable relief as provided under the laws of the State of California.

14. No amendment, change, or modification to this Agreement shall be binding unless executed in writing by all of the parties. No waiver by any party of any of the provision of this Agreement shall be deemed a waiver of any other provision, whether or not similar, nor shall any waiver be construed as a continuing waiver. No waiver shall be binding unless executed in writing by the party making the waiver. Neither party shall be deemed to have waived any default by the other party, nor to have waived any other condition provided in this Agreement, unless such waiver is expressed in writing and signed by the waiving party

15. If any term, provision, covenant, condition, clause, paragraph, phrase, section or sentence of this Agreement is found or held by a court of competent jurisdiction to be invalid, null or void or unenforceable, the remainder of the Agreement shall nevertheless not be affected thereby and the parties will agree to negotiate an equitable adjustment of the affected provision with a view toward effecting the purpose of this Agreement. The remainder of this Agreement will continue to be in full force and effect and shall not in any way be affected, impaired or invalidated.

16. All parties participated in the drafting of this Agreement. Therefore, no greater or stricter construction should be applied to any party hereto.

17. Neither this Agreement nor any duties or obligations under this Agreement may be assigned by a party without the prior written consent of the other party; provided, however, that Grantee shall not be required to obtain the consent of Grantor to operate the pipeline for water management purposes, regardless of the source or ownership of the water being transported through the pipeline.

18. The parties hereby agree that time is of the essence with respect to this Agreement and to the performance by each party of each obligation, term and condition to be performed. The strict and timely performance of obligations by a party shall be a condition precedent to the enforcement by that party of the other party's obligations. The failure to timely perform any of the terms and conditions by any of the parties will constitute a breach and default under this Agreement by the party failing to perform.

19. This Agreement may be signed and signatures transmitted by facsimile or electronic mail, and any such facsimile or electronic mail copy shall be equivalent to a signed original for all purposes.

20. This Agreement may be executed in one or more counterparts and delivered via mail,

facsimile, or electronic mail, each of which will be deemed an original, but all of which together will constitute one and the same instrument which may be sufficient evidenced by one counterpart.

21. Venue for any action arising out of this Agreement brought by any party hereto will be the Superior Court in and for the County of Kern, California which is located in Bakersfield, California. This Agreement shall be interpreted, construed and enforced in accordance with the internal laws, and not the law of conflicts, of the State of California applicable to agreements made and to be performed in such state. The parties agree that all claims in respect of the action or proceeding will be heard and determined by such court, and agree not to bring any action or proceeding arising out of or relating to this Agreement in any other court.

22. Each individual executing and delivering this Agreement on behalf of a party hereby covenants, represents and warrants to the other party that such individual has been duly authorized and empowered to make such execution and delivery on its behalf.

IN WITNESS WHEREOF, the undersigned, by its duly authorized officers, has executed this Agreement this _____ day of _____, 2015.

GRANTOR

GRANTEE

Its: _____

Its: _____

CERTIFICATE OF ACCEPTANCE
(Government Code Section 27281)

THIS IS TO CERTIFY that the interest in real property conveyed by the Water Pipeline Easement Agreement, dated _____, 2015, from _____ to ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, a California Water Storage District formed pursuant to Division 13 of the California Water Code, is hereby accepted by the undersigned on behalf of Rosedale-Rio Bravo Water Storage District, pursuant to authority conferred by the Board of Directors of Rosedale-Rio Bravo Water Storage District, and the grantee consents to recordation thereof by its duly authorized agent or officer.

Dated: _____, 2015

By: _____
Rosedale-Rio Bravo Water Storage District

Appendix B
Temporary Easement Agreement

TEMPORARY EASEMENT AGREEMENT

Preamble

This Agreement is entered into on _____, 2015 by _____, herein called "Grantor," and ROSEDALE-RIO BRAVO WATER STORAGE DISTRICT, herein called "Grantee."

AGREEMENT

FOR VALUABLE CONSIDERATION, the receipt of which is hereby acknowledged, Grantor hereby grants to Grantee a temporary construction easement upon the terms set forth herein.

The purpose of said temporary construction easement is to allow Grantee and its' agents to lay and construct a single pipeline, together with appurtenant and necessary structures, fittings and other equipment in, under, over, along, and across a parcel of real property located in the unincorporated area of the County of Kern, State of California, which is more particularly described in a Water Pipeline Easement Agreement ("Permanent Easement Area") being executed by Grantor and Grantee concurrently with this Agreement.

The temporary construction easement shall be located over and upon a parcel of real property located in the unincorporated area of the County of Kern, State of California, which is more particularly described in Exhibit A hereto, and shown on Exhibit B hereto ("Temporary Easement Area").

Terms

1. Grant of Easement. In consideration of the sum of \$_____, Grantor grants to Grantee and Grantee's agents and employees a temporary easement over and upon the Temporary Easement Area, on the terms and conditions set forth in this Agreement. In addition, Grantee shall pay to Grantor \$_____ as consideration for removal of XX almond trees within the Permanent Easement Area (\$X.XX per tree); in the event additional almond trees located within the Permanent Easement Area or Temporary Easement Area are removed or lost as a result of the construction of the pipeline, Grantee shall pay to Grantor an amount of \$X.XX per tree.
2. Character of Easement. The easement granted in this Agreement is an easement in gross.
3. Description of Easement. The easement granted in this Agreement is a temporary right to enter upon the Temporary Easement Area, to store and operate construction equipment and materials thereon, and to cross over the Temporary Easement Area in connection with the performance of certain construction work on the Permanent Easement Area.
4. Construction Work. The construction work referred to herein consists of the construction of a buried pipeline and related activities. Construction equipment and materials used will be typical to such construction.

5. Term. The temporary easement granted in this Agreement shall terminate on the earlier of completion of the construction work and satisfaction by Grantor of all requirements imposed by this Agreement or one year after Grantor commences construction. If the construction work is not completed within one year after Grantee commences construction, Grantee shall pay Grantor the sum of one-twelfth (1/12) of the consideration described in Paragraph 1 hereof for each month or portion of a month thereafter that this easement remains in effect.

6. Duty to Repair, Restore, or Replace. Within fifteen (15) days following completion of the construction work, Grantee shall (a) remove Grantee's construction equipment and materials from the Temporary Easement Area, and (b) restore the Temporary Easement Area to the condition it was in on the date and at the time of the execution of this Agreement. The restoration work shall specifically include the repair or replacement of any landscaping (which does not include trees for which consideration is paid pursuant to Paragraph 1 of this Agreement), structures, fences, driveways, or other improvements on the Temporary Easement Area that belong to Grantor and that are removed, damaged, or destroyed by Grantee or Grantee's agents or employees.

7. Nonexclusive Easement. The easement granted in this Agreement is nonexclusive. Grantor retains the right to make any use of the Temporary Easement Area, including the right to grant concurrent easements in said property to third parties that do not interfere unreasonably with Grantee's free use and enjoyment of the easement.

8. Agreement Nonassignable. This Agreement shall not be assigned. Any purported assignment of this Agreement or of any interest in this Agreement shall be void and of no effect.

9. Time of Essence. Time is of the essence in this Agreement.

10. Indemnification. Grantee shall indemnify, defend and hold harmless Grantor, its officers, agents and employees against any and all liability, claims, actions, causes of action or demands whatsoever against them, or any of them, before administrative or judicial tribunals of any kind whatsoever, arising out of, connected with, or caused by Grantee, Grantee's employees, agents, independent contractors, and provisions of this agreement whether or not caused in part by a party indemnified hereunder, except of Grantor's sole active negligence or willful misconduct.

11. Entire Agreement. This Agreement constitutes the entire agreement between Grantor and Grantee relating to the above easement. Any prior agreements, promises, negotiations, or representations not expressly set forth in this Agreement are of no force and effect. Any amendment to this Agreement shall be of no force and effect unless it is in writing and signed by Grantor and Grantee.

12. Binding Effect. This Agreement shall be binding on and shall inure to the benefit of the heirs, executors, administrators, successors, and assigns of Grantor and Grantee, except as otherwise provided in this Agreement.

IN WITNESS WHEREOF, the undersigned, by its duly authorized officers, has executed this Agreement this _____ day of _____, 2015.

GRANTOR

GRANTEE

Its:_____

Its:_____

Appendix C
Eminent Domain – Information Pamphlet

Rosedale-Rio Bravo Water Storage District ("District")

EMINENT DOMAIN – Information Pamphlet

I. Introduction

Eminent domain is the power of the government to purchase private property for a "public use" so long as the property owner is paid "just compensation." Whenever possible, the District tries to avoid use of the eminent domain power, exercising it only when it is necessary for a public project. The decision to acquire private property for a public project is made by the District only after a thorough review of the project, which often includes public hearings.

This pamphlet provides general information about the eminent domain process and the rights of the property owner in that process.¹

- **What is a "public use"?**

A "public use" is a use that confers public benefits, like the provision of public services or the promotion of public health, safety, and welfare. Public uses include a wide variety of projects such as street improvements, construction of water pipelines or storage facilities, construction of civic buildings, redevelopment of blighted areas, and levee improvements to increase flood protection. Some public uses are for private entities, such as universities, hospitals and public utilities, which serve the public.

- **What is "just compensation"?**

Just compensation is the **fair market value** of the property being acquired by the government. The state law definition of fair market value is "the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing, and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available."

II. The Eminent Domain Process and the Property Owner's Rights

The eminent domain process begins with a public use project. When selecting a project location, the goal is to render the greatest public good and the least private injury or inconvenience. If it is determined that all or a portion of your property may be necessary for a public use project, the District will begin the appraisal process to determine the property's fair market value.

¹ **The information in this pamphlet is not, nor should it be construed as, legal advice. You should consult with qualified legal counsel regarding your specific situation rather than relying on this pamphlet as legal advice.**

- **How is the fair market value of my property determined?**

The District will retain an independent, accredited appraiser familiar with local property values to appraise your property. The appraiser will invite you to accompany him or her during an inspection of your property. You may give the appraiser any information about improvements and any special features that you believe may affect the value of your property. It is in your best interest to provide the appraiser with all the useful information you can in order to ensure that nothing of value will be overlooked. If you are unable to meet with the appraiser, you may wish to have a person who is familiar with your property meet with the appraiser instead.

After the inspection, the appraiser will complete an appraisal that will include the appraiser's determination of your property's fair market value and the information upon which the fair market value is based. The appraiser will provide the District with the appraisal. The District will then make a written offer to purchase the property. The offer will also include a summary of the appraisal. The offer will be for no less than the amount of the appraisal.

- **What factors does the appraiser consider in determining fair market value?**

Each parcel of real property is different and, therefore, no single formula can be used to appraise all properties. Among the factors an appraiser typically considers in estimating fair market value are:

- The location of the property;
- The age and condition of improvements on the property;
- How the property has been used;
- Whether there are any lease agreements relating to the property;
- Whether there are any environmental issues, such as contaminated soil;
- Applicable current and potential future zoning and land use requirements;
- How the property compares with similar properties in the area that have been sold recently;
- How much it would cost to reproduce the buildings and other structures, less any depreciation; and
- How much rental income the property produces, or could produce if put to its highest and best use.

- **Will I receive a copy of the appraisal?**

The District is required to provide you with its purchase offer, a summary of the appraiser's opinion, and the basis for the District's offer. Among other things, this summary must include:

- A general statement of the District's proposed use for the property;
- An accurate description of the property to be acquired;
- A list of the improvements covered by the offer;
- The amount of the offer; and

- The amount considered to be just compensation for each improvement which is owned by a tenant and the basis for determining that amount.

However, the District is only required to show you a copy of the full appraisal if your property is an owner-occupied residential property with four or fewer residential units. Otherwise, the District may, but is not required, to disclose its full appraisal during negotiations (though different disclosure requirements apply during the litigation process if the issue of fair market value goes to court).

- **Can I have my own appraisal done?**

Yes. You may decide to obtain your own appraisal of the property in negotiating the fair market value with the District. At the time of making its initial offer to you, the District must offer to reimburse you the reasonable costs, not to exceed \$5,000, of an independent appraisal of your property. To be eligible for reimbursement, the independent appraisal must be conducted by an appraiser licensed by the State Office of Real Estate Appraisers.

- **What advantages are there in selling my property to the District?**

A real estate transaction with the District is typically handled in the same way as the sale of private property. However, there may be a financial advantage to selling to the District.

- You will not be required to pay for real estate commissions, title costs, preparation of documents, title policy or recording fees required in closing the sale. The District will pay all these costs.
- Although the District cannot give you tax advice or direction, you might also be eligible for certain property and income tax advantages. You should check with the Internal Revenue Service (IRS) for details or consult your personal tax advisor.

- **If only a portion of my property is taken, will I be paid for the loss to my remaining property?**

In general, when only a part of your property is needed, every reasonable effort is made to ensure you do not suffer a financial loss to the "remainder" property. The District will pay you the fair market value of the property being taken as well as compensation for any loss in value to your remaining property that is not offset by the benefits conferred by the project. The compensation for the loss in value to your remaining property is often referred to as "severance damages."

Also, if any remaining part is of such a size, shape, or condition as to be of little market value, the District will offer to acquire that remaining part (or remnant) from you, if you so desire.

- **Will I be compensated for loss of goodwill to my business?**

If you are the owner of a business that is conducted on the property being acquired, you may have a right to compensation for lost business goodwill if the loss is caused by the acquisition of the property. "Goodwill" consists of the benefits that accrue to a business as a result of its location, reputation for dependability, skill or quality, and any other circumstances resulting in probable retention of old or acquisition of new patronage.

- **What will happen to the loan on my property?**

Where the District is acquiring the entire property, generally the compensation payable to the owner is first used to satisfy outstanding loans or liens as in a typical real estate transaction. Where less than the entire property is being acquired, whether outstanding loans or liens are paid from the compensation will depend on the particular facts and circumstances.

- **Do I have to sell at the price offered?**

No. If you and the District are unable to reach an agreement on a mutually satisfactory price, you are not obligated to sign an offer to sell or enter into a purchase agreement.

- **If I agree to accept the District's offer, how soon will I be paid?**

If you reach a voluntary agreement to sell your property or an interest in the property to the District, payment will be made at a mutually acceptable time. Generally, this should be possible within 30 to 60 days after a purchase/sale contract is signed by all parties.

- **What happens if we are unable to reach an agreement on the property's fair market value?**

The District, to the greatest extent practicable, will make every reasonable effort to acquire your property by negotiated purchase. If, however, the negotiations are unsuccessful, the District may either file an eminent domain action in a court located within the same county where your property is located or it may decide to abandon its intention to acquire the property. If the District abandons its intention to acquire, it will promptly notify you.

If the District proceeds with eminent domain, the first step is for the District staff to request authority from the [legislative body] to file a condemnation action. The approval from the [legislative body] is called a "Resolution of Necessity." In considering whether condemnation is necessary, the [legislative body] must determine whether the public interest and necessity require the project, whether the project is planned or located in the manner that will be most compatible with the greatest public good and the least private injury, and whether your property is necessary for the project. You will be given notice and an opportunity to appear before the [legislative body] when it considers whether to adopt the Resolution of Necessity. You may want to call an attorney or contact an attorney referral

service right away. You or your representatives can raise any objections to the Resolution of Necessity and the condemnation either orally before the [legislative body] or in writing to the [legislative body].

If the [legislative body] adopts the Resolution of Necessity, the District can file a complaint in court to acquire title to the property upon payment of the property's fair market value. The District is the plaintiff. Anyone with a legal interest in the property, generally determined from a title report on the property (including tenants or mortgage holders), are named as defendants. Often, the District will also deposit the amount the District believes is the "probable amount of compensation" with the State Treasurer where the complaint is filed. A deposit must be made if the District is seeking to acquire possession of the property before agreement is reached on the fair market value.

- **Can the District acquire possession of my property before the property's fair market value is determined in the eminent domain lawsuit?**

In some cases, the District may decide it needs possession of the property before the property's fair market value is finally determined. In such a case, the District must apply to the court for an "order for possession" to allow it to take possession and control of the property prior to resolution of the property's fair market value. The District is required to schedule a hearing with the court on the proposed order for possession and to give you notice of the hearing. Notice must generally be sent at least 90 days before the hearing date if the property is occupied and 60 days before the hearing date if the property is unoccupied. A judge will decide whether the order for possession should be granted. As noted above, the District must deposit with the State Treasurer the probable amount of just compensation in order to obtain possession of the property.

- **Can I oppose the motion for an order for possession?**

Yes. You may oppose the motion in writing by serving the District and the court with your written opposition within the period of time set forth in the notice from the District.

- **Can I rent the property from the District?**

If the District agrees to allow you or your tenants to remain on the property after the District acquires possession, you or the tenants will be required to pay a fair rent to the District. Generally, such rent will not be more than that charged as rent for the use of a property similar to yours in a similar area.

- **Can I withdraw the amount deposited with the State Treasurer before the eminent domain action is completed, even if I don't agree that the amount reflects the fair market value of my property?**

Yes. Subject to the rights of any other persons having a property interest (such as a lender, tenant, or co-owner), you may withdraw the amount deposited with the State Treasurer before the eminent domain action is completed. If you withdraw the amount on deposit, you

may still seek a higher fair market value during the eminent domain proceedings, but you may not contest the right of the District to acquire the property, meaning you cannot contest that the acquisition of your property is for a public purpose or is otherwise improper.

You also have the right to ask the court to require the District to increase the amount deposited with the State Treasurer if you believe the amount the District has deposited less than the "probable amount of compensation."

- **Can I contest the condemning agency's acquisition of the property?**

Yes. Provided you have not withdrawn the amount deposited, you can challenge in court the District's right to acquire or condemn the property.

- **What happens in an eminent domain trial?**

The main purpose of an eminent domain trial is to determine the fair market value of your property, including compensable interests such as lost business goodwill caused by the taking or severance damages. The trial is usually conducted before a judge and jury. You (and any others with interests in the property) and the District will have the opportunity to present evidence of value, and the jury will determine the property's fair market value. In cases where the parties choose not to have a jury, the judge will decide the property's fair market value. Generally, each party to the litigation must disclose its respective appraisals to the other parties prior to trial.

If you challenge the District's right to acquire the property, the eminent domain trial will also determine whether or not the District has the legal right to acquire the property. In such cases, the judge (not the jury) will make this determination before any evidence is presented concerning the property's fair market value.

At the end of the trial, the judge will enter a judgment requiring the District to pay fair market value. Once the District pays the amount listed in the judgment, the judge will enter a final order of condemnation. The District will record the final order with the County Recorder, and title to the property will then pass to the [condemning agency.]

- **Am I entitled to interest?**

Anyone receiving compensation in an eminent domain action is generally entitled to interest on that compensation from the date the condemning agency takes possession of the property until the person receiving the compensation has been fully paid. The rate and calculation of the interest is determined under formulas in State law.

- **Will the District pay my attorneys' fees and costs.**

In an eminent domain action, you are entitled to be reimbursed by the condemning agency for your court costs such as court filing fees. In some circumstances, you may also be entitled to be reimbursed by the condemning agency for your attorneys' fees in the lawsuit.

Whether you will be entitled to receive reimbursement for your attorneys' fees will depend on the particular facts and circumstances of the case and the offers and demand for compensation made in the action.

- **Will I receive assistance with relocation?**

Any person, business, or farm operation displaced as a result of the property acquisition is typically entitled to relocation advisory and financial assistance for eligible relocation expenses, such as moving expenses. The amount of relocation compensation is determined on a case-by-case basis in accordance with prescribed law. Relocation benefits are handled separate and apart from the determination of the property's fair market value and are not part of the eminent domain process.

III. Contact Information

We are available to answer your questions and to assist you in understanding the acquisition program and the eminent domain process. Should you desire further information, please contact Daniel N. Raytis at (661) 322-4417.



KERN FAN GROUNDWATER STORAGE PROJECT

TECHNICAL MEMORANDUM NO. 9
(Recharge Basin Requirements)

PREPARED FOR: Groundwater Banking Joint Powers Authority (GBJPA)
PREPARED BY: Curtis Skaggs, P.E.
DATE: June 1, 2021

SUBJECT: *Recharge Basin Requirements*

I. Executive Summary

The project is anticipated to provide a total storage capacity of approximately 100,000 acre-feet per year among approximately 1,280 gross acres of recharge property or approximately 1,040 net acres of wetted area. The recharge properties are referred to as a Phase I Property and a Phase II Property each of a size of approximately 640 gross acres. Potential locations for these recharge areas have been identified, however they are preliminary and subject to change based upon available properties and land negotiations.

The project will be supplied primarily by the State Water Project's (SWP) supplies that exceed the SWP Contractors allocation during a wet year (Article 21 supplies) and also by other wet-year water supplies as available, including Kern River water. In wet years, when it is declared available by the California Department of Water Resources (DWR), the GBJPA will take delivery of Article 21 supplies that might otherwise be lost to the ocean to store in the recharge areas. The GBJPA will benefit from the recharge water for water supply and groundwater benefits while twenty-five percent (25%) of the stored Article 21 water will be held as SWP system water that will be used for ecosystem benefits. The ecosystem benefits will be derived by exchanging water from the Kern Fan Groundwater Storage Project to the Oroville Reservoir where they will be released as needed for short term pulse flows.

In addition, since the recharge basins will be intermittently flooded with captured stream flows diverted into the California Aqueduct

and conveyed to the project area, the wetlands that will be incidentally formed by the constructed recharge basins will be intermittent wetlands. The recharge basins will include design features that will function as intermittent wetlands to support and benefit water birds and wetland-dependent upland birds and wildlife. The variable presence of water, soil, and vegetation, as well as bird habitat features, will be considered in the design and operation criteria for the recharge basins as discussed herein.

The memorandum herein discusses the recharge basin layout or orientation, levee embankments and design freeboard, general design considerations, habitat elements, interbasin structures, and site fencing.

II. Recharge Basin Layout/Orientation	Page 2
III. Levee Embankments/Design Freeboard	Page 5
IV. Design Considerations	Page 6
V. Habitat Elements	Page 7
VI. Interbasin Structures	Page 9
VII. Site Fence Requirements	Page 10

II. Recharge Basin Layout/Orientation

Recharge basins are anticipated to be constructed on the entirety of the 1,280 gross acres with the goal of recharging up to approximately 100,000 acre-ft per year in a wet year and for the recovery of up to approximately 50,000 acre-ft per year when necessary. It is estimated that the wetted acres or net acreage of the recharge basins is approximately 80% to 85% of the gross acres. The constructed recharge basins will be operated to allow water to infiltrate and recharge into the underlying aquifer for groundwater storage during wet years and then the groundwater may be pumped from the underlying aquifer during dry years when in a recovery mode.

It is currently anticipated that there will be a Phase I Recharge and Recovery area that encompasses approximately 640 gross acres and a Phase II Recharge and Recovery area that includes approximately 640 gross acres. The approximate locations of these properties are illustrated in Figure 1 and Figure 2 below, however the actual locations are subject to change based upon land negotiations and property acquisitions.

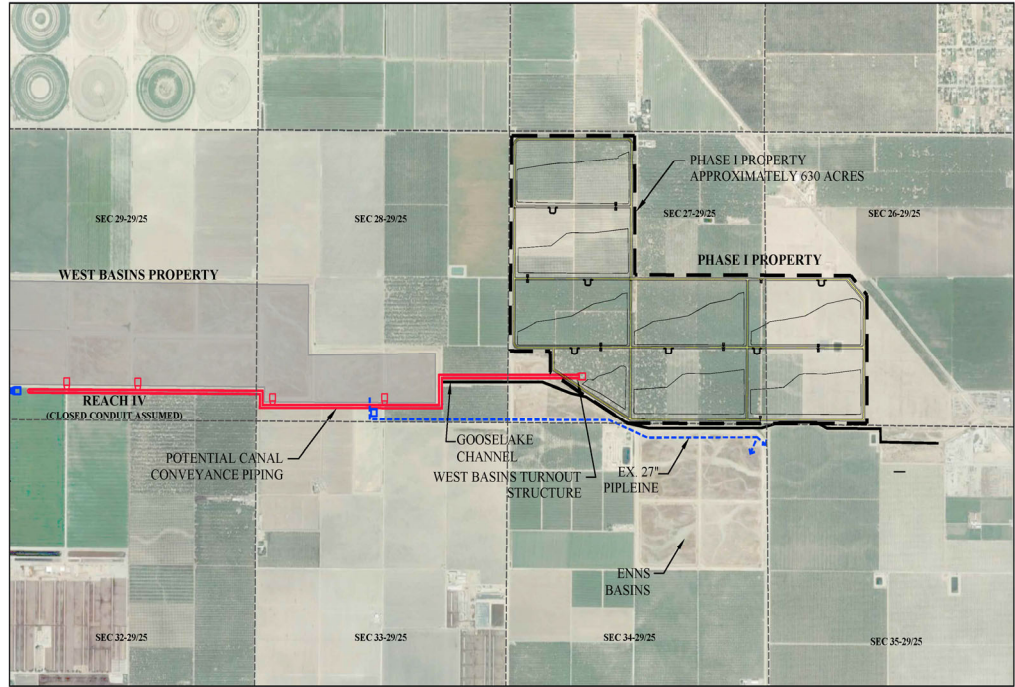


Figure 1: Preliminary Phase I Recharge Property

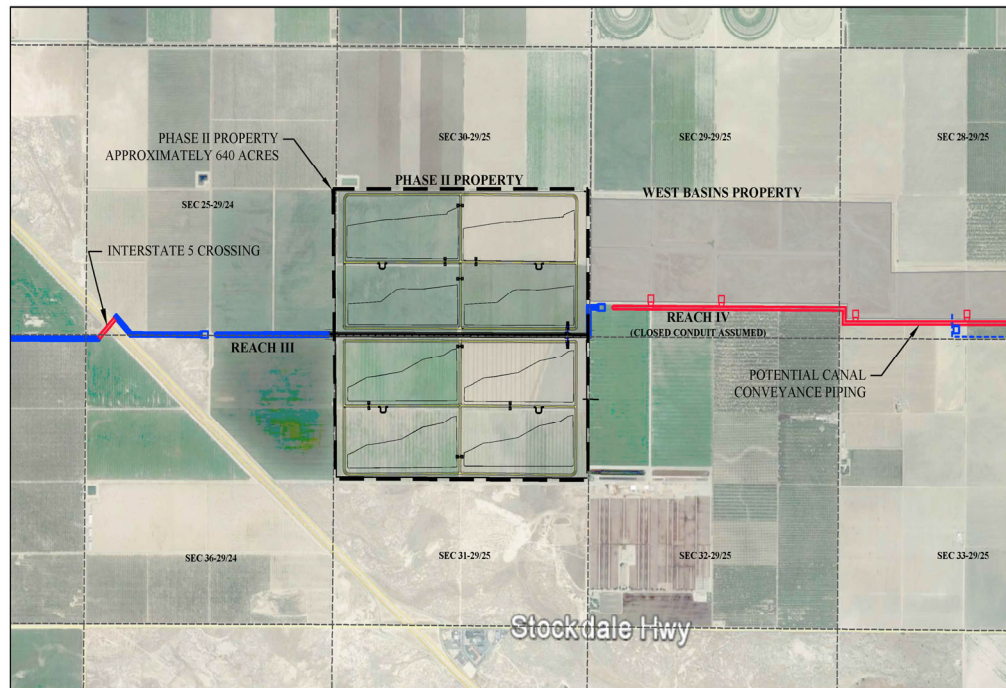


Figure 2: Preliminary Phase II Recharge Property

The recharge rates for the basins will be dependent on the actual Phase I and Phase II property locations and the associated soil types. Technical Memorandum No. 2 “Conveyance Capacity” evaluated the recharge rates of the Phase I and Phase II properties based on an assumed location. These recharge rates were based on soil survey maps, available tTEM geophysical survey information, and historical recharge rates for existing nearby recharge basins. The initial fill rates and the average recharge rates are discussed in that memorandum.

The recharge basin sizes may vary in size and shape (typically 20 acres to 80 acres in size) and will be constructed to minimize the amount of earthwork required while maximizing the amount of surface area covered by the recharge water. Recharge basins shall be oriented such that the long direction of the basins follow the predominant wind direction to minimize wave erosion. The recharge basins may need to be setback from property lines to allow room for levee slope maintenance and also setback from the conveyance canal alignment, if a canal is utilized, in order to allow for levee slope maintenance and to mitigate groundwater impacts on the canal lining.

The headworks structure conveying water to each recharge basin facility will be the conveyance canal or pipeline turnout facility. The recharge basin turnout facilities are discussed in Technical Memorandum No. 3 “Pipeline Requirements”. These facilities will include flow meters for flow measurement.

III. Levee Embankments/Design Freeboard

The levee embankments will be designed and constructed to impound water when recharging water and to also provide roadways around the recharge basins for maintenance and general upkeep. It is anticipated that the levee embankments will consist of native material that is borrowed from the basin bottoms adjacent to the levee embankment alignments. The material will be compacted to the specified design relative compaction. The levee embankment will be 20-ft wide at the top of levee. The embankments will be between two feet to six feet in height with a 4:1 slope on the inboard slopes (water side) and 2:1 slopes on the outboard slopes (dry side). Recharge basins will be designed to provide a minimum 1.5-ft of freeboard with water depths in the recharge basin areas ranging from just a few inches to up to approximately 48-inches (4-feet). Figure 3 illustrates a typical levee embankment cross-section located in between basins.

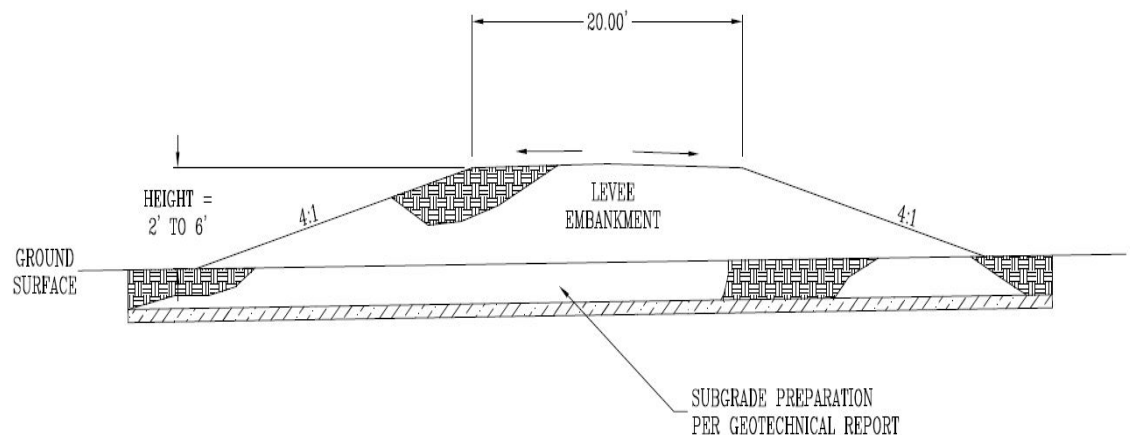


Figure 3: Levee Embankment Cross Section

The earthwork shall be performed as required by the geotechnical investigation and report, also refer to Technical Memorandum No. 5 “Geotechnical Investigation”. The geotechnical report shall address recommendations for subgrade preparation beneath levee embankments including over-excavation depths and limits, scarification, moisture conditioning of soils, keyways, and compaction. The geotechnical report shall also provide a seepage

path analysis beneath the levee embankments to prevent nuisance seepage or a potential levee failure.

It is anticipated that suitable borrow material will be obtained from the adjacent basin bottoms and will be utilized in a manner to maintain the borrow areas in a level and uniform fashion. At the completion of the recharge basin construction, the basin bottoms shall be ripped to break up compacted areas and disturbed areas based on the recommendations of the geotechnical report.

The project area has a predominant land slope of two-feet per mile (2'/mile) which will remain across the basin bottoms after the recharge basin construction.

IV. Design Considerations

A. Existing Infrastructure

The design of the recharge basin facilities will need to take into account existing infrastructure, and access routes to said infrastructure, on the property such as existing roads, easements, power lines, underground and above ground utilities, irrigation systems, and water wells.

All existing infrastructure, easements, etc. shall be identified, accommodated, and shown on the design drawings. The existing infrastructure will need to be evaluated and decisions made by the GBJPA as to whether the facilities will be relocated, worked around, demolished, and/or removed as part of the work or if the recharge basins will be designed to accommodate and/or utilize the facilities.

If existing water wells are abandoned, these will be abandoned in accordance with Kern County standards for well destruction. The GBJPA may elect to keep existing water wells and utilize them as recovery wells or convert them into monitoring wells.

B. Well Sites

The well earth pads are estimated to be approximately 100-ft by 100-ft and will be constructed as part of the recharge basin levee embankments. They will be similar in height to the adjacent levee embankment and be sloped to drain towards the recharge basin. The well pad earthwork will be completed to the same design standards as the levee embankments.

C. Well Conveyance Pipelines

Well conveyance pipelines are planned to be installed below ground and extend from the well pads to the conveyance canal or pipeline. These pipelines are discussed in Technical Memorandum No. 3 “Pipeline Requirements”.

The pipelines shall be installed in the levee embankments to the extent possible. When pipelines are installed underground beneath the basin bottoms, they shall be installed with a minimum cover of 5-feet to protect them from damage during pond maintenance, cleaning, or ripping.

D. Levee Access

The levee embankment width at the top shall be 20-ft wide for access and levee maintenance. The radius of turns at levee corners and intersections shall have a minimum radius of 50-ft.

All-weather surfacing may be required on the levee embankment access roads, however this will be dependent on the soil type and the recommendations of the geotechnical report.

E. Miscellaneous

The earthwork construction will require the preparation, filing, and adherence to a San Joaquin Valley Air Pollution Control District (SJVAPCD) Dust Control Permit and a Storm Water Pollution Prevention Plan (SWPPP). The design plans shall illustrate the best management practices (BMP's) that will need to be implemented and maintained.

V. **Habitat Elements**

The recharge basins are intended to serve as habitat as well. The recharge basins shall include design features that will function as intermittent wetlands to support and benefit water birds and wetland-dependent upland birds and wildlife. The variable presence of water, soil, and vegetation, as well as bird habitat features, shall be considered in the design and operation criteria for the recharge basins. The United States Fish and Wildlife Service maintains documents related to the classification of wetlands in the United States. Wetlands are classified as:

- Marine
- Estuarine
- Riverine
- Lacustrine
- Palustrine

A Riverine system has four subsystems:

- Tidal
- Lower Perennial
- Upper Perennial
- Intermittent

Since the recharge basins are intermittently flooded with captured stream flows, the recharge areas will most closely resemble a classification of Intermittent Flooded Riverine Wetlands with Unconsolidated Sandy Bottoms.

The recharge basins will be designed and constructed to meet the intermittent wetland requirements during recharge operations. During wet years when the project is recharging water, the basins will be inundated with water and will provide intermittent wetland habitat to support waterfowl, shorebirds, raptors, and other migratory birds. However, this water supply delivered for recharge may not be available for recharge year-round or during periods of drought and therefore are intermittent. The term “incidental” is also used to describe these intermittent wetlands because they are incidentally created as a result of water recharging in the recharge basins.

The 4:1 levee slopes and minimum 1.5-ft freeboard will result in a minimum 6-ft to 10-ft wide vegetative strip above the water line with vegetation extending into shallow water areas. Recharge basins will be designed to provide bird habitat in the intermittent wetlands that are created by these facilities. Recharge basins shall be constructed at multiple water depths to benefit both shorebirds and waterfowl as well as including periodic raptor boxes throughout the recharge area. The raptor boxes shall be installed every quarter-mile (1/4-mile) of levee embankment to provide perching structures for owls and hawks. These raptors serve to manage the burrowing rodents that can cause structural damage to earthen levee embankments. Shorebirds prefer mudflats to a depth of up to 6” with sparse vegetation (<40%) while waterfowl prefer depths of 6” to above 18” with a combination of open water and wetland cover. Dry land, levee embankments or islands, shall also be provided for resting areas with dense vegetation. Islands with similar gradual sloped banks and freeboard requirements will be constructed where reasonable and as recommended by the project biologist and design engineer.

In addition, the GBJPA will develop and maintain an adaptive management plan for the recharge areas. Land wildlife management is dynamic. As weather and climate patterns change, landscapes including intermittent wetlands, will react. Plants and wildlife will adapt to these changes on a variable basis therefore the recharge basin management will need to adapt as well to optimize wetland benefits. The adaptive management plan will include annual biota reports including adaptive management recommendations to be considered and implemented, as appropriate to optimize project water management and wildlife goals.

VI. Interbasin Structures

A. Interbasin Structures

The interbasin structure refers to the structure that is in the levee embankment of the recharge basins and is the inlet structure. The interbasin structure is on the upstream side of the conveyance of water between basins and is for the purpose of regulating flow and water level in the recharge basins.



It is anticipated that the interbasin structures will be precast concrete structures for uniformity in size and shape, see Figure 4. Each structure will include slots for weir boards and include a short stub-out of corrugated HDPE.

Water conveyance through the structure will be measured based on overflow weir measurements by District Staff. District Staff will be responsible for staff gauges or markings to ensure the maintaining of proper operating levels and measuring of flowrates.

Figure 4: Interbasin Precast Structure

Rock rip-rap shall be placed around the interbasin structures for a minimum width of ten-feet on the levee slopes on each side of the interbasin structure and out approximately ten-feet in front of the structure in the basin bottom to prevent erosion.

B. Interbasin Pipe Sizing

The interbasin piping is the piping in between the recharge basins that are used for the conveyance of water between basins. The District plans to standardize the size of the interbasin piping to be 36-inch or 48-inch diameter.

A single-barrel 36-inch pipe is anticipated to have a capacity of approximately 24 cfs to 30 cfs. A single-barrel 48-inch pipe is anticipated to have a capacity of approximately 55 cfs to 60 cfs.

C. Interbasin Pipe Type

The interbasin pipe is anticipated to be an ADS dual-wall corrugated HDPE pipe with smooth wall interior. This is an economical alternative that is corrosion resistant, has good strength properties, and the exterior corrugations help extend the seepage path.

D. Interbasin Backfill Requirements

The interbasin pipes are to be backfilled with native material and be compacted to the specified design relative compaction. There is often concern with the adequacy of compaction at the extreme haunch due to the difficulty of getting compaction equipment in this area. Therefore, it is recommended that the bottom of pipe to springline of pipe be backfilled with a two-sack cement slurry and that a concrete cutoff wall be added.

E. Discharge Structure

The corrugated HDPE pipe shall be an open discharge through the levee slope into the downstream recharge basin. The pipe invert may be below the basin bottom and discharge into a depressed area below the basin bottom to allow the water to bubble up and out into the basin bottom thus minimizing erosion and scour.

Rock rip-rap shall be placed around the pipe discharge for a minimum width of ten-feet on the levee slopes on each side of the pipe and throughout the depressed area below the basin bottom to prevent erosion.

VII. **Site Fence Requirements**

The recharge basin properties, Phase I and Phase II, may or may not be fenced. At locations where the recharge property is adjacent to paved County roadways it shall be fenced. If the recharge property is in rural or agricultural areas and is not adjacent to paved County roadways then it shall not be fenced. If the recharge areas are fenced they are typically done so with barbed 4-wire, field fence, t-posts, brace posts, and drive gates. A work area of 10-feet will be maintained between any fence line and levee toe.

Drive gates on County roads or State highways shall be set back so as to allow for safe ingress and egress when opening and closing gates. Fencing plans shall be included in the design but noted as “to be constructed by others” in the bid documents and bid packages.

VIII. Related Work Specified Elsewhere

- A. TM 2 – Conveyance Capacity Requirements
- B. TM 3 – Pipeline Requirements
- C. TM 5 – Geotechnical Investigation
- D. TM 11 - Engineer’s Estimates



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KERN FAN GROUNDWATER STORAGE PROJECT

TECHNICAL MEMORANDUM NO. 10 ***(Facility Operation and SCADA Requirements)***

PREPARED FOR: Kern Fan Joint Powers Authority (JPA)

PREPARED BY: Curtis Skaggs, P.E.

DATE: July 26, 2021

SUBJECT: *Facility Operation and SCADA Requirements*

I. Executive Summary

A SCADA system combines software and hardware to create a control and monitoring system that is frequently referred to as automation technology. The system receives data from processes and related monitoring equipment – water levels, flowrates, pressures, run status, setpoints, and alarms – which supervisors and operators can utilize to control and optimize operations. The SCADA system described herein interfaces with but does not include the process and monitoring equipment to be designed and installed at each plant or facility.

The SCADA software is the computer program that helps monitor and control plant or facility operations as well as store data. The software processes data sent from microprocessors (PLC's or RTU's) that communicate with equipment such as valves, pumps, sensors, instruments, or HMI's. The SCADA software receives the data collected from the devices and facilities and processes the information and stores it in a database. The data is then displayed on screens and dashboards often in animated graphs, diagrams, and images so that operators know in real time what is happening in the system. The operators can analyze this data to determine whether operations are running optimally, whether adjustments are needed, or if there are urgent issues through the means of alarms.

The work will include developing a control philosophy, programming PLC devices, and furnishing and installing all SCADA equipment. The equipment includes, but is not limited to, hardware, software, and ancillary equipment for each remote facility (wells, pump stations, and turnouts) and central headquarters (RRBWS District office) in order to have a fully functioning system as well as providing system redundancy. The SCADA system shall integrate with the existing facilities and the system integrator shall properly train all operators. The proposed new facilities are illustrated in Figure 1 for the alternative using a

pipeline for the conveyance facility from the California Aqueduct. Figure 2 illustrates the new facilities using a conveyance canal from the California Aqueduct.

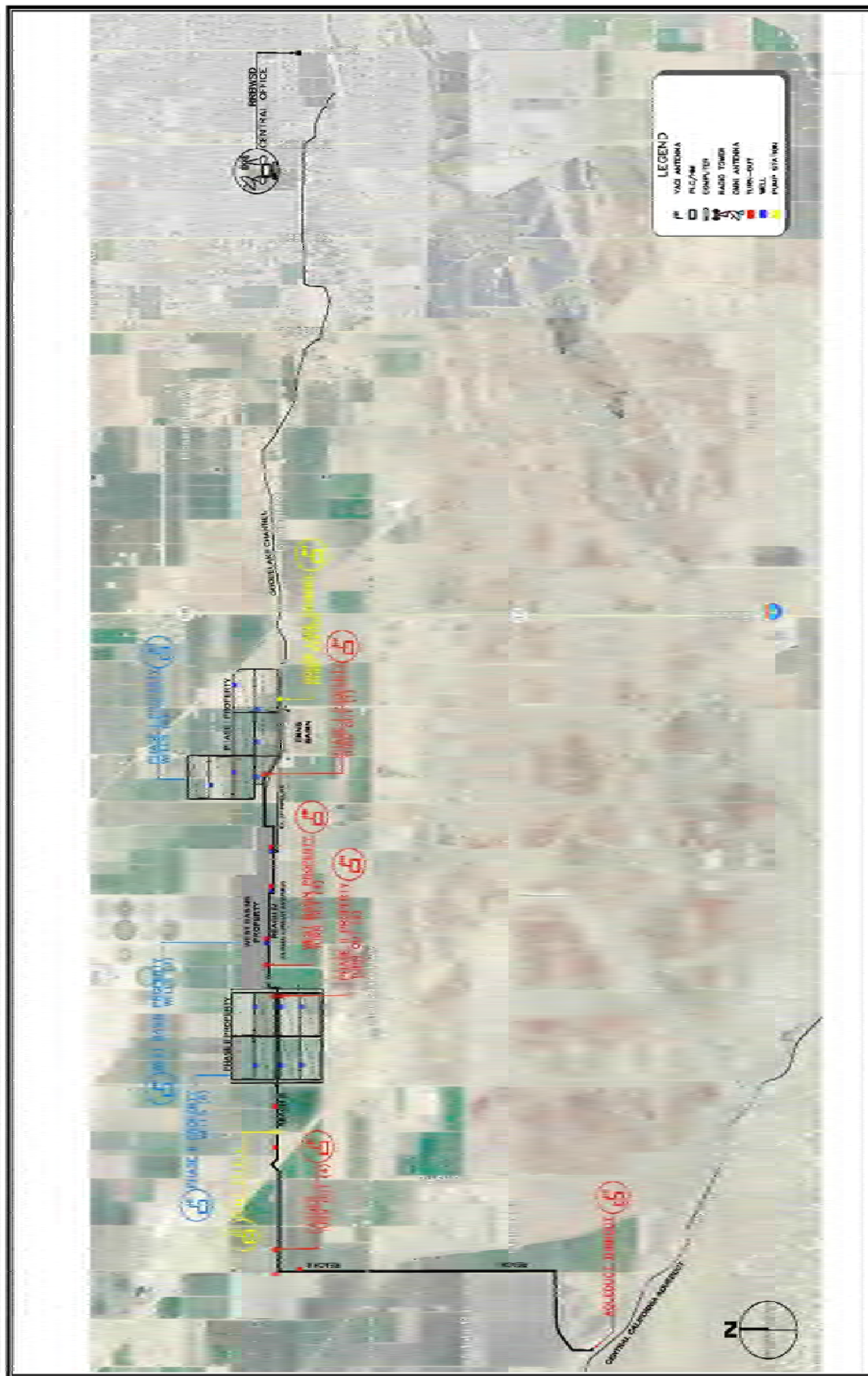


Figure 1: SCADA System Layout for Conveyance Pipeline

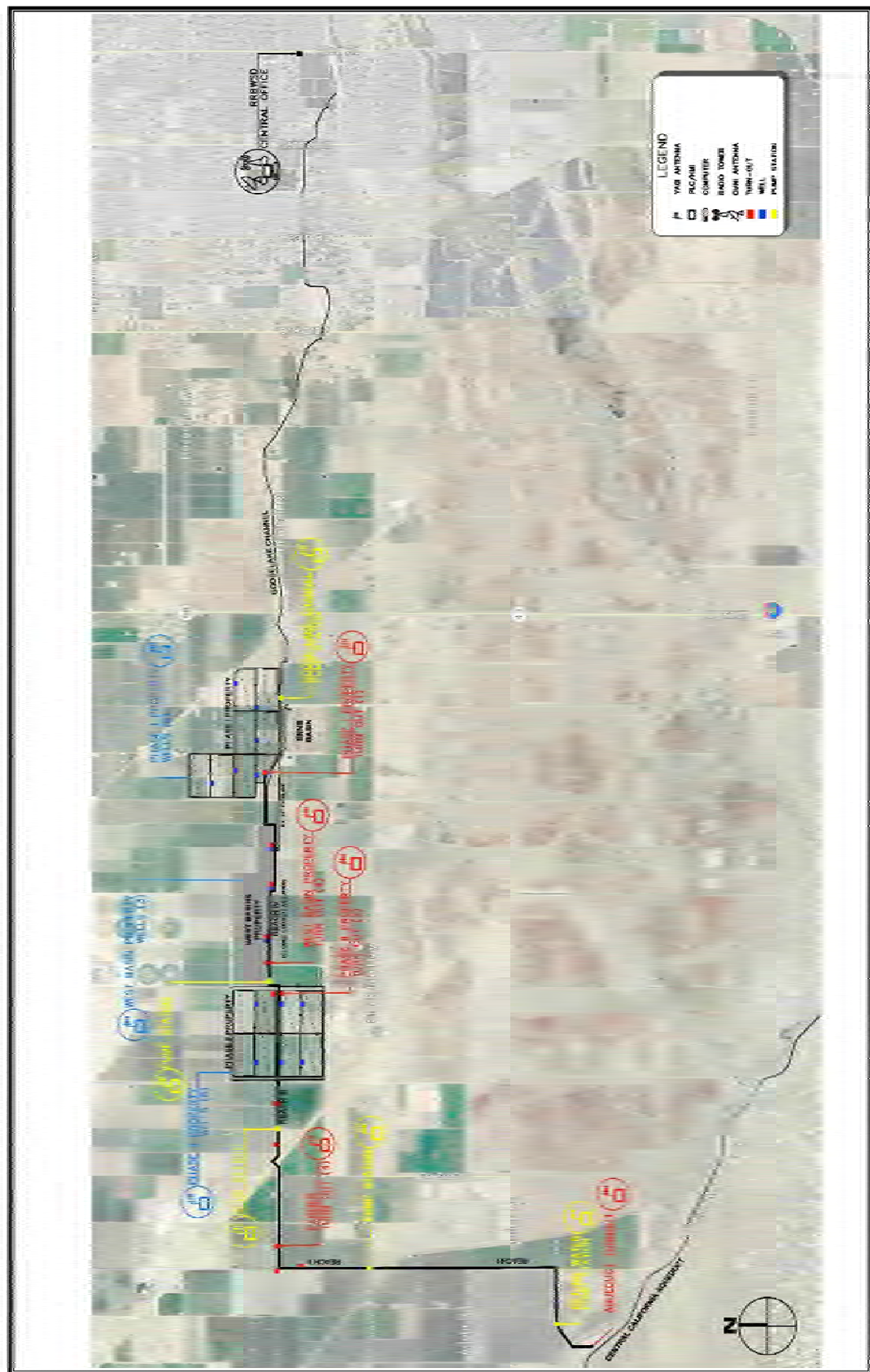


Figure 2: SCADA System Layout for Conveyance Canal

The District currently manages Mission units on some wells, SCADA with ControlLogix PLC at the DRP Pump Station, and monitoring on inflow points into the District. The implementation of SCADA for the Kern Fan Project will need to incorporate all existing water banking facilities including the DRP Pump Station, thirty-one (31) recovery wells, and the inflow monitoring points and turnouts. These existing facilities are illustrated in Figure 3.

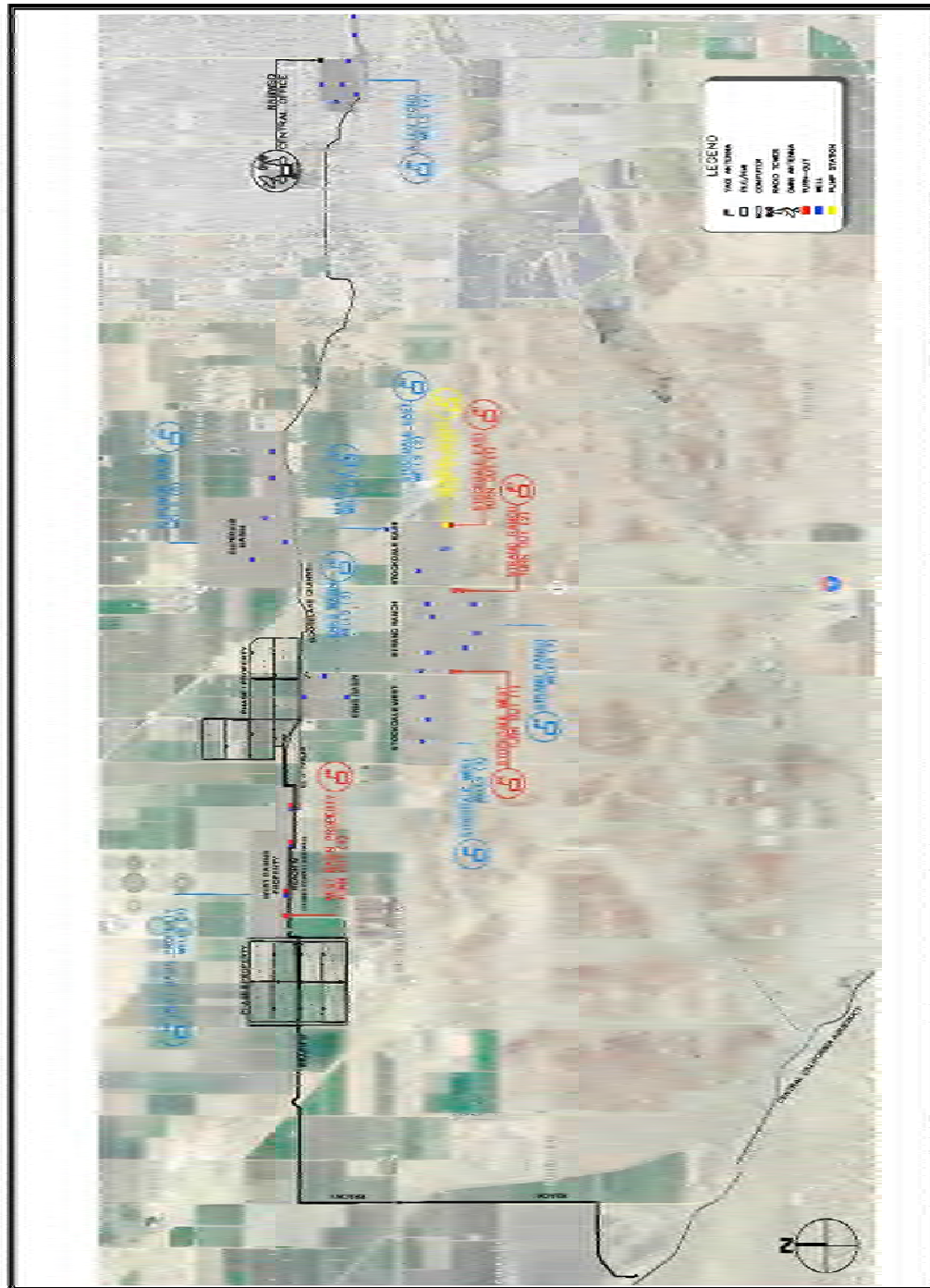


Figure 3: SCADA System Layout for Existing District Facilities

This work shall be coordinated with the design and construction efforts for the well sites, pump stations, and turnouts to ensure that the monitoring locations, PLC programming, and SCADA work is consistent with the monitoring equipment included in each facility design and its desired function.

It is anticipated that this work will be designed and constructed by a qualified firm that specializes in PLC programming and SCADA systems. The firm shall possess a State of California Class C-7 (Low Voltage Contractor) or C-10 (Electrical Contractor) Contractor's License.

The memorandum herein outlines preliminary engineering information for:

II.	Conveyance Facility/Pump Station Control Philosophy	Page 7
III.	Conveyance/Pump Station Instrumentation	Page 9
VI.	Conveyance Turnout Instrumentation	Page 9
IV.	Recovery Well Control Philosophy	Page 10
V.	Recovery Well Instrumentation	Page 10
VII.	SCADA Platforms	Page 11
VIII.	Radio Communication	Page 16
IX.	Cellular Communication	Page 17

Definitions:

HMI	Human Machine Interface
I/O	Input/Output Modules
IP	Internet Protocol
PLC	Programmable Logic Controller
OIT	Operator Interface Terminal
OPC	Open Platform Communications
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
SQL	Structured Query Language
TCP	Transmission Control Protocol

II. Conveyance Facility/Pump Station Control Philosophy

Canal Design Option (Open Channel)

The preliminary conveyance canal design option estimates three in-line pump station facilities along the conveyance canal. In addition, it estimates a return water pump station for returning water to the California Aqueduct during water recovery periods and also a Goose Lake Channel Pump Station facility for conveying water to the Phase I Recharge property. The pump station control philosophy for each pump station facility will be developed during the detailed design of the conveyance canal and pump stations.

The conveyance canal flows will be based on upstream control at the California Aqueduct turnout through the use of the slide gate and turnout flow meter. The Aqueduct Turnout and Pump Station slide gates shall have motor actuated controllers with position indicators and be capable of modulating positions.

The pump stations will need to be capable of being controlled, monitored, and operated both locally and remote through SCADA. The operators shall have the flexibility to turn on pumps and turn off pumps as necessary as well as being able to adjust set points and make changes to the operations. In addition, the SCADA system shall provide for water level monitoring in each pump forebay and afterbay as well as indicating the pump flow readings from the flow meters. The SCADA system shall provide:

- Pump Run Status
- Forebay Water Level
- Pump Bay Water Level
- Afterbay Water Level
- Emergency Spillway Water Level
- Pump Discharge Flow (Instantaneous Flow and Totalized Flow)
- Pump Discharge Pressure
- Pump Run Time
- Communicate alarm for power failure
- Communicate alarm for motor failure
- Communicate water level alarms
- Communicate high pressure alarms
- Communicate building intrusion alarms.

The Conveyance Canal pump station motors will be equipped with variable speed drives and will be able to modulate to maintain flow or level. The canal may be desired to be controlled based on flow and level. The pump station shall have the ability to set the flow rate at each pump station and have the pumps modulate to maintain the flow set point while utilizing the water level as a secondary means of control in the event of high water levels or low water levels that could

compromise the performance of the pump based on low submergence. Protective measures such as water level sensors shall be duplicated for redundancy.

The Goose Lake Channel Pump Station and Return Water Pump Station motors will be equipped with variable speed drives and will be able to modulate to maintain flow or level. It is anticipated that the Goose Lake Channel Pump Station and Return Water Pump Station will be operated for long periods of time or turned off for long periods of time. Override protective measures will be designed such as a low water level cutoff in the event the pump submergence is compromised or a high pressure switch at the pump discharge in the event of a closed valve or blockage. Protective measures such as water level sensors shall be duplicated for redundancy.

Pipeline Design Option (Closed Conduit)

The preliminary conveyance pipeline design option estimates one in-line pump station facility and also a Goose Lake Channel Pump Station facility for conveying water to the Phase I Recharge property. The pump station control philosophy for each pump station facility will be developed during the detailed design of the conveyance canal and pump stations.

The conveyance pipeline flows will be based on downstream control at the Pump Station facility. The California Aqueduct turnout can be opened and the pipeline and pump station can float off the Aqueduct. The Pump Station facility will then be set to a predetermined flowrate and the slide gate at the California Aqueduct can be modified to match the flow of the pump station, if necessary. The Aqueduct Turnout and Pump Station slide gates shall have motor actuated controllers with position indicators and be capable of modulating positions.

The pump stations will need to be capable of being controlled, monitored, and operated both locally and remote through SCADA. The operators shall have the flexibility to turn on pumps and turn off pumps as necessary as well as being able to adjust set points and make changes to the operations. In addition, the SCADA system shall provide for water level monitoring in each pump forebay, the pressure in the discharge pipeline, and also the pump flow readings from the flow meters. The SCADA system shall provide:

- Pump Run Status
- Forebay Water Level
- Pump Bay Water Level
- Pump Discharge Flow (Instantaneous Flow and Totalized Flow)
- Pump Discharge Pressure
- Pump Run Time
- Communicate alarm for power failure
- Communicate alarm for motor failure
- Communicate water level alarms
- Communicate high pressure alarms
- Communicate building intrusion alarms.

The Conveyance Pipe Pump Station motors will be equipped with variable speed drives and will be able to modulate to maintain flow or level. The pipeline may be desired to be controlled based on flow and level. The pump station shall have the ability to set the flow rate at the pump station and have the pumps modulate to maintain the flow set point while utilizing the water level as a secondary means of control in the event of high water levels or low water levels that could compromise the performance of the pump based on low submergence. Protective measures such as water level sensors shall be duplicated for redundancy.

The Goose Lake Channel Pump Station motors will be equipped with variable speed drives and will be able to modulate to maintain flow or level. It is anticipated that the Goose Lake Channel Pump Station will be operated for long periods of time or turned off for long periods of time. Override protective measures will be designed such as a low water level cutoff in the event the pump submergence is compromised or a high pressure switch at the pump discharge in the event of a closed valve or blockage. Protective measures such as water level sensors shall be duplicated for redundancy.

III. Conveyance/Pump Station Instrumentation

The instrumentation and controls for the pump stations will be utilized for pump and motor operation, safety features, and monitoring. The instrumentation and controls shall include the following devices:

- Water Level Transducer (4-20 ma) for monitoring pump station forebay levels and afterbay levels, if applicable (Ametek 575 or approved equal). Provide two transducers at each location for redundancy.
- High Level Float Switch for high level shutoff if forebay levels infringe into design freeboard level. Provide two high level float switches for redundancy.
- Low Level Float Switch for low level shutoff if forebay levels compromise minimum pump design submergence. Provide two low level float switches for redundancy.
- High Pressure Switch to protect piping from over-pressurizing (Mercoid or approved equal).
- Pressure Transmitter (4-20 ma) for monitoring discharge pressure (Smar Technology or approved equal).
- Flow Meter signal (4 – 20 ma) for monitoring pump flow (Seametrics Mag Meter with power supply – (not battery powered), Insertion Probe Meter, or Rittmeyer Meter)

IV. Conveyance Turnout Instrumentation

The conveyance turnouts consist of the Aqueduct Turnout, the Phase II Recharge Basin turnouts, the West Basin turnouts, the Phase I Recharge Basin turnout, and the in-lieu farmer turnouts. The instrumentation and controls for these turnouts will be utilized for slide gate operation, safety features, and monitoring.

California Aqueduct Turnout

The instrumentation and controls for the California Aqueduct Turnout shall include the following devices:

- Level Transducer (4-20 ma) for monitoring turnout forebay levels upstream of the trashrack as well as downstream of the trashrack (Endress + Hauser or approved equal).
- Flow Meter signal (4 – 20 ma) for monitoring turnout flow (Rittmeyer Meter)
- Slide gate position indicator

Conveyance Turnouts (Recharge Basin Turnouts and In-Lieu Farmer Turnouts)

The instrumentation and controls for the conveyance turnouts shall include the following devices:

- Flow Meter signal (4 – 20 ma) for monitoring turnout flow (SonTek IQ Meter)
- Stilling Well for level measurement
- Slide gate position indicator

V. Recovery Well Control Philosophy

The wells are operated during recovery operations and are manually operated. They are turned on manually and turned off manually unless shutdown on a power failure, equipment failure, or high pressure switch.

The monitoring devices send information via 4-20 ma signals to the RTU panel or a Mission Unit. The RTU or Mission Unit is a remote monitoring device that displays the following:

- Well Run Status
- Groundwater Level
- Well Discharge Pressure
- Well Discharge Flow
- Run Time
- Any Alarms

VI. Recovery Well Instrumentation

The instrumentation and controls for recovery wells will be utilized for well operation, safety features, and monitoring. The instrumentation and controls shall include the following devices:

- Well Level Transducer (4-20 ma) for monitoring groundwater levels (Endress + Hauser or approved equal).
- Solenoid for oil drip to deep well pump.
- High Pressure Switch to protect piping from over-pressurizing (Mercoid or approved equal).

- Pressure Transmitter (4-20 ma) for monitoring discharge pressure (Smar Technology or approved equal).
- Flow Meter signal (4 – 20 ma) for monitoring well flow (Seametrics Mag Meter with power supply – (not battery powered))

VII. SCADA Platforms

SCADA stands for Supervisory Control and Data Acquisition. SCADA is a tool with a very specific defined set of functions such as it can turn devices on and off, adjust setpoints, display real time operational data, provide equipment wide to system wide views of operation, trend data, and communicate alarms.

The platforms all connect and enable use of the Cloud, the internet, and mobile options. There are many platforms on the market including:

- AVEVA (formerly Wonderware)
- GE Intellution
- Iconics
- Ignition
- Mission Communications
- Rockwell FactoryTalk
- Siemens WinCC

These SCADA platforms are all viable alternatives, however this memorandum summarizes the three most popular software platforms, AVEVA (Wonderware), FactoryTalk, and Ignition, and has included additional detail for each of these in Appendix A, B, and C.

The PLC's installed throughout all facilities, including but not limited to, the Aqueduct Turnout, Conveyance Pump Station(s), Goose Lake Channel Pump Station, Turnouts, and Wells, shall be consistent and all of the same manufacturer. Acceptable PLC manufacturer's include ABB, Eaton, Honeywell, Rockwell Automation (Allen-Bradley), Schneider Electric, and Siemens.

The HMI's installed throughout all facilities at the discretion of the GBJPA, including but not limited to, the Aqueduct Turnout, Conveyance Pump Station(s), Goose Lake Channel Pump Station, Turnouts, and Wells, shall be consistent and all of the same manufacturer. Acceptable HMI manufacturer's include Eaton, Honeywell, Rockwell Automation (Allen-Bradley), Schneider Electric, and Siemens. The local HMI screens may display local facility information only or may display information for the entire system including wells, pump stations, and turnouts subject to the discretion of the GBJPA.

A. AVEVA System (formerly Wonderware)

The AVEVA platform is a highly scalable, flexible software that provides the tools for everything from advanced HMI/SCADA applications to small footprint embedded applications. The platform offers everything required to connect to almost any PLC or controller as well as create remote HMI applications.

However, it only works with the Windows operating system. It does also allow for remote monitoring and can add historian for data access and trending and a reporting option for dynamic reports.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server are referred to as thin clients. These have access to the system using web based browser technology.

AVEVA Costs

AVEVA has what they call a perpetual system where there is the upfront cost of the system plus an annual fee that is some percentage of the original upfront cost.

AVEVA is beginning to push more for subscription arrangements which are based on a credit system. Products are valued in credits and you pay an annual fee only based on the products that you purchase.

Since the cost is directly tied to the size and features of the system, it is important that the system not be over-sized inappropriately. If additional needs become necessary or other facilities are added, the subscription system can be increased to include additional tags, clients, and plans as necessary.

A preliminary cost estimate for the AVEVA system includes the following:

Capital Cost:

• Two Custom Built Servers (Rack or Tower)	\$20,000.00
• Two Custom Built Desktop PC's with Monitors	\$6,000.00
• Firewall VPN	\$2,000.00
• Voice Modules VoIP Modules	\$1,000.00
• Radio Survey	\$10,000.00
• Radio Tower at Central Headquarters	\$40,000.00
• Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station	<u>\$192,000.00</u>
Total Capital Cost:	\$271,000.00

Annual Costs:

• Subscription Model	
Estimate between \$7,000 to \$13,000 per year	\$10,000 per yr

This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$371,000.00.

B. FactoryTalk (Rockwell Automation)

FactoryTalk View Site Edition (SE) is the platform for Rockwell that allows for monitoring and controlling systems at all levels, from a single operator station up to multi-user applications. However, it only works with the Windows operating system. Rockwell utilizes “thin clients” to connect remotely to a server-based system that allows it to run apps, record data, and display content. Rockwell adds FactoryTalk View Point as a mobile-ready extension that provides a secure interface with the HMI applications through a web browser on any mobile device.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server would be through FactoryTalk View Point. These devices have access to the system using web based browser technology.

FactoryTalk Costs

A preliminary cost estimate for the FactoryTalk system includes the following:

Capital Cost:

• Two Custom Built Servers	\$20,000.00
• Two Custom Built Desktop PC's with Monitors	\$6,000.00
• Two FactoryTalk View Site Edition Stations	\$30,000.00
• Two FactoryTalk View Point Packages for Remote Access	\$20,000.00
• Two Historian Packages	\$10,000.00
• Two WIN-911 Software Packages	\$10,000.00
• Firewall VPN	\$2,000.00
• Voice Modules VoIP Modules	\$1,000.00
• Radio Survey	\$10,000.00
• Radio Tower at Central Headquarters	\$40,000.00
• Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station	\$192,000.00
Total Capital Cost:	\$341,000.00

Annual Costs:

• License Fees	
Estimate between \$7,000 to \$13,000 per year	\$10,000 per yr

This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$441,000.00.

C. Ignition (Inductive Automation)

The ignition platform is a modular platform with scalability and includes powerful features and core drivers to connect data and devices into one central hub. It has unlimited tags and powerful connectivity. It can connect to any major PLC and database with built-in SQL database connectivity and includes an OPC UA Server Module and core drivers such as Modbus, Allen-Bradley, and Siemens.

It is a modular platform that allows the client to select and choose the modules they desire and to combine options in the way that suites the project application the best. The software is compatible with Windows, Linux, and Mac among others. Ignition is a server software. In order to have redundancy two servers are required, however Ignition reduces the cost of the second server software 50% when being utilized in a redundant application.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server are possible without any additional costs. These devices have access to the system using web based browser technology.

Ignition Costs

The ignition system is nice because the capital costs are a one-time cost and there are no annual licensing costs. If a redundant system is installed, then there are two licenses required with one for the primary and a second license at a 50% discount for the redundant application.

Capital Cost:

The cost is dependent on the modules that are selected. The software can easily be customized, however they do offer standard packages. There are three unlimited package systems that contain the basic components. These include (redundancy not included in costs):

- | | |
|--------------------|-------------|
| • Basic Package | \$12,500.00 |
| • Pro Package | \$19,600.00 |
| • Ultimate Package | \$27,900.00 |

If redundancy is provided then the cost increases by fifty-percent:

- | | |
|--------------------|-------------|
| • Basic Package | \$18,750.00 |
| • Pro Package | \$29,400.00 |
| • Ultimate Package | \$41,850.00 |

A preliminary cost estimate for the Ignition system includes the following:

• Pro Package Software w/Redundancy	\$29,400.00
• Two Custom Built Servers (Rack or Tower)	\$20,000.00
• Two Custom Built Desktop PC's with Monitors	\$6,000.00
• Firewall VPN	\$2,000.00
• Voice Modules VoIP Modules	\$1,000.00
• Radio Survey	\$10,000.00
• Radio Tower at Central Headquarters	\$40,000.00
• Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station	\$192,000.00

When adding in the infrastructure for communication, the total estimated system cost is approximately \$300,400.00.

There are no annual license fees. This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$300,400.00 if the support care is not implemented.

Annual Costs

Ignition does provide three levels of support that results in an annual cost, however this support is not mandatory. The benefit to the support is that it covers the costs of any future software updates and upgrades as they are developed and provides support in the event of problems.

The drawback is if the support is not paid for on an annual basis, then when the client wants to purchase an update or software upgrade the cost of the update is 65% of the licensing cost. The care support options are:

D. Recommendations

FactoryTalk View has the advantage of being a Rockwell Automation product and is therefore well integrated with ControlLogix. The RSLinx Enterprise Tag Browser and Direct Referencing are the fastest and easiest way to get data from a ControlLogix PLC to an HMI. It also mixes fairly well with other Windows applications since it is a native Windows application.

However, Ignition has the simplest and fastest installation, the stability of the system is much better, and the vector graphics are nice. The SQL database integration in Ignition is also better than FactoryTalk and there is less need for conversions or exports with data. In addition, Ignition does not have any client licensing annual costs and it is a powerful tool as you can do just about anything with Ignition including trending and database access.

Ignition is fast becoming a very popular platform, is user friendly, powerful, and is the most cost effective solution for SCADA.

Cost Summary (Ten (10) Year Basis)

Ignition SCADA	\$300,400.00
AVEVA SCADA	\$371,000.00
FactoryTalk SCADA	\$441,000.00

VIII. Radio Communication

A wireless I/O network is a radio system that communicates from the desktop to the RTU or PLC and then to the field instruments without wired connections, on one continuous radio network. Wireless communication is advantageous as it allows for increased transfer distance (geographic proximity) with the decreasing probability of failure, the high capacity and high speed of data transfer, and is economical. This can be accomplished using spread spectrum (unlicensed) radios or licensed radios.

Spread spectrum radio communication is likely the most common telemetry method. A spread spectrum system uses radio waves to transmit data between the RTU and the central headquarters. It uses a FCC-defined, but unregulated band of radio waves in the 900 MHz range to transmit the data. The radio equipment is economical and no subscription or licenses are required. There are no ongoing annual costs other than routine maintenance.

Radio communication is frequently used for SCADA systems and is an effective means of transmission, however it does have its drawbacks. It does require direct line of sight between the transmitter and receiver which means that the signal can be dramatically affected by physical interference like trees, buildings, and other facilities. There are geographic areas and times when signal issues can occur, there can be issues with excess traffic on a radio frequency, potential for lightning strikes, and radio equipment quickly becomes obsolete.

In any remote SCADA application utilizing facilities that communicate using wireless technology, it is imperative the radio paths are strong, have minimal or no interference, and react in this manner whether day or night. There are sometimes conditions that can be seen and sometimes conditions that cannot be seen that can inhibit RF modulation in some form or another. This communication could also be an issue across the Interstate 5 Freeway due to the amount of radio traffic. In order to avoid these types of issues it is recommended to conduct a detailed radio path study to determine the probability of strong communication links (greater than 99% reliability) by testing in various frequency bands (VHF, UHF, spread spectrum), and using the same equipment (radio, antennas, cables, and polyphasors) which would be used in a typical SCADA system. The firm performing the radio path study shall use software and GIS tools to obtain an initial idea of terrain and obstructions that might inhibit good RF signal transmission and then assess the actual field conditions as described above. The signal strengths shall be assessed at various antenna heights to obtain

a minimum threshold to ensure reliable transmissions with minimal data packet loss.

A final radio path survey report shall be submitted to the GBJPA that provides recommendations on the locations and heights of antennas, the type of radio equipment and frequencies to utilize, and a preliminary estimate of costs for infrastructure and equipment.

IX. Cellular Communication

Cellular communication uses a grid of towers to communicate data similar to cell phones. Cell companies have invested a massive amount of resources to constructing a strong infrastructure and keeping their networks active at all times.

The advantages to cellular communication is that you do not need large towers or lightning-prone antennas to ensure line of sight and strong signal strength. This communication simply requires a small antenna and cell service. This will likely be the best option of communication from the west side of the Interstate 5 Freeway to the east side of the freeway.

The disadvantages to cellular communication are the on-going costs and potential security issues. SCADA systems rarely use much data so the monthly costs typically are not that significant, but if there are many sites then it can add up and there will be continual monthly costs that are not associated with a radio system. Furthermore, standard cell data transmissions are online which means that there is the potential for hackers to attack the system which would require a private network or other protective measures at additional costs.

The security issues could be solved by using a Cellcom. This type of unit has a SIM card and can run off a 12V or 24V power connection. It receives the data from a PLC and communicates it through a cellular connection and can be viewed in a web browser on any device. This is a good alternative that allows for a back-up monitoring system to the SCADA platform and also allows for other Districts, Engineer's, and interested parties to view the system operation and data without risk of impacting set points, operations, or other real-time data. The cost is estimated as \$240.00 to \$360.00 per year for the cell phone data plan and \$60.00 per month per site for the private system.

In addition, it may be that a combination of a radio system and a cellular system works best for this project. Due to the relative proximity of recovery wells within a recharge area or farmer turnouts, these locations could utilize radio communication between them to a central location. That central location could then utilize a cellular communication system to transmit data to the Central Headquarters. This would help maintain robust communication while minimizing the monthly costs associated with cellular data plans.

X. Related Work Specified Elsewhere

- A. TM 2 – Conveyance Capacity
- B. TM 3 – Pipeline Requirements
- C. TM 4 – Pump Station Requirements
- D. TM 7 - Well Requirements
- E. TM 11- Project Engineer's Estimates

Appendices

Appendix A – AVEVA SCADA System
Appendix B – Ignition SCADA System
Appendix C – FactoryTalk SCADA System

Appendix A **AVEVA SCADA System**

AVEVA System (formerly Wonderware)

AVEVA has three platforms that would potentially be suited for this system.

- Edge
- InTouch HMI
- System Platform

The Edge platform is a highly scalable, flexible software that provides the tools for everything from advanced HMI/SCADA applications to small footprint embedded applications. The platform offers everything required to connect to almost any PLC or controller as well as create remote HMI applications. However, it only works with the Windows operating system. It does also allow for remote monitoring and can add historian for data access and trending and a reporting option for dynamic reports.

The InTouch HMI platform provides the ability to visualize and control vital plant processes in real time. This is valuable where system operations require frequent adjustments and changes based on real-time process data. This system is around 1500 credits for unlimited everything (clients, tags, development tools, and Historian).

The System Platform allows for the secure visualization of enterprise-wide operations using an asset model to apply context to real-time processes, alarms, events, and archived historical data thus creating a single, common information stream that makes system design and maintenance more efficient, flexible, and provides operators with greater situational awareness for improved effectiveness. This system is around 2500 credits for unlimited everything.

These platforms do provide flat file logging, however this is not a relational database historian. It is recommended to add the Historian in order to provide data recall, low buffering, and access data for trending. Cloud options can be provided that allow for read only access.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server are referred to as thin clients. These have access to the system using web based browser technology.

AVEVA Costs

AVEVA has what they call a perpetual system where there is the upfront cost of the system plus an annual fee that is some percentage of the original upfront cost. It is approximated that the perpetual cost would be on the order of \$20,000 to \$30,000 for the Edge Platform software with unlimited tags and an approximate annual cost of \$1,500 to \$2,500.

AVEVA is beginning to push more for subscription arrangements which are based on a credit system. Products are valued in credits and you pay an annual fee only based on the products that you purchase. The cost increases at varying credit thresholds. For instance:

• 1,500 Tags =	80 Credits
• 16,000 Tags =	150 Credits
• Unlimited Tags and One Thin Client =	700 Credits
• Historian =	500 Credits

It is estimated that a threshold of 700 credits equates to an annual subscription cost of approximately \$7,000 per year. A threshold of 1,200 credits equates to an annual subscription cost of approximately \$13,000 per year. A threshold of 1,700 credits equates to an annual subscription cost of approximately \$20,000 per year.

Depending on the number of data points required, it might be a good option to go with 1,500 tags, unlimited clients, development, and Historian which would equate to approximately 700 credits and an annual cost of \$7,000 per year.

Since the cost is directly tied to the size and features of the system, it is important that the system not be over-sized inappropriately. If additional needs become necessary or other facilities are added, the subscription system can be increased to include additional tags, clients, and plans as necessary.

A preliminary cost estimate for the AVEVA system includes the following:

Capital Cost:

• Two Custom Built Servers (Rack or Tower)	\$20,000.00
• Two Custom Built Desktop PC's with Monitors	\$6,000.00
• Firewall VPN	\$2,000.00
• Voice Modules VoIP Modules	\$1,000.00
• Radio Survey	\$10,000.00
• Radio Tower at Central Headquarters	\$40,000.00
• Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station	<u>\$192,000.00</u>
Total Capital Cost:	\$271,000.00

Annual Costs:

- Subscription Model
Estimate between \$7,000 to \$13,000 per year \$10,000 per yr

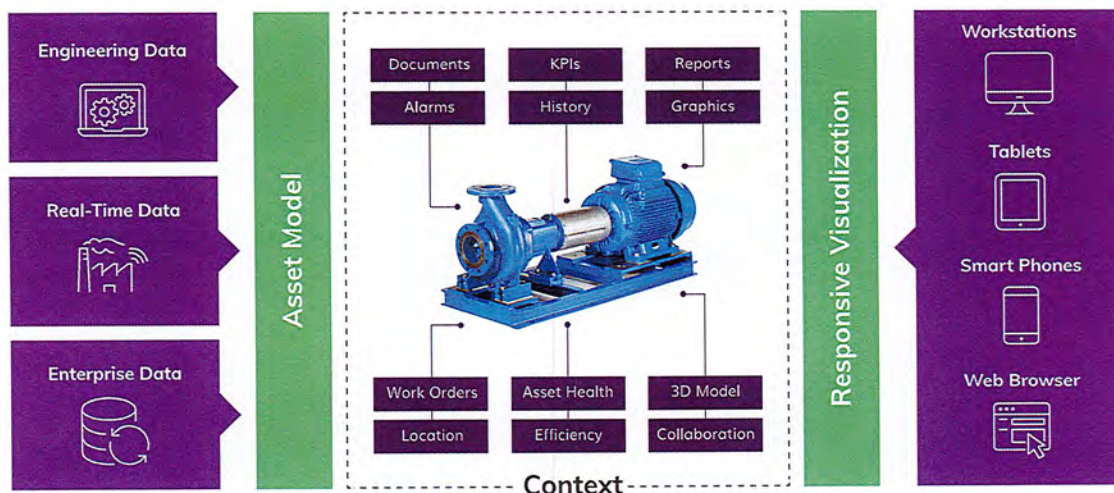
This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$371,000.00.

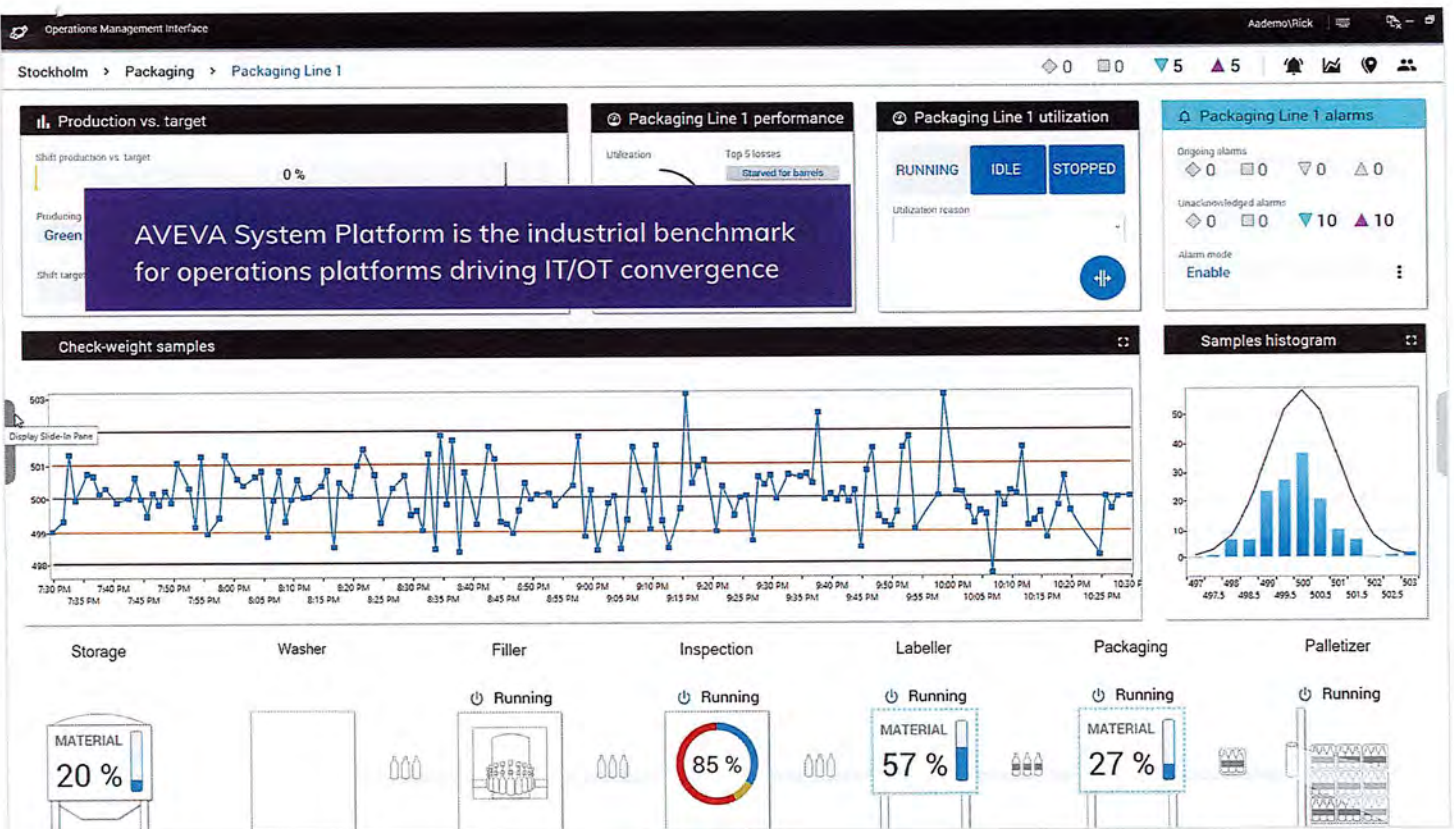
The AVEVA logo is displayed in white, bold, sans-serif capital letters against a dark background.

PRODUCT DATASHEET

AVEVA™ System Platform, formerly Wonderware

AVEVA System Platform with Operations Management Interface (OMI) is the world's only responsive, scalable solution for supervisory, Enterprise SCADA, MES, and IIoT applications that contextualizes operations processes across the organization. AVEVA System Platform provides a collaborative, standards-based foundation that unifies people, processes, and assets across all facilities for continuous operational improvement and real-time decision support.





Overview

AVEVA System Platform's Operations Management Interface (OMI) brings a responsive operations visualization framework to industrial organizations seeking an innovative new way to build rich, modern user experiences across all device formats through context-aware and re-usable content. Offering powerful experiences for both engineers and operators, AVEVA System Platform provides the foundation for a truly effective performance management system that reinforces positive outcomes. Achieve up to 80% reduction in engineering effort to create applications using templates, objects, and out-of-the-box content; and expand your operator situational awareness, increasing effectiveness up to 40%, by identifying and resolving abnormal situations 5 times faster than traditional HMIs.

At-a-glance

- Powerful context-aware UI/UX visualization framework
- Standards-based design techniques utilizing objects and templates
- Unique centralized deployment with native redundancy
- Comprehensive automation object and graphics library
- Extend your operations platform with additional AVEVA and 3rd Party software
- Hardware agnostic that works with any PLC, RTU or PAC
- Maximum device flexibility and eliminates the need for UI scripting
- Complete Scalability – unlimited IO, unlimited clients
- Most secure industrial platform with node-to-node TLS encryption

Industry-leading engineering experience

Responsive development has arrived

Easily create the optimal user experience across multiple form factor display devices from big screen monitors to smartphones.

Create applications that last

Standardize the use of templates and change propagation to build and maintain applications sustainably and maximize reusable engineering.

Dynamically build applications

By using new smart navigation capabilities and layout configurations, you can use your plant model to automatically link content.

Engineers can be wizards

Object wizards create versatile templates that adapt based on a device's configuration. Symbol wizards standardize custom configuration options like graphical elements, scripts or custom properties, and automatically assemble them into a single composite symbol.

Collaborative cloud-based development

Application design and testing can be done in the cloud or on-premise, to enable teams of engineers to work concurrently and remotely on the same application at the same time.

Most comprehensive out-of-the-box content

Leveraging pre-built application content, you can save time, reduce development costs, and reduce to time to value compared to custom configurations.

WYSIWYG

Use the device simulator and preview modes to build, test and optimize any monitor configuration or content to perform on every display screen, regardless of resolution. You can even test multi-monitor configurations without physical access to the monitors themselves.

Fluent communications for any device or system

Expand connectivity and increase the value of data by leveraging real benefits from the IIoT, big data and cloud technologies.

- Support for OPC-UA, MQTT, DNP3, Modbus and IEC 60870 protocols.
- Support for many PLC brands, including Schneider Electric, Allen-Bradley, GE, Siemens, Automation Direct, Bosch, Eaton, WAGO, Beckhoff, BACnet, Texas Instruments, Mitsubishi, Omron and Opto 22.
- Auto-Build capability expedites engineering efforts by reading the structure of a PLC program and automatically building templates and instances based on the PLC schema.
- Secure encrypted communications



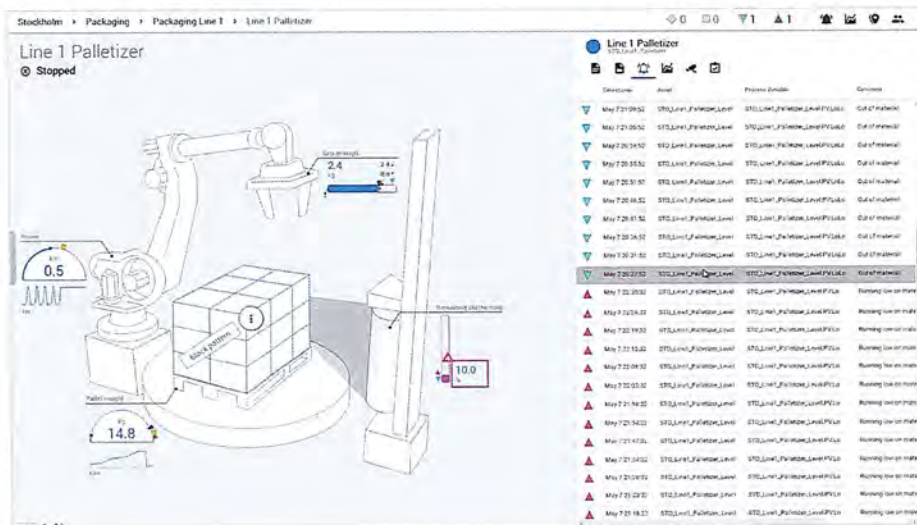
- Deliver immersive control applications that weaves context throughout the visual design including situational awareness concepts for improved operator performance.
- Quickly navigate displays following intuitive and modern UI/UX design techniques, pop-out slide panels and multi-level window structures.
- Uncover new insights and training opportunities by reviewing historical activity through the historical playback capability – no scripting or configuration necessary. Just hit play.
- Apply geographical perspectives to decision-making with the Map OMI App enabling operators to become more aware of geographically distributed assets.
- Centralize access to non-traditional information sources such as work orders and team collaboration to bring greater context to process-centric views.
- Increase usability across devices with multi-touch and gesture controls such as panning, zooming, and declutter mechanisms.
- Automatically calculate statistical summary process data (i.e. maximum, minimum, average, etc.) in real-time without any coding.
- Capture the "best operator" in the system to reduce operator strain and expedite on-boarding for new operators.

Maximize the use of advanced alarm management capabilities like state-based alarming, alarm suppression, alarm shelving, alarm grouping and aggregation to identify and filter out nuisance and "bad actor" alarms based on severity to maintain focus on the most relevant process information, reducing operator distractions and fatigue.

Unlike conventional relational databases, AVEVA Historian handles time-series data, as well as alarm and event data. Unique "block technology" captures plant data hundreds of times faster than a standard database system and utilizes a fraction of conventional storage space.

Manage low bandwidth data communications, late coming information, and even data from systems with mismatched system clocks. Ensuring high resolution data is captured accurately every time.

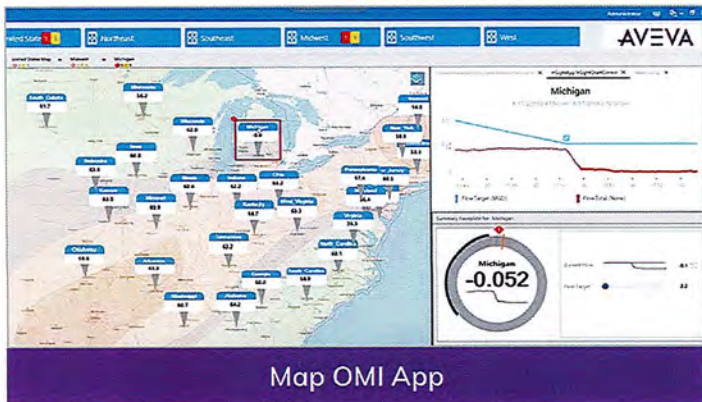
Process one year of historical data in less than a second to facilitate troubleshooting, identify inefficiencies, and eliminate the time-consuming activity of locating data, using AVEVA Historian Client's powerful trend, query and reporting tools.



Amplifying the operations platform

Visualize more with OMI Apps

OMI Apps are extensible add-on capability that can be incorporated into displays to provide enhanced functionality for specific use cases, our growing library of apps are available from both AVEVA and our partners.



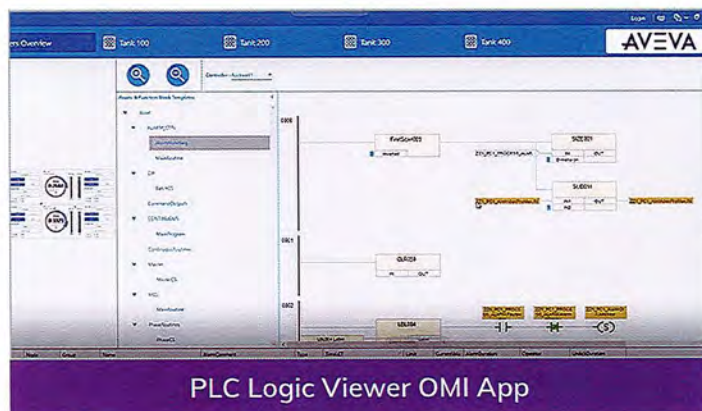
Map OMI App

Offers geographical contextual presentation which enhances the model-based navigation.



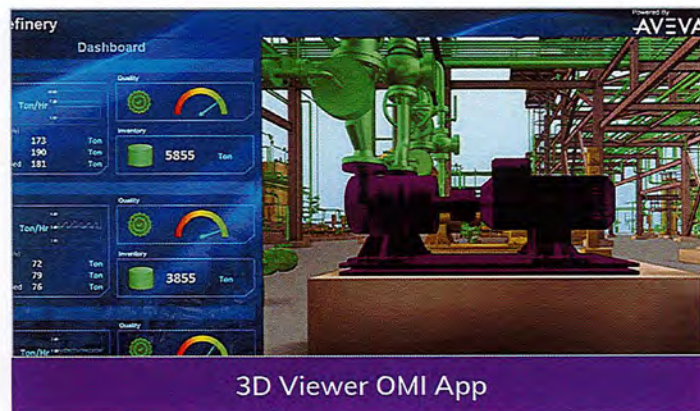
Insight OMI App

Builds artificial intelligence into the context of real-time decision making.



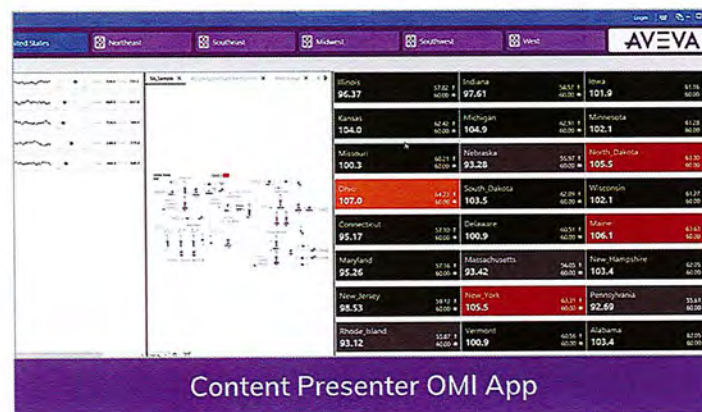
PLC Logic Viewer OMI App

Empowers operators to troubleshoot PLC logic and execution in real-time.



3D Viewer OMI App

Renders 3D models of assets contextually for alarms, alerts, and status changes.



Content Presenter OMI App

Dynamically create runtime dashboards with KPIs, symbols, or alarms status of area.



Graphic Repeater OMI App

Repeat any symbol to visually represent data that would typically be shown in a table.

Integrate with AVEVA & partner software

AVEVA System Platform is the ideal open standards-based foundation that interfaces to countless software systems and services.



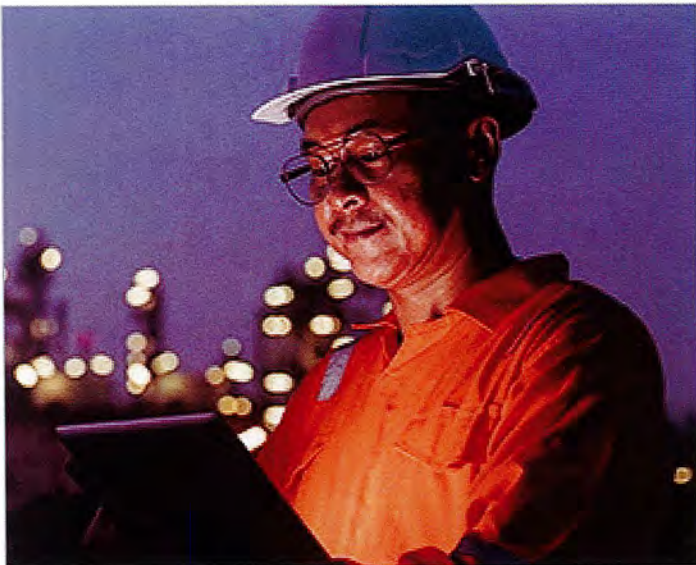
AVEVA Insight

Cloud based actionable information and Artificial Intelligence capabilities to help your teams improve asset reliability and operational performance.



AVEVA Work Tasks

Advanced management for the digital transformation of standard operating procedures and orchestration of work execution.



AVEVA Mobile Operator

Structured procedures provided on mobile devices to improve operations efficiency, streamline maintenance management, and increase regulatory compliance.



AVEVA MES

Digitally manages the production execution, quality and downtime activities using a model-driven approach for plant events in real-time.

Integrate with AVEVA & partner software

AVEVA System Platform is the ideal open standards-based foundation that interfaces to countless software systems and services.



AVEVA EAM

Comprehensive solution for providing maintenance management, spares, inventory management, and provides complete procurement capabilities.



AVEVA Teamwork

Performance support application in the cloud that empowers workers to learn, solve problems and share knowledge from their workstations.



AVEVA Batch Management

Manages multi-product and multi-stream batch operations to maximize plant throughput, increase flexibility and consistent quality to specification.



AVEVA Recipe Management

Simplifies management of product formulations, downloading of formula parameter values, and recipe execution to produce a specific product.



Future-proof investment

Architectural Flexibility

Easily scale as your operations grow, from a single box system, to client-server, to multi-tiered deployment without re-engineering the solution. AVEVA System Platform was designed to expand and change over time to accommodate shifting needs, including the ability to distribute the system across multiple servers for maximum uptime and redundancy.

The Best of All Worlds: On-Premise, Cloud, and Hybrid

AVEVA System Platform supports a mix of on-premise and cloud-based applications for the most pragmatic and flexible approach to real-time control and actionable insights that suits your needs.

Maintain A Healthy System

Enable continuous proactive monitoring of your system's health, performance, and availability. AVEVA System Platform greatly mitigates the risk of application downtime by making incremental changes on the fly and manages system patches centrally by downloading and pushing updates directly to networked machines.

Multi-device Experience

Configure applications once and deploy actionable content anywhere on any device.



For more information on AVEVA System Platform, please visit: aveva.com/en/products/system-platform/

For more information contact sales partner:

AVEVA

aveva.com

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Appendix B

Ignition SCADA System

Ignition (Inductive Automation)

The ignition platform is a modular platform with scalability and includes powerful features and core drivers to connect data and devices into one central hub. It has unlimited tags and powerful connectivity. It can connect to any major PLC and database with built-in SQL database connectivity and includes an OPC UA Server Module and core drivers such as Modbus, Allen-Bradley, and Siemens.

It is a modular platform that allows the client to select and choose the modules they desire and to combine options in the way that suites the project application the best. It has many options that provide even greater tools and includes some of the following:

- **Perspective Module Unlimited**
Allows for data to be deployed directly to a web browser, mobile device, or desktop computer.
- **Reporting Module**
Allows for the creation of dynamic, database driven PDF reports.
- **SQL Bridge Module**
Allows for the integration of PLC's and SQL databases in unlimited ways.
- **Tag Historian Module**
Allows for a SQL database to become a high-performance tag historian.
- **Alarm Notification Module**
Allows for the configuration and management of notification systems and email notifications. Can add additional modules for alarm notifications via phone, text, and twilio.

The software is compatible with Windows, Linux, and Mac among others. Ignition is a server software. In order to have redundancy two servers are required, however Ignition reduces the cost of the second server software 50% when being utilized in a redundant application.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server are possible without any additional costs. These have access to the system using web based browser technology.

Ignition Costs

The ignition system is nice because the capital costs are a one-time cost and there are no annual licensing costs. If a redundant system is installed, then there are two licenses required with one for the primary and a second license at a 50% discount for the redundant application.

Capital Cost:

The cost is dependent on the modules that are selected. The software can easily be customized, however they do offer standard packages. There are three unlimited package systems that contain the basic components. These include (redundancy not included in costs):

- Basic Package \$12,500.00

- Unlimited Tags
- Unlimited Clients
- Unlimited SQL Database Connectivity
- OPC UA Server and Client
- Core Drivers Included
- Tag Historian

- Pro Package \$19,600.00

- Unlimited Tags
- Unlimited Clients
- Unlimited SQL Database Connectivity
- OPC UA Server and Client
- Core Drivers Included
- Reporting Module**
- Tag Historian
- SQL Bridge Module**
- Alarm Notification**

**Modules that are part of Pro Package and not Basic Package*

- Ultimate Package \$27,900.00

- Unlimited Tags
- Unlimited Clients
- Unlimited SQL Database Connectivity
- OPC UA Server and Client
- Core Drivers Included
- Reporting Module
- Tag Historian
- SQL Bridge Module
- Sequential Function Charts (SFC) Module**
- Web Development Module**

- Alarm Notification
- Voice Notification Module*
- SMS Notification Module*
- Enterprise Administration Module*
- OPC COM Module*

**Modules that are part of Ultimate Package and not Pro Package*

If redundancy is provided then the cost increases by fifty-percent:

- | | |
|--------------------|-------------|
| • Basic Package | \$18,750.00 |
| • Pro Package | \$29,400.00 |
| • Ultimate Package | \$41,850.00 |

However, Ignition also allows for the customer to configure their own packaged system such that it only incorporates the modules that they actually need. For instance, a system could be provided with the following:

- | | |
|---|---------|
| • Ignition Platform – Unlimited tags, clients, & connectivity | \$1,000 |
| • Perspective Module Unlimited – Visualization on PC, phone, etc. | \$9,500 |
| • Reporting Module – Create database driven PDF reports | \$3,300 |
| • Tag Historian Module – Database trending | \$2,000 |
| • Alarm Notification Module – Email notifications | \$1,900 |
| • SMS Notification Module – Text notifications | \$800 |

The total estimated cost for the custom system is \$18,500.00, however it increases to \$27,750.00 for a redundant system.

A preliminary cost estimate for the Ignition system includes the following:

- | | |
|--|--------------|
| • Pro Package Software with Redundancy | \$29,400.00 |
| • Two Custom Built Servers (Rack or Tower) | \$20,000.00 |
| • Two Custom Built Desktop PC's with Monitors | \$6,000.00 |
| • Firewall VPN | \$2,000.00 |
| • Voice Modules VoIP Modules | \$1,000.00 |
| • Radio Survey | \$10,000.00 |
| • Radio Tower at Central Headquarters | \$40,000.00 |
| • Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station | \$192,000.00 |

When adding in the infrastructure for communication, the total estimated system cost is approximately \$300,400.00.

There are no annual license fees. This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$300,400.00 if the support care is not implemented.

Annual Costs

Ignition does provide three levels of support that results in an annual cost, however this support is not mandatory. The benefit to the support is that it covers the costs of any future software updates and upgrades as they are developed and provides support in the event of problems.

The drawback is if the support is not paid for on an annual basis, then when the client wants to purchase an update or software upgrade the cost of the update is 65% of the licensing cost. The care support options are:

- BasicCare 16% of License Cost Annually

The BasicCare provides Upgrade Protection which includes unlimited free upgrades to purchased Ignition modules throughout the duration of the Support Plan and provides email and web support.

- TotalCare 20% of License Cost Annually

The TotalCare provides Upgrade Protection which includes unlimited free upgrades to purchased Ignition modules throughout the duration of the Support Plan and provides phone, email, and web support.

- PriorityCare 24% of License Cost Annually

The PriorityCare provides Upgrade Protection which includes unlimited free upgrades to purchased Ignition modules throughout the duration of the Support Plan and provides unlimited phone, email, and web support.

Ignition! 8.1

by inductive automation

Built For Everyone

The all new Long-Term Support (LTS) release introduces powerful new features to the Ignition Platform to help you develop and use projects more effectively.

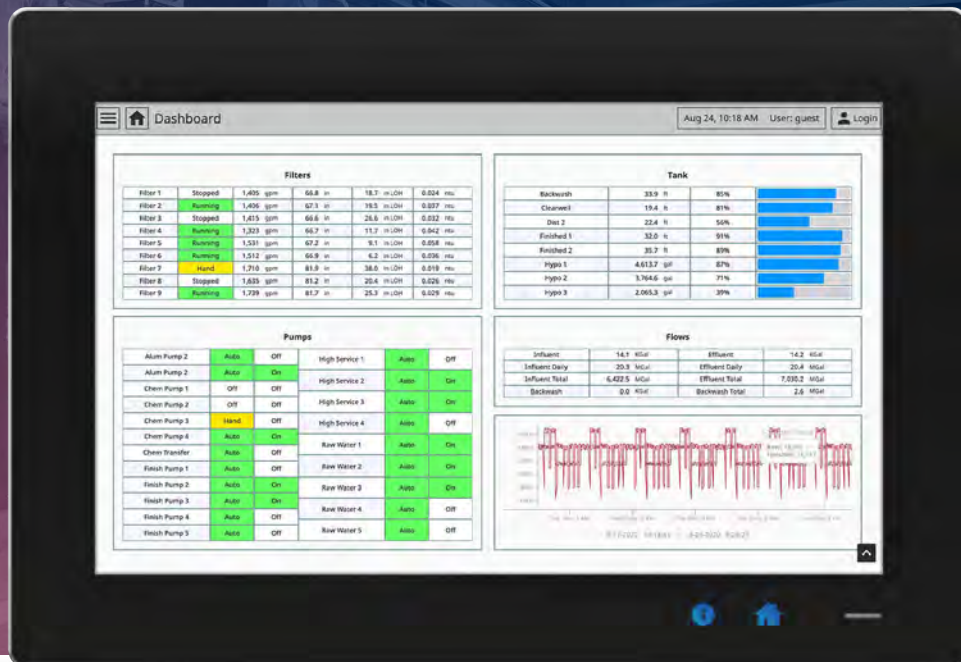


"Ignition 8.1 is a milestone for Inductive Automation and for Ignition. It represents our full vision of what The New SCADA could be, and is the platform that all of our customers will want to leverage for their next generation solutions."

— Steve Hechtman
CEO & Founder, Inductive Automation

For the Plant Floor

Ignition 8.1 adds amazing features to Ignition Perspective that help you see and control your plant-floor processes more effectively than ever before.



A New Perspective for the Plant Floor

With Perspective, you can create beautiful, mobile-responsive industrial applications that run natively on any mobile device and web browser. Now, with the new Perspective Workstation, you can instantly web-deploy native applications to any HMI, desktop, workstation, and multi-monitor configuration without the need for a third-party web browser.



Run in Full-Screen Kiosk Mode

Eliminate any distractions from the underlying OS with Perspective Workstation's Kiosk mode.



Control the Plant Floor from Your Phone

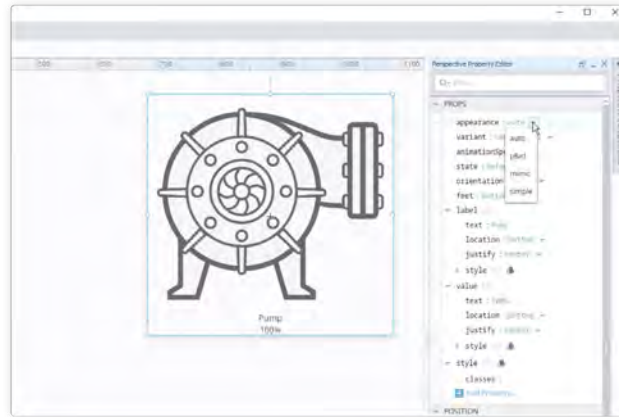
Put the full control of your plant floor in the palm of your hand with the Perspective App for iOS & Android.



Screens courtesy of Corso Systems

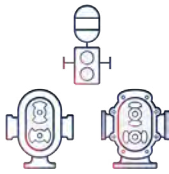
Design for Multiple Screen Sizes at the Same Time

Save development time by designing a single Perspective application that displays beautifully on screens of any size.



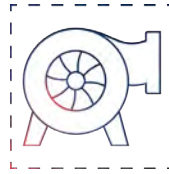
Powerful New Dynamic and Data-Driven Symbols

In 8.1, we're adding powerful dynamic symbols to the Perspective Module called Perspective Symbols. These symbols all have dynamic data models, so binding them to process values is a simple matter of drag-and-drop. They also have built-in animations so they will automatically change based on your data. With Perspective Symbols, creating beautiful HMIs is quicker and easier than ever.



Three Distinct Styles

Each Perspective Symbol comes with three different styles: Traditional P&ID, the realistic Mimic, and the optimized Simple style.



Customize Your Symbols

Visual options such as supporting text, animation, and device orientation can be defined to fit your project.



Get All the Basics & More

The initial release comes with the 2-way valve, motor, pump, vessel, and sensor, and many more symbols are coming soon.

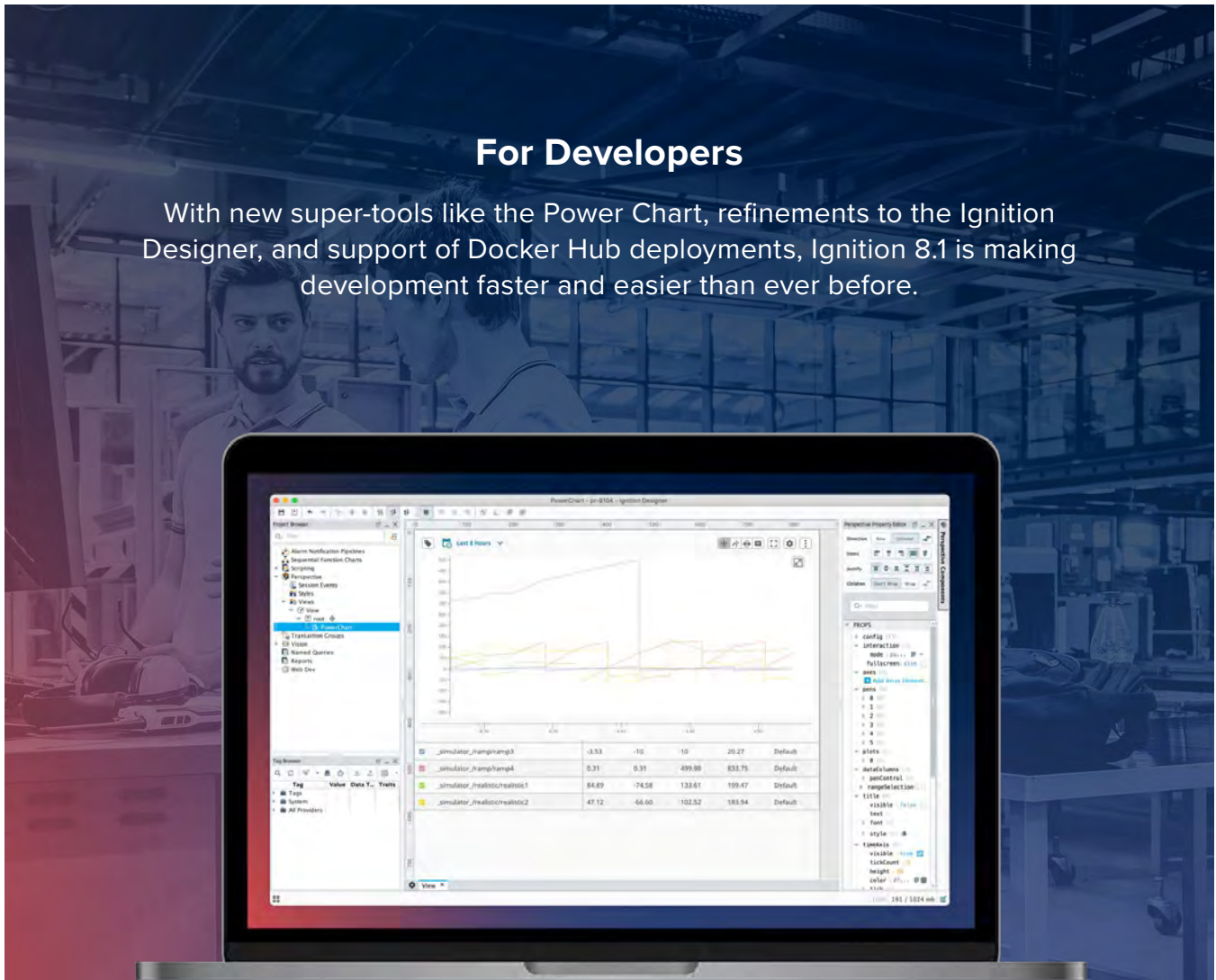


"We were able to build a fresh, responsive display that would look amazing on any device, and that could scale massively."

— Sam Burns
Control Systems Engineer, ESM Australia

For Developers

With new super-tools like the Power Chart, refinements to the Ignition Designer, and support of Docker Hub deployments, Ignition 8.1 is making development faster and easier than ever before.



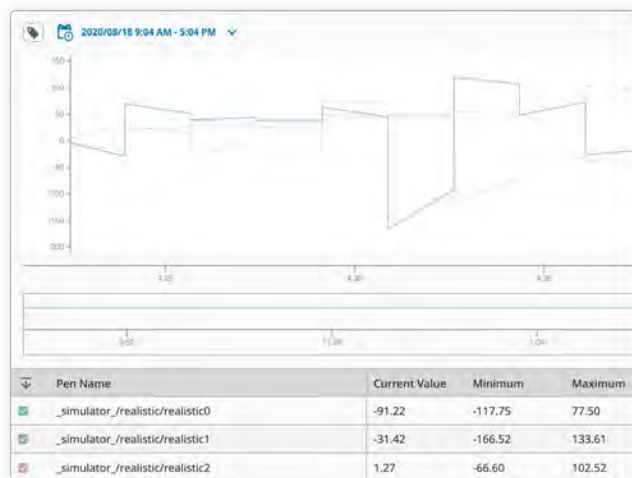
Add Powerful Ad Hoc Charts to Your Projects Instantly

The Power Chart component for Perspective allows you to quickly and easily create runtime-configurable time series charts from Tag Historian data. Now you can easily generate “ad hoc” charts within a Perspective session. Power Chart is also mobile-optimized so it adapts itself automatically for small screens.



Tag Browser Built Right In

You can easily access and analyze historical tag data right from the session window, no additional development necessary.



Data-Driven Table

Easily view dynamic chart data in a table format for quick analysis, all within the session.



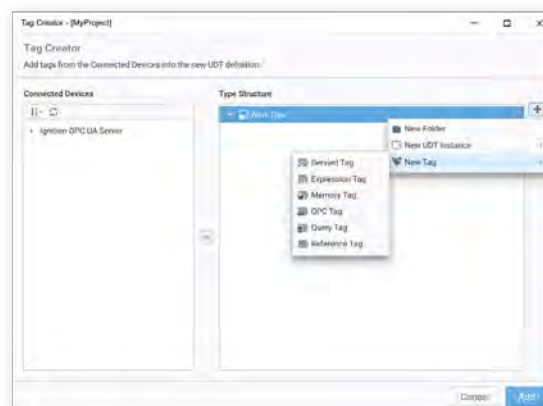
In-Session Chart Customization

You can easily and quickly customize charts by adjusting axes, chart pen parameters, and the chart's timeframe.



Develop Larger Systems Faster with Docker

Users who currently use Docker Hub will enjoy the ability to quickly develop on the Ignition platform. Quickly spin up multiple instances of Ignition and develop right away without the need for installation. You can also have multiple instances interact with each other to develop a multi-gateway architecture without the need to run multiple servers or be at multiple locations.

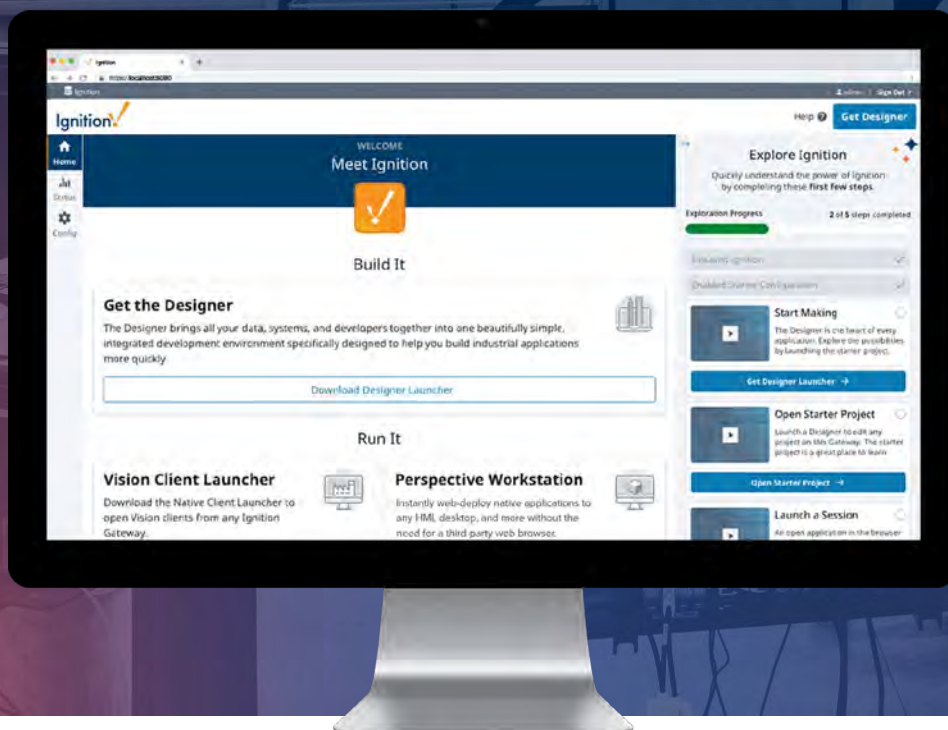


Browsing is a Breeze

In 8.1, we've refreshed the tag browser to make adding new tags to your project even easier and quicker than before. Tags are also easier to organize with new custom icons that identify tag types.

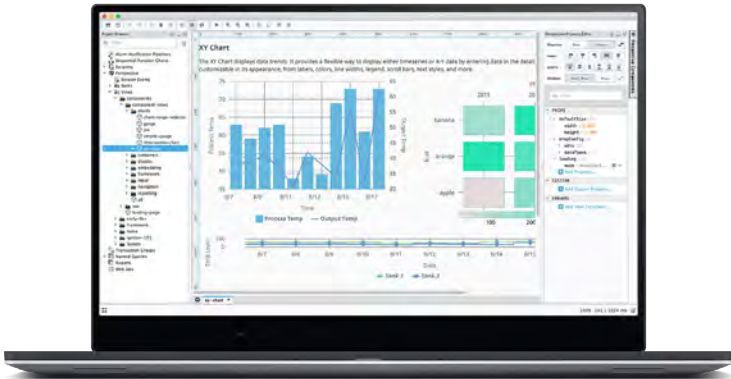
For New Users

Ignition 8.1 is packed with new features that make it easier than ever for new users to create powerful and dynamic applications from scratch.



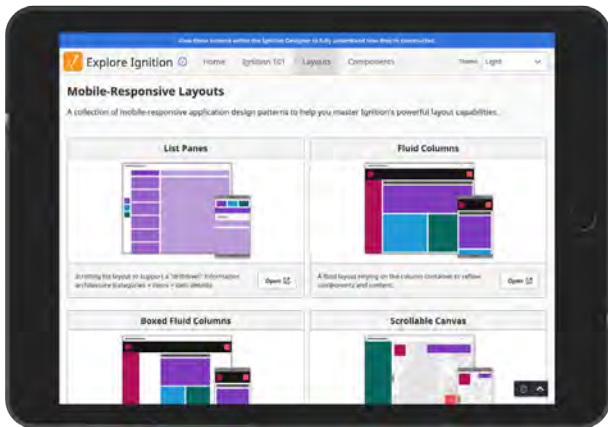
Hit the Ground Running with Quick Start

To help Ignition newcomers get up and running fast, we are introducing a feature called Ignition Quick Start. The Quick Start option provides simple tutorials and automatic configurations to set up things like security, connections to external devices, and databases faster than ever.



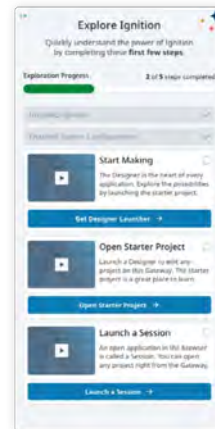
Learn by Deconstructing

Quick Start comes with a pre-configured sample project that includes core Ignition features for you to use, break apart, add to, and more to help you better understand and visualize Ignition.



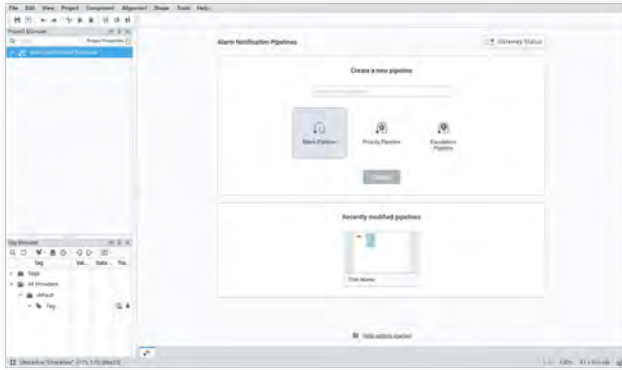
Explore Advanced Features

Learn about concepts like screen layout, components, and Python scripting.



Follow Tutorials in the Gateway

Save development time by designing a single Perspective application that displays beautifully on screens of any size.



Fast-Track Your Ignition Project Work

Developing projects is now even faster with the many shortcuts we've added across the Designer in Ignition 8.1. Instead of starting with a blank workspace when creating a new project resource, you'll now have access to clickable shortcuts for things like new Perspective resources, alarm pipelines, transaction groups, and more. Jump right in and start developing your project quickly!

Learn Ignition for Free at Your Own Pace

More videos are being added to Inductive University for 8.1, so anyone can learn how to use the newest version of Ignition on their own time. Inductive University is the industry's leading online-learning website for automation software. With more than 600 educational videos, you can learn how to use Ignition on-demand, all totally free!

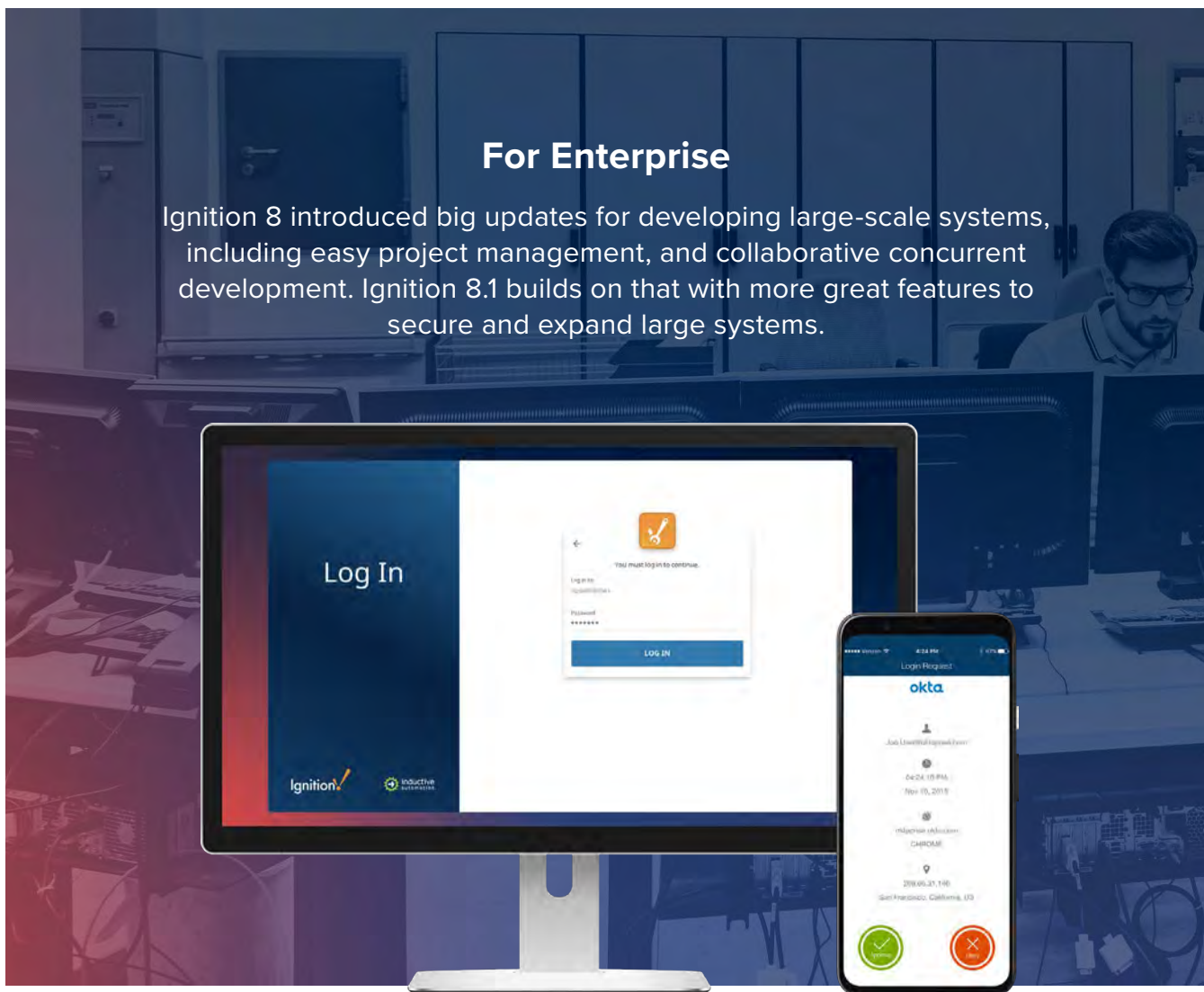


"Using Ignition we were able to build a flexible, well-tested, highly resilient SCADA platform...meeting both the business requirements and IT requirements in terms of availability, security, and integrations..."

— Li Lu
IT Project Manager, Dublin Airport

For Enterprise

Ignition 8 introduced big updates for developing large-scale systems, including easy project management, and collaborative concurrent development. Ignition 8.1 builds on that with more great features to secure and expand large systems.



Add SSO and MFA Security to all Your Ignition Projects

Ignition 8.0 introduced support for federated identity with the Perspective Module. Now with Ignition 8.1, you can also take advantage of federated identity support for the Ignition Gateway, Designer, and the Vision Module, to add multi-factor (MFA) authentication and single sign-on (SSO) to all your Ignition projects across your enterprise.



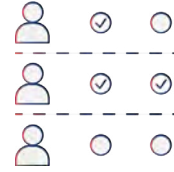
Integrate with Corporate Network Security

Ignition integrates with corporate network security using Microsoft Active Directory™.



Use Trusted Identity Management

Ignition integrates with trusted federated identity technologies such as SAML and OpenID Connect.



Control User Access

Easily control access to system areas for different users with the click of a button.



Built for Enterprise-Wide Systems of all Sizes

Ignition 8 is built to scale for any size implementation within your enterprise organization. With the ability to share project-inherited resources across multiple projects, a robust tag system that can handle huge amounts of data, and the ability to simultaneously launch hundreds of concurrent clients with ease, Ignition 8 was designed with enterprise deployment in mind.



Trusted by Manufacturing Companies Everywhere

Ignition is trusted by some of the biggest industrial organizations in the world to run their mission-critical systems. With thousands of active Ignition deployments around the world, including installations with 54% of the Fortune 100 companies, Ignition is plant-floor proven and trusted by enterprises of all sizes to get the job done.



"Ignition 8.1 is all the innovation and power of the Ignition Platform, refined into a high-performing, secure, and reliable package ready for the future."

– Carl Gould

Director of Software Engineering, Inductive Automation

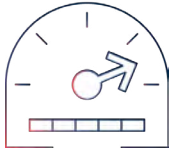
For Years to Come

Ignition 8.1 is our most polished and powerful release of Ignition ever, and with multi-year support, regularly planned updates, and improvements, it's a release you can trust for years to come.



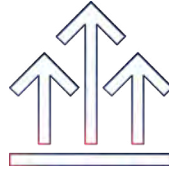
Confidence for the Long Haul

Ignition 8.1 is the first long-term supported (LTS) version of the Ignition 8 platform. As an LTS version, Ignition 8.1 will receive improvements and fixes for a full five years from the date of its release, so you can rely on 8.1 for the long haul.



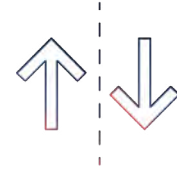
Focus on Performance

Upcoming improvements for 8.1 will focus on making its existing features even faster and more stable.



Regularly Updated

Inductive Automation will release regular updates for Ignition 8.1 for the next five years so you can always stay up-to-date.



Backward Compatibility

Ignition 8.1 is backwards-compatible, ensuring that your past projects will update safely from previous module versions.



Add Peace of Mind

There is no better way to protect your investment and future-proof your system than by adding a support contract to your Ignition purchase. That's because each support contract comes with Upgrade Protection, which includes unlimited free upgrades of purchased Ignition modules for the life of your contract, as well as access to Inductive Automation's industry-leading technical support team, so you can quickly get expert answers to your questions. Choose from three different support levels in our updated TotalCare program to fit your specific needs.



"By using Ignition we were able to develop a project that is reusable, tweakable, and we could implement feature requests rapidly...rolling out our customer's needs quicker."

—Raymond Stanford
Senior Engineer, Steritec Automation

PLATFORM FEATURES

Ignition 8.1 has everything you need to build reliable, reusable, and powerful projects for any industry at any size.



Unlimited Licensing Model

Add unlimited clients, screens, tags, connections & devices.



Server-Centric Web-Deployment

Easily deploy at one or more sites or in the cloud.



Modular Configurability

Use integrated modules to build the exact industrial application you need.



Cross-Platform Compatibility

Ignition works with any major operating system, even iOS and Android.



Run Web-Clients on Desktop or Mobile

Launch runtime clients in any web browser with no plugin required.



Based on Open Technology Standards

Built on HTML5, SQL, Python, MQTT & OPC UA.



Instant Installs and Updates

Install on a server in just 3 minutes, push updates to clients everywhere, instantly.



One Universal Platform

Build SCADA, MES, IIoT, alarming, reporting applications and more.



Mission-Critical

Add fault tolerance for mission-critical systems by adding redundant servers.

Ignition! 8.1

To discover what Ignition can do for your company, visit:

inductiveautomation.com

Some of the companies that depend on Ignition:



Morgan Stanley



Platform Specs and Requirements

Supported Operating Systems

Windows Server 2016/2019

Windows 10

macOS (10.14+)

Linux (Support for popular distributions, tested with Ubuntu 18.04)

Supported Databases

Microsoft® SQL Server

Oracle

MySQL

MariaDB

PostgreSQL

Any database with a JDBC driver

Requirements

Dual-core processor

4 GB RAM

10 GB free HD space

(Requirements vary by usage.)

To learn more about Ignition 8.1, please contact an account representative at: **800.266.7798**

Appendix C **FactoryTalk SCADA System**

FactoryTalk (Rockwell Automation)

FactoryTalk View Site Edition (SE) is the platform for Rockwell that allows for monitoring and controlling systems at all levels, from a single operator station up to multi-user applications. However, it only works with the Windows operating system.

Rockwell utilizes “thin clients” to connect remotely to a server-based system that allows it to run apps, record data, and display content.

Rockwell adds FactoryTalk View Point as a mobile-ready extension that provides a secure interface with the HMI applications through a web browser on any mobile device.

The system would be recommended to include a primary server at the central headquarters and a redundant server installed at a remote location for redundancy. Each server location would include a desktop computer for access and monitoring. All mobile and remote device connections to the server would be through FactoryTalk View Point. These devices have access to the system using web based browser technology.

FactoryTalk Costs

A preliminary cost estimate for the FactoryTalk system includes the following:


Capital Cost:

• Two Custom Built Servers	\$20,000.00
• Two Custom Built Desktop PC's with Monitors	\$6,000.00
• Two FactoryTalk View Site Edition Stations	\$30,000.00
• Two FactoryTalk View Point Packages for Remote Access	\$20,000.00
• Two Historian Packages	\$10,000.00
• Two WIN-911 Software Packages	\$10,000.00
• Firewall VPN	\$2,000.00
• Voice Modules VoIP Modules	\$1,000.00
• Radio Survey	\$10,000.00
• Radio Tower at Central Headquarters	\$40,000.00
• Radio Communication – Antenna, Radios, Cable, Switches, Grounding, and Enclosures for Aqueduct Turnout, Phase I Basins, Phase II Basins, and Pumping Station	<u>\$192,000.00</u>
Total Capital Cost:	\$341,000.00

Annual Costs:

- License Fees
Estimate between \$7,000 to \$13,000 per year \$10,000 per yr

This equates to an approximate total cost (capital plus annual costs) over a ten (10) year period of \$441,000.00.



Practitioner's Guide To Planning and Deploying Industrial Internet of Things (IIoT) Solutions



Harbor
Research



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Automation**

SUMMARY

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HOW TO DEVELOP AN IIOT VISION

“Leadership in many manufacturing companies is still observing or pondering how to initiate the transition to the high-stakes world of digital business...”

As network, software and digital technologies continue to invade the physical world of sensors, machines and manufacturing, leadership in many industrial organizations is rapidly recognizing the significant value created from extracting and leveraging the machine data and usage information from their equipment, systems and organizations.

The first movers embracing IIoT systems and solutions in manufacturing are on the road to locking down lasting dominant positions in their respective industries as a result of their early moves. Leadership in many manufacturing companies is still observing or pondering how to initiate the transition to the high-stakes world of digital business, and it is this transition, more than the technological shift, that will challenge many organizations.

Re-thinking operations and manufacturing systems to address new connected digital systems opportunities requires many changes in the way organizations think and act. These changes come in many areas.

- **Internal Leadership:** Organizations require strong leadership and support for planning and developing IIoT solutions. We have already seen—and expect to see more cases—where many members of an organization have a clear view of where the company needs to go, yet are unable to present the business case for change or ROI in a compelling enough manner to gain company-wide adoption.
- **Planning:** Companies may not know whom to invite to the planning table, let alone what to do when everybody is there. They may have planning processes in place that need to be re-designed to address the opportunities at hand. This might include inviting more, cross-discipline individuals to the table, as well as seeking third party insights.



- **Organization:** Companies risk overlooking the need to carefully assess what skills and relationships are required to successfully develop and deploy IIoT solutions. Understanding the required skills and new "digital" personas and roles that will plan, develop, design and enable new solutions is a critical element in adopting new technologies.

It's critical that the first step taken is to map out a vision and supporting goals for addressing IIoT solutions, including identifying the parts of the organization that will address IIoT first, developing and articulating a strategy for this transition and understanding clearly how the organization stands to benefit from this transformation.

"Understanding the required skills and new 'digital' personas and roles that will plan, develop, design and enable new solutions is a critical element in adopting new technologies."



HOW TO BUILD YOUR IIOT ROAD MAP AND IDENTIFY THE SUCCESS CRITERIA



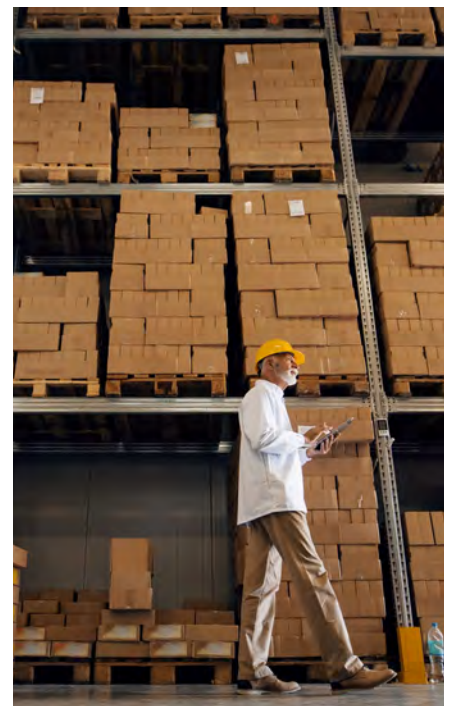
Diverse organizations across the manufacturing landscape are getting into gear to plan on how to benefit from adopting IIoT technologies and systems. However, to actually reap those benefits, it's critical that you define your goals, assess your current capabilities, and determine what resources are required to put your plan in motion.

The planning and implementation of these technologies is not a one-size-fits-all, straightforward process. Businesses can face challenges and setbacks if they do not properly plan and execute their deployment. To get the most out of IIoT technologies, it is important to develop a road map with clear priorities, goals and performance measures.

Creating an IIoT implementation roadmap ensures that you address the diverse dimensions involved in planning for IIoT systems. Careful and focused planning for IIoT systems ensures that the final result and system capabilities match the business' needs and goals. A thorough planning process can clear up misunderstandings between members of the team and the organization they serve, eliminating the possibility of discrepancies between expectations and results. The organization should establish metrics and milestones to measure performance against.

The following are typical challenges shared by many organizations. These questions must be addressed in an IIoT solution implementation and deployment road map:

- How to initiate an industrial IoT project and get management support?
- What is the best process for deploying industrial IoT?
- How to deal with human factors?
- What are the typical roadblocks and how to deal with them?
- How to handle the mismatch between information technology (IT) and operational technology (OT)?
- What is the best way to deploy specific technologies such as machine learning?



HOW TO LAUNCH A PROOF OF CONCEPT AND/OR PILOT PROJECT

Rather than launch your initiative company-wide, consider starting out small and rolling out a pilot that addresses one or two business objectives at a time. The primary benefit of launching a small project initially is that you'll have an opportunity to launch rapidly and demonstrate success to the rest of the organization. This will help validate the investment to leadership while making a case for convergence to operations and IT teams who may not yet be united.

Identifying goals for an IIoT pilot proof of concept project is critical. Examples of projects include focusing on improving process efficiency, asset management or raising product quality. In a process efficiency pilot, proof of concept project illustrative goals could include:

- Optimized utilization of existing resources
- Lower error, failure or defect rates
- Faster throughput, lead time or turnaround
- Reduced costs and improved allocation of resources necessary
- Improved predictability

These goals and related project benefits motivate funding of pilot projects by clearly translating into financial metrics and ROI. The primary value of these goals is to release resources previously being sunk into inefficient processes, taxing valuable



resources such as energy, skills, time, equipment and material. This resource shortage represents an enormous opportunity cost.

IIoT system pilot deployments take time and should never be rushed. The entire process should consist of multiple rounds of implementations. The first stage should focus primarily on testing and validating technology, pilots, proof of concept and validating use cases. Business stakeholders and employees from various functions or departments should be included in this process.

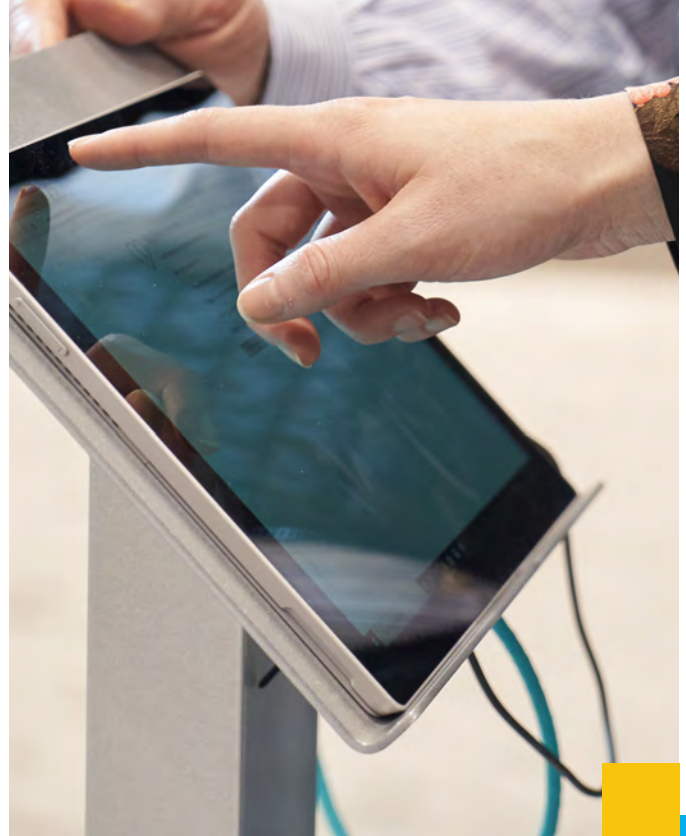
Technical elements that need to be addressed in a pilot proof of concept project include:

- **Network Management:** Network Management is a key aspect of your IIoT implementation strategy as it enables real-time performance, security and connectivity monitoring. Your network should provide a complete view of every connected device, allowing you to control operations and troubleshoot issues as they emerge. Quick response is especially critical for those managing distributed assets.
- **Connectivity:** You'll have a few different options for achieving IIoT connectivity, including Wi-Fi, cellular, Bluetooth, Sigfox, Lora, etc. What you ultimately choose depends on

bandwidth requirements, power consumption, the location of your environment, and several other factors.

- **Communications Protocols:** In a connected factory, devices from different manufacturers must work together. As such, you'll want to look for solutions such as advanced HMI's or protocol converters, that support multiple protocols, so devices can easily communicate with each other.
- **Automation:** IoT processes can be programmed to respond intelligently to events and improve system performance. Depending on your use case, you may want a solution that brings in sensor data and machine learning to make optimization decisions.

Meticulous, carefully planned implementation minimizes the risk of failure and ensures a working, effective IIoT system.



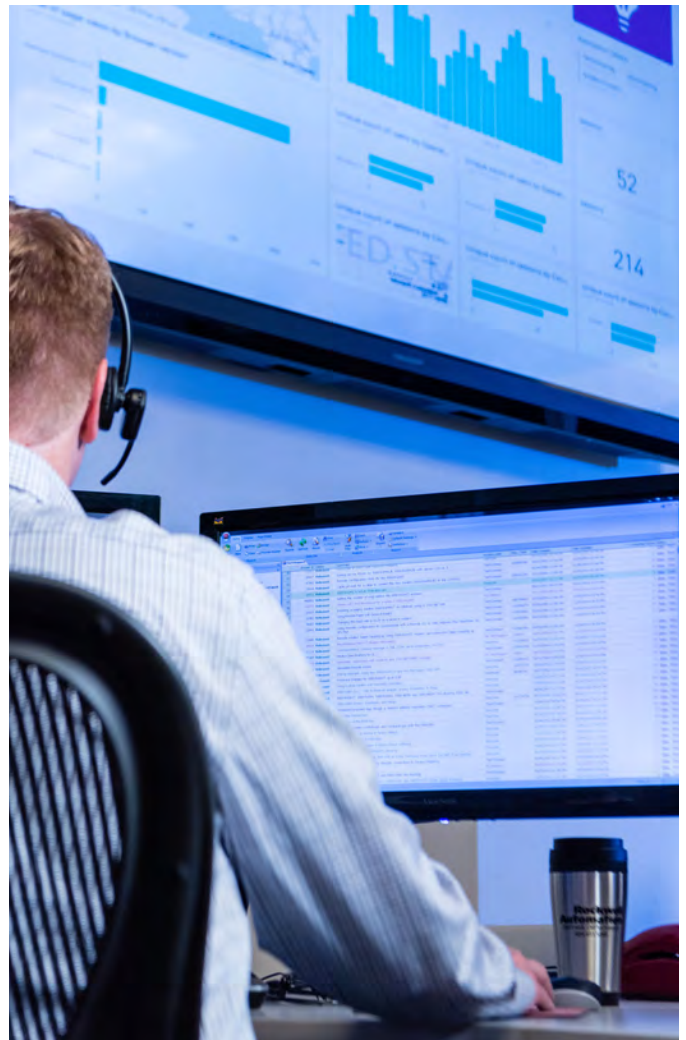
"Meticulous, carefully planned implementation minimizes the risk of failure and ensures a working, effective IIoT system."

YOUR INFRASTRUCTURE CONSIDERATIONS

An IIoT system cannot reach optimal performance without adequate infrastructure. Legacy IT equipment will not meet the IIoT's network and connectivity demands. You may need to modernize your technology and invest in infrastructure updates to ensure that your system is capable of handling a constant data flow. A secure, reliable infrastructure is essential if you want your system to be able to perform the analytics necessary for precise measurements and use case deployments.

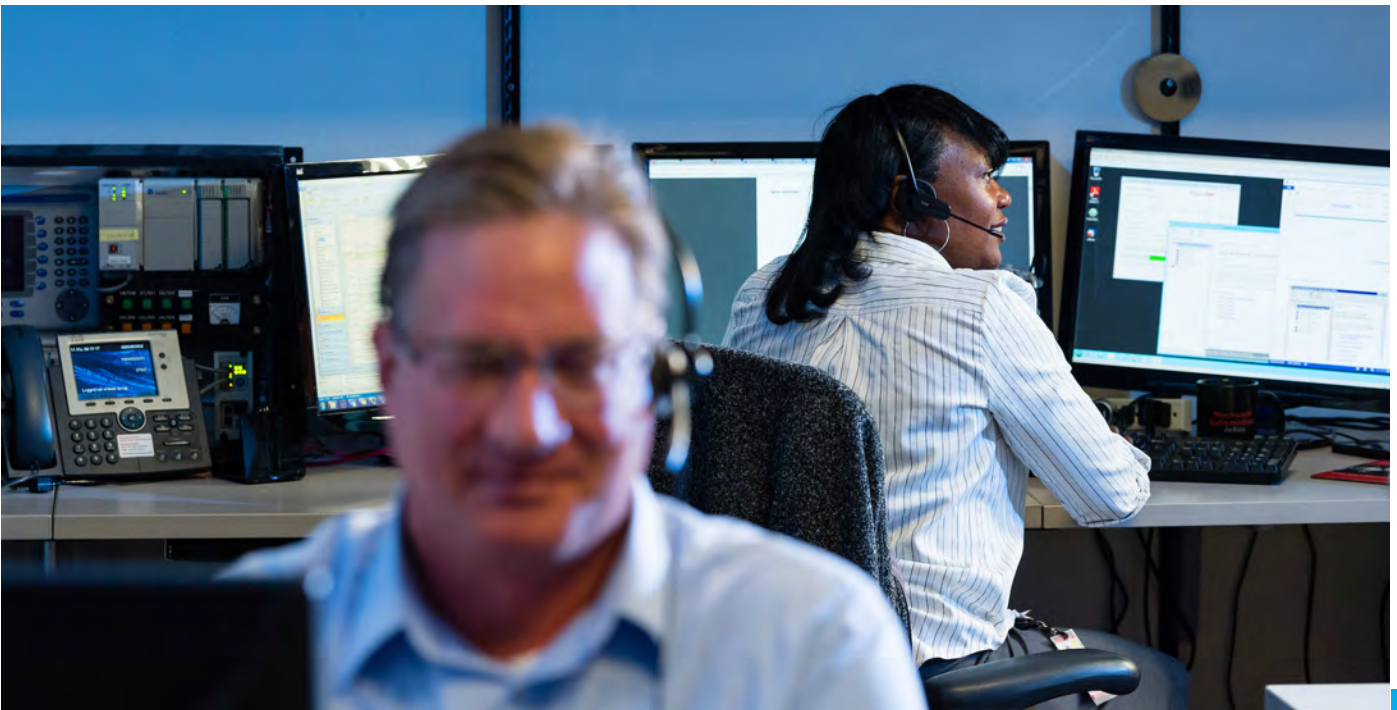
Essential capabilities to address include:

- **Edge computing:** Edge computing allows you to monitor data in real-time by bringing processing close to the data source. This is essential for IIoT applications that involve continuous uptime, like predictive maintenance or process monitoring. The quick processing time offered by the edge is also critical for detecting cyber threats that put OT equipment at risk.
- **Cloud Computing:** Where edge computing addresses time-sensitive data, you'll want to use the cloud for analyzing data, managing business tools, and long-term storage.



- **Data Management and Analytics:** One of the primary benefits of IIoT is the massive amount of data it generates, so you'll want to look for a solution that sorts, normalizes and analyzes data, extracts actionable insights, and performs actions based on its findings.

"A secure, reliable infrastructure is essential if you want your system to be able to perform the analytics necessary for precise measurements and use case deployments."



HOW TO SECURE IIOT SOLUTIONS

Security is vital, as these hyper-connected devices are vulnerable to hacking, malware and other potential security breaches. Security compromises can lead to financial and legal complications, and they will likely impact brand reputation and the customer experience.

The three standards of effective IoT security are:

- **Network Security:** Two-factor identification (2FA) and strong passwords that protect against brute force entry and guessing can thwart unauthorized access. Context-aware authentication provides another level of security by utilizing machine learning algorithms and contextual information to consistently measure risk and vulnerability.
- **Device Security:** Security capacity is a critical component of IoT devices. Always evaluate an IoT device's defenses before purchase and installation. The technology must be tamper-proof, with multiple layers of security to shield it from attacks.
- **Data Security:** Data should be protected at every point in the IoT system. From collection point to analysis to end storage, personal information and other sensitive data must be kept safe and secure.

An effective security system should be capable of automatically detecting new endpoints and verifying their legitimacy and permissions before allowing access to data. Sufficiently protected IIoT systems will be able to perform real-time risk analyses and stop potential security breaches before sensitive data is obtained.



YOUR KEY SUCCESS FACTORS

The outcomes from early IIoT pilot projects and deployments are primarily focused on the initial validation of IIoT technology choices, how to use the technology in an operational context, and an assessment of the changes required in your organization and its processes.

Key success factors for pilot projects and proof of concept programs include the following:

- Engaging multiple carefully selected partners to help you fill the gaps.
- Clarifying the requirements, constraints, risks and goals to have clear goal posts to prove ROI.
- Planning for the short-term milestones in the project, but never taking your eye off the longer horizon in order to have a plan to eventually scale.
- Understanding and planning for organizational relationships and interactions across functions and departments to have company-wide buy-in.
- Carefully defining milestones with the flexibility to iterate and refine objectives throughout the process.



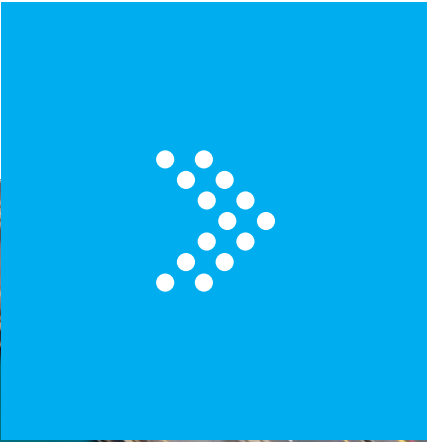


- Creating time and budget for an early discovery and investigations phase to change course as needed.
- Consciously and deliberately planning reusability and scalability to ensure long-term success.

Launching an IIoT solution may at first appear daunting, but with proper planning, stakeholder input, technical considerations and partner participation, a successful pilot can be achieved.

To learn more, click [here](#).







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KERN FAN GROUNDWATER STORAGE PROJECT

TECHNICAL MEMORANDUM NO. 11

(Engineer's Estimates)

PREPARED FOR: Kern Fan Joint Powers Authority (JPA)

PREPARED BY: Curtis Skaggs, P.E.

DATE: July 8, 2020

SUBJECT: *Engineer's Estimates*

I. Executive Summary

II. Each Phase

III. Each Phase

IV. Each Phase

V. Each Phase

VI. Each Phase

VII. Summary

VIII. Related Work Specified Elsewhere

A. NA.

Appendices

Release of Request for Proposals

DISCUSSION:

On May 3, 2021, the JPA Board authorized a proposal with Dee Jaspar and Associates to prepare and RFP (Request for Proposals) package to begin the process of selecting consulting firms to design the Kern Fan Project. The different design packages were the subject of Tech Memo 1 (approved by the GBJPA on November 2, 2020) as follows:

It is envisioned that there may be up to five different design firms and potentially multiple construction administration and inspection contracts for the following project phases:

1. Phase I Recharge Basins & Goose Lake Channel Pump Station, Check Structure, Interbasin Structures, and Well Pipelines and Intertie; Phase II Recharge Basins & Phase II Well Pipelines and Interbasin Structures
2. Phase I Well Drilling and Equipping; Phase II Well Drilling and Equipping
3. Aqueduct Turnout Facility
4. Conveyance Facilities including Turnouts & Pump Stations
5. SCADA and PLC Programming

Staff has completed its review of the attached RFP document and will proceed with the process during the 4th quarter 2021.

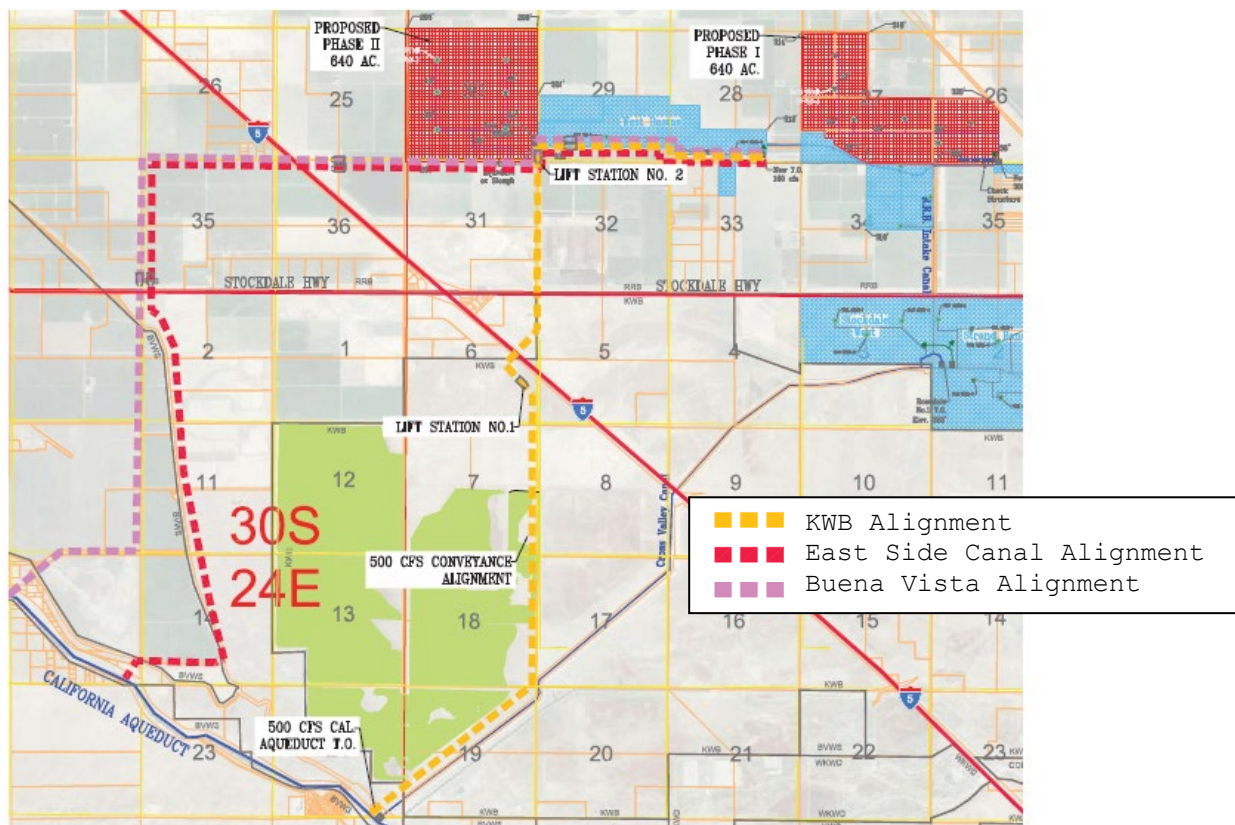
RECOMMENDATION:

None.

Alignment Coordination

DISCUSSION:

On March 27, 2020, the JPA completed its 30% design report that identified 3 different alignments as shown below. That report identified the Buena Vista Alignment as the preferred route of the three feasible options. Staff has begun discussions with the various public agencies and major landowners across each alignment.



RECOMMENDATION:

None.