AGENDA
WATER ISSUES COMMITTEE MEETING
WITH BOARD OF DIRECTORS *
ORANGE COUNTY WATER DISTRICT
18700 Ward Street, Fountain Valley, CA 92708
Wednesday, September 13, 2023 12:00 p.m., Boardroom

*The OCWD Water Issues Committee meeting is noticed as a joint meeting with the Board of Directors for the purpose of strict compliance with the Brown Act and it provides an opportunity for all Directors to hear presentations and participate in discussions. Directors receive no additional compensation or stipend as a result of simultaneously convening this meeting. Items recommended for approval at this meeting will be placed on the **September 20, 2023** Board meeting Agenda for approval.

This meeting will be held in person. As a convenience for the public, the meeting may also be accessed by Zoom Webinar and will be available by either computer or telephone audio as indicated below. Because this is an in-person meeting and the Zoom component is not required, but rather is being offered as a convenience, if there are any technical issues during the meeting, this meeting will continue and will not be suspended.

Computer Audio: Join the Zoom Webinar by clicking on the following link:
https://ocwd.zoom.us/j/98592928069

Webinar ID: 985 9292 8069

Telephone Audio: (213) 338 8477

Teleconference Sites:
10382 Bonnie Drive, Garden Grove
8856 Citrus Avenue, Westminster
20 Civic Center Plaza, Room 813, Santa Ana
100 S. Main Street, Los Angeles
* Members of the public may attend and participate at all locations.

PLEDGE OF ALLEGIANCE

ROLL CALL

ITEMS RECEIVED TOO LATE TO BE AGENDIZED

RECOMMENDATION: Adopt resolution determining need to take immediate action on item(s) and that the need for action came to the attention of the District subsequent to the posting of the Agenda (requires two-thirds vote of the Board members present, or, if less than two-thirds of the members are present, a unanimous vote of those members present.)

VISITOR PARTICIPATION

Time has been reserved at this point in the agenda for persons wishing to comment for up to three minutes to the Board of Directors on any item that is not listed on the agenda, but within the subject matter jurisdiction of the District. By law, the Board of Directors is prohibited from taking action on such public comments. As appropriate, matters raised in these public comments will be referred to District staff or placed on the agenda of an upcoming Board meeting.

At this time, members of the public may also offer public comment for up to three minutes on any item on the Consent Calendar. While members of the public may not remove an item from the Consent Calendar for separate discussion, a Director may do so at the request of a member of the public.

CONSENT CALENDAR (ITEMS NO. 1 – 9)

All matters on the Consent Calendar are to be approved by one motion, without separate discussion on these items, unless a Board member or District staff request that specific items be removed from the Consent Calendar for separate consideration.

1. MINUTES OF WATER ISSUES COMMITTEE MEETING HELD AUGUST 9, 2023

   RECOMMENDATION: Approve minutes as presented

2. PURCHASE ORDER TO DUPONT WATER SOLUTIONS FOR MEMBRANE ELEMENTS FOR GWRS REVERSE OSMOSIS SYSTEM

   RECOMMENDATION: Agendize for September 20 Board Meeting: Authorize issuance of a Purchase Order to Dupont Water Solutions for an amount not to exceed $4,989,685 for 9,500 BW30XFRLE reverse osmosis membranes for the GWRS reverse osmosis system

3. BOLSA GAP SEAWATER INTRUSION MONITORING WELL CLUSTER OCWD-BS29

   RECOMMENDATION: Agendize for September 20 Board meeting:

   1) Staff to file a Notice of Exemption from requirements of the California Environmental Quality Act;
   2) Authorize construction of the OCWD-BS29 monitoring well cluster;
   3) Establish a project budget of $500,000;
   4) Authorize issuance of a Notice Inviting Bids for monitoring well construction; and
   5) Authorize issuance of an RFP for construction inspection services

4. AMENDMENT NO. 1 WITH WATER QUALITY TREATMENT SOLUTIONS, INC FOR STUDY OF BENCH-SCALE METHODS TO PREDICT PERFORMANCE OF IX AND NOVEL ADSORBENTS FOR PFAS

   RECOMMENDATION: Agendize for September 20 Board meeting: Approve and authorize Amendment No. 1 to Agreement No. 1492 with Water Quality Treatment Solutions, Inc. (WQTS) to add additional study scope for an amount not to exceed $18,200 for the study of Evaluation of Bench-Scale Methods to Predict Drinking Water PFAS Removal Performance of Ion Exchange and Novel Adsorbents at Pilot- and Full-Scale

5. PURCHASE ORDER TO AMS FOR WARNER OUTFLOW FLOWMETER

   RECOMMENDATION: Agendize for September 20 Board meeting:

   1) Establish a project budget of $60,000 funded by the R&R reserve fund to repair the Warner Basin outflow flowmeter; and

2) Authorize issuance of a Purchase Order to Accurate Measurement Systems, Inc. for an amount not to exceed $55,542 for the Warner Outflow Flowmeter Repair

6. ANNUAL SANTA ANA RIVER STREAMGAGING JOINT FUNDING AGREEMENT WITH THE UNITED STATES GEOLOGICAL SURVEY

RECOMMENDATION: Agendize for September 20 Board meeting:

1) Approve and authorize Joint Funding Agreement with USGS to conduct streamgaging of the Santa Ana River below Prado Dam and Santiago Creek at Santa Ana for the period of October 1, 2023 to September 30, 2024; and

2) Authorize payment of $46,700 to the USGS for OCWD's share of costs for these services

7. AGREEMENT WITH KIZH NATION RESOURCES MANAGEMENT FOR NATIVE AMERICAN MONITORING SERVICES FOR THE SUNSET GAP SEAWATER INTRUSION INVESTIGATION

RECOMMENDATION: Agendize for September 20 Board meeting: Authorize the General Manager to negotiate an agreement with Kizh Nation Resources Management for Native American Monitoring Services for the Sunset Gap Seawater Intrusion Investigation Monitoring Well BS25 Construction Project, with a fee amount not to exceed $4,000

8. AGREEMENT WITH NWRI TO ADMINISTER AND FACILITATE TWO GWRS INDEPENDENT ADVISORY SUBCOMMITTEE MEETINGS

RECOMMENDATION: Agendize for September 20 Board meeting: Authorize issuance of Agreement to the National Water Research Institute for an amount not to exceed $28,458 to provide administration and facilitation services for two GWRS Independent Advisory Panel subcommittee meetings

9. AGREEMENT TO BUCKNAM INFRASTRUCTURE GROUP FOR ASPHALT PAVEMENT EVALUATION AND REPAIR RECOMMENDATIONS

RECOMMENDATION: Agendize for September 20 Board meeting: Authorize issuance of Agreement to Bucknam Infrastructure Group, Inc. for an amount not to exceed $38,795 for the 2023 Field Asphalt Pavement Evaluation and Repair Recommendation project

END OF CONSENT CALENDAR

INFORMATIONAL

10. BASIN STORAGE UPDATE FOR WATER YEAR 2022-23

CHAIR DIRECTION AS TO ITEMS IF ANY TO BE AGENDIZED AS MATTERS FOR CONSIDERATION AT THE SEPTEMBER 20 BOARD MEETING

DIRECTORS' ANNOUNCEMENTS/REPORTS

GENERAL MANAGER'S ANNOUNCEMENTS/REPORTS

ADJOURNMENT

WATER ISSUES COMMITTEE MEMBERS

Committee Members
Bruce Whitaker - Chair
Dina Nguyen - Vice Chair
Roger Yoh
Van Tran
Kelly Rowe

Alternates
Denis Bilodeau
Steve Sheldon
Natalie Meeks
Valerie Amezcua
Cathy Green

In accordance with the requirements of California Government Code Section 54954.2, this agenda has been posted at the guard shack entrance and in the main lobby of the Orange County Water District, 18700 Ward Street, Fountain Valley, CA and on the OCWD website not less than 72 hours prior to the meeting date and time above. All written materials relating to each agenda item are available for public inspection in the office of the District Secretary. Backup material for the Agenda is available at the District offices for public review and can be viewed online at the District's website: www.ocwd.com

Pursuant to the Americans with Disabilities Act, persons with a disability who require a disability-related modification or accommodation in order to participate in a meeting, including auxiliary aids or services, may request such modification or accommodation from the District Secretary at (714) 378-3234, by email at cfuller@ocwd.com by fax at (714) 378-3373. Notification 24 hours prior to the meeting will enable District staff to make reasonable arrangements to assure accessibility to the meeting.

As a general rule, agenda reports or other written documentation has been prepared or organized with respect to each item of business listed on the agenda, and can be reviewed at www.ocwd.com. Copies of these materials and other disclosable public records distributed to all or a majority of the members of the Board of Directors in connection with an open session agenda item are also on file with and available for inspection at the Office of the District Secretary, 18700 Ward Street, Fountain Valley, California, during regular business hours, 8:00 am to 5:00 pm, Monday through Friday. If such writings are distributed to members of the Board of Directors on the day of a Board meeting, the writings will be available at the entrance to the Board of Directors meeting room at the Orange County Water District office.

MINUTES OF BOARD OF DIRECTORS MEETING
WATER ISSUES COMMITTEE
ORANGE COUNTY WATER DISTRICT
August 9, 2023, @ 12:00 p.m.

Director Rowe called the Water Issues Committee meeting to order at 12:00 p.m. in the District Boardroom. Public access was also provided via Zoom webinar. The Secretary called the roll and reported a quorum as follows:

Committee Members		OCWD
Bruce Whitaker		Mike Markus – General Manager
Dina Nguyen	(absent)	John Kennedy – Executive Director
Roger Yoh		Christina Fuller –District Secretary
Van Tran		Jeremy Jungreis – General Counsel
Kelly Rowe		

Alternates	
Denis Bilodeau	
Steve Sheldon	(absent)
Valeria Amezcua	
Natalie Meeks	(absent)
Cathy Green	

CONSENT CALENDAR

The Consent Calendar was approved upon motion by Director Green, seconded by Director Rowe and carried [5-0], as follows:
Ayes: *Whitaker, Tran, Rowe, Amezcua, Green*

1. Minutes of Water Issues Committee Meeting

The Minutes of the Water Issues Committee meeting held July 12, 2023, were approved as presented.

2. Amendment No. 6 to Agreement with EVOQUA for PFAS Treatment Pressure Vessel Systems and Establish Project Budget

Recommended for approval at August 16 Board meeting: Authorize issuance of Amendment No. 6 to Agreement No. 1423 with Evoqua, for an amount not to exceed $376,350 and establish a total project budget of $2,500,000.

3. Logic Controller, User Interface, and Data Logging Systems Upgrades for Microfiltration (MF) and Reverse Osmosis (RO) Pilots

Recommended for approval at August 16 Board meeting: Authorize issuance of an agreement to KDC Systems in the amount of $157,860 for MF and RO pilots' PLC, HMI, and data logging system upgrades.

4. Agreement to Separation Processes Inc. for Technical Support on the GWRS Microfiltration and Reverse Osmosis Operations (MF/RO)

Recommended for approval at August 16 Board meeting: Authorize issuance of Agreement to Separation Processes Inc. for an amount not to exceed $125,000 to provide consulting

services on a time and material bases for the GWRS MF and RO membrane processes through August 31, 2024.

5. Agreement to Falcon Services for Aboveground Gasoline Storage Tank at Field Headquarters and Categorical Exemption

Recommended for approval at August 16 Board meeting: 1) Establish the Aboveground Gasoline Storage Tank project budget in the amount of $120,000; 2) Authorize filing of a Categorical Exemption for the Installation of Aboveground Gasoline Storage Tank in compliance with the California Environmental Quality Act (CEQA) guidelines; and 3) Authorize issuance of Agreement to Falcon Services & Construction, Inc. for Installation of Aboveground Gasoline Storage Tank for an amount not to exceed $97,569.

6. Amendment to Agreement with Aqueous Vets for Pressure Vessel Systems Tubing Modification

Recommended for approval at August 16 Board meeting: Authorize issuance of Amendment No. 5 to Agreement No. 1422 with Aqueous Vets, for an amount not to exceed $3,264.

7. Purchase Order to Agilent Technologies for One Gas Chromatograph/Mass Spectrometer (GC/MS) for the Advanced Water Quality Assurance Laboratory

Recommended for approval at August 16 Board meeting: Authorize issuance of a Purchase Order to Agilent Technologies for the total amount of $126,198 for one Agilent 8890 Gas Chromatograph coupled with a 5977C Single Quadrupole (SQ) Mass Spectrometer and stainless steel ion source.

8. Purchase Order to Thermo Scientific for Multi-year Service Support Agreement to Cover Lab IC and Autotrace Instruments

Recommended for approval at August 16 Board meeting: Authorize issuance of Purchase Order to Thermo Scientific in the amount of $84,837 for support service agreements for FY23-24, up to $74,081 for FY24-25, and up to $73,659 for FY25-26.

9. Limited Term Employment Request for Senior Engineer

Recommended for approval at August 16 Board meeting: Authorize advertisement of a three year Limited-Term Employment for a Senior Engineer.

MATTERS FOR CONSIDERATION

Directors Bilodeau and Yoh arrived at this point in the meeting and Director Yoh assumed the role of Chair.

10. Agreement with Hazen for a Sunset Gap Seawater Intrusion Barrier Feasibility Study

Principal Hydrogeologist Bill Leever provided an update on the barrier feasibility study and consultant selection process. He stated the Sunset gap will be the focus of this study. He advised that within the last 20 years, monitoring data indicates that seawater intrusion is occurring in Sunset Gap and four potential intrusion pathways have been identified where seawater is moving in. He stated the District has gone through a series of investigative and geophysical activities and expanded the Alamitos model to incorporate the Sunset Gap to support the District's understanding of and management decisions related to it. He recalled the Board authorized the issuance of a Request for Proposal to conduct the Feasibility Study of the Sunset Gap Seawater Intrusion Barrier

at the May 17 Board meeting. He stated the District received two proposals for the study, one from Hazen and Sawyer and one from Jacobs Engineering. He reported after scoring the proposals, Hazen is the staff recommendation.

Upon motion by Director Rowe, seconded by Director Whitaker and carried [5-0], the Committee recommended for approval at August 16 Board meeting: Authorize issuance of an Agreement to Hazen in the amount of $412,457 for a Sunset Gap Seawater Intrusion Barrier Feasibility Study.
Ayes: Whitaker, Yoh, Tran, Rowe, Bilodeau

11. Response to Orange County Grand Jury Report – Historic Rain, Yet Drought Remains

Executive Director of Water Quality and Technical Resources Jason Dadakis reported that staff incorporated the recommended feedback from the July Committee meeting into the updated draft letter. He reviewed the changes made to OCWD's response to the finding that South Orange County relies primarily on the importation of water. He stated that OCWD concurs with this finding but recognizes South Orange County agencies are investing in new local water supplies to reduce their dependence upon imported water. He advised that in response to the recommendation that the County of Orange Board of Supervisors should take leadership by the end of the calendar year 2023 to explore the establishment of a "Climate Resiliency District" or Joint Powers Authority to fund and expedite implementation of a drought-resistant source of water, staff has drafted the following response:

- OCWD generally supports the intent of this recommendation – to develop additional drought resistant water supplies. OCWD does not believe a Climate Resiliency District or Joint Powers Authority is necessary to achieve this recommendation. With the development of the Groundwater Replenishment System, OCWD has shown it has the technical capability and financial strength to develop and construct large water supply projects.

Mr. Dadakis reviewed new text in the body of the letter which states that OCWD is also involved in a cloud seeding program to increase rainfall within the Santa Ana River Watershed. Director Rowe requested the following change: OCWD is leading an effort through the Santa Ana Watershed Project Authority (SAWPA) in implementing a cloud seeding program to increase rainfall within the Santa Ana River Watershed.

Upon motion by Director Rowe, seconded by Director Bilodeau and carried [5-0], the Committee recommended for approval at August 16 Board meeting: Provide the Letter Response to the Grand Jury.
Ayes: Whitaker, Yoh, Tran, Rowe, Bilodeau

CHAIR DIRECTION AS TO ITEMS IF ANY TO BE AGENDIZED AS MATTERS FOR CONSIDERATION AT THE AUGUST 16 BOARD MEETING

It was agreed to place all items on the Consent Calendar at the August 16 Board meeting.

ADJOURNMENT

There being no further business, the meeting was adjourned at 12:43 p.m.

_____
Roger Yoh, Chair

2

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/ Board of Directors

From: Mike Markus

Staff Contact: M. Patel

Budgeted: Yes
Budgeted Amount: $5,250,000
Cost Estimate: $4,989,685
Funding Source: R&R
Program/Line Item No.: R23004, R23005, R23006
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: PURCHASE ORDER TO DUPONT WATER SOLUTIONS FOR MEMBRANE ELEMENTS FOR GWRS REVERSE OSMOSIS SYSTEM

SUMMARY

The original Groundwater Replenishment System (GWRS) reverse osmosis (RO) treatment facility consisted of 27, 5-mgd RO units. The typical lifespan of a membrane operating on municipal wastewater can be anywhere from 4-6 years. Staff believes replacement of membranes in three RO units is needed to address performance issues.

Attachment(s):

- Dupont Water Solutions quotation dated August 23, 2023

RECOMMENDATION

Agendize for September 20 Board meeting: Authorize issuance of a Purchase Order to Dupont Water Solutions for an amount not to exceed $4,989,685 for 9,500 BW30XFRLE reverse osmosis membranes for the GWRS reverse osmosis system.

BACKGROUND/ANALYSIS

The GWRS RO treatment facility consists of 27 RO units each capable of producing 5-mgd with one unit in reserve. There are 15 original RO units in operation since 2008. 6 that were added in 2015 as part of the GWRS Initial Expansion, and 6 additional units added as part of the recently completed GWRS Final Expansion. Each unit contains 1,050 RO membranes.

As membranes age, overall performance, including permeability and rejection decline. The expected industry lifespan of membranes is 4 to 5 years when operating in a water reuse application such as GWRS. This lifespan is based on several factors with the two most important being increasing feed pressure requirements (due to irreversible fouling) and loss of salt rejection efficiency. The RO membranes in 3 of the 15 original RO units contain Hydranuatics ESPA2LD membranes that have been in operation since March 2017 and now require replacement. These units show signs of irreversible fouling in the form of increased feed pressure requirements and lower salt rejection efficiency as compared to units with newer membranes. Also, the six RO units (F01, F02, F03, G01,

G02, G03) installed as part of the initial expansion in 2015 that contain Filmtec (now Dupont Water Solutions) XFRLE membranes have been in service since April 2015 and also require replacement. These XFRLE membranes continue to have performance superior to even those supplied by Hydranautics and LG Chemical that have been used in the GWRS RO system. The XFRLE membranes have traditionally shown lower pressure requirements and less energy consumption along with the highest salt rejection efficiency. However, at eight years in service these units are showing signs of a loss of salt rejection. Eight years is considered exceptional for RO membrane life on a wastewater feed since the typical life is five years.

The membranes in the nine RO units (E01, E02, E03, F01, F02, F03, G01, G02, G03) described above now require membrane replacement. The membranes in these units have shown signs of deterioration especially in their third stage. This is seen to a higher degree in the Train E units. This deterioration is in the form of lower productivity and higher salt passage. Staff believes some of this performance loss is a combination of changing feed water quality from the Orange County Sanitation District (OC San) and the lower efficiency of the Hydranautics ESPA2LD membranes themselves. The recent experience of more rapid fouling in several units' third stage membranes has seem to have affected the Hydranautics membranes the most. It is for this reason staff has solicited a proposal to purchase new membranes for three units from Dupont Water Solutions (formerly Filmtec) to provide their newest version of the XFRLE RO membrane now known as the BW30XFRLE. This membrane has shown superior performance in the existing Train F and G units. These BW30XFRLE membranes purchased in 2020 for units B01, C01, D01 as well as in 2021 for units B02, C02, D02 and in 2022 for units B03, C03, D03 also operate well and with lower pressures than other units containing the ESPA2LD product. Finally, the BW30XFRLE product was also installed by the GWRS Final Expansion contractor in the new RO units for Trains H and I. Those membranes are also performing very well after one year of operation with the lowest pressure requirement and highest salt rejection of all of the 27 RO units. This is observed even as these membranes have seen the new GWRS Final Expansion water quality with the addition of Orange County Sanitation District (OC San) Plant 2 flows that has increased both the salt and organics concentrations in the GWRS feed water. A past performance comparison memo drafted in May 2022 by Separation Processes, Inc. on behalf of the Orange County Water District (OCWD) has shown a 28% energy savings for the Filmtec membrane as compared to those supplied by Hydranautics and LG Chem when operated in the GWRS RO system. Upon the introduction of OC San Plant 2 water in December of 2023 this trend continues.

Based on the memo results staff solicited a quote for pricing on RO membranes from Dupont Water Solutions for their Filmtec BW30XFRLE membrane. The quotation is for 9,500 membranes or enough to replace membranes in nine full units plus 50 spares. The quotation came in at $4,989,685 including tax and freight. The total purchase price is below the total budgeted amount included in Refurbishment and Replacement (R&R) accounts R23004, 23005, and 23006 in the fiscal year 2023-2024 in the amount of $5,250,000. The R&R budget for fiscal year 2023-2024 has separate line items for each Train requiring membrane replacement: R23004 for Train E, R23005 for Train F, and R23006 for Train G each in the amount of $1,750,000.

Based on the quotation received from Dupont Water Solutions, staff recommends issuance of a purchase order for 9,500 BW30XFRLE membranes for a price not to exceed $4,989,685.

PRIOR RELEVANT BOARD ACTION(S):

October 20, 2021, R21-10-150 Authorize issuance of a Purchase Order to Dupont Water Solutions for an amount not to exceed $1,306,048 for 3,200 BW30XFRLE reverse osmosis membranes for the GWRS reverse osmosis system.

August 15, 2012, R12-8-102 Purchase Order to CSM (Woongjin Chemical America, Inc.) for GWRS Advanced Water Purification Facility Reverse Osmosis Membranes

Orange County Water District
18700 Ward Street
P. O. Box 8300
Fountain Valley, CA 92728-8300

REQUEST FOR QUOTATION

Randy Fick, Purchasing
714/378-3271 Direct line
rfick@ocwd.com

THIS QUOTATION MUST BE SUBMITTED BY: AUGUST 25, 2023

TO: Orange County Water District

ATTN: Mehul Patel

THIS IS NOT AN ORDER

Request for Quotation

Date Issued:	**Equipment Required:**
August 10, 2023	To be determined

DESCRIPTION OF SERVICES/PRODUCT REQUESTED:

SEE ATTACHED "EXHIBIT A" for description and specifications.

Selection will be based upon the equipment which best meets the District's needs as well as pricing.

Please complete the Pricing Sheet attached.

Company: DuPont Water Solutions

Signed: [signature] Dated: 8/23/23

ALL QUOTATIONS MUST BE SUBMITTED BY: August 25, 2023

RANDY FICK
CFO/TREASURER

rfick@ocwd.com

If you have any questions, regarding the specifications of this Request, please email MPatel@ocwd.com.

PRICING SHEET

BY

Dupont Water Solutions
(Firm)

FOR
SUPPLYING RO MEMBRANES

Orange County Water District
18700 Ward Street
Fountain Valley, CA 92708

Attention: Randy Fick
CFO/Treasurer

Mailing Address:
P.O. Box 8300
Fountain Valley, CA 92728-8300

The undersigned declares that he has examined the Request for Quotation documents and hereby proposes to supply the RO Membranes required by the District during the period specified, and in accordance with all provisions of Exhibit "A" attached to the Request for Quotation documents, for the following price:

Product Name/Number Filmtec BW30XFRLE-400-34 Gm.D 99044497

Price per Membrane : $470
Sales Tax: 41.13
Delivery fees: Included
Other: 14.10

TOTAL PER MEMBRANE 525.23

BIDDER INFORMATION:

Dupont Water Solutions
Name of Firm

5400 Dewey Hill Rd
Address

8/23/23
Date

Edina, MN 55439
City, State Zip Code

Vincent Marzullo sales rep
Name & title

Vint Marzullo
Signature

719-331-1614
Telephone

Vincent.marzullo@Dupont.com
Email

EXHIBIT A
REVERSE OSMOSIS (RO) MEMBRANES

PART 1 – GENERAL

1.01 DESCRIPTION

A. The membrane element manufacturer (herein called Membrane Supplier) shall furnish the membrane elements and accessories to the Orange County Water District (District), for installation into Reverse Osmosis Units in accordance with the requirements specified herein.

1. The Groundwater Replenishment System (GWRS) is an existing wastewater reclamation facility located in Fountain Valley, CA which is operated by the District. This document pertains to the specification of reverse osmosis membrane elements operating on secondary municipal treated and microfiltered effluent.

2. The following items define the scope of work for this project:

a. Furnish a quantity of 9,450 membrane elements (8 x 40 inches) plus 50 spare membrane elements for a total of 9,500 membrane elements. The 9,450 membrane elements will be initially installed in the system of 9 units each with 150 vessels containing 7 elements per vessel or 1050 elements per unit.

b. Provide the spare parts required by the specification.

3. The following services shall be provided by the manufacturer:

a. Provide the submittals, test results, warranties and other information required by the specification.

b. Provide on-site representation during membrane installation, two days per unit for a total of 18 days. Additional on-site representation may be required pursuant to Section 3.03 of this specification.

B. Reference Specifications

1. None

1.02 QUALITY CONTROL / QUALITY ASSURANCE

A. Reference Standards

1. American Society for Testing and Materials (ASTM)

a. ASTM-D4516

b. ASTM D4194

c. ASTM D6161

d. ASTM D6284

2. American Nation Standards Institute (ANSI)/ National Sanitary Foundation (NSF) Standard 61

B. Manufacturers QA/QC

1. Membrane elements shall be manufactured in accordance with ISO/9000-9001.

C. NSF Certification

1. Requirements for NSF Standard 61 for membranes supplied shall apply to this specification.

1.03 SUBMITTALS

A. Shop Drawings

1. Membrane Supplier shall submit drawings and other information necessary to describe the membrane elements and related accessories, including:

a. Dimensions.

b. Weight.

c. Materials of construction.

d. Active membrane surface area.

e. Feed channel spacer thickness.

f. Standard performance parameters (including flow and salt rejection).

g. Standard application data including limits for pH, (operating and cleaning) temperature (operating and cleaning), maximum feed water flow, maximum feed water turbidity, maximum feed water SDI, applied pressure, differential pressure (element and vessel), chlorine tolerance, chloramine tolerance, and cleaning limitations.

h. Storage and handling requirements.

i. Commercial part numbers and standard o-ring size nomenclature for the elastomer interconnector o-rings and brine seals.

j. NSF 61 Certification for the membrane and model provided.

2. Documentation including Quality Control Limits for factory wet testing to certify membrane elements tested at the factory will obtain the stabilized salt rejection and productivity upon installation as stated in the manufacturer's literature and software projection programs.

3. Normalization equations used for calculation of system values including:

a. Salt passage temperature correction factor

b. Water temperature correction factor

c. Normalization equation for system monitoring calculations including:

1) Net driving pressure
2) Normalized differential pressure
3) Normalized permeate conductivity

4. Software projections of the membrane performance using year 0, 1, 2, 3 and 5 year performance and the conditions described in paragraph 2.01 and 2.02. The supplier shall use the following constants in the projection of membrane performance:

a. 1 psi interstage manifold pressure losses.

5. Manufacturers Manufacturing and Quality Control Procedures as required by Section 3.01.A.6.

B. Factory Testing and Reports

1. Factory Testing

a. Subject to the requirements of section 3.01, 5 percent of the membrane elements shall be factory wet tested by the membrane supplier and signed test data for each membrane element shall be supplied to the District or its Representative prior to shipment (Refer to Paragraph 3.01).

b. The test data shall be accepted by the District or its Representative in writing prior to shipment.

C. Installation Instructions

1. The supplier shall provide installation instructions with the membranes.

2. If the supplier requires membranes to be installed in any particular matter, a loading schedule shall be prepared and delivered to the District by the supplier. Membranes shall be organized by rejection and/or productivity and delivered to the project site to facilitate installation.

D. Operation and Maintenance Manuals

1. Provide 3 copies of printed materials, and an electronic file in (PDF) format.

2. Provide technical data related to proper installation, operation, cleaning and storage of the products supplied.

3. Provide standard operating and maintenance data and instruction sheets for the membrane elements, covering such topics as recommended cleaning solutions as well as long and short-term storage protocols.

E. Warranty

1. The Membrane Supplier shall furnish a separate warranty for the RO membrane elements. This warranty must be signed by an individual authorized to execute contracts on behalf of the Membrane Supplier and shall state the following provisions with no additional conditions or exceptions:

a. The Membrane Supplier shall warrant the performance of the membrane elements for a period of three (3) years from the start of System Performance Testing (30-day acceptance test) or 6 months (wet elements)/12 months (dry elements) from the date of delivery, whichever occurs first.

b. The membrane elements provided shall be free of defects in workmanship and materials. Membranes shall be replaced if they exhibit defects in workmanship or materials inclusive of dimensional tolerances (out-of-round), glue line leaks and/or pinholes.

c. The Membrane Supplier shall warrant the membrane elements during that three (3) year period in accordance with the performance requirements specified herein and the following prorated replacement conditions if the elements fail to meet the warranted performance.

1) During the warranty period, permeate conductivity will be continuously monitored and periodically normalized. Conductivity profiling of vessels is also performed periodically. Individual element testing may be performed as required by the District to assess cleaning performance

and/or verify the integrity of elements. The initial conductivity profile shall be within +/- 30 percent for all vessels for District acceptance. Routine sampling of feed, concentrate and permeate for ionic constituents is also performed.

2) The overall unit salt passage for the average sodium and chloride ions in the permeate water quality shall increase by no more than 50 percent over the average initial water quality established in Section 3.04 when normalized to the design conditions using ATSM Method D4156-00 (2010). Salt passage is defined as 100 percent minus the percent rejection.

3) The above criteria shall not apply for a period of one week after membrane installation or cleaning to allow the membrane performance to stabilize.

4) Silt Density Index (SDI) Testing is performed periodically, however, SDI testing shall not be used as a provision for the membrane warranty, as the UF system utilizes daily pressure decay testing to maintain a minimum LRV of 4.0

d. The warranty shall commence on the date that System Performance Testing begins as described in 3.03.F

2. The warranty conditions specified above shall be valid under the following conditions:

a. The RO system has been operated as designed in terms of product water recovery, array configuration, and feed water pH.

b. The feed water has not contained chemicals that chemically or physically destroy the elements.

c. The elements are periodically cleaned with an effective cleaning solution to remove membrane foulants.

d. The elements are cleaned using standard cleaning solutions prior to performance testing for warranty purposes.

e. Biological matter or sparingly soluble substances in the feed water have not irreversibly fouled the elements.

3. Should the RO unit performance not meet the warranty requirements, the Membrane Supplier shall provide sufficient replacement elements to achieve the specified unit performance. Membrane elements shall be replaced if they exhibit higher than acceptable salt passage, individually or as a group necessary to achieve the water quality performance requirements.

4. After successful completion of the System Performance Test (30-day acceptance test), the replacement elements will be provided at the original purchase price, less

a credit of 1/36 of the purchase price for each unused month of the warranty period. The Membrane Supplier shall warrant that future replacement elements will be sold to the District at a price not to exceed 15% above the original purchase price per 40-inch element at any time within three years from acceptance of the RO membrane elements.

1.04 PRODUCT DELIVERY STORAGE AND HANDLEING

A. Membranes shall be sealed in a heavy bag. Performance (wet) tested membranes shall include sodium bisulfite solution as a preservative. Other inorganic preservatives or non-organic based preservatives will be considered on a case by case basis. However, the use of organic based solution preservatives is not acceptable.

B. The membrane elements, interconnector and brine seal shall be supplied in a cardboard box which is constructed from 200 lb/ft^2 cardboard. The packaging shall contain spacers to center and secure the membrane element in the box. The membrane model and serial number shall be displayed on the box.

C. Membrane boxes shall be palletized and shrink wrapped for shipment.

D. For orders in excess of 100 elements, the District will consider alternative packaging approaches to eliminate cardboard and packaging waste.

E. Membranes shall be transported to the jobsite using methods to prevent freezing.

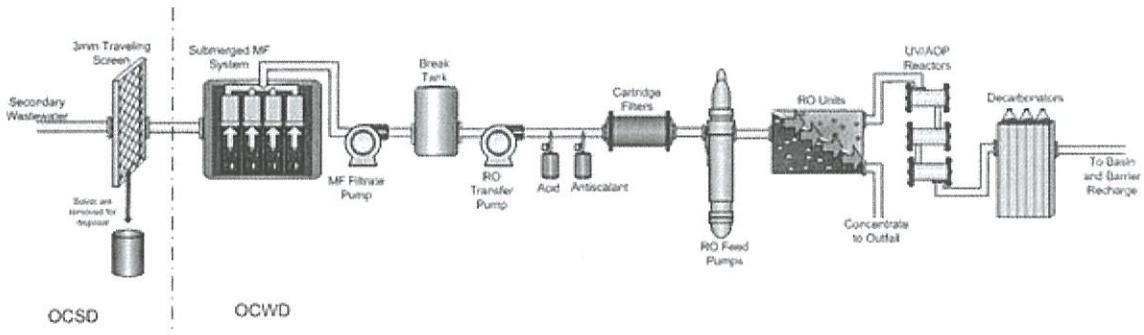
PART 2 – PRODUCTS

2.01 PROCESS SYSTEM DESIGN AND PERFORMANCE

A. Service Conditions

1. The feedwater to each RO system will be a microfiltered municipal wastewater effluent that has been further pretreated as shown in Figure 1. The microfiltration system is operated in order to maintain a log removal of Giardia and Cryptosporidium greater than 4.0 and turbidity less than 0.2 ntu (0.5 ntu maximum). Antiscalant (threshold inhibitor- AWC A-108 currently) is added at a dose of 2.0 to 4.0 mg/L to prevent precipitation of sparingly soluble salts. Sulfuric acid is added as needed to maintain a pH of 6.9.

Figure 1: GWRS System Diagram



2. A monochloramine residual of 2 – 5 mg/L as total chlorine is targeted in the RO feed water to control biogrowth.

3. The following table contains the water quality, after chemical addition, which is expected for feed to each RO System. The average value column gives the water quality that will be the basis of the performance requirements.

4. Table 1 lists the most recent analysis for the RO feedwater after chemical addition. The design water quality shall be used to establish performance and removal requirements. Membrane projections, when required shall be prepared using the design water quality, unless otherwise stated.

Table 1: GWRS RO Feedwater Quality Basis for Design

Constituent	Units	Concentration	
		Average (Design) Mean Value	Range
Temperature	°F	76.8	69.9-87.8
pH	Units	7.5	7.2-7.7
Total Dissolved Solids	mg/L	1,561.7	961-2,163
Total Organic Carbon	mg/L	7.5	7.0-9.2
Residual Chloramine	mg/L	3.6	2.3-5.8
Silt Density Index	Units	<3.0	<5.0
Total Alkalinity	mg/L as $CaCO_3$	235	207-264
Total Hardness	mg/L as $CaCO_3$	412	313-511
Silica	mg/L	20.7	16.7 – 24.7
Aluminum	mg/L	0.021	0.005-0.037
Cations			

Constituent	Units	Concentration	
		Average (Design) Mean Value	Range
Sodium	mg/L	376	193-559
Potassium	mg/L	23.5	16.9– 30.1
Calcium	mg/L	87.4	78-98
Magnesium	mg/L	47	28.0-66.0
Iron	mg/L	0.89	0.23-1.66
Manganese	mg/L	0.070	0.043-0.097
Barium	mg/L	0.103	0.033-0.173
Strontium	mg/L	0.78	0.69-1.16
Ammonia Nitrogen	mg/L	9.0	1.8-14.4
Anions			
Bicarbonate	mg/L	235	207-263
Chloride	mg/L	554	224-784
Sulfate	mg/L	249	200-298
Fluoride	mg/L	0.9	0.8 – 1.0
Phosphate	mg/L as PO4	0.5	0.2-0.8
Nitrate	mg/L (as N)	6.6	4.3 – 10.0
Nitrite	mg/L (as NO_2)		0.05-2.3
Total Nitrogen	mg/L (as N)		12.1 – 29.4

B. Process Design Requirements

1. Units E01, E02, and E03 are configured in a 3 stage 78:48:24 array. Units F01, F02, F03, G01, G02, and G03 are configured in a 3 stage 77:49:24 array. There are a total of 150 pressure vessels. Each vessel contains seven spiral-wound 8-inch diameter by 40-inch long membrane elements.

2. The design permeate flow for each unit is 3472 gpm (5.0 mgd) at 85 percent recovery.

3. The maximum permeate flow for each unit is 3472 gpm (5.0 mgd) at 85 percent recovery.

4. The minimum permeate flow for each unit is 2772 gpm (4.0 mgd) at 85 percent recovery.

5. Based on an active membrane element area of 400 square feet per RO element, the maximum operating flux is 11.9 gallons per square foot per day (gfd) at the design flow.

6. Each unit has a dedicated RO feed pump equipped with a variable frequency drive. The maximum available pump discharge pressure is approximately 300 psig. The backpressure on the system is nominally 17 psi.

7. Each unit is connected to a CIP system. The CIP system has been designed to provide a minimum of 40 gpm per vessel at 60 psi of pressure. The unit is divided into 4 sections for cleaning with the first stage split into two sections. Cleaning may be performed up to 3 times per year under the following conditions.

    a. Water: RO Permeate

    b. Chemicals

        1) AWC -227 and Avista 192 proprietary cleaning chemicals
        2) Sodium Tri Poly Phosphate (STPP) (1-2.5 percent)
        3) Sodium Dodecyl Benzene Sulphonate (SDDBS) (0.1 to 0.25 percent)
        4) pH adjustment (up to 12.0)

    c. Duration

        1) 3 hours circulation,
        2) 1 hour soak,
        3) 1 hour recirculation,
        4) 1 hour flushing

    d. Temperature

        1) 38 degrees C. maximum

8. The District may use proprietary chemical formulations specifically designed for the cleaning of polyamide RO membranes at the time, temperature and concentration limits provided by the supplier without voiding the membrane warranty. The District currently uses AWC-227 and Avista-192 as proprietary cleaning chemicals.

9. The District may use membrane supplier approved chemicals and formulations designed for the cleaning of RO polyamide membranes at the time, temperature and concentration limits provided by the membrane supplier without voiding the membrane warranty.

10. Other cleaning regimes may be used on a case by case basis. The District will notify and obtain approval for the use of alternative cleaning procedures with the membrane supplier if required to maintain warranty.

C. Performance and Filtered Water Requirements

1. Membranes shall be provided that meet the performance criteria described in Section 2.02 and as indicated by the membrane supplier's projection software.

2. The RO unit will be operated at the 85 percent recovery for the specified water quality with the use of sulfuric acid and antiscalant without scaling of the membranes.

3. The RO concentrate shall have an LSI of less than +2.0 and a maximum silica (SiO_2) concentration of less than 185 mg/L.

2.02 PRODUCT DESIGN AND FABRICATION

A. General

1. All equipment furnished under this specification shall be new and standard product of a manufacturer, regularly engaged in the manufacture of the products to be furnished.

2. The membrane supplier shall maintain offices and service facilities in the United States.

3. The membrane elements shall be fully compatible with the Protec PRO 8-450-SP pressure vessels.

4. The membrane elements and elastomers and other components must be NSF 61 certified for the production of potable water.

5. Membranes shall be limited to the models and manufacturers listed as it is acknowledged that the treatment of municipal wastewater effluents using some polyamide composite type RO membranes has resulted in unsustainable permeability and irrevocable fouling.

6. Acceptable Membrane Suppliers and Models are listed below.

   a. Dupont: BW30XFRLE-400/34

B. Performance Requirements

1. Membranes provided shall satisfy the following operational limits

a.	pH, range (operating)	2-11
b.	pH range (cleaning)	1-12
c.	Free chlorine tolerance	0.1 mg/L maximum
d.	Monochloramine tolerance	5.0 mg/L max. continuous

e.	Maximum temperature (cleaning)	45°C
f.	Maximum feed water flow	60 gpm/vessel or higher
g.	Maximum element recovery	20 percent
h.	Maximum feed water turbidity	1.0 ntu
i.	Maximum feed water Silt Density Index SDI	3
j.	Maximum applied pressure	450 psi or higher
k.	Maximum differential pressure (element)	10 psi or higher
l.	Maximum differential pressure (vessel)	60 psi or higher

2. Performance Testing: Membranes shall be manufactured and performance tested prior to shipment. Performance testing shall demonstrate that individual and lot acceptance performance criteria shall be satisfied. The quantity of elements required to be tested is described in Section 3.01.A. A minimum of 5 percent of the membrane shall be wet tested, and the membrane shall be a representative random sampling of all membranes provided to the District.

   a. Performance shall be established by wet testing performed by the membrane supplier.

   b. Testing shall be performed under the following conditions:

      1) The test equipment instrumentation for data collection shall be configured such that there are no more than two elements in parallel or in series. Permeate flow from each membrane shall be individually measured.

      2) The feedwater to each element shall contain between 500 and 2,000 mg/l of sodium chloride (as per manufacturer's standard test conditions) and it shall be at a temperature of 25°C (77°F) with a pH of between 6.5 and 8.0. Testing procedures must comply with ASTM Method A, D4194-08 (2008) as described in State of California Groundwater Replenishment with Recycled Water 60320.201 a (1). Membrane rejection performance values may be higher than those stated above, and the values contained in this section shall apply.

      3) The feedwater shall contain no foreign substance, such as large dye molecules, which will mask performance of the element.

4) The elements shall be under test at 100 - 225 psig (as per manufacturer's standard test conditions) for a period of 30 minutes prior to data collection. (Any change in test duration shall be approved at the discretion of OCWD.)

5) The recovery for each element during the test shall be set at 15 percent.

c. In the event that the membrane elements initial salt rejection and/or productivity is different from the stabilized performance after installation, the supplier shall provide documentation including quality control limits for the specific membrane to demonstrate that the stabilized performance is different from initial salt rejection.

Individual Element Performance Testing: When tested under these conditions, individual elements shall have rejection equal to or better than the rejection indicated, the productivity shall fall within the range specified, and the differential pressure shall be equal to or less than that specified below:

Supplier	Model No.	Productivity Range [gpd]	Minimum Stabilized Rejection [%]	Differential Pressure (dp) [psi]
Dupont	BW30XFRLE-400/34$_{(a)}$	9,775 – 13,225	99.1	10

d. Elements shall be tested at 2000 mg/L, 150 psi., pH 8, 15% recovery.

3. Lot Acceptance Performance Testing: The average performance of all the elements (lot acceptance) supplied under this specification shall meet the following minimum performance criteria:

Supplier	Model No.	Minimum Average Lot Productivity [gpd]	Minimum Stabilized Average Lot Element Rejection [%]	Maximum Average Differential Pressure [psi]
Dupont	BW30XFRLE-400/34$_{(a)}$	11,500	99.3	3

a. Elements shall be tested at 2000 mg/L, 150 psi., pH 8, 15% recovery.

C. Fabrication and Material Requirements

1. Membrane Element Construction

a. The membrane shall be a composite structure consisting of a support material, a coarse base membrane and a fine "thin film" polymer membrane of polyamide composition.

b. The elements shall have nominal dimensions of eight inches in diameter and 40 inches in length. The active membrane area of the elements shall be 400 square feet.

c. The membrane elements shall be spiral wound with feed and concentrate flow through the element parallel to the permeate (product water) tube of the element.

d. The element permeate connection design and dimensions shall be the same for all elements supplied in this contract.

e. The feed/concentrate spacer material shall have a nominal thickness of between 0.032 and 0.034 inches (based on product specification).

f. The membrane shall include a permeate collection spacer designed to transport water to the permeate tube.

g. The membrane edges shall be sealed or glued around the permeate collection spacer. If membranes are glued, the rolled membrane sheets shall be flush cut through the cured glue line to prevent the formation of membrane flaps or separation of the membrane sheets at the feed and concentrate ends of the element.

h. Elements shall have a reinforced fiberglass outer wrap.

i. Elements shall use a nominal 1 inch diameter permeate tube.

j. The element serial number and a method for identification as to the direction of installation.

2. Accessories

a. Each element shall be furnished complete with the following:

1) interconnector,

2) brine seal.

3. Elastomers

1) O-rings and brine seals shall be constructed of "chloramine resistant" ethylene propylene (EPDM) elastomers

2.03 SPARE PARTS

A. The Membrane Supplier shall furnish the following spare components, in addition to those required for original installation of the elements. Spare parts packaging shall indicate both an explicit written description (as shown below) and part number of the contents.

1. 72 brine seals.

PART 3 – EXECUTION

3.01 MANUAFACTURING AND TESTING PRIOR TO SHIPMENT

A. Factory Testing

1. A minimum of 5 percent of the membrane elements shall be factory tested by the Membrane Supplier. Membranes wet tested shall be a random sampling of all elements provided.

2. Signed performance test data for each membrane element shall be supplied to the District or its Representative prior to shipment.

3. The performance test data shall be accepted by the District or its Representative in writing prior to shipment.

4. The District reserves the right to have a representative observe factory testing at any time during regular testing by the Membrane Supplier.

5. 5 percent performance (wet) testing requirements:

a. The membrane supplier shall demonstrate the following manufacturing and Quality Control practices to the satisfaction of the District.

1) Lot acceptance testing (flow/rejection) of membrane flat sheet media across the width and length of each production roll at predetermined intervals.

2) Automated membrane element (gluing and rolling) assembly.

3) Automated dimensional analysis of membrane element diameter and length.

4) Intermediate integrity testing of membrane subassemblies with air or vacuum based test methods.

5) Finished membrane element defect rates of less than 0.1 percent (1 in 1000)

6) 5 years minimum prior experience with the packaging and supply of dry membrane elements.

7) A statistical analysis of the performance wet test data to demonstrate within a 99 percent confidence interval that all membrane provided will satisfy the specified limits for salt rejection and productivity.

8) Documentation to demonstrate wet test requirements correlate to the stated stabilized salt rejection and productivity specifications provided in the manufacturer's literature and software projections.

9) No pin-holes or other defects are present.

b. Membrane elements that are not wet tested by the Membrane supplier shall be packaged and shipped dry.

B. Performance Test Data

1. The signature for all test data shall be of the Membrane Suppliers quality control person responsible and witness to the testing of elements.

2. The test data shall be submitted at least 3 days prior to shipment of the membrane elements in Microsoft Excel spreadsheet format.

3. Raw test data shall be normalized to the reference conditions indicated. The membrane supplier shall provide the Quality Control information used for the wet testing of the elements.

4. The membrane supplier shall sign and submit test data for elements furnished as specified herein. The test data shall include productivity, and salt rejection for each element. The District reserves the right to waive any or all portions of the test data listed at its sole discretion.

5. The membrane supplier shall sign and submit lot acceptance average calculations for the membranes to be provided.

6. Membranes (individual or as a lot) which do not satisfy the stated performance criteria shall not be shipped.

3.02 SHIPMENT, HANDLING, AND STORAGE

A. All equipment, including spare components, shall be delivered complete by the date required by the District.

B. Shipment shall be made only after the District's written acceptance of Membrane Supplier's factory test data.

C. The supplier shall provide packing information to the District prior to delivery.

D. Deliver the membranes in accordance with the conditions outlined in the bid documents.

E. The District shall store the membrane per the manufacturer's requirements. If no requirements are provided, store membrane in a dry location temperature controlled between 40 and 110 degrees F.

3.03 INSTALLATION

A. The Membrane Supplier shall provide the services of an official representative to be present at the GWRS to ensure proper installation of membrane elements and to help evaluate initial operation of the system as it impacts the performance of the membrane elements. Alternatively, the Membrane Shall provide in writing that the District has capabilities to install membrane without the assistance of the Membrane Supplier. The Membrane Supplier and District shall establish protocols and methods of communication (Zoom/Teams) to Discuss installation issues that may arise.

B. District Responsibilities

1. The District is responsible for unloading existing membrane elements.

2. The District is responsible for any testing required before membrane installation.

3. The District is responsible for cleaning the pressure vessels.

4. The District will provide glycerin for use as a lubricant for installation.

C. The Membrane Supplier or District shall visibly inspect each pressure vessel prior to membrane installation.

D. The Membrane Supplier shall provide written instruction to the District on the proper installation of membranes. Installation shall include the lubrication of o-rings and seals and adapters using the lubricant provided by the District.

E. The Membrane Supplier shall provide a bar code scanner to the District with instructions on its use. The Membrane Supplier or District shall document membrane vessel, position and serial number of membranes as they are installed into the pressure vessels. The data shall be provided to the District in an Excel (.xls or.xlsx) file format.

F. After Start Up and Flushing the membrane supplier or District shall perform the following:

1. The Membrane Supplier or District shall perform unit conductivity profiling and identify individual vessels which are producing permeate of unacceptable quality (vessels producing permeate with conductivity 40 percent higher than the median stage conductivity).

2. The Membrane Supplier or District shall identify these vessels and shall be present when the unit is taken off-line to inspect the off-spec vessels and help identify problems with element adapters, rolled brine seals, or other like causes.

3. The Membrane Supplier or District shall continue conductivity profiling and identification until all pressure vessels are conforming.

4. If required, the Membrane Supplier or District shall perform single element testing on questionable vessels to locate the problem area within the vessel using District provided test equipment. The membrane supplier may exchange installed membrane elements with spare membrane elements. Membrane elements that have been exchanged shall be replaced at no charge to the District.

5. The Membrane Supplier and District shall share the results of installation and both parties shall agree that the elements are properly installed without apparent leakage before proceeding.

6. The initial conductivity profile shall be accepted by the GWRS Executive Director of Operations or their designated representative.

G. Operational Data for the RO unit is normalized by the control system.

H. Once the operating pressure and conductivity of the membranes has been determined to be acceptable, the membrane supplier shall provide written acknowledgment to the District that the membranes have been properly installed and are operating in a manner acceptable to the membrane supplier.

3.04 SYSTEM PERFORMANCE TESTING

A. Following installation of the membrane and receipt of the acknowledgment of proper installation and initial operation, a System Performance Test (30-day acceptance test) shall demonstrate successful operation of the membrane, at the design conditions equal to or less than the design limits for design flow and recovery.

1. Water quality and operational performance data shall be normalized to the design conditions using ASTM, membrane supplier provided, or other generally recognized methodology agreeable to the District and membrane supplier and shall include a temperature compensation factor for salt rejection and water permeability. A single method shall be used and established prior to system performance testing. The parameters of specific flux, normalized differential pressure, and normalized permeate conductivity shall be calculated.

2. Membrane vessel integrity shall be established using conductivity profiling from pressure vessels weekly. Conductivity profiling will be performed by the District. Permeate quality of vessels outside of a statistical sampling (a conductivity result greater than 30 percent of the median for vessels in the stage) shall inspected and/or repaired to the satisfaction of the District.

3. The feed and permeate water quality shall be established using grab samples, based on the average of grab-samples taken once per week over the 30 days. The first water quality sample for compliance with the specifications shall be taken no sooner than on the 7th day after initial operation. This value will be used to establish the normalized permeate conductivity and average feed water quality. Normalized parameters shall be calculated using the average of the second, third and fourth sample (average initial water quality).

B. Successful completion of the acceptance test will be determined at the end of the System Performance Test (30-day acceptance test. Any observed deficiency in performance of the

membrane elements shall be corrected to the satisfaction of the District at no additional cost to the District.

C. A deficiency is defined as the permeate water quality as having higher than projected levels of constituents. A deficiency in water quality occurs when the average permeate water quality is greater than 15 percent higher than software projected Year 0 water quality normalized to the design conditions for any of the following constituents

1. Sodium

2. Chloride

END OF SECTION

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/
Board of Directors

From: Mike Markus

Staff Contact: R. Herndon/D. Field

Budgeted: Yes
Budgeted Amount: $500,000
Cost Estimate: $500,000
Funding Source: CIP
Program/ Line Item No.: C23004
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: Yes

Subject: BOLSA GAP SEAWATER INTRUSION MONITORING WELL CLUSTER OCWD-BS29

SUMMARY

Since 2010 the District has been conducting a seawater intrusion investigation in the Sunset Gap, including geophysical surveys, construction of multi-depth monitoring wells, and development of an expanded groundwater flow and transport model. Proposed well cluster OCWD-BS29 will help to identify if a potential intrusion pathway from Bolsa Gap exists and is contributing to the intrusion. Answering this question is important in determining appropriate future actions to control seawater intrusion.

RECOMMENDATIONS

Agendize for September 20 Board meeting:

1. Authorize staff to file a Notice of Exemption from requirements of the California Environmental Quality Act;
2. Authorize construction of the OCWD-BS29 monitoring well cluster;
3. Establish a project budget of $500,000;
4. Authorize issuance of a Notice Inviting Bids for monitoring well construction; and
5. Authorize issuance of an RFP for construction inspection services.

BACKGROUND/ANALYSIS

In the coastal area of Orange County, the primary source of saline and brackish groundwater is seawater intrusion through permeable aquifer sediments underlying topographic lowlands or gaps between the erosional remnants or mesas of the Newport-Inglewood Uplift. The susceptible locations from north to south are the Alamitos, Sunset, Bolsa, and Talbert gaps as shown in Figure 1.

OCWD has been investigating the nature and extent of seawater intrusion in the Sunset Gap since 2010: 1) performed two surface geophysical surveys within the Naval Weapons Station Seal Beach (NWSSB); 2) installed thirteen multi-depth monitoring wells at the NWSSB and in the city of Huntington Beach; 3) prepared nine hydrogeologic cross-sections through the area; and 4) developed a computer model

that simulates groundwater flow and brackish water movement in the Alamitos and Sunset Gaps. In August, the Board authorized proceeding with a study to evaluate the feasibility of a potential seawater intrusion barrier in the Sunset Gap.

Proposed Bolsa Gap Monitoring Well Cluster (OCWD-BS29)

Proposed well OCWD-BS29 fills an important data gap where seawater intrusion potentially occurs across the Bolsa-Fairview Fault to the north beneath the Bolsa Chica Mesa and into the southeastern portion of Sunset Gap (Figure 2). Confirmation of this potential intrusion pathway or lack thereof will help define the lateral extent and depth of intrusion and inform potential remedial actions in Sunset Gap.

The four single-cased wells will be constructed of 2-inch PVC, similar to the Sunset Gap wells described above. A well site has been selected and coordinated with Huntington Beach staff. Table 1 below summarizes the anticipated casing depths and target aquifers for these wells.

Table 1. Monitoring Well Cluster OCWD-BS29 Anticipated Depths and Target Aquifers

Well No.	Aquifer Name	Approx. Screen Depth (feet bgs)
OCWD-BS29A	Bolsa/Beta	80-100
OCWD-BS29B	Lambda	120-140
OCWD-BS29C	Omicron	150-170
OCWD-BS29D	Main	340-360

California Environmental Quality Act

Staff has evaluated the project and determined that it qualifies for an exemption from the California Environmental Quality Act (CEQA) under Class 3 (new construction of small structures), Section 15303, as the project involves limited construction of narrow-diameter wells at sites devoid of sensitive habitat and occurring within previously developed roadways.

Table 2 below summarizes the proposed budget based on the geologist's estimated costs for construction of the OCWD-BS29 monitoring well cluster.

Table 2. OCWD-BS29 Monitoring Well Cluster Construction Budget

Task	Cost Estimate
OCWD-BS29 Monitoring Well Cluster Construction	$ 380,000
Construction Inspection Services	75,000
Well Survey	7,000
Project Contingency	38,000
TOTAL:	**$ 500,000**

Figure 1: Coastal Gaps in Orange County

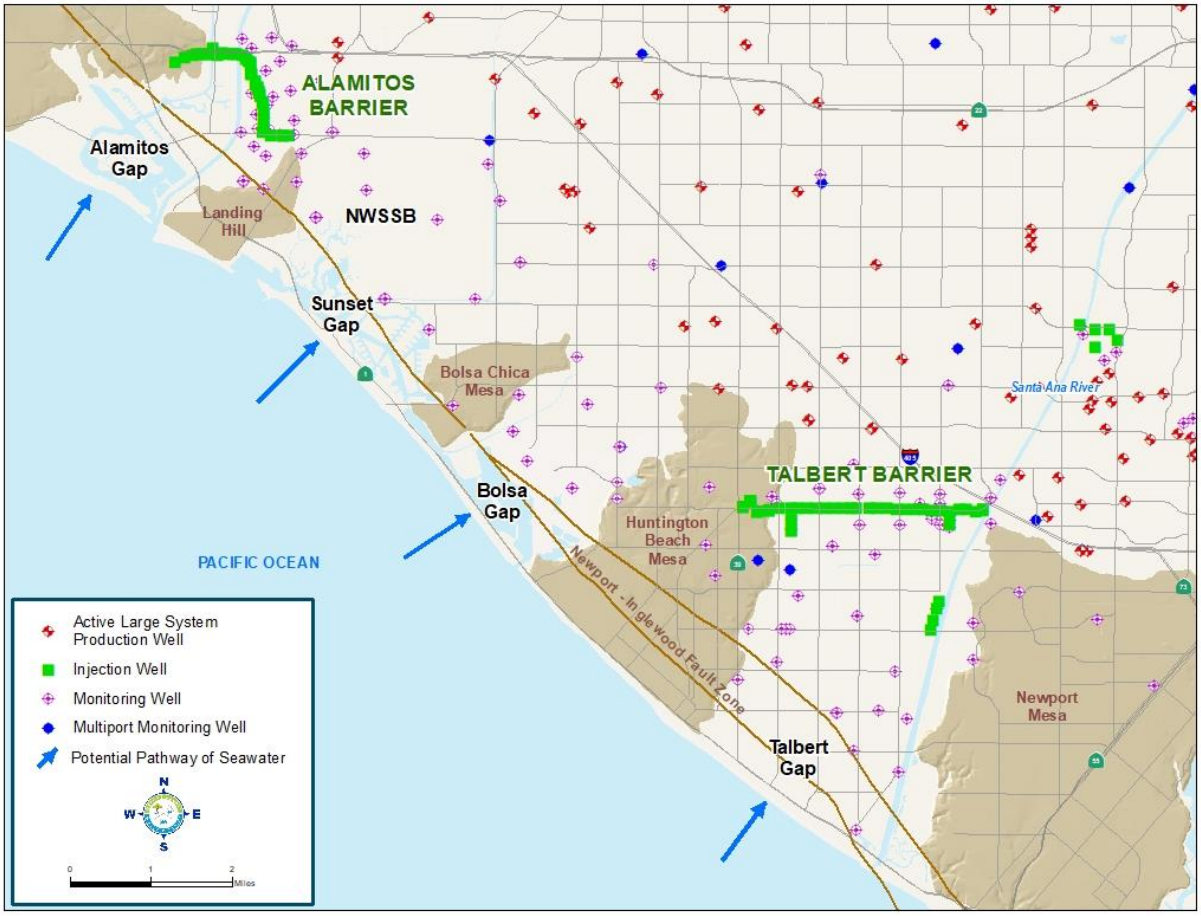
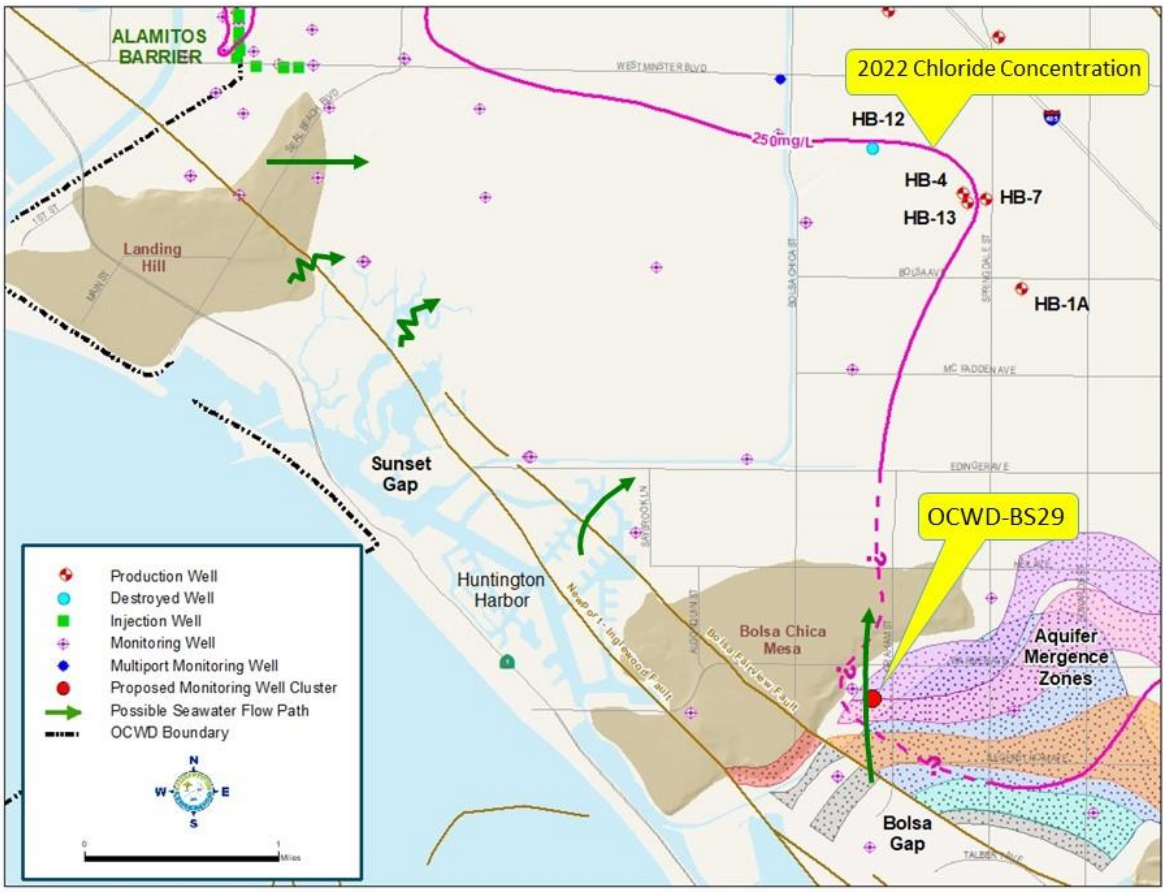


Figure 2: Proposed OCWD-BS29 monitoring well cluster in the city of Huntington Beach.



PRIOR RELEVANT BOARD ACTIONS

6/16/2021 R21-6-90 - Receive and file Affidavit of Publication of Notice Inviting Bids for Contract No. SG-2021-1, waive the BC2 Environmental, LLC inconsequential bid informalities, and accept bid and award Contract SG-2021-1 to BC2 Environmental, LLC for an amount not to exceed $1,038,730.

1/20/21 R21-1-6 – Authorize issuance of a services agreement to ENGEO for construction management and surveying services during the installation of additional Sunset Gap monitoring wells for an amount not to exceed $198,347.

10/21/20 R20-10-140 - Adopt resolution certifying the Final IS/MND, authorizing to file the Notice of Determination, approving the Geologist's Report, approving the proposed Sunset Gap Additional Monitoring Well Project, establishing a project budget of $1,600,000, authorizing issuance of a Notice Inviting Bids for well construction, authorizing necessary permitting documents by the General Manager from regulatory agencies, and authorizing issuance of an RFP for construction management services.

8/5/20 R20-8-97 – Authorize execution of a 30-year no-fee License Agreement for proposed monitoring wells OCWD-BS26A and OCWD-BS26B with The Boeing Company for well construction, monitoring, and maintenance.

8/15/18 R18-8-112 – Receive and file Affidavit of Publication of Notice Inviting Bids for Contract No. SG-2018-1; Accept bid and award Contract No. SG-2018-1 to ABC Liovin Drilling, Inc. for an amount not to exceed $807,646; and Authorize issuance of services agreement to Geotechnical Consultants, Inc. for inspection services during construction of the OCWD-BS13 and OCWD-BS24 monitoring well clusters for an amount not to exceed $203,000.

2/21/18 R18-2-12 – Adopt the Final Initial Study/Mitigated Negative Declaration for Sunset Gap Monitoring Well Clusters BS13 and BS24, and the Bolsa Chica Channel Levee Repair Project; Approve the proposed construction of BS13 and BS24 Monitoring Well Clusters and proposed repairs to the Bolsa Chica Flood Control Levee; Authorize a budget increase in the amount of $1,648,771 to establish a revised project budget of $4,054,711 covering R7R projects R12030 and R14026, and complete capital project C13005; Authorize issuance of a Request for Proposals for inspection services during the construction of BS13 and BS24 well clusters; Authorize issuance of the Notice Inviting Bids for construction of BS13 and BS24 Monitoring Well Clusters; Authorize issuance of the Notice Inviting Bids for Repair of the Bolsa Chica Flood Channel; and Authorize staff to file the Notice of Determination.

2/15/17 R17-2-11 – Authorize issuance of Amendment No. 2 to Agreement No. 1087 with Ninyo & Moore in the amount of $20,789 for additional out-of-scope geotechnical services required for the OCWD-BS13 well site geotechnical investigation.

12/7/16 R16-12-168 – Award Contract SG-2016-1 for monitoring well OCWD-BS24C construction to BEKS Acquisition Inc. dba BC2 Environmental in the amount of $177,425.

10/19/16 R16-10-143 – Authorize General Manager to execute an amendment to Contract SG-2015-1 to reflect Change Order No. 1 for out-of-scope costs associated with the destruction of the OCWD-BSO9 monitoring wells and abandonment of the OCWD-BS24 borehole and to terminate the contract without fault to either party.

9/16/16 R15-9-123 – Award Contract SG-2015-1 for destruction of Sunset Gap OCWD-BSO9 monitoring wells and construction of replacement monitoring well OCWD-BS24 to Cascade Drilling in the amount of $464,074.

7/20/16 R16-7-102 – Authorize issuance of agreement to Intera, Inc., in an amount not to exceed $135,032, to expand and recalibrate the Alamitos Gap groundwater model into the Sunset Gap.

5/18/16 R16-5-61 – Authorize Amendment No. 1 in the amount of $19,904 to agreement with Ninyo & Moore for geotechnical investigation.

4/20/16 R16-4-41 – Approve Department of Navy license agreements for monitoring wells and geotechnical investigation at Naval Weapons Station and authorize payment of fees.

6/17/15 R15-6-77 – Authorize filing Notice of Exemption for the construction of monitoring well BS24; authorize destruction of monitoring wells BSO9A, BSO9B and BSO9C, and construction of replacement monitoring well OCWD-BS24; and authorize issuance of Amendment No. 2 to Agreement No. 0958 with CDM Smith in the amount of $56,550 for additional field inspection services required for the destruction of BSO9A, BSO9B and BSO9C, and construction of monitoring well OCWD-BS24.

6/17/15 R15-6-81 – Authorize issuance of Amendment No. 1 to Agreement No. 0958 with CDM Smith in the amount of $127,935 for additional field inspection services required for the Sunset Gap Project and issuance of agreement to Ninyo & Moore for geotechnical services at the OCWD-BS13 well site for an amount not to exceed $58,078.

3/15/15 R15-3-30 – Approve modification to license agreement with the Department of the Navy for the Sunset Gap Seawater Intrusion Investigation.

5/21/14 R14-5-66 – Award Contract No. SG-2014-1 to Yellow Jacket Drilling for $1,477,295 for construction of six monitoring wells and destruction of three monitoring wells.

12/18/13 R13-12-00 – Authorize agreement with CDM Smith for an amount not to exceed $194,117 for construction management of the Sunset Gap monitoring well installations and destructions.

9/18/13 R13-9-121 – Receive and file Geologist’s Report and approve Sunset Gap Groundwater Investigation including the construction of four new monitoring wells, two replacement monitoring wells, and destruction of three unusable monitoring wells for a combined capital and R&R budget of $1,896,400; authorize issuance of a RFP for field inspection services; authorize filing a Notice of Determination.

6/20/12 R12-6-70 – Authorize application for California Department of Water Resources Local Groundwater Assistance Grant.

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/
Board of Directors

From: Mike Markus

Staff Contact: M. Plumlee/M. Pannu

Budgeted: Yes
Budgeted Amount: $50,000
Cost Estimate: $18,200
Funding Source: General Fund
Program/Line Item No. 1040.53001.2019
General Counsel Approval: Pending
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: AMENDMENT NO. 1 WITH WATER QUALITY TREATMENT SOLUTIONS, INC FOR STUDY OF BENCH-SCALE METHODS TO PREDICT PERFORMANCE OF IX AND NOVEL ADSORBENTS FOR PFAS

SUMMARY

District staff are completing an ongoing research study funded by a $220,000 grant from the Water Research Foundation (WRF) to evaluate alternative bench-scale laboratory methods to predict drinking water treatment performance of ion exchange (IX) and novel adsorbents for removal of per- and polyfluorinated alkyl substances (PFAS). The grant funds are being applied toward both District staff labor and subawards to project partners including $156,600 for project partner Water Quality & Treatment Solutions, Inc. (WQTS). A budget augmentation for an amount not to exceed $18,200 is required for WQTS to complete additional work to understand impact of resin/water contact time on bench-scale method results.

Attachment:

- WQTS, Inc. Supplemental Services Proposal

RECOMMENDATION

Agendize for September 20 Board meeting: Approve and authorize Amendment No. 1 to Agreement No. 1492 with Water Quality Treatment Solutions, Inc. (WQTS) to add additional study scope for an amount not to exceed $18,200 for the study of *Evaluation of Bench-Scale Methods to Predict Drinking Water PFAS Removal Performance of Ion Exchange and Novel Adsorbents at Pilot- and Full-Scale.*

BACKGROUND/ANALYSIS

In late 2021, Research and Development Department (R&D) staff were awarded a research grant from The Water Research Foundation (WRF) based on their competitive proposal to WRF's Tailored Collaboration program. The grant was for a study on alternative bench-scale (laboratory) methods to predict drinking water treatment performance of ion exchange (IX) resins and novel adsorbents for removal of per- and polyfluorinated alkyl substances (PFAS). Successful validation of these alternative bench-scale methods would allow more rapid and less expensive screening of IX resins and novel adsorbents compared to the industry's current reliance on pilot-scale testing. The WRF Tailored Collaboration program requires cash co-funding contributions from third

parties and/or the grant recipients, and WRF matches these funds 1:1 up to $100,000. District staff successfully obtained commitments for $100,000 in cash contributions from multiple water agencies and technology partners; the District also contributed $20,000. With $120,000 in co-funding, the project was eligible for the full WRF match of $100,000, such that the total grant funding awarded was $220,000. The $220,000 in funds are being dispersed by WRF as the grant administrator to the District as the lead investigator. The District is applying the award funds to a combination of internal R&D Department staff labor and subawards to project partners Water Quality & Treatment Solutions, Inc. (WQTS) and Jacobs Engineering Group. The study is ongoing now, with WQTS carrying out the bench-scale (laboratory) methods assessment and Jacobs providing key technical advisory support.

Over an 18-month period beginning February 2022, the study now underway has evaluated the ability of certain bench-scale testing procedures to predict the removal of PFAS by IX resins and other non-crushable alternative adsorbents in comparison to full-scale applications. The same IX resins and water sources that have been evaluated in various pilot- or full-scale systems are being evaluated at laboratory scale. These laboratory scale methods include Bottle Point Isotherm (BPI) based on a protocol developed by WQTS and a modified Rapid Small-Scale Column Test (RSSCT), to compare the laboratory-predicted performance to the actual observed pilot or full-scale performance. This will serve as a critical validation exercise for these emerging laboratory methods to ascertain to what degree the predictions of the RCI and modified RSSCT (completed in days) match the observed performance in the pilot or full-scale system (that required months or years).

Need for Additional Scope and Agreement Amendment Cost

Thus far, the team has completed testing of 1) District Bessie Well groundwater including comparison of the results to OCWD's pilot testing results; 2) Water Replenishment District (WRD) groundwater including comparison of the results to WRD's pilot testing results; and testing is in process for 3) Yorba Linda Water District (YLWD) groundwater with the goal of comparing the results to YLWD's full-scale system performance.

The original plan was to conduct all RSSCTs at the design Empty Bed Contact Time (EBCT) of the pilot or full-scale system to which the test is being compared. However, while the YLWD system was designed for an EBCT of 2 minutes at full capacity, operational data to date indicate that YLWD's average EBCT has been about 2.7 minutes. In preparation for the YLWD RSSCT testing, OCWD asked WQTS to add an RSSCT test on YLWD water designed to simulate a full-scale EBCT of 2.7 minutes and compare its results to those of the RSSCT designed for a simulated EBCT of 2.0 minutes. The comparison will provide OCWD with valuable insight into the significance of EBCT in the execution of an RSSCT test.

To disperse the total $220,000 WRF grant award, the District executed contractor subaward agreements at project kickoff to WQTS for up to $156,600 and to Jacobs for up to $20,000. That left $43,400 remaining to be applied toward District staff (R&D) labor costs for the District's role managing the research, preparing samples, arranging for groundwater sampling, etc. With the addition of the WQTS scope for RSSCT work described above, staff recommend a budget augmentation for WQTS to complete the additional scope for an amount not to exceed $18,200 via a proposed Amendment No. 1 to

the OCWD-WQTS subaward agreement. This includes $5000 as an approximately 37% contingency to allow for unanticipated WQTS expenses such as materials and supplies or labor; any such unanticipated expenses would need to be justified to and approved by District staff. Staff propose to cover this cost via a WRF project budget adjustment to shift funds from the District's labor budget to WQTS, reducing District budget to approximately $25,200. This means that any District labor not covered by this reduced budget represents in-kind contribution of staff time to execute the research. These funds will flow through the approved R&D Department's FY23-24 Professional Services budget, which itself will not require any net change.

PRIOR RELEVANT BOARD ACTION(S)

2/9/2022, R22-2-17, Project funding contract with the Water Research Foundation for study of Bench-Scale methods to predict performance of IX and novel adsorbents for PFAS

WQTS
Water Quality & Treatment Solutions, Inc.
An environmental engineering and science consulting company

August 23, 2023

Dr. Megan Plumlee
Director of Research
Orange County Water District
18700 Ward Street
Fountain Valley CA 92708

Subject: Proposal for Supplemental Services – WRF Project 5153

Dear Dr. Plumlee:

WQTS is providing bench-scale testing services under to OCWD Water Research Foundation (WRF) project 5153 titled: "*Evaluation of Bench-Scale Methods to Predict Drinking Water PFAS Removal Performance of IX and Novel Adsorbents at Pilot and Full-Scale*". We have completed testing of OCWD Bessie Well water and compared the results to OCWD's pilot testing results, WRD Well water and compared the results to WRD's pilot testing results, and we are in the process of testing YLWD's groundwater, with the goal of comparing the results to those of YLWD's full-scale system performance results.

The original plan was to conduct all Rapid Small-Scale Column Tests (RSSCTs) at the design Empty Bed Contact Time (EBCT) of the pilot or full-scale system to which the test is being compared. However, while the YLWD was designed for an EBCT of 2 minutes at full capacity, analysis of the operational data to date showed that the average EBCT has been about 2.7 minutes. In preparation for the YLWD RSSCT testing, asked WQTS to add an RSSCT test on YLWD water designed to simulate a full-scale EBCT of 2.7 minutes and compare its results to those of the RSSCT designed for a simulated EBCT of 2.0 minutes. The comparison will provide OCWD with valuable insight into the significance of EBCT in the design of an RSSCT test.

The cost of including the additional RSSCT test to the YLWD testing is projected at $13,200 and is broken down by task in the table below. This increases WQTS' budget on the project from $156,600 to $169,800.

Task/Activity	**Cost**
Water Collection and RSSCT Column Prep.	$6,238
Operate and Monitor RSSCT	$5,847
Reporting	$1,115
Total	**$13,200**

If you have any questions, please do not hesitate to contact me at issam.najm@WQTS.com.

Regards,
Water Quality & Treatment Solutions, Inc.

Issam Najm, Ph.D., P.E.
President

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/
Board of Directors

From: Mike Markus

Staff Contact: M. Patel / B. Smith

Budgeted: No
Budgeted Amount: N/A
Cost Estimate: $55,542
Funding Source: R&R
Program/Line Item No.: R23***
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: PURCHASE ORDER TO AMS FOR WARNER OUTFLOW FLOWMETER

SUMMARY

The Warner Basin's open channel outflow flowmeter is producing erroneous readings. Staff attempted a repair last year but were unable to correct the issue. The exclusive vendor for the flowmeter, Accurate Measurement Systems) has submitted a quote to repair the flowmeter.

Attachment(s):
- Accurate Measurement Systems quotation dated July 24, 2023.

RECOMMENDATION

Agendize for September 20 Board meeting:
1. Establish a project budget of $60,000 funded by the R&R reserve fund to repair the Warner Basin outflow flowmeter; and
2. Authorize issuance of a Purchase Order to Accurate Measurement Systems, Inc. for an amount not to exceed $55,542 for the Warner Outflow Flowmeter Repair.

BACKGROUND/ANALYSIS

The Warner System is a critical part of the forebay's surface recharge system. It is the series of basins that feed the Upper System, including Anaheim Lake, water supplies from the river. Like most of the surface recharge system, the Warner System consists of open channel gravity conveyance. The outflow of the Warner System enters a pipeline that travels northward underneath Tustin Ave and discharges to one of the Upper System's basins. There is an existing flow meter at the Warner outflow that has been reporting erroneous values. This flowrate is critical because it is the only way to feed river water into the Upper System. Additionally, if flows conveyed through the pipeline are too high, then the pipeline can flood city streets. Staff attempted a repair of the flowmeter last year but were unsuccessful at getting new components to communicate with the older ones. The exclusive vendor of this meter brand for our region, Accurate Measurement Systems, Inc. (AMS), has provided a quotation to complete the flowmeter repair for a fee not to exceed $55,542. Staff is recommending a budget establishment of $60,000 funded by the R&R reserve, which includes the AMS purchase order and a contingency to cover the potential need of staff support.

PRIOR RELEVANT BOARD ACTION(S): N/A

ACCURATE MEASUREMENT SYSTEMS, INC.
INSTRUMENTATION: Application * Sales * Engineering * Service
33159 Camino Capistrano, Suite E, San Juan Capistrano, CA 92675
P: (949) 218-9350 / F: (949) 218-9351 / www.AccurateMeasurement.com

"EASY TO USE, SIMPLE TO MAINTAIN"

QUOTATION #: **061223JL2R**

DATE: July 24, 2023

CUSTOMER: Orange County Water District
4060 E. La Palma Ave.
Anaheim, CA 92807

ATTENTION:

Pete Doplito,	714-378-8274	PDoplito@ocwd.com
Danny Simala	562-965-3090	dannysimala@hotmail.com
Jeff Boudreau	949-584-8705	JBoudreau@ocwd.com

REFERENCE: Rittmeyer RIMO-1E4P, Completion of the 4-Path Open Channel Ultrasonic Flowmeters upgrade of existing Accusonic meter at Warner Outflow Location.

Gentlemen:

Per your request, we are pleased to submit the following revised quotation for your consideration.

Thank you for the opportunity to visit the potential installation site and application discussions. Based on our site walk, Accurate Measurement Systems, Inc. (AMSI) is pleased to submit the following quotation for the purchase, installation and commissioning of a Rittmeyer RIMO-1E4P, (4) path, Open Channel Ultrasonic Flowmeter similar to that at the Conrock location..

Our proposal reflects the use of existing conduit and operation building that may be upgraded by OCWD personnel at their discretion during the meter installation process. We would suggest that any exposed PVC conduit should be replaced due to UV breakdown. All of the existing transducer cable will be replaced with new Rittmeyer submersible coax as part of our proposal.

The Rittmeyer Small Field Panel with the RIMO controller unit powered by 120VAC will include a separate Weidmuller 120VAC/24VDC power supply and Fiber Optic Data Module to interface with a second, remote mounted SS Panel located near the channel meter section. This SS Panel will contain the RIMO Transducer Interface (RIMOUSTT) module and second Weidmuller Fiber Optic Data Module. Utilizing the proposed Fiber Optic Link between the Control Building and the meter section will greatly reduce the required coax Transducer Cable runs. The other signal conditioning components typical of those provided on our previous installation will remain in the Small Field Panel.

The (8) Rittmeyer 316SS Type B transducers for the (4) four path meter section along with the Rittmeyer submersible coax Transducer Cable will be included with flowmeter deliverables. The Rittmeyer Small Field RIMO Console Unit was purchased separately and delivered on 11/3/22 to the proposed job-site. Any client required conduit and/or pull box components not identified during our sight walk, may be provided and installed by others or quoted separately.

Based on the provided description of the open channel metering section, we estimate the performance of the proposed RIMO meter to be better than +/- 2 to 3 % of flow with a repeatability of better than 1.0 %.

The proposed RIMO (Risonic Modular) meter reflects the installation requirements presented during our site walk. The RIMO console enclosure will be mounted (or already mounted) on the open wall within the existing, Control Building located a couple of hundred feet away from the meter section. We plan on wall mounting the Rittmeyer Type B transducers with SS lag securing plates within the same meter section as the existing Accusonic in a single plane, 4 path configuration. The transducers and sensor cable protection conduit are to be secured to the channel walls with 316SS anchors. Existing installation material will be upgraded as needed based on our findings during installation, and may be provided by others or submitted as separately quoted items.

OCWD or others will provide and secure a channel outage and any required power, lighting, scaffolding and/or ladders along with safe and ready access in to the channel meter section. OCWD will be responsible for providing any additional safety apparatus and/or personnel to support the proposed meter installation effort so as to be in compliance with OCWD safety regulations. We will be utilizing Factory Certified meter installation personnel who are confined space certified that will be equipped with appropriate personal safety equipment.

The RIMO Flowmeter:

Our proposal is based on the readily available access to the proposed channel meter section and the Controller Building to perform the indicated work as follows:

1) The OCWD will schedule the channel outage and the draining to allow time for us to install the (8) wall mounted Type B transducers and level transmitter. Per our discussion, the proposed installation schedule will be during the first last quarter of 2023.
2) The installation of the (8) transducers for the meter section will have the following steps:
    a. Survey the meter section to determine viable sensor locations for the new transducers.
    b. Bore holes to secure each transducer to the side of the channel,
    c. Install transducer SS securing hardware,
    d. Mount transducers aligning sensors for each of the (4) paths,
    e. Installation of the proposed Krohne level transmitter. If a stilling well is required for the level measurement, it will be provided by OCWD.
    f. Confirm alignment and determine accurate “as built” measurements needed to configure flowmeter console unit,
    g. Install transducer cable protective conduit and securing hardware and pull cable.
3) OCWD or others will provide the permanent electrical 115VAC power with appropriate rigid conduit between the existing power location and the newly installed flow meter RIMO Console unit. (If acceptable to OCWD, we will utilize existing power cabling to power RIMO console unit within the existing Control Building.)
4) AMSI personnel can assist with the removal of the existing transducer cable and the pulling of the new transducer, power and duplex Fiber Optic cable. Once pulled, we will terminate the new cable at the remote mounted SS Panel and newly installed Transducers. The provided Fiber Optic cable will come with Type S connectors to plug into the installed Data Modules.
5) The (4) paths of the RIMO will provide a precise, average flow velocity through the meter section. Critical to the flow volume measurement is the accurate measurement height of water in the channel at the meter section. We have included in our proposal a new level measuring instrument from Krohne that will provide us with the needed input signal to the RIMO controller to complete the flow volume measurement.
6) AMSI will return for commissioning/start-up of the meter and client training once the channel has been recharged.

If you should have any questions relative to our proposal/quotation submittal, please feel free to contact us. You may wish to also refer to www.Rittmeyer.com and www.AccurateMeasurement.com for additional information on the RIMO flow meter.

Ultrasonic Flowmeter(s) Description:

The flowmeter will include (4) horizontal paths in a single vertical plane, crossing the channel in a 45 degree angle. The RIMO Transducer Interface Module SS panel will be housed in a weather tight panel supported above a concrete base. The RIMO Console will be wall mounted in the existing Control Building and will utilize the dynamic velocity information from each of the meter ultrasonic paths to determine instantaneous flow rate. This with the height measurement of the water in the channel, the RIMO controller will provide the totalized flow data. The Console unit will be equipped with various analog output signals to communicate process data and flowmeter diagnostic information. MODBUS values via Ethernet TCP/IP and MODBUS RTU485 are also included with the RIMO Flowmeter.

Proposed Sensor Installation:

The field technicians will also layout the location for the transducers, confirm viability of existing conduit, and location any new protective conduit components within the channel meter section. Once completed, they will begin the installation of the needed meter components. We estimate that the indicated transducer and conduit installation work will be completed within (2) to (3) days.

The typical installation of the sensors involves a procedure where the meter section is surveyed to identify the correct location for each of the transducers. Once identified, the channel wall will be cored to accept the needed securing hardware for each of the "type B" transducers. With the transducers installed and secured, the sensors will be properly aligned. At this point, "as installed" dimensions will be taken and recorded for later configuration of the flowmeter console unit.

Required OCWD Personnel Support Effort:

1) OCWD will be responsible for safe handling of the associated flow meter components upon delivery and during the meter installation process. In addition, the OCWD will be responsible for coordination of the requested support tasks indicated within this document.
2) Any required scaffolding, ladders and or lifts to safely access the channel meter sections will be provided by the OCWD or others.
3) The OCWD or others will be responsible for any lighting required for completing installation of the flowmeter components.
4) The OCWD or others will be responsible for providing any needed conduit or SS securing hardware for the installation of the component for the new flowmeter.
5) The OCWD or others will also be responsible for providing any power, air vent units, safety apparatus, etc., required to complete the flowmeter component installation and startup effort per OCWD safety standards.

Factory Personnel Effort:

Factory field tech will bring appropriate personnel safety equipment and hand tools along with any special meter installation tools to ensure proper installation of the transducers. Factory personnel will be responsible for surveying the channel meter section for proper transducer location, assisting with the coring of channel walls and installation of securing hardware. Factory personnel will also be responsible for the correct installation and orientation of the (8) transducers and proper securing conduit for all RIMO meter.

Once the Console unit, remote SS panel and conduit are installed, factory personnel will be responsible for landing of all cable connections at both transducer and console unit termination points, including the power and signal leads in the flowmeter console. With this effort complete and power to the console unit, factory personnel will install the configuration parameters into the RIMO controller unit.

At this time, we anticipate that we will need to schedule a return visit to the site to complete the commissioning efforts on the meter once the channel is re-charged. As such, our proposal includes up to two job-site visits by AMSI and/or Factory field technicians to complete all of the installation, meter commissioning and client training tasks.

Scheduling of Factory personnel will be mutually coordinated based on OCWD's project time line and availability of Factory personnel. Pricing quoted for the meter is based on a single purchase as quoted where the installation and commission of the unit will be performed during the indicated site visits. Additional visits and/or efforts not reflected in our quotation either requested and/or caused by delays, reschedules, or scope changes initiated by the OCWD will be quoted and invoiced separately.

T&C's Comments:

The O&M manual for the meter will be provided to include "as installed" documentation and configuration details for the flowmeter and will be delivered upon job completion.

Warner Open Channel Flowmeter Upgrade Project:

Item	Qty	Description	Unit Price	Total
1	0	Rittmeyer (4) Path RIMO Flowmeter (Existing) Controller Part No.: RIMO-1E4P Transducer Interface Module, Part No.: RIMOUSTT-1E4P Rittmeyer Small Enclosure Console Unit (complete) Part No.: MFSSFC-40-C-110V Includes: Factory assembly of Console unit including, pre-wiring & testing Din rail for mounting of components AC power switch 85-265 VAC/24VDC Power Supply Over voltage protection module 120VAC Over voltage protection module 4-20MA	$	$ 0.00
2	4	Transducers Part No.: MFATB05.101 (2 per path set) (8) SS Transducer wall support plates	$ 6,480.00	$ 29,010.00
	lot	Rittmeyer Submersible Coax Cable (up to 600 feet)	$ 2,940.00	
	1	Rittmeyer RIMO O&M Manual Packet (1 per meter)	$ 150.00	
3	lot	Remote Mounted TIM's Components: 1) Weidmuller 120VAC/24VDC, 5W Power Supply 2) Weidmuller Data Modules (CAT6 to Fiber Duplex) 1) 200ft Duplex Fiber Cable w/ Type S Connectors 1) 3' CAT6 Straight Patch Cable 1) 200ft of 24VDC power cable 1) Remote Mounted "TIMs" SS Panel (20x16x6") 1) Remote Mounted CS NEMA4 Equipment Protection Enclosure (36x36x12) lot) Misc. Installation Hardware	$ $ 195.00 $ 530.00 $ 295.00 $ 4.25 $ 430.00 $ 980.00 $ 1,046.25 $ 250.00	$ 3,730.50
4	1	Krohne Radar Level Transmitter, Optiwave Model 7500C **Model No.: VFDF403B** Includes: Converter Unit w/ LCD Display 24VDC powered (via loop) Output Signal -4 -20MA (HART) Accuracy: 1 mm (high resolution) Rating: IP-68 (submersible) 1.5" NTPM SS Flange Mounting Fitting w/ ETFE Antenna	$ 1,895.00	$ 1,895.00

5	lot	Rittmeyer RIMO Field Technician Service Includes: Up to (3) days Onsite Installation (1) day Commissioning Efforts. Field Tech travel T&E Expenses	$ 16,375.00	$ 16,375.00

Subtotal	$ 51,010.50
CA Sales Tax (8.75%)	$ 3,030.61
Material Shipping and Handling	$ 1,500.00
Total	**$ 55,541.11**

AMS Quotation Terms and Conditions:

Prices	-	Quoted prices are based on placement of a single order for all items and quantities shown without Customer imposed delivery restrictions.
	-	**AMS has a minimum order subtotal of $100.** If the subtotal quoted is below that price point, you may increase your quantity; otherwise you will be charged a minimum of $100. This ONLY applies to items that are NOT in stock at our San Juan Capistrano, CA location.
Validity	-	Prices reflected in our quotation are valid for (30) days from the date of this proposal.
Model Selection	-	Please review specification details to confirm that our proposed model and/or part number comply with the application requirements.
Delivery	-	Material delivery and installation can be completed within 8 to 10 weeks ARO.
	-	FOB point is the Manufacturer's Factory location unless otherwise stated in writing.
	-	Shipping method will be "Best Way", typically UPS or truck unless otherwise specified at time of order.
Payment Terms	-	**Payment terms of "Net 30 Days" with approved credit will apply to any Purchase Order resulting from this quotation (unless approved otherwise).**
	-	**Credit Card purchases (Visa or MasterCard) will incur a 3% processing fee.**
Past Due Invoices	-	Account balances that are beyond their due date based on the specified terms will result in an 'Account Freeze'.
	-	If you wish to submit a PO for an item while your account is frozen, the order will not be delivered until the past due invoice(s) have been paid.
	-	**AMS reserves the right to refuse an order due to an outstanding balance.**
Shipping Costs	-	**Shipping charges listed above are estimated** based on general weight and package rates. **Actual charges will be prepaid by AMS and invoiced to the customer accordingly.** We charge the customer what we are charged by the factory for shipping your order only.
	-	**Certain manufacturers charge an additional fee to have orders drop-shipped to the end user and will be applied to the invoice.**
Sales Tax	-	All orders are subject to State Sales Tax. If the quoted items are for "Resale", AMS requires a copy of a valid "Resale Certificate" be on file prior to processing your order.
Warranty	-	All items are quoted with the standard "Factory Warranty" only unless otherwise documented.
Product Returns	-	Returns for repair, replacement, credit and/or exchange are subject to Manufacturer's warranty, repair and restocking procedures.

Field Service	-	Customers requiring post installation "Field Service" must submit a purchase order for applicable labor, material and expenses. Labor will be billed at $225.00/hour onsite (minimum 4 hours) and $125.00/hour travel time. Applicable charges will be adjusted for "Factory Warranty" covered items.
Exceptions	-	Unless otherwise acknowledged in writing, the "Terms and Conditions" contained herein will apply and take precedence.
Order Placement	-	**If procured, please forward Purchase Order to the Application Engineer who provided the quote and/or the following:** **Lois Leigh – lleigh@accuratemeasurement.com** **Inside Sales – 949-218-9351 Fax**

We appreciate the opportunity to submit our proposal for your consideration and invite you to contact us should there be any questions relative to our quotation or the equipment contained therein.

Respectfully,

James Leigh
Accurate Measurement Systems, Inc.
949-218-9350

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/ Board of Directors

From: Mike Markus

Staff Contact: R. Herndon

Budgeted: Yes
Budgeted Amount: $48,000
Cost Estimate: $46,700

Funding Source: General Fund
Program/ Line Item No.: 1075.51112.9900
General Counsel Approval: Yes
Engineers/Feasibility Report: NA
CEQA Compliance: NA

Subject: ANNUAL SANTA ANA RIVER STREAMGAGING JOINT FUNDING AGREEMENT WITH THE UNITED STATES GEOLOGICAL SURVEY

SUMMARY

The United States Geological Survey (USGS) has proposed to continue providing streamgaging (flow and quality) services along the Santa Ana River and Santiago Creek for the period October 1, 2023 to September 30, 2024. The District's share of the streamgaging costs is $46,700 for 2023-24.

Attachment: Cover Letter and Joint Funding Agreement for October 1, 2023 to September 30, 2024

RECOMMENDATIONS

Agendize for September 20 Board meeting:

1. Approve and authorize Joint Funding Agreement with USGS to conduct streamgaging of the Santa Ana River below Prado Dam and Santiago Creek at Santa Ana for the period of October 1, 2023 to September 30, 2024; and

2. Authorize payment of $46,700 to the USGS for OCWD's share of costs for these services.

BACKGROUND/ANALYSIS

Flow and quality measurements along the Santa Ana River (SAR) and Santiago Creek are key data used by District staff for a wide range of programs, including calculation of base and storm flows for the annual SAR Watermaster Report, estimation of Forebay recharge and losses to the ocean, and the Prado Water Conservation Program. Data from these streamgaging stations were integral to the District's successful completion of its water rights permit from the State Water Resources Control Board in 2008.

In addition to the Prado gauge, several upstream stations along the SAR and its tributaries were determined by the Watermaster to be vital to the calculation of base and storm flows, as required by the 1969 Judgment. OCWD has established joint funding of

SAR streamgaging at the Prado and Santiago Creek stations, while San Bernardino Valley Municipal Water District (SBVMWD) has agreed to continue managing the joint funding agreement for upstream gauges. USGS costs of measuring and maintaining these streamgages are shared among the four Watermaster agencies: OCWD, SBVMWD, Inland Empire Utilities Agency, and Western Municipal Water District.

Staff recommends that OCWD continue to contract with the USGS to conduct streamgaging at the Santa Ana River at Prado and Santiago Creek stations for the 2023-24 year. The Prado station is designated as a federal priority streamgage; thus, the costs of the flow measurements at Prado are covered by the USGS. The remainder of the USGS monitoring costs between the two stations are shared approximately 73 percent by OCWD and 27 percent by the USGS. The total cost to OCWD for 2023-24 is $46,700.

PRIOR RELEVANT BOARD ACTION(S)

7/20/2022, R22-7-91 Approve and authorize execution of Joint Funding Agreement with USGS to conduct flow and quality monitoring of the Santa Ana River below Prado Dam and Santiago Creek at Santa Ana for the period of October 1, 2022 to September 30, 2023; and authorize payment of $45,530 to the USGS for OCWD's share of costs for stream flow and quality monitoring services.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
California Water Science Center
6000 J Street
Sacramento, CA 95819

June 27, 2023

Michael Markus, P.E.
General Manager
Orange County Water District
Post Office Box 8300
Fountain Valley, CA 92728-8300

Dear Michael Markus, P.E.:

Attached is the Joint Funding Agreement (JFA) 24ZGJFA10000001, signed by our agency, for your approval to enact the cost changes to the project(s) California Water Science Center Water Resources Investigations, during the period October 1, 2023 through September 30, 2024 in the amount of $46,700 from your agency. U.S. Geological Survey contributions for this agreement are $17,180 for a combined total of $63,880. If you are in agreement with this proposed program, please return the fully executed signed copy to CAgageADMIN@usgs.gov (preferred) or send one fully executed paper copy to Cade Castro at the address in the letter head.

Federal law requires that we have a signed agreement before we start or continue work. Please return the signed agreement by **October 1, 2023**. If, for any reason, the agreement cannot be signed and returned by the date shown above, please contact Jonathan Newby by phone number (909) 798-3272 or email jnewby@usgs.gov to make alternative arrangements.

This is a fixed cost agreement to be billed quarterly via Down Payment Request (automated Form DI-1040). Please allow 30-days from the end of the billing period for issuance of the bill. If you experience any problems with your invoice(s), please contact Cade Castro at phone number (970) 462-2034 or email at ccastro@usgs.gov.

The results of all work performed under this agreement will be available for publication by the U.S. Geological Survey. We look forward to continuing this and future cooperative efforts in these mutually beneficial water resources studies.

Sincerely,

Jeanette Rainey
Acting Director, USGS California Water Science Center

Enclosure
Detailed Summary

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 6000000805
Agreement #: 24ZGJFA10000001
Project #: ZG00GZV
TIN #: 95-6002277

Fixed Cost Agreement YES[X] NO[ ]

THIS AGREEMENT is entered into as of the October 1, 2023, by the U.S. GEOLOGICAL SURVEY, California Water Science Center, UNITED STATES DEPARTMENT OF THE INTERIOR, party of the first part, and the Orange County Water District party of the second part.

1. The parties hereto agree that subject to the availability of appropriations and in accordance with their respective authorities there shall be maintained in cooperation Water Resource Investigations (per attachment), herein called the program. The USGS legal authority is 43 USC 36C; 43 USC 50, and 43 USC 50b.

2. The following amounts shall be contributed to cover all of the cost of the necessary field and analytical work directly related to this program. 2(b) include In-Kind-Services in the amount of $0.00

(a) $17,180 by the party of the first part during the period October 1, 2023 to September 30, 2024

(b) $46,700 by the party of the second part during the period October 1, 2023 to September 30, 2024

(c) Contributions are provided by the party of the first part through other USGS regional or national programs, in the amount of: $0

Description of the USGS regional/national program:

(d) Additional or reduced amounts by each party during the above period or succeeding periods as may be determined by mutual agreement and set forth in an exchange of letters between the parties.

(e) The performance period may be changed by mutual agreement and set forth in an exchange of letters between the parties.

3. The costs of this program may be paid by either party in conformity with the laws and regulations respectively governing each party.

4. The field and analytical work pertaining to this program shall be under the direction of or subject to periodic review by an authorized representative of the party of the first part.

5. The areas to be included in the program shall be determined by mutual agreement between the parties hereto or their authorized representatives. The methods employed in the field and office shall be those adopted by the party of the first part to insure the required standards of accuracy subject to modification by mutual agreement.

6. During the course of this program, all field and analytical work of either party pertaining to this program shall be open to the inspection of the other party, and if the work is not being carried on in a mutually satisfactory manner, either party may terminate this agreement upon 60 days written notice to the other party.

7. The original records resulting from this program will be deposited in the office of origin of those records. Upon request, copies of the original records will be provided to the office of the other party.

8. The maps, records or reports resulting from this program shall be made available to the public as promptly as possible. The maps, records or reports normally will be published by the party of the first part. However, the party of the second part reserves the right to publish the results of this program, and if already published by the party of the first part shall, upon request, be furnished by the party of the first part, at cost, impressions suitable for purposes of reproduction similar to that for which the original copy was prepared. The maps, records or reports published by either party shall contain a statement of the cooperative relations between the parties. The Parties acknowledge that scientific information and data developed as a result of the Scope of Work (SOW) are subject to applicable USGS review, approval, and release requirements, which are available on the USGS Fundamental Science Practices website (https://www2.usgs.gov/fsp/).

Form 9-1366
(May 2018)

U.S. Department of the Interior
U.S. Geological Survey
Joint Funding Agreement
FOR
Water Resource Investigations

Customer #: 6000000805
Agreement #: 24ZGJFA10000001
Project #: ZG00GZV
TIN #: 95-6002277

9. Billing for this agreement will be rendered **quarterly**. Invoices not paid within 60 days from the billing date will bear Interest, Penalties, and Administrative cost at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury.

USGS Technical Point of Contact

Name:	Jonathan Newby Supervisory Hydrologic Technician
Address:	1653 Plum Lane Redlands, CA 92374
Telephone:	(909) 798-3272
Fax:	(909) 335-3407
Email:	jnewby@usgs.gov

Customer Technical Point of Contact

Name:	Michael Markus, P.E. General Manager
Address:	Post Office Box 8300 Fountain Valley, CA 92728-8300
Telephone:	(714) 378-3200
Fax:	
Email:	mmarkus@ocwd.com

USGS Billing Point of Contact

Name:	Cade Castro Budget Analyst
Address:	6000 J Street Placer Hall Sacramento, CA 95819
Telephone:	(970) 462-2034
Fax:	
Email:	ccastro@usgs.gov

Customer Billing Point of Contact

Name:	Michael Markus, P.E. General Manager
Address:	Post Office Box 8300 Fountain Valley, CA 92728-8300
Telephone:	(714) 378-3200
Fax:	
Email:	mmarkus@ocwd.com

U.S. Geological Survey
United States
Department of Interior

Signature

By_____ **Date:** 06/27/23
Name: Jeanette Rainey
Title: Acting Director, USGS California Water Science Center

Orange County Water District

Signatures

By_____ **Date:** _____
Name:
Title:

By_____ **Date:** _____
Name:
Title:

By_____ **Date:** _____
Name:
Title:

Orange County Water District
Attachment for 24ZGJFA10000001
2023-10-01 to 2024-09-30

WATER QUALITY

SITE NUMBER	DESCRIPTION	CODE	NO. UNITS	DIFF FACTOR	USGS FUNDS	CUST. CASH	OTHER FUNDS	TOTAL COST
11074000	SANTA ANA R BL PRADO DAM CA							
	Water Quality, Continuous	WQCONT	1	1	$6,400	$16,200		
	Water Quality, Measurement	WQMEAS	1	1	$3,450	$12,630		
				WQ Total:				**$38,680**
				WQ Grand Total:	**$9,850**	**$28,830**		**$38,680**

SURFACE WATER

SITE NUMBER	DESCRIPTION	CODE	NO. UNITS	DIFF FACTOR	USGS FUNDS	CUST. CASH	OTHER FUNDS	TOTAL COST
11077500	SANTIAGO C A SANTA ANA CA							
	Full Range Streamflow Station	QCONT	1	1	$7,330	$17,870		
				SW Total:				**$25,200**
				SW Grand Total:	**$7,330**	**$17,870**		**$25,200**

SUMMARY FOR

TYPE	USGS FUNDS	CUST. CASH	OTHER FUNDS	TOTAL COST
WATER QUALITY (WQ)	**$9,850**	**$28,830**		**$38,680**
SURFACE WATER (SW)	**$7,330**	**$17,870**		**$25,200**
GRAND TOTAL				**$63,880**

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/
Board of Directors

From: Mike Markus

Staff Contact: L. Haney/S. Nevill

Budgeted: Yes
Budgeted Amount: $8,000

Cost Estimate: $4,000
Funding Source: CIP
Program/Line Item No.: C18005
General Counsel Approval: Yes
Engineers/Feasibility Report: Yes
CEQA Compliance: Yes

Subject: AGREEMENT WITH KIZH NATION RESOURCES MANAGEMENT FOR NATIVE AMERICAN MONITORING SERVICES FOR THE SUNSET GAP SEAWATER INTRUSION INVESTIGATION

SUMMARY

OCWD plans to construct monitoring well cluster BS-25 at the Naval Weapons Station Seal Beach (NWSSB) as a part of the Sunset Gap Seawater Intrusion Investigation. As a part of the Mitigated Negative Declaration (MND) and MND Addendum project requirements, construction monitoring for Native American artifacts is required for portions of the excavations. The mitigation requires Kizh Nation Resource Management to conduct this monitoring and a Tribal Monitoring Agreement is required for this effort.

RECOMMENDATION

Agendize for September 20 Board meeting: Authorize the General Manager to negotiate an agreement with Kizh Nation Resources Management for Native American Monitoring Services for the Sunset Gap Seawater Intrusion Investigation Monitoring Well BS25 Construction Project, with a fee amount not to exceed $4,000.

DISCUSSION

OCWD has been actively investigating the nature and extent of seawater intrusion in the Sunset Gap since 2010, including the installation of nine multi-depth monitoring well clusters within the NWSSB.

In October 2020 the Board approved staff's recommendation to install 11 additional monitoring wells clustered at five locations: one site in Seal Beach (BS25) and four in Huntington Beach. With the exception of the two-well cluster at site BS25, all of the wells have been constructed. Associated with this approval, the Board adopted and certified a Mitigated Negative Declaration (MND) for the Sunset Gap Monitoring Wells Project in October 2020. After an unsuccessful effort to obtain a California Coastal Commission permit to construct monitoring well cluster BS25 at Gum Grove Park in the City of Seal Beach, BS25 was relocated to the NWSSB and an Addendum to the MND was adopted in December 2022.

The mitigation measures identified in the Addendum to the MND require certain ground disturbances to be monitored by a Tribal Monitor from the Gabrieleno – Kizh Nation

tribe. Tribal monitoring would entail having monitor be present at the work site to monitor ground disturbances to a depth of 15 feet below the ground surface in order to identify any cultural resources that may be present. In order to comply with the mitigation, the tribal representatives require the approval of a Tribal Monitoring Agreement. The Tribal Monitoring Agreement would include the following provisions:

- Scope of Work specifying the activities of the tribal monitor;
- Treatment plan for any discovered items;
- Fees and invoice provisions.

Staff recommends that the District enter into a Tribal Monitoring Agreement with Kizh Nation Resources Management, the final terms to be negotiated with General Manager approval.

This work is budgeted in the approved Sunset Gap Seawater Intrusion Investigation project budget. The Agreement would be limited to a budget of $4,000, which staff has identified as adequate in relation to the limited disturbances that will be monitored. The budget will be used to compensate tribal monitors for time spent monitoring excavations at the project site.

PRIOR RELEVANT BOARD ACTIONS:

6/15/22 R22-6-74 - Authorize execution of License Agreement N62473-22-RP-00085 with the Department of the Navy and payment of fee to the Navy in the amount of $4,200 for the continued monitoring of existing District monitoring wells and installation of two additional monitoring wells at the Naval Weapons Station Seal Beach.

6/16/21, R-21-6-90 - Receive and file Affidavit of Publication of Notice Inviting Bids for Contract No. SG-2021-1; Waive the BC2 Environmental, LLC inconsequential bid informalities; and Accept bid and award Contract SG-2021-1 to BC2 Environmental, LLC for an amount not to exceed $1,038,730.

1/20/21 R21-1-6 – Authorize issuance of a services agreement to ENGEO for construction management and surveying services during the installation of additional Sunset Gap monitoring wells for an amount not to exceed $198,347.

10/21/20 R20-10-140 - Adopt resolution certifying the Final IS/MND, authorizing to file the Notice of Determination, approving the Geologist's Report, approving the proposed Sunset Gap Additional Monitoring Well Project, establishing a project budget of $1,600,000, authorizing issuance of a Notice Inviting Bids for well construction, authorizing necessary permitting documents by the General Manager from regulatory agencies, and authorizing issuance of an RFP for construction management services.

8/5/20 R20-8-97 – Authorize execution of a 30-year no-fee License Agreement for proposed monitoring wells OCWD-BS26A and OCWD-BS26B with The Boeing Company for well construction, monitoring, and maintenance.

11/20/19 R19-11-141 – Ratify issuance of Change Order Nos. 1 and 2; and Accept completion of work and authorize filing a Notice of Completion for Contract No. SG-2018-1, Construction of OCWD-BS13 and OCWD-BS24 Monitoring Well Clusters.

8/15/18 R18-8-112 – Receive and file Affidavit of Publication of Notice Inviting Bids for Contract No. SG-2018-1; Accept bid and award Contract No. SG-2018-1 to ABC Liovin Drilling, Inc. for an amount not to exceed $807,646; and Authorize issuance of services agreement to Geotechnical Consultants, Inc. for inspection services during construction of the OCWD-BS13 and OCWD-BS24 monitoring well clusters for an amount not to exceed $203,000.

2/21/18 R18-2-12 – Adopt the Final Initial Study/Mitigated Negative Declaration for Sunset Gap Monitoring Well Clusters BS13 and BS24, and the Bolsa Chica Channel Levee Repair Project; Approve the proposed construction of BS13 and BS24 Monitoring Well Clusters and proposed repairs to the Bolsa Chica Flood Control Levee; Authorize a budget increase in the amount of $1,648,771 to establish a revised project budget of $4,054,711 covering R7R projects R12030 and R14026, and complete capital project C13005; Authorize issuance of a Request for Proposals for inspection services during the construction of BS13 and BS24 well clusters; Authorize issuance of the Notice Inviting Bids for construction of BS13 and BS24 Monitoring Well Clusters; Authorize issuance of the Notice Inviting Bids for Repair of the Bolsa Chica Flood Channel; and Authorize staff to file the Notice of Determination.

2/15/17 R17-2-11 – Authorize issuance of Amendment No. 2 to Agreement No. 1087 with Ninyo & Moore in the amount of $20,789 for additional out-of-scope geotechnical services required for the OCWD-BS13 well site geotechnical investigation.

12/7/16 R16-12-168 – Award Contract SG-2016-1 for monitoring well OCWD-BS24C construction to BEKS Acquisition Inc. dba BC2 Environmental in the amount of $177,425.

10/19/16 R16-10-144 – Authorize Notice Inviting Bids for Contract No. SG-2016-1 monitoring well OCWD-BS24C construction.

10/19/16 R16-10-143 – Authorize General Manager to execute an amendment to Contract SG-2015-1 to reflect Change Order No. 1 for out-of-scope costs associated with the destruction of the OCWD-BSO9 monitoring wells and abandonment of the OCWD-BS24 borehole and to terminate the contract without fault to either party.

9/16/16 R15-9-123 – Award Contract SG-2015-1 for destruction of Sunset Gap OCWD-BSO9 monitoring wells and construction of replacement monitoring well OCWD-BS24 to Cascade Drilling in the amount of $464,074.

7/20/16 R16-7-102 – Authorize issuance of agreement to Intera, Inc., in an amount not to exceed $135,032, to expand and recalibrate the Alamitos Gap groundwater model into the Sunset Gap.

5/18/16 R16-5-61 – Authorize Amendment No. 1 in the amount of $19,904 to agreement with Ninyo & Moore for geotechnical investigation.

4/20/16 R16-4-41 – Approve Department of Navy license agreements for monitoring wells and geotechnical investigation at Naval Weapons Station and authorize payment of fees.

6/17/15 R15-6-77 – Authorize filing Notice of Exemption for the construction of monitoring well BS24; authorize destruction of monitoring wells BSO9A, BSO9B and BSO9C, and construction of replacement monitoring well OCWD-BS24; and authorize issuance of Amendment No. 2 to Agreement No. 0958 with CDM Smith in the amount of $56,550 for additional field inspection services required for the destruction of BSO9A, BSO9B and BSO9C, and construction of monitoring well OCWD-BS24.

6/17/15 R15-6-81 – Authorize issuance of Amendment No. 1 to Agreement No. 0958 with CDM Smith in the amount of $127,935 for additional field inspection services required for the Sunset Gap Project and issuance of agreement to Ninyo & Moore for geotechnical services at the OCWD-BS13 well site for an amount not to exceed $58,078.

3/15/15 R15-3-30 – Approve modification to license agreement with the Department of the Navy for the Sunset Gap Seawater Intrusion Investigation.

5/21/14 R14-5-66 – Award Contract No. SG-2014-1 to Yellow Jacket Drilling for $1,477,295 for construction of six monitoring wells and destruction of three monitoring wells.

12/18/13 R13-12-00 – Authorize agreement with CDM Smith for an amount not to exceed $194,117 for construction management of the Sunset Gap monitoring well installations and destructions.

9/18/13 R13-9-121 – Receive and file Geologist's Report and approve Sunset Gap Groundwater Investigation including the construction of four new monitoring wells, two replacement monitoring wells, and destruction of three unusable monitoring wells for a combined capital and R&R budget of $1,896,400; authorize issuance of a RFP for field inspection services; authorize filing a Notice of Determination.

6/20/12 R12-6-70 – Authorize application for California Department of Water Resources Local Groundwater Assistance Grant.

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/ Board of Directors

From: Mike Markus

Staff Contact: C. Johnson/ J. Dadakis

Budgeted: Yes
Budgeted Amount: $60,000
Cost Estimate: $28,458
Funding Source: General Fund
Program/ Line Item No. 1046.53001.9922
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: AGREEMENT WITH NWRI TO ADMINISTER AND FACILITATE TWO GWRS INDEPENDENT ADVISORY SUBCOMMITTEE MEETINGS

SUMMARY

Regular review of the Groundwater Replenishment System (GWRS) project by a Panel of independent qualified experts was previously a requirement of the project's Regional Water Quality Control Board (RWQCB) permit. These reviews have been effectively administered by National Water Research Institute (NWRI) since 2004. NWRI manages similar Panels for the Metropolitan Water District of Southern California, City of San Diego, Los Angeles Department of Water and Power, Valley Water (formerly Santa Clara Valley Water District), Padre Dam Municipal Water District, and the State Water Resources Control Board. Under the new RWQCB permit for the GWRS Final Expansion, regular Panel meetings are no longer required; however, input of two subcommittees of the Panel is needed to facilitate regulatory review and acceptance of specific outstanding matters: 1) the Mid Basin Injection Project tracer study and resulting subsurface retention time boundaries; and 2) pathogen reduction crediting for time that recycled water spends in the groundwater aquifer.

Attachment: NWRI proposal dated September 5, 2023

RECOMMENDATION

Agendize for September 20 Board meeting: Authorize issuance of Agreement to the National Water Research Institute for an amount not to exceed $28,458 to provide administration and facilitation services for two GWRS Independent Advisory Panel subcommittee meetings.

BACKGROUND/ANALYSIS

The District was issued the original permit to operate the Groundwater Replenishment System (GWRS) in 2004 by the Santa Ana Regional Water Quality Control Board (RWQCB) via Order No. R8-2004-0002. A condition of this permit required an independent advisory Panel provide on-going periodic scientific peer review of the project. At a minimum, members of the advisory panel were to include a toxicologist, an engineering geologist or hydrogeologist registered in California, an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, a microbiologist, and a chemist.

NWRI has successfully administered and facilitated the Panel since its inception in 2004. During the initial five years of the operation of Interim Water Factory 21 (immediate predecessor facility) and GWRS, the Panel was required to meet at least annually to review the prior year's annual report of plant operations, Operations Management Monitoring Plan (OMMP), recycled water and groundwater quality monitoring reports, and associated groundwater recharge issues. After each meeting, the Panel provides the District and the regulators with a comprehensive report detailing its findings and recommendations. The permit requirement for the Panel stemmed from the groundbreaking nature of the GWRS project and the evolving state Draft Regulations under which it was permitted at the time; the Panel has provided an additional measure of independent review and reassurance to the District, state regulators, and the public.

In December 2022, a new RWQCB permit was issued for the GWRS Final Expansion, Order No. R8-2022-0050. This Order supersedes Order No. R8-2004-0002 and no longer includes a requirement for regular Panel meetings. However, Panel review is still required if proposing an alternative to any of the requirements in the state's Title 22 regulations guiding Groundwater Replenishment Reuse Projects (GRRPs), and if directed by the State Water Resources Control Board Division of Drinking Water (DDW) to demonstrate public health equivalency to the regulation.

The GWRS Panel was last convened in September 2021 and two Panel subcommittee meetings are scheduled for October 2023.

The first Panel subcommittee this year will review final District staff report of the Mid Basin Injection project Tracer Test and Modeling, which is required to delineate boundary areas within which operation of drinking water production wells is not permitted. The full Panel previously reviewed and supported a protocol for the Tracer Test and initial modeling results. The test was initiated concurrent with the beginning of GWRS recharge at the MBI Centennial Park injection wells in March 2020. Once reviewed by the Panel subcommittee, the final MBI Tracer Test and Modeling report will be submitted to DDW and the RWQCB, and the project boundary areas will be presented to the Board of Directors for approval. Once approved, project boundary areas will be enforced by local well permitting agencies including the Orange County Health Care Agency.

The second Panel subcommittee will review a protocol for a study to evaluate a project specific GWRS soil aquifer treatment virus removal. This study will take place in FY 2023-24. State of California Title 22 regulations grant a standard 1-log of virus removal credit per each month that recycled water resides underground prior to extraction for drinking water supply. Currently the GWRS is granted 4-log of credit for the 4+ months that recharged water spends underground, which counts toward the total 12-log virus LRV required for the project. However, a literature review suggests that soil aquifer treatment virus removal is temperature-dependent with the standard credit assuming a groundwater temperature of 12 degrees Celsius. Greater than the standard 1-log per month of virus removal may be occurring in the Orange County Groundwater Basin where GWRS water is recharged due to the higher groundwater temperatures of 20 degrees Celsius or more. The full Panel was previously briefed on this topic during the

2020 and 2021 Panel meetings, and while they concurred that additional virus removal was likely occurring, they recommended a project-specific study evaluating the removal and including both temperature and other factors as variables. Panel subcommittee review of the protocol for such a study will facilitate future Panel review of the study results. Because any additional soil aquifer treatment virus LRV credit above the standard 1-log/month may be construed as an alternative to Title 22 regulation, DDW will likely require the full Panel to review any future LRV credit proposal based on the results of the study and confirm the proposal is protective of public health.

Two subcommittees of the full Panel will be convened to address the specific topics noted above. It is proposed that these subcommittees be comprised of the experts listed below. However, subcommittee membership may differ based on Panel member availability.

Subcommittee One, MBI Tracer Study Report
• Subcommittee Chair Larry Honeybourne, Orange County Health Care Agency (Santa Ana, CA) (retired)
• Reed M. Maxwell, Ph.D., Princeton University (Princeton, NJ)
• Mike Wehner, MPA, Orange County Water District (Fountain Valley, CA) (retired)

Subcommittee Two, Soil Aquifer Treatment Virus LRV Study Protocol
• Subcommittee Chair Larry Honeybourne, Orange County Health Care Agency (Santa Ana, CA) (retired)
• Joan B. Rose, Ph.D., Michigan State University (East Lansing, MI)
• Mike Wehner, MPA, Orange County Water District (Fountain Valley, CA) (retired)

NWRI is uniquely qualified to facilitate the Panel subcommittees. It possesses significant experience and credibility with state regulators for bringing together independent experts to review projects like GWRS. NWRI has successfully facilitated the GWRS Panel meetings since 2004. NWRI offers discounted rates to member agencies like the District, such that its facilitation services are very competitively priced when compared to typical rates for other similar professional services. Similar to the last full Panel meeting in 2021, this year's meetings will be held remotely/virtually by NWRI and thereby eliminate panel member travel expenses. Additionally, convening two targeted subcommittees of three Panel members rather than the full nine-member Panel reduces the honoraria expense. The result is a cost approximately 50% less than the FY 2023-24 budgeted amount to administer an in-person full GWRS Panel.

PRIOR RELEVANT BOARD ACTION(S)

R21-7-105: Authorize issuance of Agreement to the National Water Research Institute for an amount not to exceed $38,496 to provide administration and facilitation services for the 2021 GWRS Independent Advisory Panel meeting.

R20-7-85: Authorize issuance of Agreement to the National Water Research Institute for an amount not to exceed $36,706 to provide administration and facilitation services for the 2020 GWRS Independent Advisory Panel meeting.

R19-9-121: Authorize issuance of Agreement to the National Water Research Institute for an amount not to exceed $44,921 to provide administration and facilitation services for the 2019 GWRS Independent Advisory Panel meeting.

NATIONAL WATER RESEARCH INSTITUTE
18700 Ward St. • Fountain Valley, CA 92708 • (714) 378-3278

Proposal for Independent Advisory Panel Services

Date: September 5, 2023

To: Jason Dadakis, Executive Director, Water Quality and Technical Resources
Claire Johnson, Principal Regulatory Specialist
Orange County Water District

From: Kevin Hardy, Executive Director

Subject: Proposal for Expert Advisory Services in Support of OCWD GWRS

The National Water Research Institute (NWRI) is pleased to transmit this proposal to administer and facilitate an Independent Expert Advisory Panel (Panel) to support the Orange County Water District's (OCWD) Groundwater Replenishment System (GWRS).

Our approach is collaborative by design. We customize our processes and service offerings to meet the needs of our clients and the communities they serve. Our Panels support water resources projects in various stages of development in the United States and around the world. See the section titled **About NWRI** at the end of the proposal for more information.

Project Description

This proposal outlines the scope of work to engage two sub-Panels to address the following topics:

1. Mid-basin Injection Tracer Test Monitoring and Modeling, and
2. Project-Specific GWRS Soil Aquifer Treatment Virus Log Reduction Value.

Each sub-Panel will complete the following tasks:

a. Review one technical memo and prepare pre-meeting feedback and questions to share with the OCWD Project Team,

b. Attend one three-hour meeting with the OCWD Project Team, and

c. Write a consensus-based memo that presents the Panel's findings and recommendations in response to OCWD Project Team questions.

The estimated cost for the services described in this scope of work is $28,458 (Attachment 1).

Services Overview

A detailed Scope of Work that describes the steps in each of the services described here is in Attachment 2. **Attachment 2, along with this proposal, will be included in contract documents.**

NWRI will provide the following services:

- Administer and manage the sub-Panels. We find and contract with qualified experts to serve on Panels, communicate with them, and reimburse project-related expenses in conformance with the contract requirements.
- Facilitate planning calls or meetings. If needed, we schedule and facilitate a planning call with the sub-Panel chairperson(s) to prepare for meetings.
- Facilitate two online sub-Panel meetings. We prepare Panel members to participate in meetings; work with client Project Team members to develop, contextualize, and organize the agenda; and distribute client-created review materials before each meeting.
- Collect initial impressions and comments from sub-Panel members before each meeting to support the Project Team as it prepares for meeting presentations.
- Produce a sub-Panel meeting memo report following each meeting. We edit and produce draft and final reports that include the consensus findings, conclusions, and recommendations of the sub-Panel.

Deliverables

Manage and Administer Project. This deliverable provides communication, coordination, and billing through delivery of the final report.

Transmit Meeting Agenda to Project Team and Stakeholders. In collaboration with the Project Team, we will develop and produce a Panel meeting agenda and will distribute the pre-meeting review materials provided by the Project Team. The agenda will define objectives for the meeting; list the scientific, technical, and policy questions for the Panel to address; list the presenters, topics, and time for each topic to be covered; and allocate time to cover all subject matter necessary for the Panel members to reach consensus and give expert recommendations in the Panel report.

Facilitate Panel Meeting. Our Executive Director, Project Manager, or contracted facilitator will lead each meeting to achieve the objectives stated in the agenda in the allocated time.

Produce Draft and Final Panel Meeting Reports. Following each meeting, the sub-Panel, as directed by the Chair, will author a draft recommendation report. The report may be in the form of a technical memo or a formal report, depending on project needs. We will edit, produce, and transmit the draft report to the Project Team within four weeks of the meeting. We will transmit the final Panel Meeting Report to the Project Team as soon as possible after receiving the Project Team's responses to the draft report.

Proposed Budget

The proposed budget includes the following Panel meetings:

Mid-basin Injection Tracer Test Monitoring and Modeling sub-Panel. This will be a three-hour, online meeting that includes up to two hours of presentations and a one-hour closed working session. The sub-Panel will provide feedback before the meeting to support agenda planning and Project Team presentations, and it will write and deliver a draft memo report within four weeks after the meeting.

Project-Specific GWRS Soil Aquifer Treatment Virus Log Reduction Value sub-Panel. This will be a three-hour, online meeting that includes up to two hours of presentations and a one-hour closed working session. The sub-Panel will provide feedback before the meeting to support agenda planning and Project Team presentations, and it will write and deliver a draft memo report within four weeks after the meeting.

Proposed Payment Terms

Quarterly invoices. We submit invoices quarterly through the end of the contract period. If monthly billing is required, then we will update the budget estimate to include additional hours for finance staff.

Additional Services

Other services, which are not included in the detailed Scope of Work (Attachment 2) may be necessary or appropriate. If needed, we can provide additional services by using a change order at the rates and terms set forth in this proposal. We will ask for authorization to amend the budget before undertaking any additional work.

Contact

If you have questions or would like to discuss this proposal further, please contact Suzanne Sharkey, Project Manager, at ssharkey@nwri-usa.org or (949) 258-2093.

About the National Water Research Institute

Founded in 1991 by water utilities and civic leaders, NWRI collaborates with water utilities, regulators, and researchers in innovative ways to help develop new, healthy, and sustainable sources of drinking water. We assemble Panels of scientific, technical, and policy experts that provide credible, independent peer review of water projects. Our Panels make recommendations that support water resource management decisions grounded in science and best practices.

NWRI is organized as both a Joint Powers Agency (JPA) pursuant to the California Government Code and a 501c3 nonprofit corporation pursuant to the Internal Revenue Code. Based in Fountain Valley, California, NWRI's JPA members include:

- Inland Empire Utilities Agency
- Irvine Ranch Water District
- Los Angeles Department of Water and Power
- Metropolitan Water District of Southern California
- Orange County Sanitation District
- Orange County Water District

NWRI Project Staff

The titles, project duties, and qualifications of NWRI staff who may work on this project are listed on our website at https://www.nwri-usa.org/staff.

Current or Related Projects

Recent or ongoing projects include:

- Statewide DPR Guidance for Stakeholders and/or Regulators in Colorado, Arizona, New Mexico, and Texas
- California State Water Resources Control Board, Division of Drinking Water on:
  - DPR Public Health Determination for Preliminary Statewide Regulations
  - DPR Statewide Source Control Regulatory Guidance
  - DPR Feasibility of Uniform Statewide Criteria
  - Uniform Statewide On-Site Nonpotable Water Regulations
  - Livestock Hydration Regulatory Guidance
  - California State Water Board Division of Water Quality to Optimize Evaluation of Bioanalytical Tools for Recycled Water Policy
- Orange County Water District (CA) Integrated Groundwater Replenishment System and Santa Ana River Public Health Monitoring Projects

- Los Angeles Department of Water and Power (CA) Operation NEXT and Groundwater Replenishment Projects
- City of San Diego (CA) Pure Water San Diego
- Metropolitan Water District of Southern California (CA) Pure Water Southern California Program, Advanced Purification Center Demonstration Project
- Los Angeles Bureau of Sanitation (CA) Hyperion Membrane Bioreactor Pilot Project
- Hampton Roads Sanitation District (VA) Sustainable Water Initiative for Tomorrow
- City of Boise (ID) Water Renewal Utility Plan
- LOTT Clean Water Alliance (WA) Recycled Water Infiltration Study
- East County (CA) Advanced Water Purification Project
- Las Virgenes-Triunfo JPA (CA) Las Virgenes Reservoir Augmentation Project
- Valley Water District (CA) Regional Potable Reuse Program (San Jose)
- Anne Arundel County (MD) OurwAAter Managed Aquifer Recharge Program
- Soquel Creek Water District (CA) Pure Water Soquel Groundwater Replenishment Project
- One Water Monterey (CA) Pure Water Monterey Groundwater Replenishment Project
- Palmdale Water District (CA) Regional Water Augmentation Program

Attachment 1 ● Proposed Panel Meeting Budget

NATIONAL WATER RESEARCH INSTITUTE

Independent Advisory Panel for OCWD GWRS: 2023 Budget

Two Online Sub-Panel Meetings

	Hourly Rates		Remote Panel	
A. NWRI Staff Time	**Member**	**Non-Member**	**Hours**	**Cost**
Executive Director	$ 176	$ 264	24	$ 4,224.00
Research Scientist - Project Manager	$ 115	$ 173	40	$ 4,600.00
Technical Editor - Communication Manager	$ 106	$ 159	24	$ 2,544.00
Finance Manager	$ 95	$ 142	16	$ 1,520.00
Project Management Assistant	$ 95	$ 142	16	$ 1,520.00
Subtotal - NWRI Staff			120	**$ 14,408.00**
B. Project Administration	**Member**	**Non-Member**	**Units**	**Cost**
Flat Fully-Billed Rate for Technology, Postage, Supplies, Misc.	$ 50.00	$ 150.00	1	$ 50
Subtotal - Project Administration				**$ 50**
C. Expert Panel Member Time	**No. Panelists**	**Cost per Day**	**Days**	**Cost**
Mid-Basin Injection Subpanel				
Prepare for and Attend Meeting and Working Calls, Prepare Report	3	$ 1,000	2	$ 6,000
Subpanel Chair - Additional Effort	1	$ 1,000	1	$ 1,000
Soil Aquifer Treatment LRV Subpanel				
Prepare for and Attend Meeting and Working Calls, Prepare Report	3	$ 1,000	2	$ 6,000
Subpanel Chair - Additional Effort	1	$ 1,000	1	$ 1,000
Subtotal - Honoraria				**$ 14,000.00**
	Member	Non-Member		
Total Direct Costs				**$ 28,408**
Project Management & Administration	**0.0%**	12.5%		**$ 50**
Total Costs				**$ 28,458**

Attachment 2 • Detailed Scope of Work

Each task in this scope of work is necessary to plan and facilitate the meetings and prepare meeting reports. This proposed scope of work and deliverables are intended to:

- Establish the Panel's membership, leadership, and independence.
- Plan meetings that meet the needs of the Client's Project Team, regulators, and Panel members through each stage of the work.
- Report the Panel's consensus findings and recommendations in draft and final documents. Deliverables may consist of memos, technical memos, or formal reports, depending on the project.

Project Management and Administration

This task includes administering the expert Panel and managing project tasks to conform with the scope of work.

Identify, Engage, and Support Experts. Find, engage, administer, manage, reimburse, and compensate subject matter experts in each required discipline or area of relevant technical expertise.

- Work with the Client Project Team to develop a qualifications profile for prospective independent experts, including potential disqualifying conflicts of interest.
- Contact qualified individuals and develop a list of experts who are willing and available to participate on the Panel.
- Transmit a proposed Panel roster to the Project Team to ensure there are no known conflicts of interest.
- Prepare and transmit a final Panel roster to the Project Team.
- Engage Panel members with a letter that defines the project terms, conditions, expectations, and compensation.
- Notify the Project Team when all Panel members have signed their engagement letters and are ready to begin work.

If a Panel member must leave the Project for personal or professional reasons, we will recruit and contract with another qualified expert to fill that role.

Manage and Administer Project. Conduct all necessary and appropriate project administration and management duties. These duties include communications, records management, billing, scope management, and related logistics to support the Project Team, Client, Panel, and stakeholders.

Meeting Planning and Preparation

We will schedule, plan, and prepare for Panel meetings in compliance with relevant contract requirements and/or milestones.

Panel Meeting Planning. We will work with the Project Team to plan and articulate the full scope of the Panel meeting. This collaborative process includes the following tasks:

- Plan the Panel meeting objectives, agenda, facilitation processes, and key questions for the Panel to support the Project.
- Curate scientific, technical, policy, and related questions that the Project Team would like the Panel to advise on, referred to as the Panel Charge.
- Develop and share relevant Project background information and data that will quickly orient Panel members to the Project before the meeting.
- Identify meeting attendees, including the Project Team, consultants, state and regional regulators, and other stakeholders.
- Discuss and clarifying roles and expectations for all Panel meeting participants.

Panel Meeting Preparation. NWRI will work with the Project Team to prepare for each Panel meeting. This work includes developing the meeting agenda, compiling background materials from the Project Team, transmitting these pre-meeting review materials to the Panel before the meetings, and informing/engaging relevant Project stakeholders as identified by the Client before the meetings. Tasks include:

- Working with the Project Team to develop the meeting agenda.
- Supporting the Project Team and consultants as they define, develop, and prepare presentations on agenda topics. The Project Team will prepare and provide materials for the Panel members to review before and during the meeting.
- Facilitating the Panel meeting and distributing materials provided by the Project Team to support their presentations.
- Collecting background material from the Project Team, its partners and other stakeholders as appropriate.
- Distributing an official pre-meeting review transmittal to the Panel members by email approximately ten (10) business days before the meeting so the Panel has time to review and consider the materials. **The Project Team should provide all pre-meeting review documents to the NWRI Project Manager at least two weeks before the meeting.**
- Preparing and transmitting a meeting agenda to identified stakeholders.

- Collecting preliminary feedback and questions from the Panel members to share with the Project Team before the meeting.

Communicate Panel Meeting Logistics. NWRI will communicate logistics for each meeting to the Panel. If requested, NWRI can support the Project Team in notifying interested parties about Panel meetings and the availability of Panel meeting reports.

Meeting Facilitation

This task includes facilitating each Panel meeting and preparing and delivering the draft Panel meeting report. Panel meetings are planned to be completed in one day. The specific timing and length of panel meetings vary depending on the scope of the meeting as determined collaboratively by the Project Team and NWRI. NWRI will administer, facilitate, and moderate the meetings, including stakeholder participation at the meeting. Responsibilities include:

- **Administer the Panel meeting.** Duties include welcome, introducing NWRI to the participants, explaining the panel process, attendance, taking notes, and Panel support as described including editing, presenting, and transmitting the Panel's draft and final reports.
- **Facilitate the meeting.** NWRI and the Panel Chair will moderate the meeting. Meetings typically include an open session for the Project Team and invited stakeholders, and a private closed working session of the Panel.
- **Support the Panel process.** NWRI and the Panel Chair will keep the meeting on schedule to create a balance of Panel member engagement to exchange ideas and to have time for questions and answers.

As described above, the Project Team is responsible for the content and preparation of all scientific, technical, and policy presentations made at the meeting.

Closed Working Session. At the conclusion of the meeting presentations, the Panel will meet privately to plan and initiate drafting of the Panel Meeting Report (described in the next section). During this private session, NWRI staff and Panel members will generally:

- Determine consensus on key findings and recommendations to anchor the report.
- Prepare a plan for authoring the report based on the questions and the information presented.
- Assign report writing tasks to Panel members based on their expertise. In authoring their assigned sections, Panel members will consider information and other materials presented at the meeting and relevant findings from other concurrent efforts. Panel members will apply their expert judgment to develop informed and useful recommendations.

Panel Meeting Report

The draft and final Panel Meeting Reports reflect the Panel's consensus on the questions presented at the meeting as well as related scientific, technical, and policy issues.

This task provides for the research, writing, editing, and review of the draft and final reports. NWRI panel reports are authored by the Panel under the leadership of the Panel Chair. The reporting process begins during the Panel's private working session at the conclusion of the meeting presentations.

The report is a consensus report of the Panel, meaning that each finding and recommendation will have the support of all Panel members.

NWRI will coordinate the Panel's efforts in drafting, editing, and transmitting the reports to the Project Team for review, and ensuring the final report is clear, accurate, and timely. NWRI and the Panel members will:

- Write and submit assigned sections to the Panel Chair and the NWRI Project Manager, who work collaboratively to compile the draft report.
- Review and edit the draft report. This process is coordinated by the Panel Chair and NWRI. The first work product is the draft Panel Meeting Report.
- Transmit the draft report to the Project Team for their review to identify mistakes of fact, unintended inconsistencies, and errors or omissions in the application of relevant science. To ensure Panel independence and credibility, neither the Panel nor NWRI will negotiate findings and recommendations absent a mistake of fact or mistaken application of fact by the Panel.
- Review and address any questions that the Project Team may have about the draft report.
- Transmit the final report to the Project Team.

The Project Manager will communicate and discuss report delivery expectations with the Project Team as necessary and appropriate throughout the reporting process.

The report production schedule depends on the complexity of the subject matter, the quality of the meeting materials prepared by the Client and its consultants, Panel requests for additional data and/or information, expert availability, and report writing and production logistics.

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee
Board of Directors

From: Mike Markus

Staff Contact: M. Patel / B. Smith

Budgeted: Yes
Proposed Budget: $50,000
Cost Estimate: $38,795
Funding Source: R&R
Program/Line Item No. R23023
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: AGREEMENT TO BUCKNAM INFRASTRUCTURE GROUP FOR ASPHALT PAVEMENT EVALUATION AND REPAIR RECOMMENDATIONS

SUMMARY

Staff issued a Request for Proposals for an asphalt pavement evaluation and repair recommendation project. A total of six proposals were received. Staff has evaluated the proposals and recommends awarding an agreement.

RECOMMENDATION

Agendize for September 20 Board meeting: Authorize issuance of Agreement to Bucknam Infrastructure Group, Inc. for an amount not to exceed $38,795 for the 2023 Field Asphalt Pavement Evaluation and Repair Recommendation project.

BACKGROUND/ANALYSIS

Many of the District's sites include asphalt pavements on roadways, parking lots, and maintenance yards that total an area greater than 19 acres across 12 different sites. The sites are located in the cities of Fountain Valley, Anaheim, Orange, and Corona. Some of the asphalt pavements are failing, while others are in various stages of disrepair.

If proactively managed, asphalt pavements can have a long lifespan. Active maintenance of the surfaces reduces the lifecycle costs of asphalt pavements compared to replacements required after catastrophic failures. Staff issued a Request for Proposals (RFP) on August 8, 2023 via invitation to specific firms and advertisement on the District's website. The RFP outlined a scope of work to evaluate the condition of each of the District's asphalt pavements through visual observation and coring samples, perform an engineering analysis to develop rehabilitation recommendations and costs, hold a workshop with staff to strategically plan the rehabilitations and associated costs, and to provide a written report. Six proposals were received by the August 28 deadline. The proposals were independently reviewed and scored by a panel of operations staff members. Scoring of the proposals included evaluating qualifications of the firm and key staff, project approach, estimated level of effort, related project experience, and schedule. The scoring and fee results are presented in Table 1.

Table 1: Asphalt Evaluation Proposal Scores and Fees

Firm	Score (out of a possible 100)	Proposed Fee
Bucknam	86	$38,795
NCE	79	$41,500
Stantec	79	$44,863
GMU	79	$58,674
NOVA	53	$12,100
G3	45	$28,941

Several proposals provided strong teams, good understanding of the project needs, and consisted of well qualified staff. The highest ranked firm, Bucknam Infrastructure Group, Inc., also provided the lowest proposed fee of those that presented a well-rounded understanding of the project scope. Staff recommends award of this scope's Agreement to Bucknam.

Upon completion of this scope of work, staff will recommend an on-going rehabilitation budget strategy to keep the District's asphalt pavements in a satisfactory condition.

PRIOR RELEVANT BOARD ACTION(S)
N/A

AGENDA ITEM SUBMITTAL

Meeting Date: September 13, 2023

To: Water Issues Committee/
Board of Directors

From: Mike Markus

Staff Contact: Herndon/Sovich/Neel

Budgeted: N/A
Budgeted Amount: N/A
Cost Estimate: N/A
Funding Source: N/A
Program/Line Item No.: N/A
General Counsel Approval: N/A
Engineers/Feasibility Report: N/A
CEQA Compliance: N/A

Subject: BASIN STORAGE UPDATE FOR WATER YEAR 2022-23

SUMMARY

Staff evaluated water level conditions throughout the basin and constructed groundwater elevation contour maps representing the end of the water year. Using the "full basin" benchmark for all three aquifer layers in the basin, an accumulated overdraft of 188,000 acre-feet (AF) was calculated as of June 30, 2023. Thus, the basin experienced an annual storage increase of 70,000 AF for water year (WY) 2022-23. A brief description of the water level change and accumulated overdraft calculation will be presented.

Attachment: Presentation

RECOMMENDATION

Informational

BACKGROUND/ANALYSIS

Following the methodology outlined in the March 2007staff report entitled, "Evaluation of Orange County Groundwater Basin Storage and Operational Strategy," staff calculated the storage change and accumulated overdraft in the basin based on water levels in the three primary aquifer layers: Shallow, Principal, and Deep. Accumulated overdraft is essentially the volume of "empty basin storage" that is available to fill with groundwater.

Staff constructed groundwater elevation contour maps for each of the three aquifer layers in the basin. These hand-drawn contour maps representing end of June 2023 groundwater elevations were scanned and digitized into the District's GIS database and then used to calculate the accumulated overdraft from the full-basin condition and the annual change in storage for WY 2022-23 using the three-layer storage change methodology.

Findings

The calculated storage increased approximately 70,000 AF and resulted primarily from a significant rise in groundwater levels throughout most of the basin from June 2022 to June 2023. In the Shallow aquifer, groundwater levels increased approximately 30 to 40 feet in

the Anaheim Forebay area surrounding the OCWD recharge facilities, 20 to 50 feet near Santiago Basin, and 5 to 10 feet throughout the greater Anaheim/Fullerton Forebay area. Shallow aquifer groundwater levels increased approximately 0 to 5 feet in the Pressure area of the basin and were stable relative to the prior year near the Talbert Barrier, where elevations remained at or above protective elevations for seawater intrusion control.

In the Principal aquifer, groundwater levels rose approximately 20 to 30 feet surrounding the OCWD Anaheim recharge facilities, 20 to 60 feet in the Santiago area, 10 to 20 feet in the greater Anaheim/Fullerton Forebay area, and 20 to 40 feet in the Irvine Sub-basin. Principal aquifer groundwater levels rose 5 to 10 feet throughout most of the Pressure area of the basin, except for the IRWD Dyer Road Well Field and west end of the Talbert Barrier, where water levels decreased up to 5 feet.

In the Deep aquifer, groundwater levels rose approximately 10 to 30 feet surrounding the OCWD recharge facilities in Anaheim and near Santiago Basin. Deep aquifer groundwater levels rose approximately 0 to 10 feet throughout the Pressure area and 5 to 20 feet in the greater Anaheim/Fullerton Forebay area and within the Irvine Sub-basin. Throughout all other areas of the basin, Deep aquifer groundwater levels increased 5 to 10 feet.

Since the Shallow aquifer in the Forebay area (generally north of the 5 Freeway) behaves as an unconfined water table aquifer, the majority of the storage change in the basin typically occurs due to the rise and fall of this uppermost Shallow aquifer water table. Sediments in this area are largely comprised of coarse sands and gravels. Although over 90% of basin pumping typically comes from the Principal aquifer, the majority of pumped groundwater originates from the Shallow aquifer, which in turn is replenished by the District's recharge activities at the Forebay spreading grounds. For these reasons, the largest storage change typically occurs in the Shallow aquifer.

During WY 2022-23, the Shallow aquifer exhibited the largest storage increase, primarily due to applied recharge from both the SAR and GWRS water in the Anaheim Forebay. Due to the confined or pressurized conditions in the Principal and Deep aquifers, their groundwater level increases led to much smaller changes in groundwater storage, as shown in the following table:

Aquifer	WY 2022-23 Storage Change (AF)
Shallow	+55,000
Principal	+11,000
Deep	+4,000
Total:	**+70,000**

The total storage increase of 70,000 AF during WY 2022-23 represents the first year of increase after two consecutive years of decline. This storage increase that was more than was originally budgeted assuming average rainfall but was significantly less than expected given the well above-average rainfall.

During WY 2022-23, 25.7 inches of rain fell at the District's field headquarters in Anaheim, representing 94% above the 36-year average of 13.26 inches for that location. The estimated incidental recharge of 24,700 AF (Table 1) was significantly below expectations based on the historical correlation between rainfall and incidental recharge over the last several years. The incidental Recharge term incorporates all unmeasured subsurface inflows and outflows to and from the basin (e.g., outflow to Los Angeles County and inflow from/outflow to the ocean). Unlike natural recharge which depends solely on rainfall, subsurface outflows depend on relative basin conditions between Orange and Los Angeles counties as well as barrier operations and coastal groundwater elevations relative to sea level. Reasons for the incidental recharge being lower than expected during WY 2022-23 may include:

- Measured SAR storm flow recharge approximately 30,000 AF higher than expected based on empirical correlation between rainfall and SAR stormflow recharge;
- Local inflows and recharge along the lower SAR (below Ball Road) more accurately measured by Forebay Operations staff than in past years;
- Possible storm flow inaccuracies at 5th St. bridge stream gage in Santa Ana;
- Dry antecedent conditions along the mountain-front areas than have not recovered completely from two prior consecutive years of below average rainfall;
- Late season rains (7.38 inches in March) during warmer growing season possibly leading to greater evapotranspiration losses;
- Possible time lag of mountain-front recharge from late rains to infiltrate the basin;
- Uncertainty in storage calculation near Santiago Basin. Shallow aquifer groundwater levels were approximated in prior year due to several dry monitoring wells; and
- Possible increase in outflow to Los Angeles County in the Principal aquifer.

Total demand for WY 2022-23 was 353,603 AF, representing a 10% decrease from the prior water year. The decrease was likely due to continued conservation and reduced landscape irrigation during the unusually wet winter and cool spring. Basin pumping was approximately 244,300 AF, which was about 5% lower than the prior water year. Basin replenishment water purchased from MWD totaled 16,900 AF.

Table 1 shows a comparison of budgeted versus actual inflows and outflows to and from the basin for WY 2022-23. The budgeted values were developed prior to commencement of the water year based on an assumption of average rainfall conditions.

Table 1. Groundwater Budget for Water Year 2022-23: Budgeted vs. Actual

Inflows & Outflows (acre-feet)	Original Budget (Assuming Avg. Rain ~13 in.)	Actual (Rain 25.7 in.)
SAR Base and Storm Flow Recharge	127,000	168,400[(1)]
Incidental Recharge	56,000	24,700
GWRS (Forebay, Barrier, and Mid-Basin)	110,000	101,900
MWD Replenishment Water Purchases	22,000	16,900
Other (Alamitos Barrier, Talbert OC-44)	3,000	2,400
Total Water into Basin	318,000	314,300
Total Basin Pumping @ 77% BPP	-295,000	-244,300
Storage Change	+23,000	+70,000
Accumulated Overdraft	235,000	188,000

[(1)]Includes 10,374 AF of percolation from prior year's carryover storage in recharge basins and 27,625 AF of Santiago Creek and other local inflows.

Notable variations in the original versus actual water budget include:

- 50,700 AF less basin pumping than budgeted;
- 41,400 AF more recharge from the SAR than budgeted;
- 31,300 AF less incidental recharge than budgeted; and
- 8,100 AF less GWRS recharge than budgeted due to unavailable capacity in full recharge basins during exceptionally wet periods.

PRIOR RELEVANT BOARD ACTION

3/21/07 M07-44 Receive and file staff report, titled "Evaluation of Orange County Groundwater Basin Storage and Operational Strategy," and adopt new three-layer storage change methodology with the associated new full basin condition.

Basin Storage Update
Water Year 2022-23

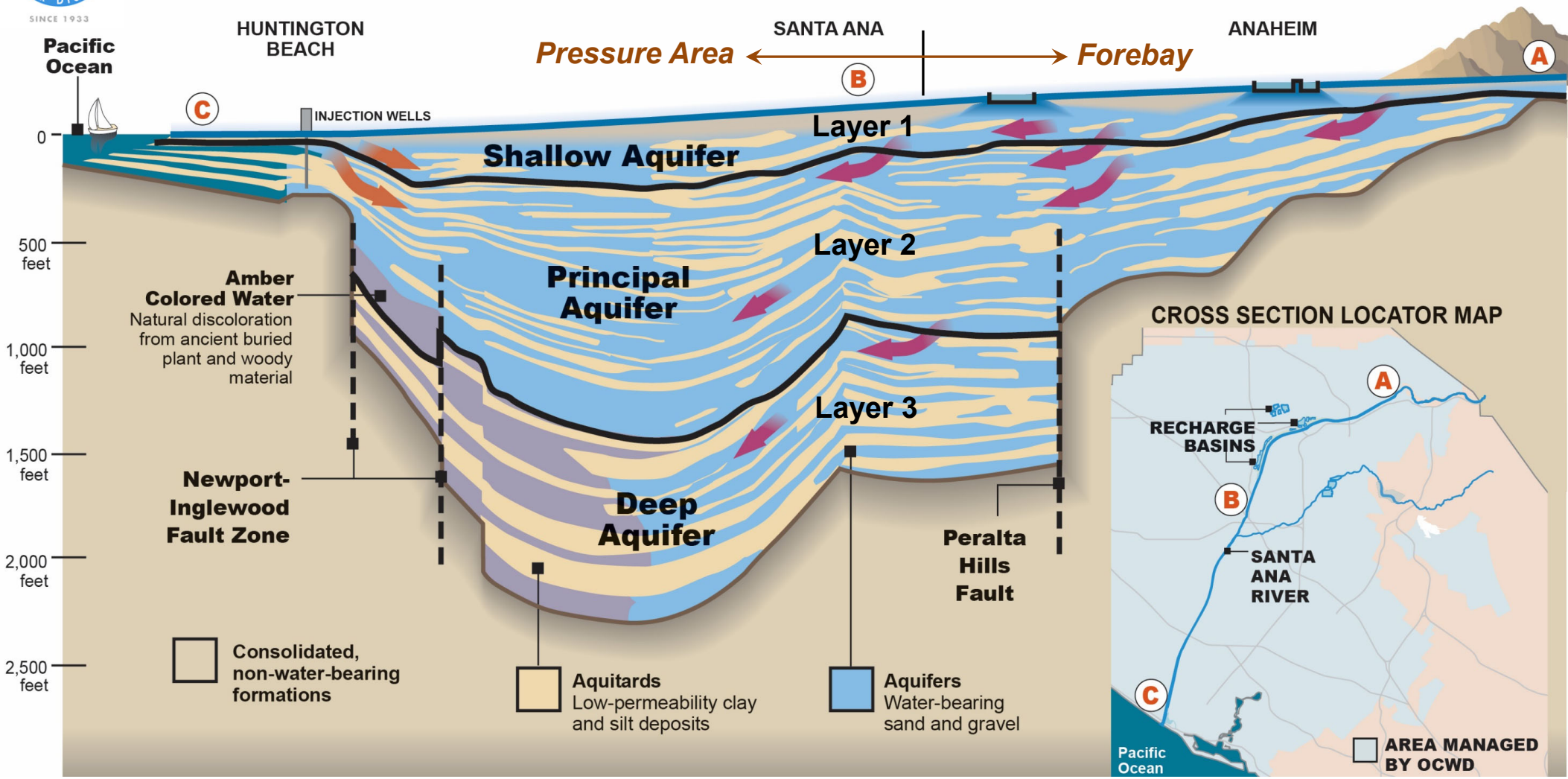
OCWD Water Issues Committee Meeting

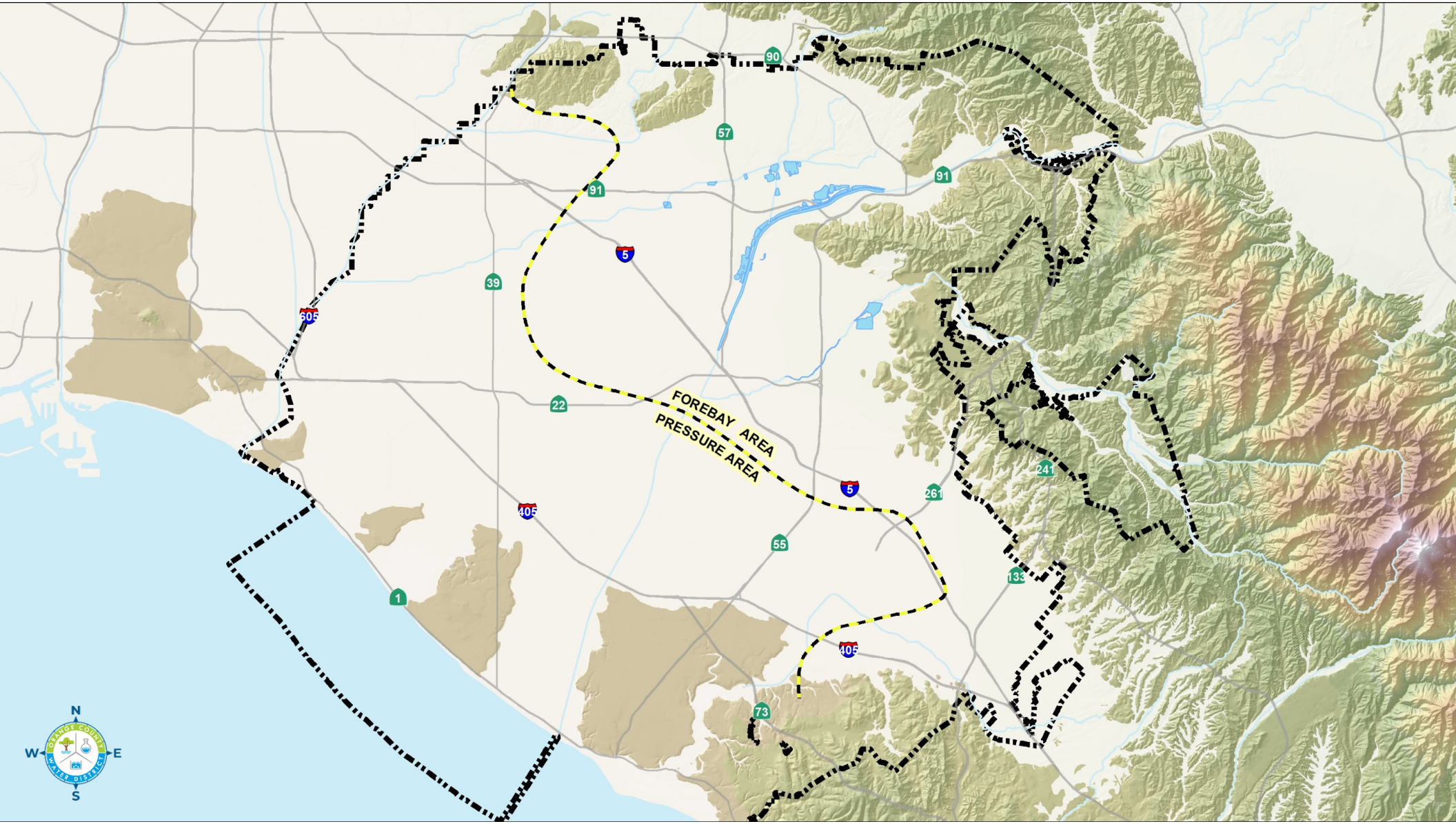
September 13, 2023

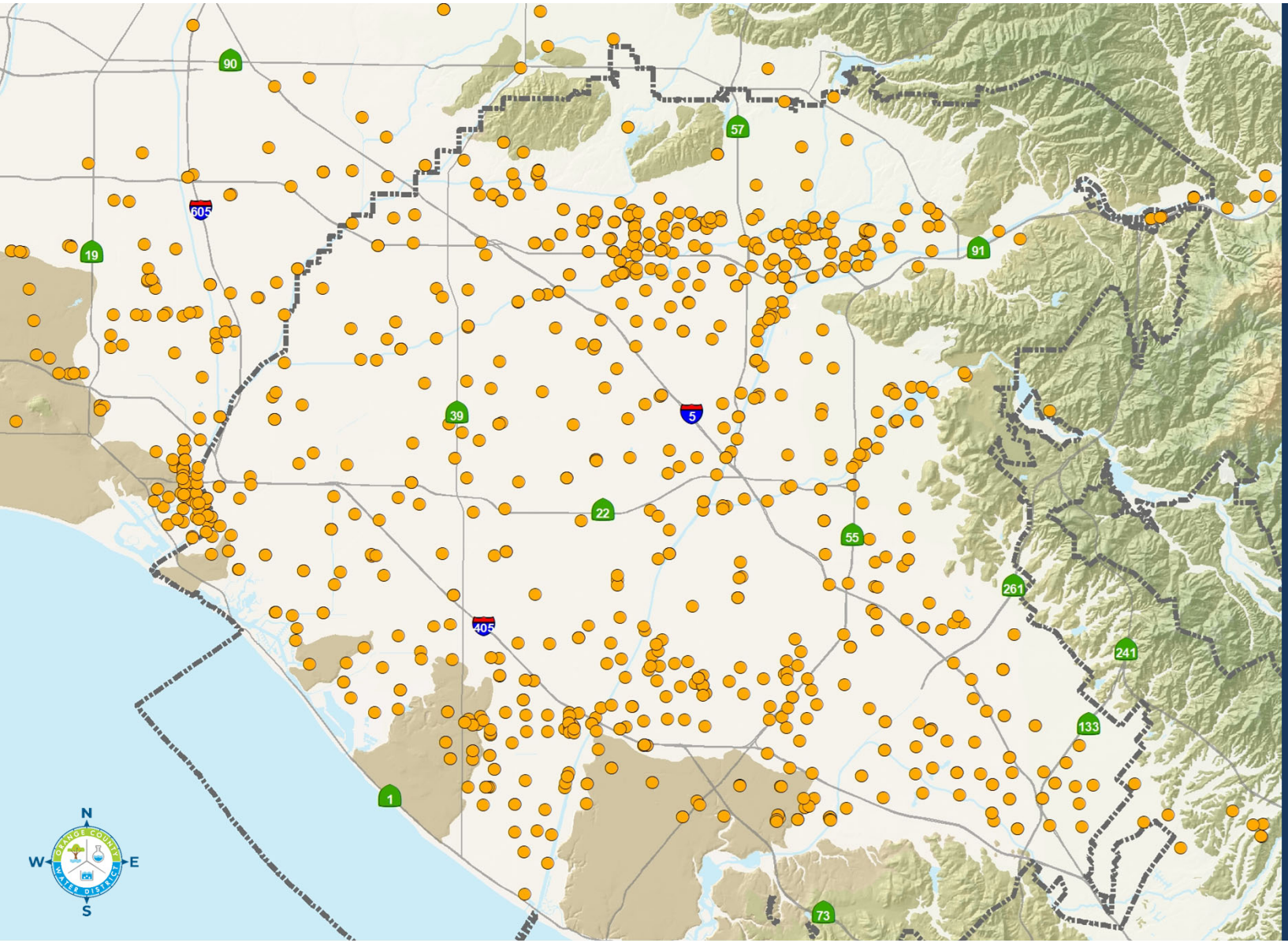
WY 2022-23 Highlights

- **+** Recharge 41,400 AF more than budgeted from SAR
  - 25.7 inches of rainfall at FHQ (~2x the 36-year average)
- **+** Basin pumping 50,700 AF less than budgeted
- **–** Incidental recharge 31,300 AF less than budgeted
- **–** GWRS recharge 8,100 AF less than budgeted

Storage change was calculated for the three aquifer layers in the basin.



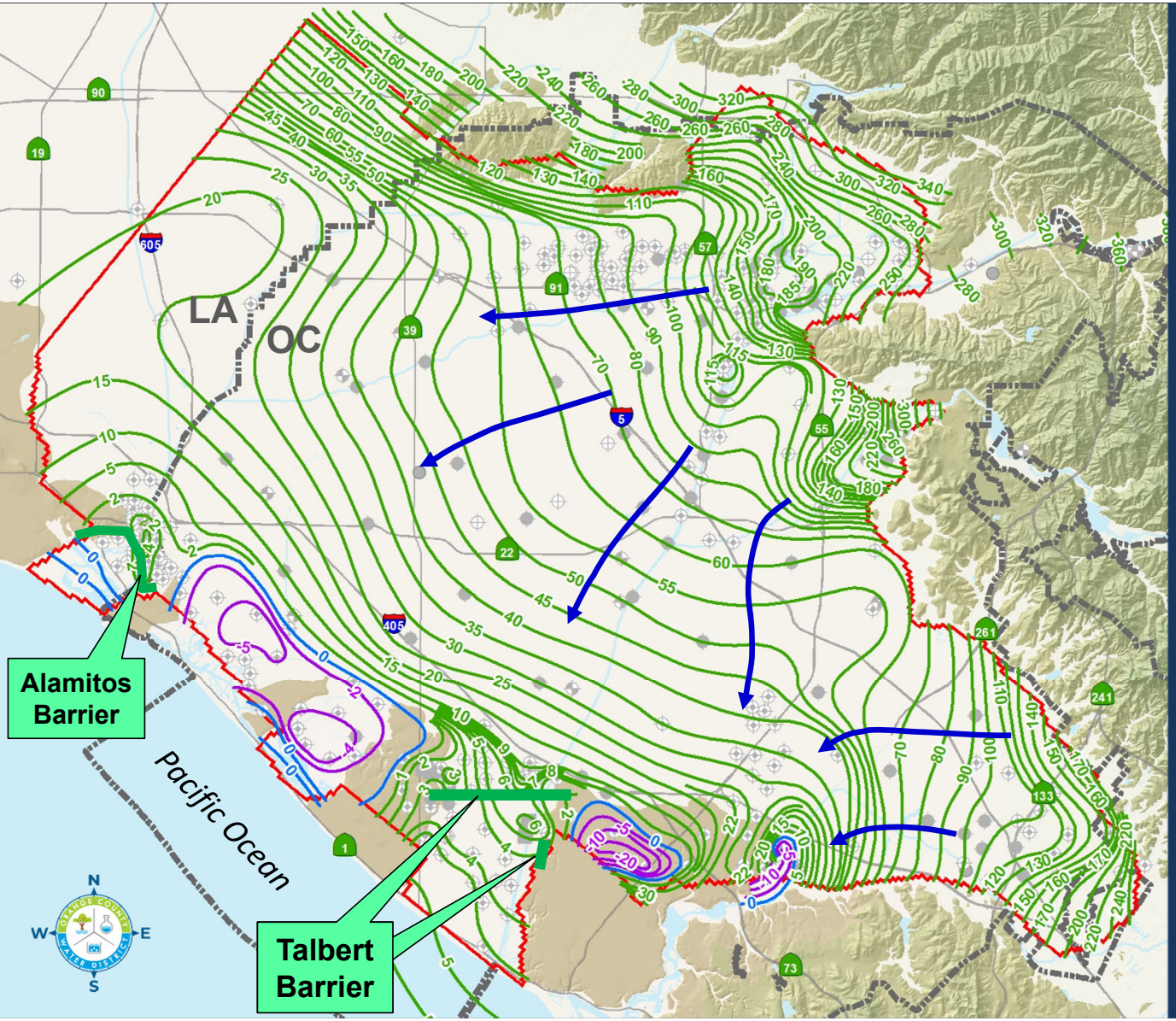

FOREBAY AREA
PRESSURE AREA
90
57
91
91
5
39
605
22
405
55
1
5
241
261
133
405
73
N
W
E
S



Several hundred water levels used for constructing groundwater contour maps…

Collaboratively measured near June 30:

- **OCWD staff**
- **OC Producers**
- **LA Producers**
- **WRD**

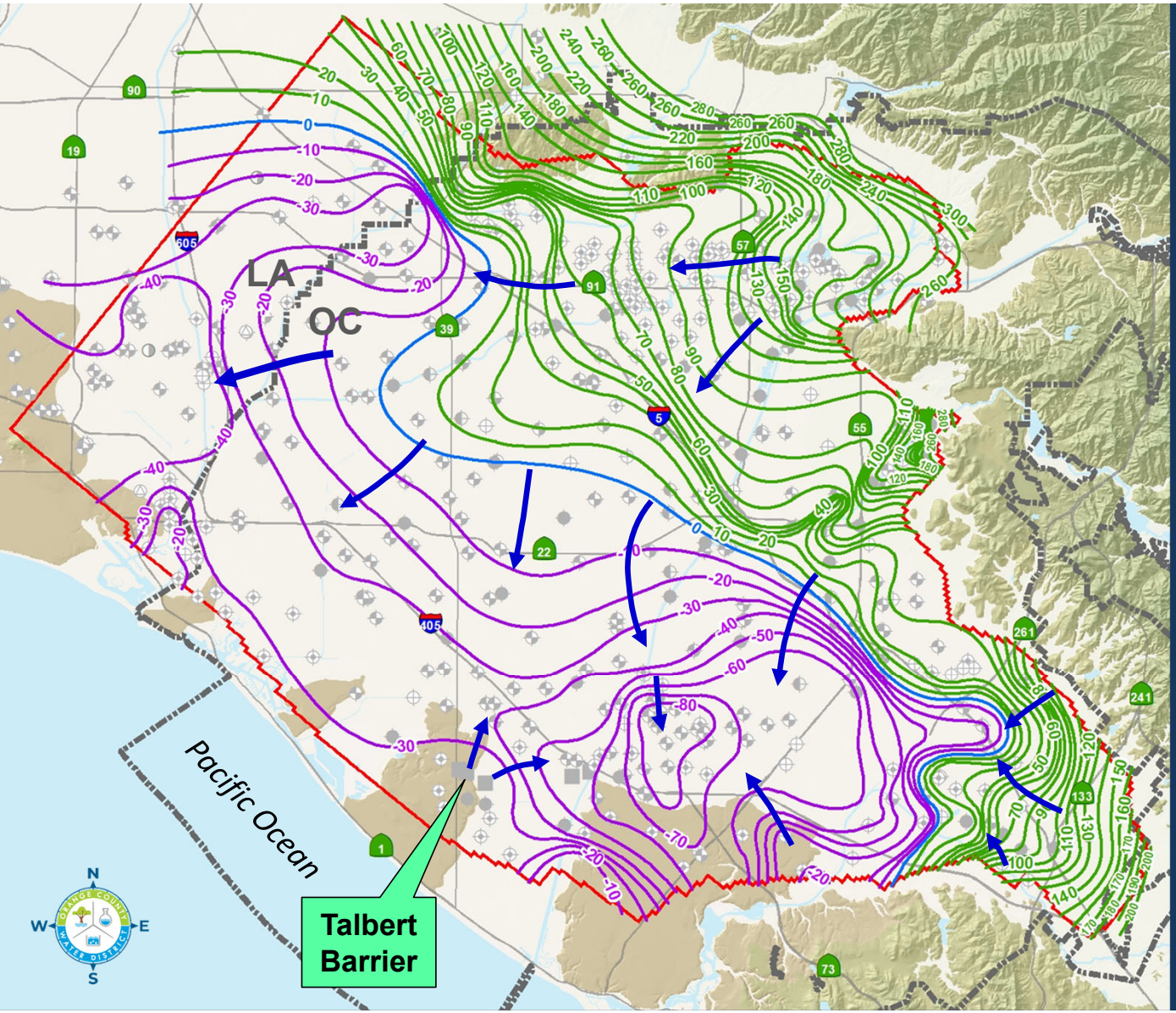


Shallow Aquifer Groundwater Elevations June 2023

Relatively smooth parallel contours since not much shallow pumping.

Groundwater flows to the SW from Forebay towards the coast.

Groundwater levels at or above protective elevations seaward of Talbert Barrier.

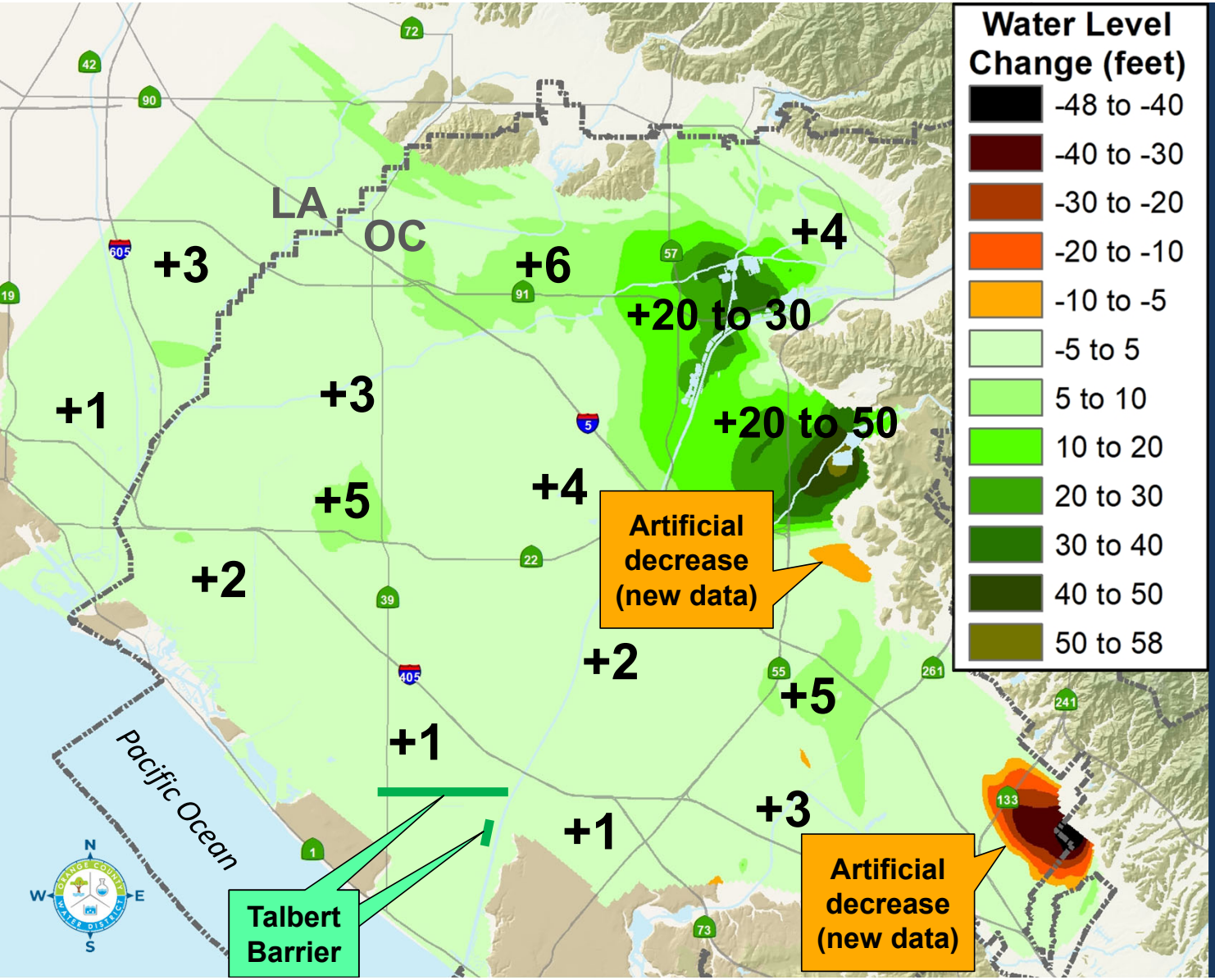


Principal Aquifer Groundwater Elevations June 2023

Groundwater flows from Forebay towards the coast and LA County

Steep hydraulic gradients and depressions below sea level due to pumping

Typical low point around IRWD DRWF and Mesa Water wells (-80 ft msl)

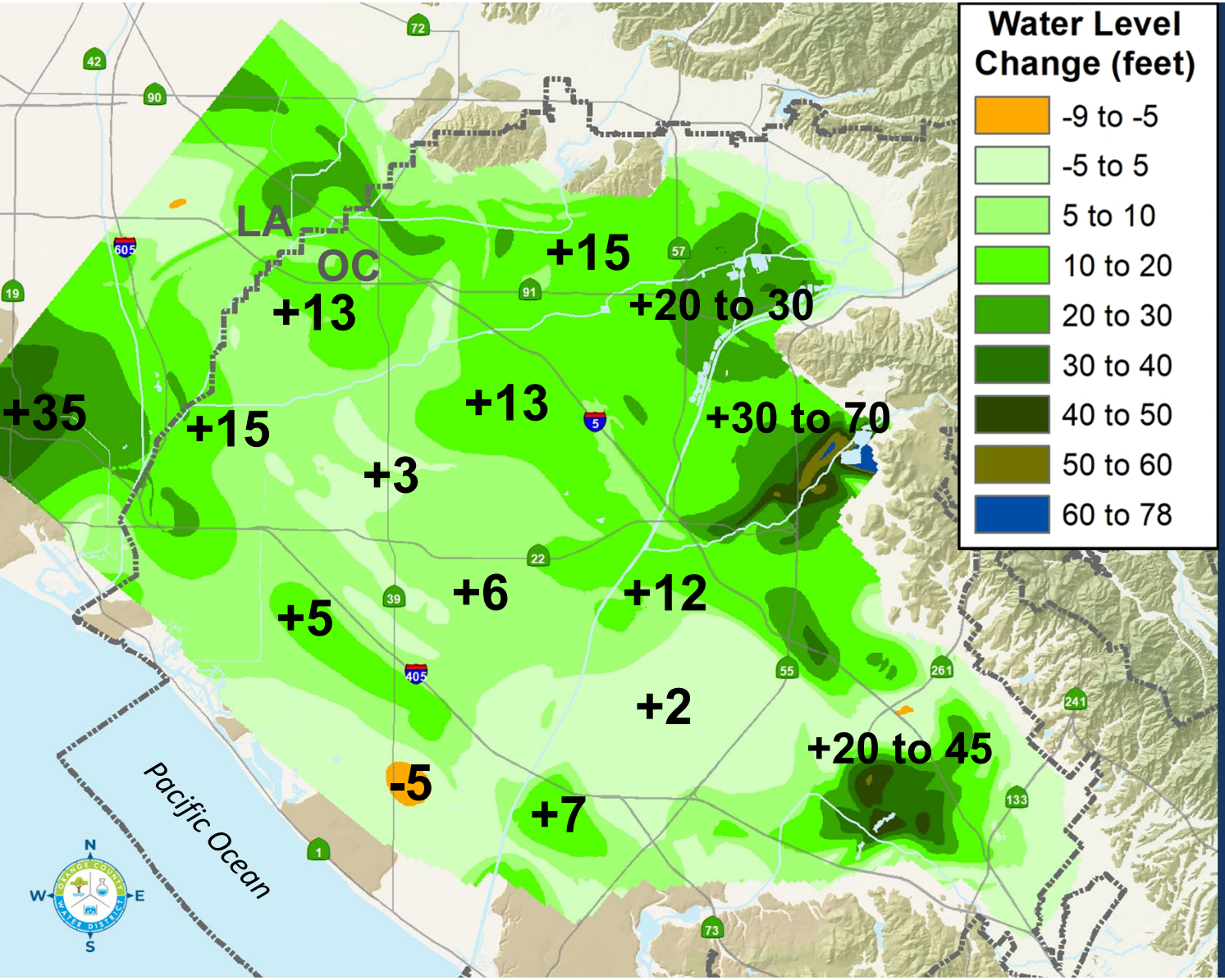


Shallow Aquifer Water Level Change

June 2022 to June 2023

Anaheim and Orange: significant increase

Pressure Area: slight increase



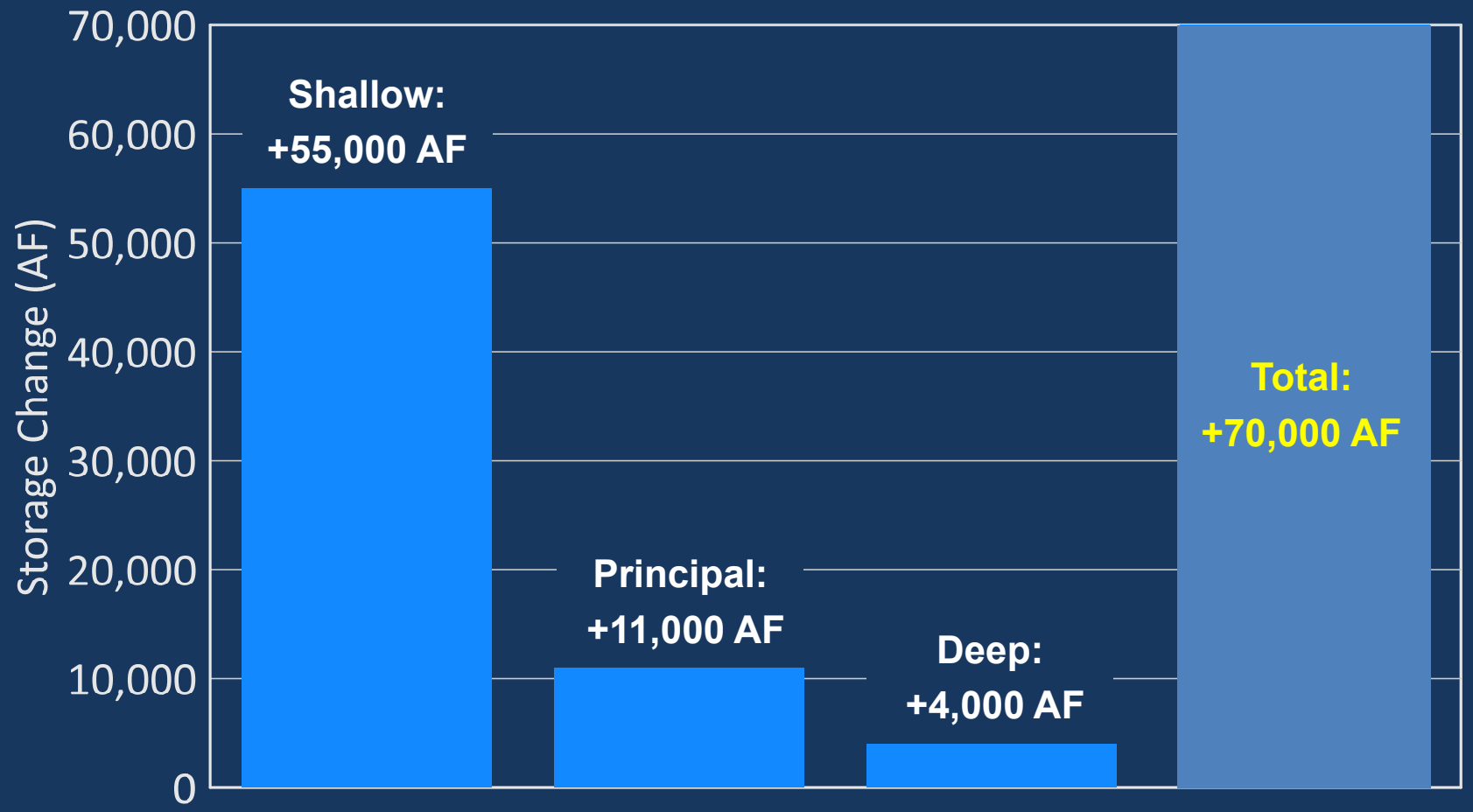
Principal Aquifer Water Level Change

June 2022 to June 2023

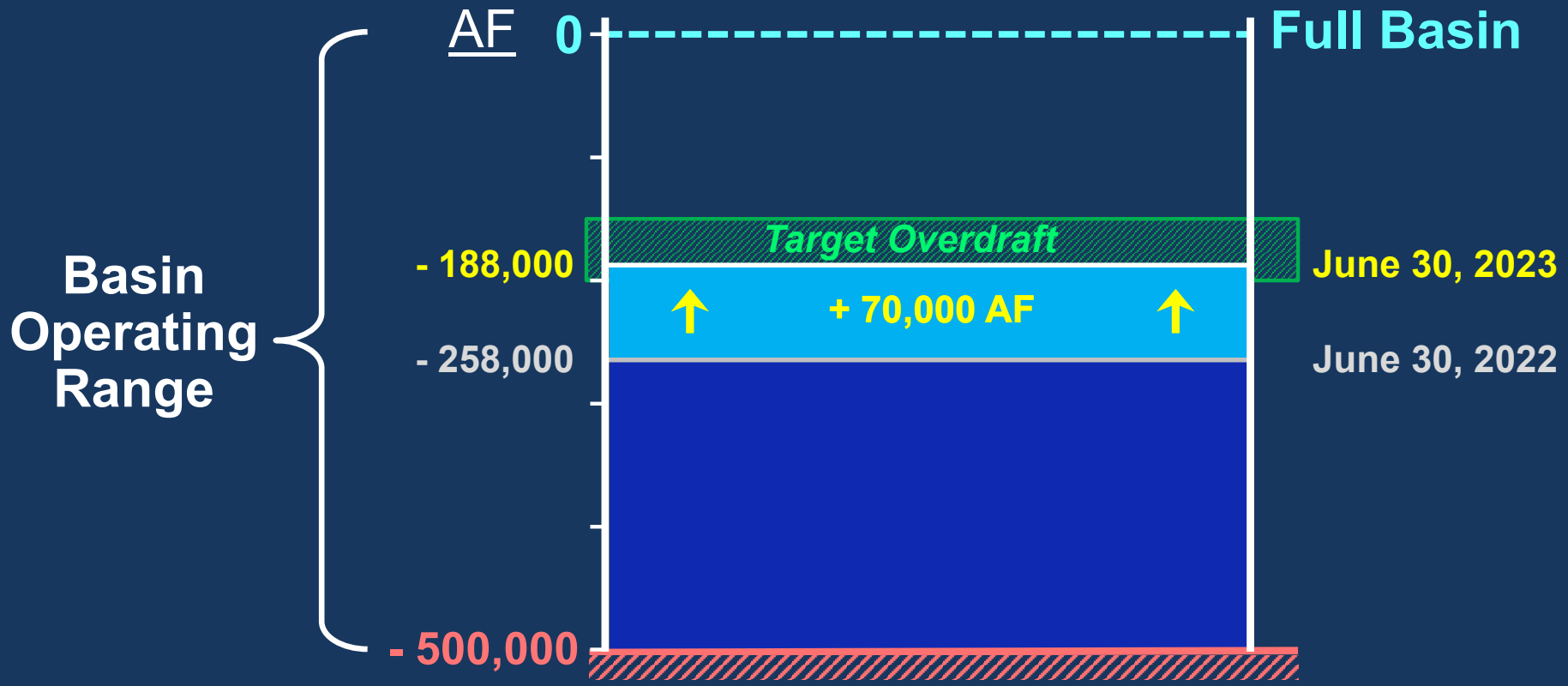
Anaheim and Orange: major increase

Pressure Area: moderate increase

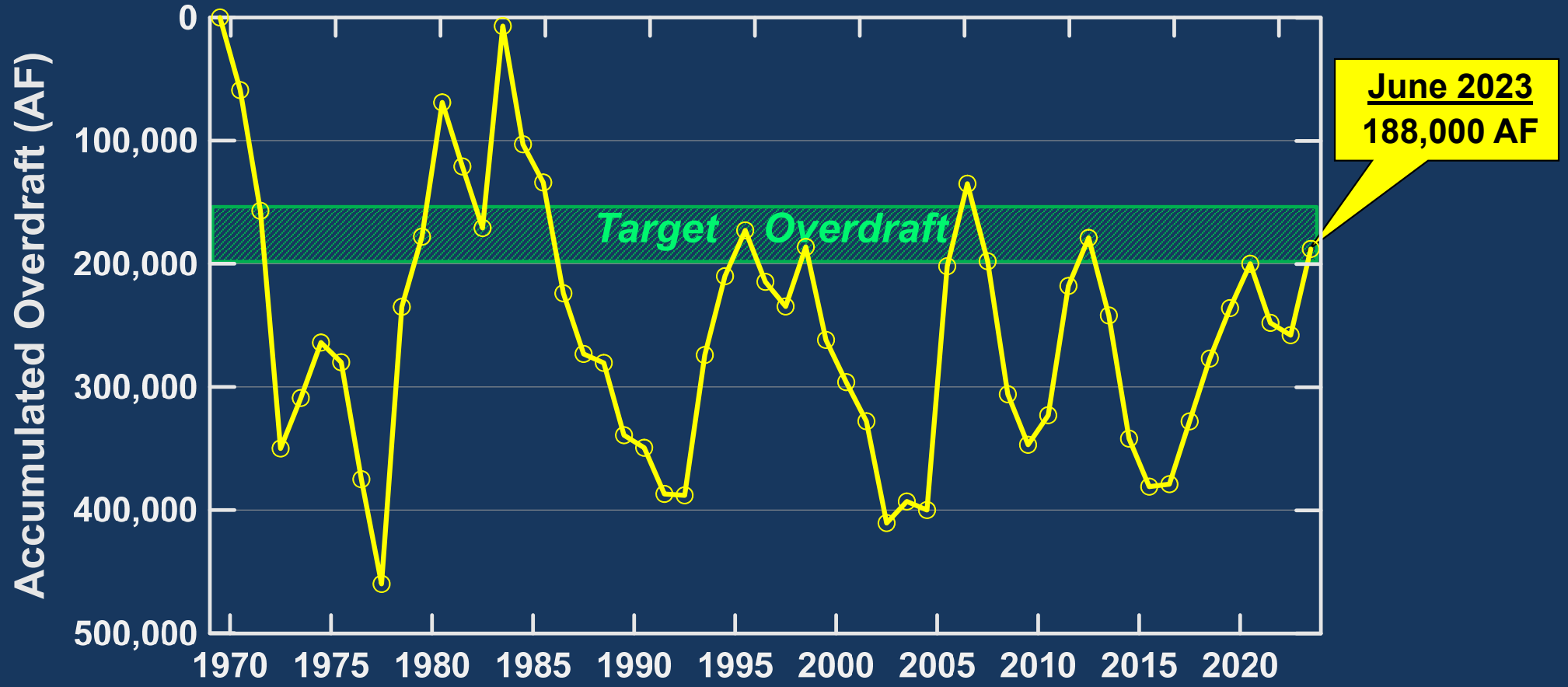
WY 2022-23 annual storage change was calculated for all three aquifer layers



Accumulated Overdraft for June 30, 2023: 188,000 AF below Full



Accumulated Overdraft Since 1969



WY 2022-23 Groundwater Balance

Inflows & Outflows (acre-feet)	Budget (Rain~13 in.)	Actual (Rain 25.7 in.)	Difference
SAR Base and Storm Flow Recharge	127,000	168,400	41,400
Incidental Recharge	56,000	24,700	-31,300
GWR System (Forebay, Barrier, and MBI)	110,000	101,900	-8,100
MWD Supplies	22,000	16,900	-5,100
Other (Alamitos Barrier, Talbert OC-44)	3,000	2,400	-600
Total Water Into Basin	318,000	314,300	-3,700
Total Basin Pumping @ 77% BPP	-295,000	-244,300	50,700
Storage Change	+23,000	+70,000	
Accumulated Overdraft	235,000	188,000	

End of Presentation