

AGENDA
WATER ISSUES COMMITTEE MEETING
WITH BOARD OF DIRECTORS *
ORANGE COUNTY WATER DISTRICT
18700 Ward Street, Fountain Valley, CA 92708
Wednesday, February 12, 2020 8:00 a.m.

* 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 **February 19, 2020** Board meeting Agenda for approval.

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 –4)

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 JANUARY 15, 2020

RECOMMENDATION: Approve minutes as presented

2. LIMITED TERM EMPLOYMENT AGREEMENT WITH JAMES KALINOWSKI FOR TECHNICAL SUPPORT SERVICES

RECOMMENDATION: Agendize for February 19 Board meeting: Authorize execution of a Limited Term Employment Agreement with James Kalinowski for an amount not to exceed \$190,000 per year for two years for technical consulting services for the period of March 16, 2020 to March 16, 2022

3. ACCEPT COMPLETION OF CONTRACT NO. GA-2019-1, 2018 GREEN ACRES PROJECT (GAP) PIPELINE VALVE REPAIRS PROJECT (T.E. ROBERTS, INC.)

RECOMMENDATION: Agendize for February 19 Board meeting:

- 1) Ratify issuance of Change Orders No. 1 and No. 2 to Contract No. GA-2019-1, 2018 Green Acres Project (GAP) Pipeline Valve Repairs Project, in the amount of (\$24,964.99); and
- 2) Accept completion of work and authorize filing a Notice of Completion

4. ISSUE AGREEMENT WITH JAMISON ENGINEERING TO SUPPORT THE GWRS PIPELINE INSPECTION WORK

RECOMMENDATION: Agendize for February 19 Board meeting: Authorize issuance of an Agreement to Jamison Engineering Contractors, Inc to support the GWRS Pipeline 2020 Inspection Work for an amount not to exceed \$152,900

MATTER FOR CONSIDERATION

5. COST-SHARING AGREEMENT BETWEEN OCWD AND WATER REPLENISHMENT DISTRICT AND CONSULTING SERVICES AGREEMENT WITH INTERA FOR MODEL EVALUATION REGARDING UNDERFLOW ACROSS COUNTY LINE

RECOMMENDATION: Agendize for February 19 Board meeting:

- 1) Authorize execution of the Agreement between OCWD and Water Replenishment District of Southern California to Jointly Fund a Third-Party Review of the Orange County Basin and Central Basin Groundwater Flow Models; and
- 2) Authorize issuance of a professional services agreement in an amount not to exceed \$56,000 to Intera, Inc. to perform the Phase I scope of work in its proposal to evaluate the hydrogeology and groundwater models constructed respectively by OCWD and the U.S. Geological Survey for the Water Replenishment District

INFORMATIONAL ITEM

6. PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) UPDATE

CHAIR DIRECTION AS TO ITEMS IF ANY TO BE AGENDIZED AS MATTERS FOR CONSIDERATION AT THE FEBRUARY 19 BOARD MEETING

DIRECTORS' ANNOUNCEMENTS/REPORTS

GENERAL MANAGER'S ANNOUNCEMENTS/REPORTS

ADJOURNMENT

WATER ISSUES COMMITTEE MEMBERS

Committee Members

Cathy Green - Chair
Dina Nguyen - Vice Chair
Ahmad Zahra
Jordan Brandman
Tri Ta

Alternates

Steve Sheldon
Roger Yoh
Kelly Rowe
Denis Bilodeau
Vicente Sarmiento

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) 378-3233, by email at jdurant@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
January 15, 2020 @ 8:00 a.m.

Director Green called the Water Issues Committee meeting to order at 8:00 a.m. in MWDOC 101 conference room in Fountain Valley. The Assistant District Secretary called the roll and reported a quorum of the Committee as follows.

Committee Members

Cathy Green
Dina Nguyen (absent)
Ahmad Zahra
Jordan Brandman
Tri Ta

OCWD

Mike Markus – General Manager
John Kennedy – Executive Director
Christina Fuller – Assistant District Secretary
Jeremy Jungreis – General Counsel

Alternates

Steve Sheldon
Roger Yoh (absent)
Kelly Rowe
Denis Bilodeau
Vicente Sarmiento

CONSENT CALENDAR

The Consent Calendar was approved upon motion by Director Zahra, seconded by Director Ta, and carried [5-0].

Yes – Green, Zahra, Brandman, Ta, Sheldon,

1. Minutes of Water Issues Committee Meeting held December 11, 2019

The Minutes of the Water Issues Committee meeting held December 11, 2019 were approved as presented.

2. Renewed Agreement with the Department of the Army for Continued Access to Monitoring Well Lam-1

Recommended for approval at January 22 Board meeting: Authorize execution of no-cost License No. DACA09-3-20-3250 with the Department of the Army for five years of continued access to OCWD monitoring well LAM-1.

3. Agreement with DDB Engineering for the Preparation of 2019 GWRS Annual Report

Recommended for approval at January 22 Board meeting: Authorize issuance of Agreement to DDB Engineering Inc. for an amount not to exceed \$53,000 to provide consulting services for the preparation of the calendar year 2019 GWRS Annual Report.

4. Amendment No. 4 to Agreement with James Pike for Prado Vireo Monitoring

Recommended for approval at January 22 Board meeting: Approve Amendment No. Four to Agreement Number 0637 with James Pike to extend the termination date to December 31, 2021 and increase the not to exceed reimbursement amount by \$134,000 over a two-year period.

5. Amendment No. 2 to Intertox, Inc. for PFAS Toxicological Consulting Services

Recommended for approval at January 22 Board meeting: Authorize issuance Amendment No. 2 to Agreement No. 1373 to Intertox, Inc. for an amount not to exceed \$107,000 for additional toxicological consulting services.

6. Decommissioning of Monitoring Well Sa5 and Construction of Replacement Monitoring Well OCWD-M58

Recommended for approval at January 22 Board meeting: Adopt resolution approving the proposed monitoring well SA5 destruction and construction of replacement monitoring well OCWD-M58, certifying the Final IS/MND, authorizing issuance of a Notice Inviting Bids, and authorizing issuance of an RFP for inspection services during monitoring well destruction and installation.

7. Purchase Order for Two Gas Chromatograph / Mass Spectrometers (GC/MS) for the Philip L. Anthony Water Quality Laboratory

Recommended for approval at January 22 Board meeting: Authorize issuance of a Purchase Order to Agilent Technologies for the total amount of \$256,380 for two Agilent 8890B Gas Chromatographs: one coupled with a 5977B Single Quadrupole (SQ) Mass Spectrometer and stainless-steel ion source, and the other coupled with a 5977B Single Quadrupole (SQ) Mass Spectrometer and Extractor EI ion source.

8. Authorize Issuance of Work Order with Environmental Science Association for Construction Monitoring Services for the Groundwater Replenishment System Final Expansion Project In the Amount of \$124,290

Recommended for approval at January 22 Board meeting: Authorize issuance of a work order with Environmental Science Association (ESA) under the Agreement No. 1135 for construction monitoring services for the Groundwater Replenishment System Final Expansion Project in an amount not to exceed \$124,290.

MATTERS FOR CONSIDERATION

9. Phase III Study of Forecast-Informed Reservoir Operations at Prado Dam

Executive Director Greg Woodside reported that Phase II of a Scoping Study on Forecast-Informed Reservoir Operations (FIRO) at Prado Dam has been completed. He stated that staff recommends proceeding with Phase III of the FIRO Study, which is receiving support from federal and state funding of a broader FIRO program. Mr. Woodside presented the timeline of the major tasks for Phase III then the Committee took the following action.

Upon motion by Director Ta, seconded by Director Zahra and carried [5-0], the Committee recommended that the Board at its January 22 meeting: Authorize amending agreement with UC San Diego/Scripps Institution of Oceanography by adding an amount not to exceed \$291,000 for Phase III of Study on Forecast-Informed Reservoir Operations at Prado Dam.

Ayes – Green, Zahra, Brandman, Ta, Sheldon

10. Modification to Per- And Polyfluoroalkyl Substances (PFAS) Program

General Manager Mike Markus recalled that in November 2019 the District established a per- and polyfluoroalkyl substances (PFAS) policy to assist the Producers with treating groundwater that

exceeds a 10 part-per-trillion Perfluorooctanic acid (PFOA) Response Level that is expected to be set by the State Division of Drinking Water. He reported that staff was directed at that time to develop an amendment to the policy regarding how the District and Producers would coordinate in any litigation efforts to recover PFAS expenses against potential responsible parties. He reviewed the proposed changes to the PFAS policy and advised that staff expects to have a draft of the agreement out for review in late January or early February.

Representatives from Yorba Linda Water District, Irvine Ranch Water District and the City of Anaheim suggested changes and additions to the policy to address Producer concerns.

Upon motion by Director Sheldon, seconded by Director Ta and carried [5-0], the Committee directed Staff to modify the policy to consider Producers comments and present the updated policy at the January 22 Board meeting.

Ayes – Green, Zahra, Brandman, Ta, Sheldon

CHAIR DIRECTION AS TO ITEMS IF ANY TO BE AGENDIZED AS MATTERS FOR CONSIDERATION AT THE JANUARY 22 BOARD MEETING

It was agreed to place item No.10 as a Matter for Consideration at the January 22 Board meeting.

ADJOURNMENT

There being no further business, the meeting was adjourned at 9:00 a.m.

Cathy Green, Chair

AGENDA ITEM SUBMITTAL

Meeting Date: February 12, 2020

To: Water Issues Committee
Board of Directors

From: Mike Markus

Staff Contact: M. Markus/M. Patel

Budgeted: No

Budget Amount: N/A

Cost Estimate: \$190,000 per year

Funding Source: General Fund

Program/Line Item No.: 1050.53001.9900

General Counsel Approval: N/A

Engineers/Feasibility Report: N/A

CEQA Compliance: N/A

**Subject: LIMITED TERM EMPLOYMENT AGREEMENT WITH JAMES KALINOWSKI
FOR TECHNICAL SUPPORT SERVICES**

SUMMARY

James (Jay) Kalinowski retired from the District as Process Control and System Manager in March 2019. A renewal of an existing Agreement with Mr. Kalinowski is recommended so that he can provide technical support to the Water Production, Recharge Operations and oversee electrical and controls issues for the GWRS Final Expansion (GWRSFE) construction project. Mr. Kalinowski possesses unique knowledge and experience on electrical, process control systems (PCS), and computerized maintenance management systems (CMMS) from his 32 years of employment at the District.

Attachment: Limited Term Employment Agreement

RECOMMENDATION

Agendize for February 19 Board meeting: Authorize execution of a Limited Term Employment Agreement with James Kalinowski for an amount not to exceed \$190,000 per year for two years for technical consulting services for the period of March 16, 2020 to March 16, 2022.

DISCUSSION/ANALYSIS

Jay Kalinowski was employed by OCWD for 32 years in various roles involving the management of the Instrumentation and Electrical (I&E) of Water Factory 21, Green Acres Project and GWRS. His position held prior to retirement has been as the Process Control and System Manager overseeing the I&E department providing electrical, PCS, CMMS and asset management oversight for GWRS, GAP, Recharge and other district facilities. During his 32 years at the District, Mr. Kalinowski has acquired unique knowledge that will be valuable to assist the Water Production and Recharge Operations staff and provide support on process control monitoring, electrical and asset management. In addition to managing these duties, Mr. Kalinowski has been the sole staff source of electrical and instrumentation support for the design and now construction of the GWRS Final Expansion (GWRSFE). His primary duties would be to continue in that role during construction of the project. The rate of construction progress will accelerate over the next two years and require even greater electrical and controls oversight, which Mr. Kalinowski will provide. This is the main reason for seeking a two year term for the employment agreement renewal.

Mr. Kalinowski's scope of work under this limited term contract will include the following activities:

- Provide support and guidance to the new Process Control and System Manager, Executive Director of Operations, and GWRP Program Manager
- Review and comment on the construction contractor submittals and Request for Information (RFI) for the GWRPFE
- Provide construction management support for GWRPFE including addressing electrical and controls related field issues discovered during construction.
- Assist GWRPFE construction manager, Butler Engineering, with the installation and upgrade of the current Delta V Process Control System software and hardware.
- Assist staff with the ongoing development of the Computerized Maintenance Management System and the development of maintenance practices
- Assist with ongoing maintenance and programming of the Delta V software program for the GWRP Process Control System
- Assist the Engineering department as needed with electrical, controls, and instrumentation support for capital improvement and R&R projects
- Review GWRP power consumption and instrumentation data
- Provide general technical consulting on an as-needed basis

Mr. Kalinowski possesses specialized knowledge of OCWD facilities which will provide a unique resource. Jay has been the sole electrical and instrumentation support for district facilities and their associated issues associated with the GWRPFE construction project. Mr. Kalinowski has agreed to work limited hours for the District as a consultant to assist with the activities listed above at an hourly rate of \$150 per hour.

PRIOR RELEVANT BOARD ACTION(S) N/A

LIMITED TERM EMPLOYMENT AGREEMENT

(James Kalinowski)

THIS LIMITED TERM EMPLOYMENT AGREEMENT is entered into as of **March 16, 2020** by and between the ORANGE COUNTY WATER DISTRICT, a political subdivision of the State of California (hereinafter, "OCWD"), James Kalinowski (hereinafter, "EMPLOYEE"), for the employment of EMPLOYEE by OCWD for the period commencing March 4, 2020 through the termination date as established in Section Three herein below, in accordance with the following terms and conditions:

SECTION ONE: EMPLOYMENT AND DUTIES OF EMPLOYEE

1.1 OCWD hereby employs EMPLOYEE, and EMPLOYEE hereby accepts employment from OCWD, in the capacity of PCS & Electrical Advisor, commencing as of March 4, 2019.

1.2 During EMPLOYEE's employment with OCWD, EMPLOYEE shall do and perform all services, acts or things necessary or advisable to fulfill the duties and responsibilities as directed by the Executive Director of Operations.

1.3 EMPLOYEE shall work not more than twenty-five (25) hours in any work week.

1.4 Unless otherwise, the employment services of EMPLOYEE shall be performed at the offices of OCWD, located at 18700 Ward Street, Fountain Valley, CA; provided, however, that OCWD may require EMPLOYEE to travel temporarily to other locations to perform services for or on behalf of OCWD.

1.5 EMPLOYEE shall, to the best of EMPLOYEE's ability and experience, loyally and conscientiously perform all of the duties and obligations required of EMPLOYEE, either expressly or implicitly by the terms of this Agreement or the provisions of the OCWD Personnel Manual (hereinafter, the "Personnel Manual"), as adopted by the Board of Directors of OCWD and as may be amended by the Board of Directors in its legislative discretion from time to time (copy of which has been provided to EMPLOYEE); provided, however, that in the event of a conflict between this

Agreement and the Personnel Manual, this Agreement shall supersede and prevail of the Personnel Manual.

SECTION TWO: COMPENSATION AND BENEFITS

2.1 As of the date of commencement of employment as set forth in Paragraph 1.1, EMPLOYEE shall receive wages based on an hourly rate of \$150, with a do not exceed of \$190,000 per year and \$380,000 for the term of the contract.

2.2 For and during the term of employment, EMPLOYEE shall **NOT** be entitled to all of the benefits provided within the contract period and enjoyed by full-time or part-time employees of OCWD, as set forth in the Personnel Manual.

SECTION THREE: TERM OF EMPLOYMENT

3.1 OCWD and EMPLOYEE hereby expressly understand and acknowledge that EMPLOYEE is employed by OCWD, for a period not to exceed a two-year duration.

3.2 While OCWD and EMPLOYEE anticipate that the term of employment under this Agreement shall be approximately 2 years from the date of commencement of EMPLOYEE's employment pursuant to Paragraph 1.1 hereinabove, the actual date of termination of employment shall be determined by the completion of duties as determined by the District. In this regard, OCWD shall provide EMPLOYEE at least 14 days' written notice of the termination of employment due to the completion of duties.

3.3 Notwithstanding the provisions of Paragraphs 3.1 and 3.2 hereinabove, OCWD and, EMPLOYEE each reserve the right to terminate this Agreement and the EMPLOYEE's employment with OCWD, at any time, with or without cause.

SECTION FOUR: MISCELLANEOUS

4.1 Effect of Personnel Manual: To the extent not inconsistent with the provisions of this Agreement, the Personnel Manual is incorporated herein by this reference and shall govern the terms and conditions of EMPLOYEE's employment with OCWD, and the employment relationship of EMPLOYEE and OCWD, in all matters not expressly set forth herein.

4.3 Integration: This Agreement, together with all of the provisions of the Personnel Manual not inconsistent with any of the terms and conditions herein, represents the entire understanding of OCWD and EMPLOYEE as to the employment of EMPLOYEE by OCWD; and this Agreement, as complemented by the provisions of the Personnel Manual not inconsistent with the terms and conditions contained herein, supersedes any and all other agreements and understandings, either oral or in writing, between OCWD and EMPLOYEE with respect to the employment of EMPLOYEE by OCWD. Each party to this Agreement expressly acknowledges that no representations, inducements, promises or agreements, orally or otherwise, have been made by any party, or any person acting on behalf of any party, which are not embodied herein, and that no other agreement, statement, representation or promise not contained in this Agreement or in the Personnel Manual shall be of any force or effect.

4.4 Construction and Amendment: This Agreement shall be governed by the laws of the State of California. This Agreement may not be modified, altered or amended except in writing signed by OCWD and EMPLOYEE.

4.5 Effective Date: This Agreement shall be deemed executed by the parties as of the date first above written.

APPROVED AS TO FORM:

ORANGE COUNTY WATER DISTRICT

By _____
General Counsel, OCWD

By _____

President

By _____

General Manager

By _____

Employee

AGENDA ITEM SUBMITTAL

Meeting Date: February 12, 2020

To: Water Issues Committee
Board of Directors

From: Mike Markus

Staff Contact: C. Olsen/R. Bouley

Budgeted: Yes

Budgeted Amount: \$155,000

Cost Estimate: \$116,635

Funding Source: R&R

Program/Line Item No.: R18026

General Counsel Approval: N/A

Engineers/Feasibility Report: N/A

CEQA Compliance: N/A

Subject: ACCEPT COMPLETION OF CONTRACT NO. GA-2019-1, 2018 GREEN ACRES PROJECT (GAP) PIPELINE VALVE REPAIRS PROJECT (T.E. ROBERTS, INC.)

SUMMARY

The 2018 Green Acres Project (GAP) Pipeline Valve Repairs Project was completed in January 2020. Staff recommends filing a Notice of Completion for Contract GA-2019-1.

RECOMMENDATION

Agendize for February 19 Board meeting:

- 1) Ratify issuance of Change Orders No. 1 and No. 2 to Contract No. GA-2019-1, 2018 Green Acres Project (GAP) Pipeline Valve Repairs Project, in the amount of (\$24,964.99);
- 2) Accept completion of work and authorize filing a Notice of Completion.

BACKGROUND/ANALYSIS

Due to the age of the GAP distribution system, an annual repair and rehabilitation budget has been set aside to address maintenance and replacement needs. The Board authorized award the contract for GA-2019-1 2018 Green Acres Project (GAP) Pipeline Valve Repairs Project to T.E. Roberts to address seventeen locations where valve boxes have been paved over by the local jurisdictions, and the valves are completely inaccessible. These valves cannot be operated for preventative maintenance, nor can they be closed in the event of emergency damage to the distribution system. Staff prioritized making these valves operable as the highest importance. Staff did include replacing one broken valve in the project since it is adjacent to a buried valve and will be exposed when the buried valve box is repaired.

After awarding the contract for the work, Staff was informed that four of the locations could not be completed due to street moratorium. These will be completed in the future when the street moratorium is lifted. There are four of locations in a street that will be reconstructed within 1-2 years, and the valves will be adjusted to grade at that time by the City's contractor. Staff also had one GAP valve to replace as an emergency replacement and valve box adjustments to perform at four additional locations not indicated in the original plans. Staff issued Change Order No. 1 in the amount of \$635.01 and deductive Change Order No. 2 to T.E. Roberts in the amount of (\$25,600)

to add the additional repairs and remove the moratorium locations from the contract. T.E. Roberts has completed the contract work at the remaining locations.

A summary of the project expenditures is shown in Table 1:

Table 1: 2018 GAP Pipeline Valve Repairs Project Expenditures

Description	Budget	Project Expenditures
Design (Completed by OCWD Staff)	\$ 0	\$ 0
Permitting (Included in Construction Contract)	\$ 0	\$ 0
Construction	\$ 141,600	\$ 141,600
CCO #1		\$ 635
CCO #2		(\$ 25,600)
Construction Management (By Staff)	\$ 0	\$ 0
Project Contingency/Other Project Costs	\$ 14,400	\$ 0
Total Project Budget	\$ 155,000	\$ 116,635

PRIOR RELEVANT BOARD ACTION(S)

05/22/19, R19-5-64: Award Contract No. GA-2019-1, 2018 Green Acres Project (GAP) Pipeline Valve Repairs Project, to T.E. Roberts, Inc.

12/05/18, M18-134: Authorize Publication of a Notice Inviting Bids for Contract No. GA-2019-1, Green Acres Project (GAP) Pipeline Valve Repairs Project

AGENDA ITEM SUBMITTAL

Meeting Date: February 12, 2020

To: Water Issues Committee
Board of Directors

From: Mike Markus

Staff Contact: S. Scott-Roberts / B. Smith

Budgeted: No

Budgeted Amount: NA

Cost Estimate: \$152,900

Funding Source: R&R

Program/Line Item No.: NA

General Counsel Approval: NA

Engineers/Feasibility Report: NA

CEQA Compliance: NA

**Subject: ISSUE AGREEMENT WITH JAMISON ENGINEERING TO SUPPORT THE
GWRS PIPELINE INSPECTION WORK**

SUMMARY

In September 2018, the 78-inch diameter GWRS Unit I pipeline was epoxy lined to protect the pipeline. In April 2020, there is a scheduled 14-day GWRS outage for the GWRSFE Project. Staff would like to use this scheduled outage to inspect the epoxy work within the pipeline. Staff requested a proposal from Jamison Engineering to allow staff and outside professionals access into the GWRS pipeline to perform this inspection. Staff is recommending issuing an agreement to Jamison Engineering in the amount of \$152,900 to provide this service.

Attachments:

- Jamison Engineering Contractors, Inc. proposal

RECOMMENDATION

Agendize for February 19 Board meeting: Authorize issuance of an Agreement to Jamison Engineering Contractors, Inc to support the GWRS Pipeline 2020 Inspection Work for an amount not to exceed \$152,900.

DISCUSSION

The 13.8-mile Groundwater Replenishment System (GWRS) pipeline was put into service in January 2008. The pipeline is a cement mortar lined and coated steel pipe which telescopes in diameter from 78-inches, to 72-inches, to 66-inches, and finally to 60-inches. Short duration plant shutdowns have provided staff the opportunity to inspect the GWRS pipeline. These inspections revealed signs of deterioration of the cement mortar lining on the interior of the steel pipeline. Due to the corrosive index of GWRS water, the water appears to have absorbed minerals from the cement mortar lining (CML) thereby loosing particles within the CML into the product water. Water Production staff revised operations to increase alkalinity in the GWRS product water to better protect the mortar lining. However, the deterioration of the CML is gradually continuing, and causing dissolved mortar and sand to flow from the lining into the OCWD's recharge basins and injection wells.

Staff completed a project in September 2018 that applied a thin layer of epoxy onto the cement mortar lining within the 78-inch diameter GWRS Unit I pipeline. This section of

the pipeline begins at the GWRS treatment plant in Fountain Valley and ends at Edinger Avenue. This work was finished prior to completion of the Mid Basin Injection Wells project to ensure that the new injection wells do not receive any particles from the observed CML deterioration. Since completion of this project, staff has been continuously monitoring the particles within the GWRS water at the Mid Basin outlet near Edinger Avenue and the Santa Ana River with bypass filters. The amount of particles within the GWRS water has drastically decreased since the epoxy work was completed. This gives staff good indication that the epoxy continues to provide protection and is intact. In addition to the particle data, staff would also like to physically inspect the epoxy lining to ensure it is in good condition.

As part of the GWRS Final Expansion Project, the Delta V operational software, which runs the treatment plant, will be upgraded to the latest version. This software upgrade requires a 14-day outage of the treatment facility. This GWRSFE project outage is scheduled for April 20, 2020 through May 4, 2020. Staff would like to use this scheduled outage as an opportunity to physically inspect the GWRS pipeline. It will have been 18 months since the application of the epoxy and therefore a long enough duration to see indications of coating failure – should there be any. This work was not budgeted in fiscal year 2019-2020 since the GWRSFE Project outage dates were not confirmed until after the GWRSFE general contractor received their Notice-To-Proceed (November 2, 2019) and established a baseline construction scheduled for their work.

As with past inspections, staff requested a proposal from Jamison Engineering to provide access into the pipeline by removing manhole lids, pumping out standing water, providing ventilation, and providing confined space rescue to staff and outside professionals that will be entering the pipeline. Staff also requested Jamison to provide entry into manholes within Unit II and Unit III of the GWRS pipeline to spot check the thickness of the CML in those reaches. This data will be logged and used to determine if the remaining reaches of the GWRS pipeline will need to be rehabilitated as well.

The proposal provided by Jamison Engineering is for an amount not to exceed \$152,900. The costs associated with this work are reasonable and in-line with cost proposals we have received for this work in the past. Jamison has successfully provided similar pipeline services in the past for the District and completely understands the work and coordination that is necessary and the strict time frames involved. Therefore, staff is recommending issuing an agreement with Jamison to provide this GWRS pipeline inspection service.

In addition to OCWD staff, FD Thomas, the general contractor that applied the epoxy coating, and CSI Services, the coating inspection firm that oversaw the epoxy work, will be entering the pipeline to perform an inspection. FD Thomas will be ready to provide any necessary repairs, if needed, during this outage. Staff will provide an update to the Board of Directors summarizing the findings of this inspection work and provide recommendations for the remaining GWRS pipeline.

PRIOR RELEVANT BOARD ACTIONS:

6/20/2018, R18-6-69: Authorize filing of Categorical Exemption with Orange County Recorder's Office; and Accept bid, waive inconsequential bid informalities, and award Contract GWRS-2018-1, Groundwater Replenishment System Unit I Pipeline Rehabilitation Project: Alternative A (30 days) to the lowest responsive bidder F.D. Thomas, Inc. in the amount of \$4,833,540; and Authorize issuance of Agreement to CSI Services, Inc. for Inspection and Testing Services for an amount not to exceed \$72,252; and Authorize issuance of Agreement to Jamison Engineering Contractors, Inc for Construction Support Services for an amount not to exceed \$159,400; and Reduce project budget by \$1.9 million, for a total project budget of \$6,100,000.

Quote # 02767

To: OCWD
Attention: Sandy Scott-Roberts, P.E.
Date: January 9, 2020
REFERENCE: **GWRS Inspection Project 2020**

Dear Sandy,

We propose to do the following for the price **not to exceed \$152,900.00** (*One Hundred Fifty-Two Thousand Nine Hundred Dollars and no/100 Cents*). Includes all applicable taxes.

The following is a detailed breakdown & description of Jamison Engineering's tasks and responsibilities for this portion of the project:

- *Unit 3*
 - *742+30 Remove manway and bit test*
 - *670+00 Remove manway and bit test*
- *Unit 2*
 - *470+00 Remove manway and bit test*
 - *449+60 Pump from blow off then remove manway and install 6" electric pump and perform visual inspection*
 - *386+10 Remove manway. Install pump and lower level to 2 inches. Install sandbags*
- *Unit 1*
 - *211+74 Remove manway and ventilate for inspection*
 - *193+45 Remove manway and ventilate for inspection*
 - *104+55 Remove manway and install 6" electric pump. Ventilates for inspection*
 - *83+40 Remove manway and ventilate for inspection*
 - *28+88 Remove manway and ventilate for inspection*
 - *303+00 Pump from blowoff. Remove manway and finish pumping with electric pump. Ventilates for inspection*

Pre-Shut Down

- | | |
|--|-------------------|
| 1. Meetings, Safety Paperwork, Administrative costs - | \$3,000.00 |
| 2. 2 men – 1 day with equipment to remove dirt from vault cover, remove nuisance water and debris from 11 vaults - | \$5,400.00 |
| 3. Install construction signage, Traffic Control - | \$3,000.00 |

Shut Down

- | | |
|---|--------------------|
| • Day #1 – 1st 12 hour shift (0600-1800 hrs) - | \$24,000.00 |
| ○ 2 – Un-bolting and blind flange removal teams – 3 men per team with equipment | |
| ○ 2 – Pump teams, 3 men per team with pumps, vehicles & equipment. | |
| • Day #2 – 2nd 12 hour shift (0600 - 1800 hrs) - | \$24,000.00 |
| ○ 2 – Un-bolting and blind flange removal teams – 3 men per team with equipment | |
| ○ 2 – Pump teams, 3 men per team with pumps, vehicles & equipment. | |
| • Day #3 – (0600 – 1800 hrs) - | \$22,000.00 |
| ○ 2- Pump teams if needed. 3 man with equipment | |
| ○ 1- 6 man inspection team | |
| ○ 1- unbolting team if needed 3 man with equipment | |
| • Day #4 – (0600 – 1800 hrs) - | \$12,000.00 |
| ○ 1- 6 man inspection team with equipment | |
| • Day #5 – (0600 – 1800 hrs) - | \$12,000.00 |
| ○ 1- 6 man inspection team | |
| • Materials, Equipment & Rental costs | \$11,500.00 |
| • Contingency | \$36,000.00 |
| ○ 3 days for 6 man entry team if needed for additional entries or repairs | |

Total cost - (not to exceed) = \$152,900.00

Note:

- **Adjustments to the “*Total Cost – not to exceed*” shall be made for any Contingency area(s) not used.**

We sincerely appreciate the opportunity of presenting this quotation. Please do not hesitate to contact me should you have any questions.

Respectfully Submitted,

Andrew Jamison

Project Manager

Jamison Engineering Contractors, Inc.

Cell: 714-620-5048

Office: 714-434-9196

AGENDA ITEM SUBMITTAL

Meeting Date: February 12, 2020

To: Water Issues Committee
Board of Directors

From: Mike Markus

Staff Contact: R. Herndon

Budgeted: No

Budgeted Amount: \$0

Cost Estimate: \$56,000
(split 50/50 with WRD)

Funding Source: General Fund

Program/ Line Item No.: 1075.53010.9900

General Counsel Approval: Yes

Engineers/Feasibility Report: N/A

CEQA Compliance: N/A

Subject: COST-SHARING AGREEMENT BETWEEN OCWD AND WATER REPLENISHMENT DISTRICT AND CONSULTING SERVICES AGREEMENT WITH INTERA FOR MODEL EVALUATION REGARDING UNDERFLOW ACROSS COUNTY LINE

SUMMARY

OCWD and Water Replenishment District of Southern California (WRD) staff have negotiated the attached agreement to collaborate and share the costs for a consultant to evaluate the two districts' respective groundwater flow models with the goal of reducing uncertainty in the estimates of underflow across the Los Angeles County-Orange County line. Per Board authorization, OCWD staff requested and received a proposal from Intera, Inc., a firm that is uniquely qualified to perform this evaluation. Intera's proposal to conduct the first phase of the evaluation includes a \$56,000 cost, which would be split equally between the districts.

Attachments:

- 1) Proposed Agreement between OCWD and WRD to Jointly Fund a Third-Party Review of the Orange County Basin and Central Basin Groundwater Flow Models
- 2) Proposal from Intera, Inc. dated 12/26/19 for evaluation of the two flow models

RECOMMENDATIONS

Agendize for February 19 Board meeting:

1. Authorize execution of the Agreement between OCWD and Water Replenishment District of Southern California to Jointly Fund a Third-Party Review of the Orange County Basin and Central Basin Groundwater Flow Models; and
2. Authorize issuance of a professional services agreement in an amount not to exceed \$56,000 to Intera, Inc. to perform the Phase I scope of work in its proposal to evaluate the hydrogeology and groundwater models constructed respectively by OCWD and the U.S. Geological Survey for the Water Replenishment District.

BACKGROUND/ANALYSIS

The proposed agreement between OCWD and WRD provides for a collaborative effort and cost sharing for third-party review and comparison of the respective groundwater models developed by OCWD and the U.S. Geological Survey (USGS) for WRD. The OCWD 5-layer basin model has provided estimates of underflow to LA County ranging from 5,000 to 25,000 acre-feet per year. More recently, the USGS, under contract with WRD, completed a major revision to its 12-layer groundwater model of the Central Basin in LA County. The USGS model estimates of underflow are substantially less than the OCWD basin model, and in some years the USGS model indicates net flow *into* Orange County.

Understanding the amount of groundwater flow across the county line has long been a topic of interest between OCWD and WRD, and staff of both agencies agree that this is best addressed via an open exchange of technical information and analyses. Because each agency has spent decades developing their respective sophisticated and calibrated groundwater models, each with different underflow estimates, a logical next step is to examine each model for their similarities and differences and how well each model represents the hydrogeologic conditions in the region around the county line.

OCWD and WRD staff believe an objective third-party review of each model and the underlying hydrogeologic conditions will provide answers to the reasons for the different models' output and recommendations for either or both models to improve the accuracy of their respective underflow estimates. OCWD believes that the results of this effort will provide a path to narrow the gap between the two models via model refinement (if appropriate) and ultimately increase confidence in the underflow estimates.

With Board authorization, OCWD staff requested and received a proposal from Intera, Inc. as the most qualified consultant to perform this evaluation. Intera has worked on model development for both agencies, including in the region along the county line. For OCWD, Intera constructed the Alamitos Gap flow model which extends into LA County and was recently expanded to the north along the county line and to the southeast in the Sunset Gap area. Intera has also been tasked with modeling work for WRD and is already familiar with the USGS Central Basin model. This experience has engendered confidence by OCWD and WRD staff in Intera's technical abilities and expected objectivity in their analysis and findings for the recommended model evaluation effort.

Intera structured its proposal in two phases, with Phase I being an initial comparison of the two numerical models, including their respective calibrations, water budgets and simulated groundwater flow directions. Depending on the results of Phase I, OCWD and WRD staff may recommend proceeding with Phase II by requesting a cost estimate from Intera, subject to OCWD Board approval. OCWD staff requests authorization to execute the cost-sharing agreement with WRD and a professional services agreement for the Phase I scope of work with Intera in an amount not to exceed \$56,000.

PRIOR RELEVANT BOARD ACTION(S)

11/20/19 M19-141; Authorize issuance of an RFP to Intera to evaluate the hydrogeology and respective groundwater models constructed by OCWD and the USGS for WRD.

**Agreement between
Orange County Water District
and
Water Replenishment District of Southern California
to Jointly Fund a
Third-Party Review of the Orange County Basin and Central Basin
Groundwater Flow Models**

This Agreement is entered into this _____ day of _____, 2020, ("Effective Date") by and between the Orange County Water District ("OCWD") and the Water Replenishment District of Southern California ("WRD"), collectively referred to hereafter as "Parties" or individually as "Party."

SECTION 1 – RECITALS

1. WRD is a special district created pursuant to California Water Code, Section 60000, *et seq.*, adopted by the California legislature in 1955.
2. WRD has operated since 1959 to protect and preserve the quantity and quality of the groundwater supplies in the Central and West Coast groundwater basins which serve as the source of nearly 50 percent of the water used by the 4 million people overlying WRD's 420-square-mile service area.
3. WRD's mission includes managing and safeguarding the groundwater resources of the Central and West Coast Basins by ensuring its water quality and by maximizing the amount of groundwater in those basins.
4. OCWD is a special district created by the Orange County Water District Act adopted by the California legislature in 1933.
5. OCWD has operated since 1933 to manage the Orange County Groundwater Basin ("Orange County Basin"), which supplies approximately 77 percent of the water used by 20 cities and water agencies to serve 2.5 million Orange County residents over a 316-square-mile service area.
6. OCWD's mission includes managing and safeguarding the groundwater resources of the Orange County Basin through water conservation and replenishment, ensuring its water quality, ensuring a reliable supply of water for the region, and maximizing the amount of groundwater in the basin.
7. The understanding and quantification of the volume of groundwater flow across the Los Angeles County/Orange County line ("County line") has been the subject of interest and discussion between OCWD and WRD since at least the 1980s. Since then, the Parties have made substantial investments in data collection and analysis to

better understand the hydrogeologic characteristics, respectively, of the Orange County Basin and Central Basin, including the vicinity of the County line.

8. Consistent with its groundwater management mission, OCWD developed a numerical groundwater flow model of the Orange County Basin (“OCWD model”). Similarly, WRD in association with the U.S. Geological Survey developed a numerical groundwater flow model of the Los Angeles Coastal Plain, which includes the Central Basin (“WRD-USGS model”). Each model extends several miles across the County line into the adjoining basin.
9. OCWD and WRD have run their respective groundwater models for the purpose of quantifying the historical volume of groundwater flow across the County line, with each model yielding different results by an appreciable, but not unexpected, margin given the complex hydrogeologic conditions and independent model development.
10. OCWD and WRD recognize that it is in their mutual interest to reduce the uncertainty in the quantification of groundwater flow across the County line using the best available modeling tools. To this end, the Parties desire to jointly fund the third-party review of the OCWD and WRD-USGS models and underlying hydrogeologic conditions.
11. OCWD and WRD will agree on a professional consulting firm experienced in groundwater modeling to perform the third-party review. OCWD will directly contract with the consulting firm and WRD will reimburse OCWD for half of the authorized expenditures.

NOW, THEREFORE, in consideration of the mutual benefits to be derived by OCWD and WRD, and of the premises herein contained, it is hereby agreed by the Parties as follows:

SECTION 2 – SCOPE OF WORK

The Scope of Work for the third-party review of the OCWD and WRD-USGS models was agreed upon by the Parties as described in Exhibit A, attached hereto and incorporated herein by this reference.

SECTION 3 –CONSULTANT ENGAGEMENT AND PHASING OF WORK

After the Parties reach mutual agreement on the professional consulting firm to be retained, OCWD shall have the authority to hire a third-party consultant (“Consultant”) to perform the Scope of Work by means of procurement procedures consistent with OCWD’s normal procurement and contract process. The Scope of Work has been divided into two phases, Phase I and Phase II. OCWD shall initially instruct the Consultant to perform Phase I of the Scope of Work with total expenditures not to exceed \$56,000. Following completion of the Phase I Scope of Work, the Parties shall confer on whether the Parties wish to proceed with having the Consultant perform the Phase II Scope of Work under this Agreement. If the Parties wish to proceed with the Phase II

Scope of Work, then OCWD shall request a cost proposal from the Consultant to perform the Phase II Scope of Work. OCWD and WRD shall confer on their respective review of the Consultant's cost proposal for the Phase II Scope of Work, including any refinements or clarifications. Provided that both Parties are satisfied with the cost proposal for the Phase II Scope of Work, then OCWD shall amend the Consultant's contract to authorize and add the costs for the Phase II Scope of Work, with a total contract amount not to exceed \$200,000 for the combined Phases I and II Scope of Work. Consultant shall be required as part of the contract terms to indemnify, defend, hold harmless and insure WRD to the same extent as OCWD. If there is not mutual agreement between the Parties to proceed with the Phase II Scope of Work, then WRD may opt-out of the Phase II work and WRD's payment obligations under this Agreement will be limited to Phase I only. Nothing in this Agreement shall bar either Party from separately contracting with the Consultant or any other consultants for any services outside the terms of this Agreement.

SECTION 4 – PAYMENTS

OCWD will directly pay Consultant's invoices for Phase I and Phase II, if performed. WRD shall be responsible for reimbursing OCWD for one-half of Consultant's services, unless WRD opts out of Phase II and then WRD will only be responsible for one-half of Phase I services. OCWD shall invoice WRD periodically based on invoices received from the Consultant. OCWD shall be responsible for all costs in excess of said contributions by WRD. WRD will not reimburse OCWD for any additional costs to perform or complete the Scope of Work except pursuant to a written amendment to this Agreement.

SECTION 5 – REVIEW AND OWNERSHIP OF THE WORK PRODUCTS

OCWD and WRD are collaborating in this effort, and therefore both agencies will be invited to be included in any and all meetings, conference calls, webinars, and product deliverables, and information sharing from OCWD, WRD and the Consultant will go to both parties simultaneously. OCWD shall include WRD in the review and development of the Consultant's draft and final technical memoranda and presentations ("Work Products"). Consultant shall provide OCWD and WRD with copies of the project deliverables for review and comment simultaneously. Should OCWD and WRD disagree with any of the technical findings, conclusions, and/or recommendations of the Work Products, they agree to meet and confer on those differences until such differences can be worked out and mutually agreed upon, and agree to keep the final Work Products Draft and non-releasable (to the extent allowed by law) until both parties agree to make the Work Products Final or otherwise release them prior to their finalization. Equal and separate ownership of the Work Products, including all copyrights and other Intellectual Property and proprietary rights, is held by each of the individual Parties (OCWD and WRD). Each Party, as a co-owner, has the right to use, update, or modify the Work Products, or publish the results of such usage, updates, or modifications without permission from the other Party.

SECTION 6 – NOTICES

Notices required or permitted shall be given by personal delivery or by first class mail, postage prepaid, or facsimile transmission to the following addresses:

To: WRD
Water Replenishment District of Southern California
Attention: General Manager
4040 Paramount Blvd
Lakewood, California 90712

To: OCWD
Orange County Water District
Attention: General Manager
18700 Ward Street
Fountain Valley, California 92708

SECTION 7 - INDEMNIFICATION

(a) OCWD shall hold harmless, defend at its own expense, and indemnify WRD, its respective officers, employees, representatives, and agents against any and all liability, claims, losses, damages, or expenses, including reasonable attorneys' fees, arising from the negligence or willful misconduct of OCWD or its officers, employees, representatives, or agents in rendering services under this Agreement; excluding, however, such liability, claims, losses, damages, or expenses arising from the negligence or willful misconduct of WRD, its respective officers, employees, representatives, or agents.

(b) WRD shall hold harmless, defend at its own expense, and indemnify OCWD, its respective officers, employees, representatives, and agents against any and all liability, claims, losses, damages, or expenses, including reasonable attorneys' fees, arising from the negligence or willful misconduct of WRD or its officers, employees, representatives, or agents in rendering services under this Agreement; excluding, however, such liability, claims, losses, damages, or expenses arising from the negligence or willful misconduct of OCWD, its respective officers, employees, representatives, or agents.

SECTION 8 – TERM

The Term of this Agreement shall commence on the Effective Date and shall conclude upon delivery of the Consultant's final Work Products to OCWD and WRD. Notwithstanding the preceding sentence, the provisions of Section 7 of the Agreement shall survive the earlier expiration or termination of this Agreement.

SECTION 9 - ASSIGNMENT

No Party to this Agreement shall assign, sell, or otherwise transfer any obligation or interest in this Agreement without the specific written consent of the other Party to the Agreement.

SECTION 10 - CONSTRUCTION AND AMENDMENT

This Agreement shall be construed in accordance with and governed by the laws of the State of California and any action brought relating to this Agreement shall be brought solely in a court of competent jurisdiction in the county of Los Angeles, California. No amendment to this Agreement shall be valid unless in writing and signed by all of the Parties hereto.

SECTION 11 - INTEGRATION

This Agreement represents the entire understanding of the Parties as to the matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered by this Agreement.

SECTION 12 – SEVERABILITY

In the event that any provision herein is held to be invalid by any court of competent jurisdiction, the invalidity of any such provision shall not affect the validity of the remaining provisions of this Agreement, which shall remain in full force and effect.

[SIGNATURES ON THE NEXT PAGE]

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed the date first above written.

APPROVED:

Water Replenishment District of Southern California

By: _____
President, Board of Directors

By: _____
Secretary, Board of Directors

APPROVED AS TO FORM

By: _____
Leal, Trejo LLP, District Counsel

Orange County Water District

By: _____
Michael R. Markus, General Manager

Vicente Sarmiento, President

APPROVED AS TO FORM

By: _____
Jeremy Jungreis, District Counsel

December 26, 2019

Mr. Roy Herndon, PG, CHG
Chief Hydrogeologist
Orange County Water District
PO Box 8300
18700 Ward Street
Fountain Valley, CA 92728-8300

RE: Proposal for Model Evaluation to Improve Understanding of Underflows Across the Los Angeles County-Orange County Line

Dear Mr. Herndon,

INTERA is pleased to present this proposal to evaluate existing groundwater flow models and prevailing hydrogeologic conditions with the goal of reducing uncertainty in the estimates of underflow across the Los Angeles County-Orange County line. OCWD staff have used the OCWD basin model to estimate groundwater flow across the Los Angeles-Orange County line. The OCWD basin model has provided estimates of underflow to Los Angeles County ranging from 5,000 to 25,000 acre-feet per year. More recently, the USGS, under contract with WRD, completed a major revision to its 12-layer groundwater model of the Central Basin in Los Angeles County. The USGS model estimates of underflow are substantially less than the OCWD basin model, and in some years the USGS model indicates net flow into Orange County. Understanding the amount of groundwater flow across the county line has long been a topic of interest between OCWD and WRD, and staff of both agencies agree that this is best addressed via an open exchange of technical information and analyses. Because each agency has spent decades developing their respective sophisticated and calibrated groundwater models, each with different underflow estimates, a logical next step is to review the models and examine each model for their similarities and differences and how well each model represents the hydrogeologic conditions in the region around the county line.

INTERA is uniquely qualified to perform this work since we are familiar with both the recently-completed United States Geological Survey (USGS) model which is used for basin management of the Central Basin by the Water Replenishment District of Southern California (WRD), and the five-layer basin-wide groundwater flow model (basin model) which is used by Orange County Water District (OCWD) for management of the Orange County Basin.

INTERA has worked on model development for both agencies, including in the region along the county line. For OCWD, INTERA constructed the Alamitos Gap flow model which extends into Los Angeles County and is currently being expanded to the north along the county line and to the southeast in the Sunset Gap area. INTERA has also been tasked with modeling work for WRD and is already familiar with the USGS Central Basin model. INTERA has strong working relationships and extensive modeling experience with both the OCWD and WRD and is committed to providing an impartial third-party review.

This proposal presents a two-phased approach to reduce uncertainty in current estimates of flow across the Los Angeles County-Orange County line. For this effort INTERA proposes to: a) review and compare the USGS and OCWD Regional models; and b) develop a better understanding of prevailing hydrogeologic conditions across the County line to verify model parameters/boundary conditions and recommend model refinements/modifications to resolve any discrepancies between the two models. Since the effort for the second phase (b) is dependent on findings from the first, the scope and cost detailed in this proposal only covers the first phase.

Background

The Water Replenishment District (WRD) and the United States Geological Survey (USGS) have developed a revised groundwater flow model of the Los Angeles Coastal Plain Groundwater Basins. The Los Angeles Coastal Plain Groundwater Model (LACPGM) updates a previous USGS regional model (Reichard, 2003) while incorporating new data and analysis. The LACPGM implements a chronostratigraphic (depositional time-based) approach to defining the geologic structure of the model. Chronostratigraphic sequences range from late Pliocene through Holocene (approximately 3 Ma to present) and are based on analysis of geophysical logs, seismic-reflection data, and surficial geology. The model is implemented in MODFLOW-USG with an unstructured finite-difference grid, which allows intermediate model layers to pinch out and the upper and lower layers to directly connect in merge zones. The model contains 12 layers for the 13 chronostratigraphic units (the two bottom units are modeled as a single layer). The LACPGM simulates groundwater flow on a quarterly basis from 1971-2015. The model boundary extends across the Los Angeles Coastal Plain and extends past the Los Angeles-Orange County Boundary (into Orange County) by several miles.

The Orange County Water District (OCWD) has built a regional groundwater flow model of the Orange County Groundwater Basin. It encompasses the entire groundwater basin and extends approximately three miles into Los Angeles County. The model is a five a layer model comprising of the Shallow, Principal, and Deep aquifers and the upper and lower aquitards that separate the three units. Comparison of underflows across the Los Angeles-Orange County (LA-OC) boundary have shown differences between the LACPGM and the OCWD model. INTERA is also developing a detailed hydrogeologic and numerical model of the Alamitos and Sunset Gap area that overlaps with the LACPGM model domain.

Proposed Methodology

Phase - I

INTERA will evaluate the LACPGM and OCWD model structure, properties, calibration, and predictions along and near the County boundary as detailed in the following sub-tasks:

1) Model Review and Comparison

We will identify key differences in model structure, properties, boundary conditions, level of calibration, and hydraulic head and flow predictions in both models. We will assess calibration at key monitoring and production wells by evaluating the goodness of fit of simulated hydrographs with observed data. This will be done at all the depth intervals for which data is available. Areas where calibration can be improved will be identified for both models. We will evaluate the correspondence of the model boundaries (General Head Boundaries for the LACPGM and Specified Head boundaries for the OCWD model) to measured heads at multi-level

wells. Any differences in simulated vs observed water-levels, (vertical and horizontal) gradients, or flow-direction will be assessed in relation to a) the state of calibration in the area of interest, b) the plausibility of the geologic properties in the model, and c) the uncertainty in the observed and interpreted water-levels.

Interim Milestone: In person or web-based meeting with OCWD and WRD to present review of calibration and model properties.

2) Zone Budget and Particle Tracking

We will conduct zone-budget analysis across the County boundary with the LACPGM and OCWD Regional Models to compare and contrast simulated flows from the different models. INTERA will also conduct particle-tracking with both models to evaluate and compare the flow-fields along the LA-OC boundary. INTERA will use a particle tracking software like Mod-PATH3DU conducive to unstructured grids for the LACPGM and MODPATH for the OCWD model. Since, high capacity production wells near the County boundary have a very strong influence on the flow-field in that part of the basin, the particle tracks and capture zone analysis will provide a useful visual tool to understand how groundwater production is influencing flow in the HSUs along the County boundary.

Interim Milestone: In person or web-based meeting with OCWD and WRD to present review of water-budget and particle-tracking analyses.

3) Technical Memorandum

The model review and comparison will be documented in a technical memorandum. The technical memorandum will also identify key areas of uncertainty with respect to evaluating underflows across the County boundary and recommend a) model refinements/modifications (be it to the LACPGM or the OCWD regional model) to reduce the uncertainty and improve model predictions of water-levels and flows across the County boundary, and b) the approach to develop better conceptual understanding of hydrostratigraphy and flows across the County boundary based on existing data (Phase II).

We will present the salient aspects of the memorandum in an in-person or web-based meeting with OCWD and WRD and solicit comments and feedback to incorporate into one revision of the report.

Phase II: Understanding of Hydrostratigraphy and Flows Across County Boundary

The County boundary is, for most parts, an administrative boundary; hence, groundwater flows across the boundary as driven by regional groundwater hydraulics as well as pumping from groundwater production wells across the boundary. The hydrostratigraphy is complex, comprising of interbedded sands and clays forming aquifer units with varying degrees of vertical hydraulic connectivity. Production wells pump

significant amounts of groundwater from both sides of the LA-OC boundary. Key to understanding the underflows in this area is developing a good understanding of the hydrostratigraphic units (HSUs) underlying and extending across the boundary as well as the flow system in these units. The goal of this phase will be to use existing hydrogeologic datasets to improve the conceptual understanding of hydrostratigraphy and underflows at different depth intervals along the County boundary and to recommend a) additional data-collection efforts or b) model refinements/modifications to better represent the hydrogeology and flow along the boundary. The extent and level of effort for this phase will depend on the outcome of the Phase I investigation, which will identify areas of key differences in the LACPGM and OCWD as well as uncertainties/data-gaps along the County boundary.

This phase will be sub-divided into the following subtasks:

1) 3D Geologic Visualization

The WRD and OCWD along with other municipal entities have collected significant amounts of geologic and hydraulic data from several production and monitoring wells. The LACPGM chronostratigraphy has been developed based on these datasets (among others). OCWD has also developed several regional cross-sections that run parallel and perpendicular to the LA-OC boundary. Key cross-sections have been revised based on the new USGS interpretations of regional sequence stratigraphy. Based on this data, we will develop a 3D geologic visualization interface in Leapfrog to compile, view, evaluate, and compare these datasets. The 3D visualization model will consist of a) model layers (corresponding to chronostratigraphic sequences) from the LACPGM, b) model layer conductivities from the LACPGM, c) model layers and conductivities from the OCWD models, d) OCWD regional cross-sections, e) lithologic picks (and, if needed, e-logs) from key wells along and near the LA-OC boundary, f) average seasonal high and low water levels from multi-port wells, and g) average difference in water-levels across different depth intervals at multi-port wells. In addition, we will also create geologic cross-sections – one running along and two perpendicular to the LA-OC boundary - to visualize the hydrostratigraphy in the area.

2) Hydrostratigraphic Assessment

The 3D geologic visualization interface will be used to evaluate the LACPGM (sequence stratigraphy based) structure and model properties in conjunction with hydrostratigraphy from OCWD cross-sections and well logs from key wells. HSUs will be defined based on OCWD cross-sections and observed vertical gradients at (multi-port) monitoring-wells. We will assess available water-quality data to identify any water-quality signatures for different depth intervals that may help better delineate the HSUs. We will next correlate zones of hydraulic conductivities in the LACGPM with HSUs and assess connectivity of the zones across different cross-sections. The HSU's from the LACGPM will be compared with the model properties from the OCWD regional and Alamitos models. Any differences between model properties, regional cross-sections, or well logs will be documented, presented, and discussed.

3) Hydrogeologic Assessment

With the HSUs delineated, we will identify sets of monitoring and production wells (with corresponding depth intervals) within respective HSUs. Observed water-levels from wells will be used to develop water-level contours across the LA-OC boundary for each HSU under

representative seasonal high and seasonal low groundwater conditions. These water-levels will be verified against OCWD water-level contours created for the three main aquifer systems. The HSU-based water-level contours will be key to understanding flow-directions and gradients across the County boundary based on the monitoring data.

4) Technical Memorandum

The analyses, results, and conclusions from this task will be documented in a technical memorandum. The technical memorandum will also identify remaining areas of uncertainty with respect to evaluating underflows across the County boundary and recommend a) field-investigations and data-collection efforts as well as b) additional model refinements (be it to the LACPGM or the OCWD regional model) to reduce the uncertainty and improve model predictions of water-levels and flows across the County boundary based on the findings from this investigation.

Budget and Personnel

The budget for the Phase-I tasks detailed above is estimated at \$55,872 as detailed below. The Project will be managed by Dr. Abhishek Singh, PhD, PE, who has almost a decade of direct experience leading several WRD and OCWD modeling projects. Dr. Raghavendra (Raghu) Suribhatla, PhD, PE, who will lead the technical analysis, has several years of direct experience working on several WRD and OCWD models, including with the LACPGM on a WRD modeling study in the West Coast Basin. The support staff consist of modelers, geologists, and GIS analysis who are familiar with and have worked with WRD and OCWD data-sets and models.

Project Role	Proposed Staff	Rate	Task 1. Model Review and Comparison		Task 2. Zone Budget and Particle Tracking		Task 3. Technical Memorandum	
			Hours	Cost	Hours	Cost	Hours	Cost
Project Manager	Abhishek Singh	\$195	16	\$3,120	8	\$1,560	16	\$3,120
Technical Lead	Raghu Suribhatla	\$165	80	\$13,200	40	\$6,600	40	\$6,600
Geologist/Modeler	Ali Forghani; Patrick O'Connell	\$130	40	\$5,200	40	\$5,200	24	\$3,120
GIS	Erick Fox	\$110	16	\$1,760	16	\$1,760	24	\$2,640
Tech Editor	Joanna Stakutis	\$83	0	\$0	0	\$0	24	\$1,992
Sub-Total			152	\$23,280	104	\$15,120	128	\$17,472
Total			384	\$55,872				

Schedule

The work outlined in this proposal is expected to be completed within 2 months of receiving the notice to proceed.

Mr. Roy Herndon, PG, CHG

December 17, 2019

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We look forward to beginning this important work at your convenience. Should you have any questions, please feel free to contact me at asingh@intera.com or (424) 275-4055.

Sincerely,

INTERA Incorporated

A handwritten signature in dark ink that reads "Abhishek Singh". The signature is written in a cursive style with a horizontal line underneath the name.

Abhishek Singh, PhD, PE
Vice President - Western Region
INTERA Incorporated