AGENDA IRVINE RANCH WATER DISTRICT ENGINEERING AND OPERATIONS COMMITTEE TUESDAY, JUNE 16, 2020

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

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

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

Via Web: https://irwd.my.webex.com/irwd.my/j.php?MTID=macbc19f2cdaf7df3cc3b7be1185fb8db

Meeting Number (Access Code): 629 135 726

Meeting Password; JGJsfHGEA832 (45734432 from phones and video systems)

After joining the meeting, in order to ensure all persons can participate and observe the meeting, please select the "Call in" option and use a telephone to access the audio for the meeting by using the call-in information and attendee identification number provided.

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

PLEASE NOTE: Participants joining the meeting will be placed into the Webex lobby when the Committee enters closed session. Participants who remain in the "lobby" will automatically be returned to the open session of the Committee once the closed session has concluded. Participants who join the meeting while the Committee is in closed session will receive a notice that the meeting has been locked. They will be able to join the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

Engineering and Operations Committee June 16, 2020 Page 2

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the "chat" feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing comments@irwd.com before 7:30 a.m. on Tuesday, June 16, 2020.

ALL VOTES SHALL BE TAKEN BY A ROLL CALL VOTE.

COMMUNICATIONS

- 1. Notes: Burton
- 2. Public Comments
- 3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted.
- 4. Determine which items may be approved without discussion.

INFORMATION

5. <u>RESEARCH BUSINESS PLAN UPDATE – OLDEWAGE / COLSTON /</u> <u>BURTON</u>

Recommendation: Receive and file.

6. <u>PFAS TREATMENT AT IRWD WELL OPA-1 – MORI / BURTON</u>

Recommendation: Receive and file.

ACTION

7. <u>ZONE A TO RATTLESNAKE RESERVOIR PUMP STATION CONSULTANT</u> <u>SELECTION – MCGEHEE / MORI / BURTON</u>

Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with Brown and Caldwell in the amount of \$871,000 for engineering support services during construction for the Zone A to Rattlesnake Reservoir Pump Station, Project 05476.

OTHER BUSINESS

- 8. Directors' Comments
- 9. Adjourn

Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to comments@irwd.com. Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

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June 16, 2020 Prepared by: L. Oldewage Submitted by: J. Colston / K. Burton Approved by: Paul A. Cook *I. Core.*

ENGINEERING AND OPERATIONS COMMITTEE

RESEARCH BUSINESS PLAN UPDATE

SUMMARY:

Staff will provide an update on the research projects in which IRWD is currently involved.

BACKGROUND:

Periodically IRWD receives requests to participate in various research projects pertaining to emerging technologies through either direct funding or dedication of in-kind staff resources. Guidelines were developed to assist staff with its evaluation and response to those requests. These guidelines were incorporated into the IRWD Research Business Plan, which also provides a tracking mechanism for the various requests and ongoing research projects and programs in which IRWD participates. The fundamental purpose of the Research Business Plan is to ensure that IRWD's research resources are being prioritized and utilized effectively.

IRWD has rejoined the Isle Utilities Wastewater and Water Technical Advisory Group (TAG). Through TAG's quarterly meetings, staff is exposed to, and has an opportunity to provide feedback on, new technologies applicable to various operational areas, including treatment, analysis, wastewater collection and potable water storage and distribution. A summary of the technologies presented at the TAG meetings will be summarized in future Research Business Plan Updates, including an assessment of each technology's potential application to IRWD treatment processes.

One of the components of the Research Business Plan is for staff to provide a status update on the research projects to the Engineering and Operations Committee on a quarterly basis. A status update on the current research projects is provided as Exhibit "A".

FISCAL IMPACTS:

The annual fee for participation in both the water and wastewater TAGs is \$15,000.

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – Research Projects Summary Table

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Exhibit "A"

Research Projects Summary Table

| No | Project Title | Project Description | IRWD Contact | Organizations Involved | Type of Research | IRWD Participation Resource | Start Date | Projected Completion Date | Comments/Next Steps |
|----|--|--|-----------------|--|---|---|---------------|---------------------------------|--|
| | Practical Framework for Water Infrastructure Resilience (WRF 5014) | This proposed project will help water utilities better understand the relationships between various "enterprise risk management" planning tools, performance, and level of service. The project will also develop frameworks summarizing currently available resources, approaches, and legislation regarding infrastructure risk and resilience. | Akiyoshi | Water Research Foundation and Black & Veatch | Case study, data review, best practice analysis and technical report. | Staff time for review of reports, sharing information, and site analysis. | Oct-19 | Feb-21 | The research team recently released two project papers, "AWIA Execution: Lessons Learned" and a literature review regarding Water Infrastructure Resilience. The next steps are for the team to develop a series of utility case studies based on AWWA's Utility Resiliency Index during the summer of 2020. |
| | UCI Industry- University Research Center- Perfluorinated Compound Sources and Loading at Wastewater Treatment Plants-A Sewershed-Scale Analysis | This project will develop and implement methodology for sewershed analysis to identify raw wastewater sources of PFAS. | Weghorst | UCI Industry- University Research Center | Case study, data review, best practice analysis and technical report. | Staff time for review of reports, sharing information, and site analysis. | Sep-20 | TBD (1-2 year project) | The research proposal from the Civil and Environmental Engineering Department at UCI has been developed, reviewed and accepted. The agreements needed to implement the research have been executed and financial contributions to the research are in progress. The duration of the project will be 15 months. Quarterly status reports and a final report and presentation will be provided. Budget is approximately \$140K. |
| | B Developing Adaptive Strategies Toward Climate-Ready Infrastructure Systems in California | This project will identify adaptive strategies that will help develop resilient public works infrastructure-specifically mitigating the impacts to public works infrastructure from climate change and natural disasters associated with climate change. | Akiyoshi | UC Irvine | | IRWD will consult and provide feedback on the project. | TBD | TBD | IRWD provided a letter of support to UCI and the principal investigator, Professor AghaKouchak, anticipates hearing back from the California Strategic Council by the end of June 2020. The COVID-19 pandemic delayed the award notifications from May to June. |
| 2 | Development of an Orange County Regional Coastal Resiliency Collaborative and Coastal Resiliency Action Plan | This project will help Orange County increase resilience, reduce risks from coastal storms and flooding, and advance county-level actions and solutions while protecting wildlife habitat. | Weghorst | UC Irvine and Coastal Quest | | IRWD will consult and provide feedback on the project. | NA | NA | IRWD provided a letter of support to UCI and the principal investigator, Dr. Tegan Hoffman. Recently, the team heard that the project will not be funded. This is the last update for this project. |

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June 16, 2020 Prepared by: R. Mori Submitted by: K. Burton Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

PFAS TREATMENT AT IRWD WELL OPA-1

SUMMARY:

Per-and polyfluoroalkyl substance (PFAS) compounds have emerged as "contaminants of concern" primarily due to human health impacts. Several of these compounds have been detected in significant concentrations in parts of the Orange County groundwater basin. In response, the Orange County Water District (OCWD) is proceeding with a PFAS Treatment Systems Planning Study for 11 groundwater producer agencies with wells affected by PFAS compounds. IRWD's Well OPA-1 is included in the Study. In October 2019, OCWD contracted with Carollo Engineers to conduct the Study, and significant progress has been made since then. At the Committee meeting, staff will provide a presentation summarizing the overall scope of the Study, the associated findings related to Well OPA-1, and the next steps in this process.

BACKGROUND:

In October 2019, OCWD contracted with Carollo to conduct a PFAS Treatment Systems Planning Study for 11 groundwater producer agencies including East Orange County Water District, Golden State Water Company, IRWD, Serrano Water District, Yorba Linda Water District, and the Cities of Anaheim, Fullerton, Garden Grove, Orange, Santa Ana, and Tustin. In general, and on an individual groundwater producer agency basis, the Study will:

- Evaluate water quality for each affected well;
- Identify treatment approaches for each groundwater producer agency;
- Identify and evaluate opportunities for centralized treatment for multiple wells on both an individual groundwater producer agency basis and between multiple groundwater producer agencies; and
- Develop conceptual capital, operating and maintenance, and life-cycle costs for proposed treatment facilities.

IRWD's Well OPA-1 is impacted by PFAS compounds and is included in the Study. To facilitate completion of the Study, OCWD and Carollo are working directly with each individual groundwater producer agency. Staff met multiple times with OCWD and Carollo and provided a site visit to Well OPA-1. In April 2020, Carollo submitted a draft report to IRWD that summarized the evaluation of Well OPA-1 and the associated findings. Staff has completed its review of the report and will provide a presentation summarizing the overall scope of the Study and the associated findings related to Well OPA-1 at the Committee meeting.

FISCAL IMPACTS:

Not applicable.

Engineering and Operations Committee: PFAS Treatment at IRWD Well OPA-1 June 16, 2020 Page 2

ENVIRONMENTAL COMPLIANCE:

Not applicable.

RECOMMENDATION:

Receive and file.

LIST OF EXHIBITS:

Exhibit "A" – PFAS Treatment at Well OPA-1 Draft Presentation

EXHIBIT "A"









| PFAS Regulatory Requirements | | | | | | | | | | | |
|---|--|---|-------------------------------------|--|--|--|--|--|--|--|--|
| | PFAS Compound | Notification Level (NL), ng/L or ppt | Response Level (RL), ng/L or ppt | | | | | | | | |
| | PFOA (perfluorooctanoic acid) | 5.1 | 10 | | | | | | | | |
| | PFOS (perfluorooctane sulfonic acid) | 6.5 | 40 | | | | | | | | |
| Notification Level Non-regulatory, precautionary health-based measures that warrant notification and further monitoring and assessment. Required to report exceedances to governing bodies and DDW and urged to report to customers | | | | | | | | | | | |
| Response Level | | | | | | | | | | | |
| recommended level that water systems consider taking a water source out of service or provide treatment | | | | | | | | | | | |
| Irvine Ranch Water District 4 | | | | | | | | | | | |



Irvine Ranch Water District

| PFAS Compound | Notification Level (NL), ng/L or ppt | Response Level (RL), ng/L or ppt | Well OPA-1 Concentration ^{(1),} ng/L or ppt | Treatment Objective, ng/L or ppt | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|
| PFOA (perfluorooctanoic acid) | 5.1 | 10 | 15.4 | ND ⁽²⁾ | | | | | | |
| PFOS (perfluorooctane sulfonic acid) | 6.5 | 40 | 23.5 | ND ⁽²⁾ | | | | | | |
| ⁽¹⁾ Average concentration of samples obtained 08/07/18, 4/23/2019, and 6/4/2019 ⁽²⁾ ND = Non-detect, currently established as 2ng/L or less <i>Note:</i> Besides PFAS / PFOA, no other "constituents of concern" have been identified in the water quality analyses of OPA 1 | | | | | | | | | | |

Irvine Ranch Water District







Conceptual Design Criteria for GAC and IX

| Description | Units | GAC (1220/1240) | IX (1220) |
|--|---------|--------------------|--------------|
| Flow per Vessel | GPM | 525/1,000 | 2,000 |
| Number of Vessels | | 8/4 | 2 |
| Vessel Configuration | | Lead-Lag | Lead-Lag |
| Vessel Diameter | Feet | 12 | 12 |
| Vessel Height | Feet | 17/27 | 17 |
| Empty Bed Contact Time (EBCT) per vessel | Minutes | 10 | 2 |
| Backwash System | | Required | Not Required |
| Pre-Filtration System | | Not Required | Required |
| Bed Volumes Treated | | 60,000 | 150,000 |
| Media Replacement Frequency | Days | 400 | 200 |
| | | | |
| Ranch Water District | | | |

A-4





Summary of Treatment Costs · Capital, annual operations and maintenance, and life cycle costs were developed • "All-In" cost includes construction cost with 15% contingency plus soft costs (20% of total construction cost) **Treatment Alternative** "All-In" Capital Annual O&M Life-Cycle Cost (30-Year) Cost Cost GAC 1220 Vessels \$6,800,000 \$70,000 \$8,700,000 GAC 1240 Vessels \$5,400,000 \$70,000 \$7,400,000 IX 1220 Vessels \$2,900,000 \$80,000⁽¹⁾ \$5,400,000 ⁽¹⁾ Based on production of 600 AFY, which results in an O&M cost of \$133/AF. OCWD will fund 50% of O&M costs up to a maximum of \$75/AF IX is the recommended treatment alternative. Irvine Ranch Water District 10















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June 16, 2020 Prepared by: J. McGehee/R. Mori Submitted by: K. Burton Approved by: Paul A. Cook

ENGINEERING AND OPERATIONS COMMITTEE

ZONE A TO RATTLESNAKE RESERVOIR PUMP STATION CONSULTANT SELECTION

SUMMARY:

The design for the Zone A to Rattlesnake Reservoir Pump Station project, which was prepared by Brown and Caldwell, is complete and the project is currently being advertised for construction bids. To prepare for the construction phase, staff solicited a proposal from Brown and Caldwell for engineering support services during construction. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement in the amount of \$871,000 with Brown and Caldwell for engineering support services during construction of the Zone A to Rattlesnake Reservoir Pump Station.

BACKGROUND:

IRWD is proceeding with the replacement of the Zone A to Rattlesnake Reservoir Pump Station as identified in the 2016 Recycled Water Distribution System Analysis. The project is located within the Rattlesnake Reservoir Complex, as shown on the location map provided as Exhibit "A". The Complex consists of several critical facilities including the Rattlesnake Reservoir, Zone A North Reservoir, Northwood Zone A to B pump station, Zone A to Rattlesnake Reservoir pump station, Zone A to C+ pump station, Zone 3 to 5 pump station, dechlorination facility, chlorination facility, Rattlesnake Reservoir strainers, the IRWD Caretaker Residence, and several aboveground and belowground piping and valving systems.

The existing pump station, which delivers recycled water from the Zone A system to the Rattlesnake Reservoir, was constructed in 1976 and is nearing the end of its useful life. The pump station consists of three gas engine driven pumps and one electric motor driven pump. The existing pump station requires frequent maintenance, and procuring replacement parts is becoming increasingly challenging. The project will replace the pump station in its entirety with a new pump station equipped with all electric motor driven pumps.

In addition to the pump station replacement, this project also includes demolition of the existing dechlorination building and dechlorination facilities, construction of a new dechlorination facility, installation of a new permanent backup power generator for the new pump station, extended sewer facilities to eliminate onsite septic systems currently located at the caretaker house and the park restrooms, new Rattlesnake Reservoir return pump station vault, new site electrical service, undergrounding of the overhead utility poles on site, various communications and control system improvements, and demolition of the Northwood Zone A to B pump station (which will be replaced by the Eastwood Zone A to B pump station currently under construction). Due to the critical nature of the facility, the new permanent backup power generator and associated diesel fuel storage are sized to provide emergency power to the entire Rattlesnake Complex for a 72-hour period without the need for refueling.

Engineering and Operations Committee: Zone A to Rattlesnake Reservoir Pump Station Consultant Selection June 16, 2020 Page 2

The Zone A to Rattlesnake Reservoir Pump Station is currently out to bid to a select list of 13 contractors. The bid opening is scheduled for June 24, 2020, and the Engineer's estimate is \$21,950,000. Staff anticipates bringing a recommendation for construction award to the Board on July 13.

Consultant Selection:

Brown and Caldwell performed all elements of the preliminary and final design phases for the project including geotechnical, civil, mechanical, structural, architectural, electrical, and instrumentation and control. Staff requested Brown and Caldwell to submit a proposal for engineering support services during construction. The proposal, provided as Exhibit "B", includes scope for submittal reviews, responses to contractor requests for information, site visits, record drawings, energy control procedures, construction coordination and engineering support commensurate with the requirements of the project.

Staff reviewed Brown and Caldwell's scope of work and fee and recommends the Board authorize the General Manager to execute a Professional Services Agreement with Brown and Caldwell in the amount of \$871,000 for engineering support services during construction.

FISCAL IMPACTS:

The Zone A to Rattlesnake Reservoir Pump Station, Project 05476, is included in the FY 2020-21 Capital Budget and will be funded through replacement funds. The existing budget is sufficient to fund the recommendation presented.

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA) and in conformance with California Code of Regulations Title 14, Chapter 3, Article 6, a Notice of Intent to adopt a Mitigated Negative Declaration was filed with the County of Orange on January 6, 2020. Pursuant to State Guideline § 15073, the IS/MND was made available for public review for a period of 30 days from January 6, 2020 through February 4, 2020. The IS/MND was adopted by the Board on March 9, 2020. A Notice of Determination was filed with the Orange County Clerk/Recorder and the CA State Clearinghouse on March 13, 2020.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with Brown and Caldwell in the amount of \$871,000 for engineering support services during construction for the Zone A to Rattlesnake Reservoir Pump Station, Project 05476.

LIST OF EXHIBITS:

Exhibit "A" – Location Map

Exhibit "B" – Brown and Caldwell Proposal for Engineering Support Services during Construction



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18500 Von Karman Avenue, Suite 1100 EXHIBIT "B" Irvine, CA 92612 T: 714-730-7600

Brown AND Caldwell

June 3, 2020

Joe McGehee, P.E. Irvine Ranch Water District 15600 Sand Canyon Ave Irvine, California 92618

Subject: Zone A to Rattlesnake Reservoir Pump Station Project– Proposal for Engineering Services During Construction

Dear Mr. McGehee:

This letter proposal summarizes the scope of work and level of effort for engineering services during construction (ESDC) of the Irvine Ranch Water District (IRWD) Zone A to Rattlesnake Reservoir Pump Station Project (Project). The Brown and Caldwell (BC) team and project schedule are also presented in the sections that follow.

Task 1: Project Management

Task 1 includes the effort required for general project management and administration over the duration of construction and project close out. A total duration of 32 months (30 months of construction and 2 months for project closeout, including record drawings) is included. Half hour per week for the Project Manager (PM) and one hour per week for the Project Analyst (PA) and an additional two hours for PM and three hours per month for PA for monthly reviews, earned value analysis, and monthly invoicing have been accounted.

Task 2: Project Meetings

The effort required to attend 25 project meetings of two hours each is included in this task. BC will prepare agendas prior to each meeting and will prepare minutes within five (5) working days of each meeting. Appropriate discipline leads will be available to attend these meetings at IRWD's office, construction site, or via web/teleconference, as requested by IRWD. The intent is to keep the number of attendees to the minimum. As much as possible, one representative from BC will attend the meetings. There may be occasions when more than one representative will need to attend. BC will track this budget as the project progresses. The budget includes time for travel, preparation, attendance and follow-up, as needed. A total of 10 hours is budgeted for the Principal-in-charge (PIC) for periodic check-ins with IRWD.

Task 3: Conformed Contract Documents

BC will prepare conformed documents compiling all addenda issued during the bid phase with the bid documents and submit to IRWD electronically as pdf files. The addenda will be referenced in the project manual and drawings at appropriate locations. A total of 16 hours for project manual updates and 70 hours for drawing updates have been accounted for.

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Task 4: Shop Drawings

Review of a total of 350 shop drawing submittals, including required resubmittals is included in this task. Submittals will be reviewed for completeness and conformity with the contract documents. Comments will be provided on the IRWD shop drawing transmittal form in MS Word and on the submittal PDF file electronically. All comments will be provided to the contractor in PDF format. BC will maintain a log of submittals using IRWD's standard submittal log. Submittal review transmittals and comments will be completed and returned to IRWD within no more than 14 calendar days. Submittals on critical items, particularly on products with long lead times, will be expedited in coordination with IRWD. An average review time of less than 5 hours per submittal, inclusive of discipline lead and support engineer time, is accounted for

Task 5: Request for Information (RFIs)

Responses to a total of 150 Contractor RFIs is included in this task. BC will maintain a log of RFIs using the IRWD standard RFI log. Responses to IRWD will be returned within no more than 7 calendar days. RFI responses will be expedited on critical path items when requested by IRWD or Contractor. An average review time of approximately 3 hours per RFI, inclusive of discipline lead and support engineer time, is accounted for.

Task 6: Plan Revisions

Task 6 includes two (2) sub tasks:

Task 6.1: Delta Drawings

A total budget of 100 hours consisting of staff from different disciplines is included for plan revisions to the construction drawings at the request of IRWD. Revised drawings will be submitted electronically to IRWD.

Task 6.2: Potholing Results

A total budget of 100 hours of staff time for plan revisions to the construction drawings during the contractor's utility investigation phases is included. Revised drawings will be submitted electronically to IRWD.

Task 7: Site Visits

A total budget for 20 site visits of two hours each on site during construction is included in this task. BC staff will provide an e-mail summary of each visit when key findings or recommendations need to be shared with IRWD and/or the Contractor. This task will be utilized for investigations or review of existing or construction conditions in preparation for revisions and clarifications provided to the Contractor. An average 5.5 hours per site visit is accounted for preparation, travel, time on site, and e-mail summary preparation.

Task 8: Energy Control Procedures (ECP) and Asset Management

BC will prepare ECP's in accordance with California Occupational Safety and Health (Cal/OSHA) requirements for all equipment that may have potential energy. BC will also complete IRWD's Asset Management spreadsheet to inventory all of the new equipment for the project. A draft set of ECPs and an Asset Management spreadsheet will be submitted for IRWD review and will finalize these documents upon receipt of IRWD

review comments. Documents will be submitted in electronic and hard copy format, as requested. An allowance of \$30,000 is included for this task. Actual work under this task will be tracked against this allowance.

Task 9: Record Drawings

BC will prepare record drawings at construction completion, using the Engineer's, Contractor's, and IRWD Inspector's red lines and the results from all relevant responses to contractor RFI's. Record drawings will consist of updates prepared in AutoCAD to the original design drawings reflecting the as-constructed condition. BC will prepare and submit final record drawings to IRWD, including AutoCAD electronic files and one color PDF file of the entire construction plan set. A total of 185 sheets will be updated under this task. An average of just under 2.5 hours per sheet spread between the PM, discipline leads, support engineers and BIM staff is accounted for.

Task 10: Construction Coordination

Task 10 includes five (5) subtasks as described below. Subtasks 10.1 to 10.3 are intended to include construction coordination that does not result in an RFI, submittal, or plan revisions. Most often, these tasks result from Contractor inquiries via phone, e-mail, or field discussion.

Task 10.1: General Plan Clarifications

This subtask includes staff time for the review and respond to Contractor inquiries which are deemed minor and do not result in specific changes to the construction plans. A total budget of 125 hours is included.

Task 10.2: General Construction Alternatives Analysis / Engineering Calculations / Exhibit Preparation

This subtask includes staff time for the following items:

- Review of Contractor suggested alternatives, including equipment, means and methods, and phasing.
- General engineering calculations: staff time to prepare calculations and summarize the results of the calculations in a memorandum to support any of the general construction coordination tasks and any direction given to the contractor, as required.
- General exhibit preparation: staff time to prepare exhibits as requested by IRWD to support coordination with interested parties, such as IRWD Operations, The Irvine Company, Irvine Ranch Conservancy, Orange County Fire Authority (OCFA), etc.

A total budget of 150 hours is included in this task.

Task 10.3: General Field Questions

This subtask includes staff time to address questions posed in the field by IRWD inspection, the Contractor, or other interested parties. A total budget of 150 hours is included.

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Task 10.4: Instrumentation / Control and Electrical

This subtask includes staff time to assist IRWD staff in coordinating shutdowns and switchovers for all SCADA and electrical related equipment and provide additional assistance to the Contractor as required to execute the work. A total budget of 150 hours is included.

Task 10.5: Startup and Testing

This subtask includes staff time to assist IRWD staff in coordinating the startup and testing phases of the project, including preparation of relevant testing protocols, identifying and coordinating required activities in advance of the scheduled need, and assisting the Contractor with meeting the needs of the Contract Documents. A total budget of 100 hours is included.

Project Team

The project design team will continue to provide services during construction. The BC team organization chart is provided below:



Schedule

The ESDC work will continue for a 30 month construction period followed by two months for project closeout activities (i.e., record drawings).

Fee Estimate

Our proposed level of effort and fee are included as **Attachment A.** The total fee is **\$871,000**.

Thank you for the opportunity to be of continued service to IRWD. Please contact me at (714) 689-4840 with any questions.

Very truly yours,

Brown and Caldwell

Andrew Lazenby, P.E. Principal-in-Charge

Farrent

Madhavan K Jayakumar, P.E. Project Manager

AGL:MJ

Attachment A: Labor Hours and Fee Estimate

Irvine Ranch Water District

Zone A to Rattlesnake Reservoir Pump Station Project

Attachment A: Labor Hours and Fee Estimate - Construction Support Services

| Task Item | Andrew Lazenby | M. Jayakumar | M. Lin | D. Crawford | R. Austin | Kirstin Byrne | S. V Vo | M. Ridley | A. Rivas | Multiple | Multiple | Multiple | Flavia Boese | Total BC Labor Hours | Direct Costs | Total Fee |
|--|----------------|--------------------|------------|------------------------|--------------------|--------------------|--------------------|-----------|----------|----------------------|-------------|----------|--------------------|-------------------------|--------------|-----------|
| | PIC | Project Manager | Civil Lead | Architectura I Lead | Structural Lead | Mechanical Lead | Electrical Lead | I&C Lead | BIM Lead | Support Engineers | BIM Support | QC | Project Analyst | | | |
| Billing Rate | \$325.54 | \$302.25 | \$208.69 | \$280.76 | \$229.07 | \$192.66 | \$207.15 | \$236.85 | \$187.37 | \$159.00 | \$148.40 | \$159.00 | \$103.41 | | | |
| Project Management | | 133 | | | | | | | | | | | 234 | 367 | | \$64,397 |
| Project Meetings | 10 | 75 | 30 | | | | 20 | 30 | | | | | | 165 | \$1,500 | \$44,933 |
| Conformed Documents | | 16 | | | | | | | 23 | 23 | 24 | | | 86 | | \$16,426 |
| Shop Drawings | | 45 | 50 | 40 | 90 | 30 | 200 | 200 | | 950 | | 100 | | 1,705 | | \$317,413 |
| RFIs | | 45 | 50 | 50 | 50 | 50 | 75 | 75 | | 75 | | 25 | | 495 | | \$108,360 |
| Plan Revisions | | | | | | | | | | | | | | | | |
| Delta Drawings | | 10 | | | | | | | 25 | 30 | 35 | | | 100 | | \$17,671 |
| Pothole Results | | 5 | 20 | | | | | | 25 | 25 | 25 | | | 100 | | \$18,054 |
| Site Visits | | 5 | 25 | | 25 | | 25 | 30 | | | | | | 110 | \$1,000 | \$25,740 |
| Energy Control Procedures and Asset Management | | | | | | | | | | | | | | | \$30,000 | \$30,000 |
| Record Drawings | | 19 | 12 | 5 | 6 | 5 | 14 | 16 | 46 | 56 | 208 | 48 | | 434 | \$624 | \$75,004 |
| Construction Coordination | | | | | | | | | | | | | | | | |
| General Plan Clarifications | | 15 | 20 | 10 | 20 | 10 | 25 | 25 | | | | | | 125 | | \$29,123 |
| General Construction Alternatives Analysis / Engineering Calculations / Exhibit Preparation | | 10 | 20 | 10 | 30 | 5 | 25 | 25 | | 25 | | | | 150 | | \$32,914 |
| General Field Questions | | 25 | 20 | 5 | 20 | | 20 | 20 | | 40 | | | | 150 | | \$32,955 |
| Instrumentation / Control and Electrical | | 10 | | | | | 70 | 70 | | | | | | 150 | | \$34,103 |
| Startup and Testing | | 8 | | | | | 32 | 60 | | | | | | 100 | \$648 | \$23,906 |
| | | | | | | | | | | | | | | | | |
| Total | 10 | 421 | 247 | 120 | 241 | 100 | 506 | 551 | 119 | 1,224 | 292 | 173 | 234 | 4,237 | 33,772 | \$871,000 |