

AGENDA
IRVINE RANCH WATER DISTRICT
ENGINEERING AND OPERATIONS COMMITTEE
TUESDAY, SEPTEMBER 20, 2016

CALL TO ORDER 7:00 a.m., Operations Center, First Floor Committee Room
3512 Michelson, Irvine, California

ATTENDANCE Committee Chair: Douglas Reinhart _____
Committee Member: Steve LaMar _____

ALSO PRESENT

Paul Cook	_____	Patrick Sheilds	_____	Harry Cho	_____
Kevin Burton	_____	Eric Akiyoshi	_____	Paul Weghorst	_____
Rich Mori	_____	Scott Toland	_____	Tom Roberts	_____
Kellie Lew	_____	Ken Drake	_____	Ken Pfister	_____
Lars Oldewage	_____	Arseny Kalinsky	_____	Steve Malloy	_____
Malcolm Cortez	_____	Bruce Newell	_____		_____

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.

ACTION

5. SANTIAGO HILLS II CAPITAL FACILITIES – KESSLER/LEW/BURTON

Recommendation: That the Board authorize the addition of the Santiago Hills II, Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452 and 7543 to the FY 2016-17 in the amounts of \$1,126,900, \$259,600 and \$2,228,300, respectively; authorize the General Manager to accept Irvine Community Development Company's (ICDC's) design and bid support services contract with Michael Baker International in the amount of \$194,200 for the Santiago Hills II, Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452 and 7543; and authorize the General Manager to accept ICDC's design and bid support services contract with Michael Baker International in the amount of \$258,212 for the Santiago Hills II, Recycled Water Capital Improvements, Projects 5823 and 7137.

ACTION - Continued

6. REIMBURSEMENT AGREEMENT WITH MERITAGE HOMES FOR THE
COMMERCENTRE DRIVE PRESSURE REGULATING STATION –
LEW/BURTON

Recommendation: That the Board authorize the addition of the Lake Forest Encanto Commercentre Domestic Pressure Regulating Station, Project 7513 to the FY 2016-17 Capital Budget in the amount of \$255,200; authorize the General Manager to execute a Reimbursement Agreement with Meritage Homes of California, Inc. for the construction of the Commercentre Drive pressure regulating station; and authorize the General Manager to accept Meritage Homes of California, Inc.'s construction change order with Kana Pipeline in the amount of \$134,149 for Project 7513.

7. CONSULTANT SELECTION FOR SECOND ZONE 1 RESERVOIR –
LYNCH/MCGEHEE/MORI/BURTON

Recommendation: That the Board authorize the General Manager to execute a Professional Services Agreement with Tetra Tech in the amount of \$438,000 for engineering services for the Second Zone 1 Reservoir, Project 6401.

8. INITIAL DISINFECTION FACILITY SODIUM HYPOCHLORITE
STORAGE AND FEED SYSTEM DESIGN VARIANCE AND
CONSULTANT SELECTION – LYNCH/MOEDER/MORI/BURTON

Recommendation: That the Board authorize the General Manager to execute Variance No. 2 in the amount of \$22,428 with Carollo Engineers for additional final design engineering services, and authorize the General Manager to execute a Professional Services Agreement with Carollo Engineers in the amount of \$183,586 for engineering services during construction for the Initial Disinfection Facility Sodium Hypochlorite Storage and Feed System Project, Project 6213.

9. DYER ROAD WELLFIELD WELL NO. 3 REHABILITATION BUDGET
ADDITION AND CONTRACT CHANGE ORDER –
CHO/CORTEZ/BURTON

Recommendation: That the Board authorize the addition of Project 4327 to the FY 2016-17 Capital Budget for \$1,112,100, and authorize the General Manager to execute Contract Change Order No. 5 with General Pump Company in the amount of \$236,006 for the Dyer Road Wellfield Well No. 3 Rehabilitation, Project 4327.

ACTION - Continued

10. FATS, OILS AND GREASE PROGRAM VARIANCE NO. 1 –
LEWIS/SANCHEZ/WEGHORST

Recommendation: That the Board authorize the General Manager to execute Variance No. 1 with Environmental Engineering and Contracting, Inc. to provide Fats, Oil and Grease (FOG) Program services in the amount of \$165,950 for the period November 1, 2016 to October 31, 2017 and for an optional additional year at \$165 as may be necessary to transition to the District's new Pretreatment and FOG Programs.

11. MICHELSON WATER RECYCLING PLANT BIOSOLIDS AND ENERGY
RECOVERY FACILITIES VARIANCES AND BUDGET INCREASE –
MALLOY/BURTON

That the Board authorize the General Manager to execute Variance No. 5 with Black & Veatch in the amount of \$3,564,215 for supplemental contract administration, construction phase, and start-up and commissioning services; authorize the General Manager to execute Variance No. 1 with Arcadis, Inc. in the amount of \$1,345,755 for supplemental construction inspection, construction management, and document control system services; authorize the General Manager to execute Variance No. 2 with HDR Engineering, Inc. in the amount of \$496,003 for supplemental construction inspection; authorize the General Manager to execute Variance No. 1 with EI&C Engineering, Inc. in the amount of \$734,600 for supplemental process control system construction management services, start-up testing, and development of process control system operation manuals and associated training presentations; and authorize a budget increase in the amount of \$19,607,600 from \$196,465,500 to \$216,073,100, to the FY 2016-17 Capital Budget for the Michelson Water Recycling Plant Biosolids and Energy Recovery Facilities, Project 4286.

12. DYER ROAD WELLFIELD WELL 7 AND IRVINE DESALTER PROJECT
WELL 107 REHABILITATION CONSULTANT SELECTION –
SPANGENBERG/CORTEZ/BURTON

Recommendation: That the Board authorize the addition of Irvine Desalter Project Well 107 Rehabilitation, project 7589, in the amount of \$770,000 to the FY 2016-17 Capital Budget, and authorize the General Manager to execute a Professional Services Agreement in the amount of \$130,500 with Richard C. Slade & Associates for the Dyer Road Wellfield Well 7 Rehabilitation and Irvine Desalter Project Well 107 Rehabilitation, projects 7093 and 7589.

OTHER BUSINESS

13. A. Directors' Comments

B. 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 at the entrance of the meeting room at the District's Operation's Committee Room at 3512 Michelson, Irvine, California. The Irvine Ranch Water District's Committee Room is wheelchair accessible. If you require any special disability-related accommodations (e.g., access to an amplified sound system, etc.), please contact the District Secretary at (949) 453-5312 during business hours at least seventy-two (72) hours prior to the scheduled meeting.

September 20, 2016

Prepared by: C. Kessler/K. Lew

Submitted by: K. Burton

Approved by: Paul Cook



ENGINEERING AND OPERATIONS COMMITTEE

SANTIAGO HILLS II CAPITAL FACILITIES

SUMMARY:

Irvine Community Development Company (ICDC) is beginning development of Santiago Hills II which includes the construction of streets, storm drains, domestic water, sewer, and recycled water improvements. Staff recommends that the Board:

- Authorize the addition of the Santiago Hills II Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452, and 7453 in the amounts of \$1,126,900, \$259,600 and \$2,228,300, respectively, to the FY 2016-17 Capital Budget;
- Authorize the General Manager to accept ICDC's design and bid support services contract with Michael Baker International in the amount of \$194,200 for the Santiago Hills II Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452, and 7453; and
- Authorize the General Manager to accept ICDC's design and bid support services contract with Michael Baker International in the amount of \$258,212 for the Santiago Hills II, Recycled Water Capital Improvements, Projects 5823 and 7137.

BACKGROUND:

ICDC is moving forward with improvements in the Santiago Hills II development located between State Route 241/261 and Jamboree Road at Santiago Canyon Road. The proposed land use consists of 1,180 residential dwelling units, community parks, and natural open space as shown in the location map attached as Exhibit "A". ICDC plans to start grading in fall 2016.

The design and construction of the IRWD facilities will be performed under the terms of the Master Reimbursement Agreement and Supplemental Reimbursement Agreement between ICDC and IRWD approved by the Board in May 1997 and August 2016, respectively.

Santiago Hills II Santiago Canyon Road and Jamboree Road Capital Improvements:

The Santiago Hills II Santiago Canyon Road and Jamboree Road Capital Improvements project consists of installing approximately 2,000 feet of 12-inch domestic water pipeline, 300 feet of 15-inch sanitary sewer pipeline, 5,000 feet of 6-inch recycled water pipeline, 1,200 feet of 8-inch recycled water pipeline and 600 feet of 12-inch recycled water pipeline within Santiago Canyon Road and Jamboree Road. ICDC retained Michael Baker International to provide design and bid support services for Projects 7451, 7452 and 7453 in the amount of \$69,200. In addition, Michael Baker International has presented ICDC with two Contract Change Orders that reflect additional design efforts associated with revisions to the Santiago Hills II SAMP in the amount of \$102,000 and potholing and traffic control to aid design in the amount of \$23,000 for a total design and bid support of \$194,200.

Santiago Hills II Recycled Water Capital Improvements:

The Santiago Hills II Recycled Water Improvements will expand IRWD's Zone C+ recycled water system by installing approximately 9,800 feet of 42-inch diameter recycled water pipeline, 1,200 feet of 20-inch recycled water pipeline and 3,500 feet of 10-inch recycled water pipeline in Jamboree Road, Chapman Avenue and Santiago Canyon Road, and converting portions of the Irvine Lake Pipeline to the Zone C+ system. ICDC retained Michael Baker International to provide design and bid support services for Projects 5823 and 7137 in the amount of \$258,212.

FISCAL IMPACTS:

Projects 5823 and 7137 are included in the FY 2016-17 Capital Budget. Staff requests the addition of Santiago Hills II Santiago Canyon Road and Jamboree Road Improvements, Projects 7451, 7452 and 7453 to the FY 2016-17 Capital Budget in the amounts of \$1,126,900, \$259,600 and \$2,228,300, respectively. Expenditure Authorizations, attached as Exhibit "B" will be approved by the General Manager.

Project No.	Current Budget	Addition <Reduction>	Total Budget
7451	-0-	\$1,126,900	\$1,126,900
7452	-0-	\$ 259,600	\$ 259,600
7453	-0-	\$2,228,300	\$2,228,300
Total	-0-	\$2,487,900	\$2,487,900

ENVIRONMENTAL COMPLIANCE:

Construction of capital domestic water, sewer, and recycled water facilities for the Santiago Hills II Development is subject to CEQA. In conformance with the California Code of Regulations Title 14, Chapter 3, Article 7 an Environmental Impact Report (EIR) was certified by the City of Orange, the lead agency on April 11, 2000 (SCH# 2000041122). An Addendum to the EIR was approved by the City of Orange on July 15, 2016.

RECOMMENDATION:

That the Board authorize the addition of the Santiago Hills II, Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452 and 7543 to the FY 2016-17 in the amounts of \$1,126,900, \$259,600 and \$2,228,300, respectively; authorize the General Manager to accept Irvine Community Development Company's (ICDC's) design and bid support services contract with Michael Baker International in the amount of \$194,200 for the Santiago Hills II, Santiago Canyon Road and Jamboree Road Capital Improvements, Projects 7451, 7452 and 7543; and authorize the General Manager to accept ICDC's design and bid support services contract with Michael Baker International in the amount of \$258,212 for the Santiago Hills II, Recycled Water Capital Improvements, Projects 5823 and 7137.

LIST OF EXHIBITS:

Exhibit "A" – Location Map
Exhibit "B" – Expenditure Authorizations

EXHIBIT "A "

SANTIAGO HILL II - NORTH 17895

	PRODUCT	UNITS	ACRES	
	G-1	60x90	154	21.9
	G-2	50x90	119	24.2
	G-3	48x75	17	3.5
	H-1	48x75	30	12.6
	I-1	SIX COURT	649	17.7
	I-2	FOUR COURT	110	14.4
	I-3	38x92	103	15.2
NORTH RESIDENTIAL TOTAL		1180	114.7	

SANTIAGO HILL II - SOUTH 18199

	PRODUCT	UNITS	ACRES
	J-1 30x70	94	22.1
	J-2 60x100	15	3.5
	J-3 60x50	42	7.2
	J-4 60x40	48	9.5
	J-5 48x75	95	14.5
	J-6 48x75	52	7.6
	K CASTLEWOOD TOWNS	114	11.4
SOUTH RESIDENTIAL TOTAL		461	77.8
SHII RESIDENTIAL TOTAL		1180	191.5

	PARK
	LANDSCAPE
	UNDEVELOPED NATURAL AREA



IRVINE RANCH WATER DIST EXHIBIT "B"

Expenditure Authorization

Project Name: SHII SANTIAGO CYN (FROM D ST TO A ST) 12"DW
 EPMS Project No: 11966 EA No: 1
 Oracle Project No: 7451
 Project Manager: LEW, KELLY
 Project Engineer: RIOS, BELISARIO
 Request Date: September 6, 2016

ID Split: Miscellaneous

Improvement District (ID) Allocations

ID No.	Allocation %	Source of Funds
153	100.0	BONDS YET TO BE SOLD**
Total	100.0%	

Summary of Direct Cost Authorizations

Previously Approved EA Requests:	\$0
This Request:	\$1,126,900
Total EA Requests:	\$1,126,900
Previously Approved Budget:	\$0
Budget Adjustment Requested this EA:	\$1,126,900
Updated Budget:	\$1,126,900
Budget Remaining After This EA	\$0

Comments:

Phase	This EA Request	Previous EA Requests	EA Requests to Date	This Budget Request	Previous Budget	Updated Budget	Start	Finish
ENGINEERING DESIGN - IRWD	60,000	0	60,000	60,000	0	60,000	7/16	7/17
ENGINEERING DESIGN - OUTSIDE	73,000	0	73,000	73,000	0	73,000	7/16	7/17
DESIGN STAFF FIELD SUPPORT	37,000	0	37,000	37,000	0	37,000	7/16	7/17
ENGINEERING - CA&I IRWD	73,000	0	73,000	73,000	0	73,000	7/16	7/17
ENGINEERING - CA&I OUTSIDE	60,000	0	60,000	60,000	0	60,000	7/16	7/17
CONSTRUCTION FIELD SUPPORT	37,000	0	37,000	37,000	0	37,000	7/16	7/17
CONSTRUCTION	730,000	0	730,000	730,000	0	730,000	7/16	7/17
LEGAL	3,000	0	3,000	3,000	0	3,000	7/16	7/17
Contingency - 5.00% Subtotal	\$53,900	\$0	\$53,900	\$53,900	\$0	\$53,900		
Subtotal (Direct Costs)	\$1,126,900	\$0	\$1,126,900	\$1,126,900	\$0	\$1,126,900		
Estimated G/A - 185.00% of direct labor*	\$383,100	\$0	\$383,100	\$383,100	\$0	\$383,100		
Total	\$1,510,000	\$0	\$1,510,000	\$1,510,000	\$0	\$1,510,000		
Direct Labor	\$207,000	\$0	\$207,000	\$207,000	\$0	\$207,000		

*EA includes estimated G&A. Actual G&A will be applied based on the current ratio of direct labor to general and administrative costs.

EA Originator:

Chantich Kessler KNL 9/8/16

Department Director:

Rosin L. Burt 9/9/16

Finance:

Board/General Manager:

** IRWD hereby declares that it reasonably expects those expenditures marked with two asterisks to be reimbursed with proceeds of future debt to be incurred by IRWD in a maximum principal amount of \$1,541,000. The above-captioned project is further described in the attached staff report and additional documents, if any, which are hereby incorporated by reference. The official intent to reimburse costs of the above-captioned project is made under Treasury Regulation Section 1.150-2.

IRVINE RANCH WATER DISTRICT

Expenditure Authorization

Project Name: SHII CANYON VIEW (AT JAMBOREE RD) 15" SS

EPMS Project No: 21966 EA No: 1

Oracle Project No: 7452

Project Manager: LEW, KELLY

Project Engineer: RIOS, BELISARIO

Request Date: September 6, 2016

ID Split: Miscellaneous

Improvement District (ID) Allocations

ID No.	Allocation %	Source of Funds
253	100.0	BONDS YET TO BE SOLD**
Total	100.0%	

Summary of Direct Cost Authorizations

Previously Approved EA Requests:	\$0
This Request:	\$259,600
Total EA Requests:	\$259,600
Previously Approved Budget:	\$0
Budget Adjustment Requested this EA:	\$259,600
Updated Budget:	\$259,600
Budget Remaining After This EA	\$0

Comments:

Phase	This EA Request	Previous EA Requests	EA Requests to Date	This Budget Request	Previous Budget	Updated Budget	Start	Finish
ENGINEERING DESIGN - IRWD	13,000	0	13,000	13,000	0	13,000	7/16	7/17
ENGINEERING DESIGN - OUTSIDE	16,000	0	16,000	16,000	0	16,000	7/16	7/17
DESIGN STAFF FIELD SUPPORT	8,000	0	8,000	8,000	0	8,000	7/16	7/17
ENGINEERING - CA&I IRWD	16,000	0	16,000	16,000	0	16,000	7/16	7/17
ENGINEERING - CA&I OUTSIDE	13,000	0	13,000	13,000	0	13,000	7/16	7/17
CONSTRUCTION FIELD SUPPORT	8,000	0	8,000	8,000	0	8,000	7/16	7/17
CONSTRUCTION	160,000	0	160,000	160,000	0	160,000	7/16	7/17
LEGAL	2,000	0	2,000	2,000	0	2,000	7/16	7/17
Contingency - 10.00% Subtotal	\$23,600	\$0	\$23,600	\$23,600	\$0	\$23,600		
Subtotal (Direct Costs)	\$259,600	\$0	\$259,600	\$259,600	\$0	\$259,600		
Estimated G/A - 185.00% of direct labor*	\$83,300	\$0	\$83,300	\$83,300	\$0	\$83,300		
Total	\$342,900	\$0	\$342,900	\$342,900	\$0	\$342,900		
Direct Labor	\$45,000	\$0	\$45,000	\$45,000	\$0	\$45,000		

*EA includes estimated G&A. Actual G&A will be applied based on the current ratio of direct labor to general and administrative costs.

EA Originator:

Christina Kessler *KLC* *9/8/16*

Department Director:

Ross L. Burton *9/9/16*

Finance:

Board/General Manager:

** IRWD hereby declares that it reasonably expects those expenditures marked with two asterisks to be reimbursed with proceeds of future debt to be incurred by IRWD in a maximum principal amount of \$350,000. The above-captioned project is further described in the attached staff report and additional documents, if any, which are hereby incorporate official intent to reimburse costs of the above-captioned project is made under Treasury Regulation Section 1.150-2.

IRVINE RANCH WATER DISTRICT

Expenditure Authorization

Project Name: SHII SANTIAGO CYN AND JAMBOREE 6"8"12"16" RW
EPMS Project No: 31966 EA No: 1
Oracle Project No: 7453
Project Manager: LEW, KELLY
Project Engineer: RIOS, BELISARIO
Request Date: September 6, 2016

ID Split: Miscellaneous

Improvement District (ID) Allocations

ID No.	Allocation %	Source of Funds
253	100.0	BONDS YET TO BE SOLD**
Total	100.0%	

Summary of Direct Cost Authorizations

Previously Approved EA Requests:	\$0
This Request:	\$2,228,300
Total EA Requests:	\$2,228,300
Previously Approved Budget:	\$0
Budget Adjustment Requested this EA:	\$2,228,300
Updated Budget:	\$2,228,300
Budget Remaining After This EA	\$0

Comments:

Phase	This EA Request	Previous EA Requests	EA Requests to Date	This Budget Request	Previous Budget	Updated Budget	Start	Finish
ENGINEERING DESIGN - IRWD	116,000	0	116,000	116,000	0	116,000	7/16	7/17
ENGINEERING DESIGN - OUTSIDE	145,000	0	145,000	145,000	0	145,000	7/16	7/17
DESIGN STAFF FIELD SUPPORT	73,000	0	73,000	73,000	0	73,000	7/16	7/17
ENGINEERING - CA&I IRWD	145,000	0	145,000	145,000	0	145,000	7/16	7/17
ENGINEERING - CA&I OUTSIDE	116,000	0	116,000	116,000	0	116,000	7/16	7/17
CONSTRUCTION FIELD SUPPORT	73,000	0	73,000	73,000	0	73,000	7/16	7/17
CONSTRUCTION	1,450,000	0	1,450,000	1,450,000	0	1,450,000	7/16	7/17
LEGAL	4,000	0	4,000	4,000	0	4,000	7/16	7/17
Contingency - 5.00% Subtotal	\$106,300	\$0	\$106,300	\$106,300	\$0	\$106,300		
Subtotal (Direct Costs)	\$2,228,300	\$0	\$2,228,300	\$2,228,300	\$0	\$2,228,300		
Estimated G/A - 185.00% of direct labor*	\$753,100	\$0	\$753,100	\$753,100	\$0	\$753,100		
Total	\$2,981,400	\$0	\$2,981,400	\$2,981,400	\$0	\$2,981,400		
Direct Labor	\$407,000	\$0	\$407,000	\$407,000	\$0	\$407,000		

*EA includes estimated G&A. Actual G&A will be applied based on the current ratio of direct labor to general and administrative costs.

EA Originator:

Christina Vach KAL 9/8/16

Department Director:

Kevin L. Burton 9/9/16

Finance:

Board/General Manager:

** IRWD hereby declares that it reasonably expects those expenditures marked with two asterisks to be reimbursed with proceeds of future debt to be incurred by IRWD in a maximum principal amount of \$3,042,000. The above-captioned project is further described in the attached staff report and additional documents, if any, which are hereby incorporated
project is made under Treasury Regulation Section 1.150-2.

September 20, 2016

Prepared by: K. Lew

Submitted by: K. Burton

Approved by: Paul Cook 

ENGINEERING AND OPERATIONS COMMITTEE

REIMBURSEMENT AGREEMENT WITH MERITAGE HOMES FOR THE COMMERCENTRE DRIVE PRESSURE REGULATING STATION

SUMMARY:

Meritage Homes of California, Inc. (Meritage) is beginning development of a new residential development in Lake Forest. The development includes the construction of streets, storm drains, domestic water, sewer, and recycled water improvements. Staff recommends that the Board:

- Authorize the addition of the Commercentre Drive Zone LF2 to Zone LF2Ra Pressure Regulating Station, Project 7513 in the amount of \$255,200 to the FY 2016-17 Capital Budget;
- Authorize the General Manager to execute a Reimbursement Agreement (RA) with Meritage for construction of a pressure regulating station; and
- Authorize the General Manager to accept Meritage's construction change order with Kana Pipeline for \$134,149.

BACKGROUND:

Meritage is beginning construction of Encanto, a new residential development consisting of 52 single family homes located on the southeast corner of Alton Parkway and Commercentre Drive in Lake Forest. Recently, IRWD re-evaluated and modified the pressure zones in this area of Lake Forest to address an area of high pressure that did not meet IRWD's pressure criteria. This recent modification affected the Encanto development by requiring two new pressure regulating stations to maintain normal service pressures to these new homes. IRWD intends to reimburse Meritage for the new primary pressure regulating station. Meritage will install the secondary pressure regulating station at its cost because there is no longer a need to install individual pressure regulators at each residence.

Reimbursement Agreement:

Meritage has requested that IRWD enter into an RA for construction of one primary pressure regulating station located on Commercentre Drive. Meritage will construct the Zone LF2 to Zone LF2Ra pressure regulating station as part of its water, sewer, and recycled water improvements for the entire development as shown in the location map provided as Exhibit "A".

The terms of the Meritage RA are substantially the same as IRWD's RAs with the Irvine Community Development Company and Heritage Fields El Toro. The proposed RA has been reviewed by IRWD's legal counsel and is provided as Exhibit "B". The required IRWD domestic water, sewer, and recycled water capital facilities are documented in the Lake Forest Sub-Area Master Plan Addendum for the Encanto Residential Development prepared by Huitt-Zollars, Inc. in April 2016.

Construction Change Order:

Meritage retained Huitt-Zollars to prepare the Encanto improvement plans and Kana Pipeline to construct the improvements. Since the need for the pressure regulating station was identified after receiving construction bids, Kana Pipeline submitted a change order to construct the pressure regulating station. The proposed change order cost of \$134,149 to construct a primary pressure regulating station with telemetry is comparable with other recent bids and staff finds the cost to be acceptable. A summary of the reimbursement costs is shown below.

Design (Huitt-Zollars)	\$ 6,460.00
Construction Change Order (Kana Pipeline)	\$ 134,149.00
Meritage Administration Fee (1%)	<u>\$ 1,341.49</u>
	\$ 141,950.49

FISCAL IMPACTS:

Staff recommends the addition of Commercentre Drive Zone LF2 to Zone LF2Ra Pressure Regulating Station, Project 7513 to the FY 2016-17 Capital Budget in the amount of \$255,200 as shown in the table below. The Expenditure Authorization for Project 7513 is provided as Exhibit "C" and will be approved by the General Manager.

Project No.	Current Budget	Addition <Reduction>	Total Budget
7513	\$ -0-	\$ 255,200	\$ 255,200

ENVIRONMENTAL COMPLIANCE:

Activities such as executing reimbursement agreements are not subject to the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15061 (b) (3), in that CEQA applies only to projects which have the potential for causing a significant effect on the environment.

Construction of capital domestic water, sewer, and recycled water facilities for the Meritage project is subject to CEQA. In conformance with the California Code of Regulations Title 14, Chapter 3, Article 7, a Negative Declaration was certified by the City of Lake Forest on December 17, 2015.

RECOMMENDATION:

That the Board authorize the addition of the Lake Forest Encanto Commercentre Domestic Pressure Regulating Station, Project 7513 to the FY 2016-17 Capital Budget in the amount of \$255,200; authorize the General Manager to execute a Reimbursement Agreement with Meritage Homes of California, Inc. for the construction of the Commercentre Drive pressure regulating station; and authorize the General Manager to accept Meritage Homes of California, Inc.'s construction change order with Kana Pipeline in the amount of \$134,149 for Project 7513.

LIST OF EXHIBITS:

Exhibit "A" – Location Map

Exhibit "B" – Reimbursement Agreement between IRWD and Meritage for the Commercentre
Drive Pressure Regulating Station

Exhibit "C" – Expenditure Authorization

EXHIBIT "A"

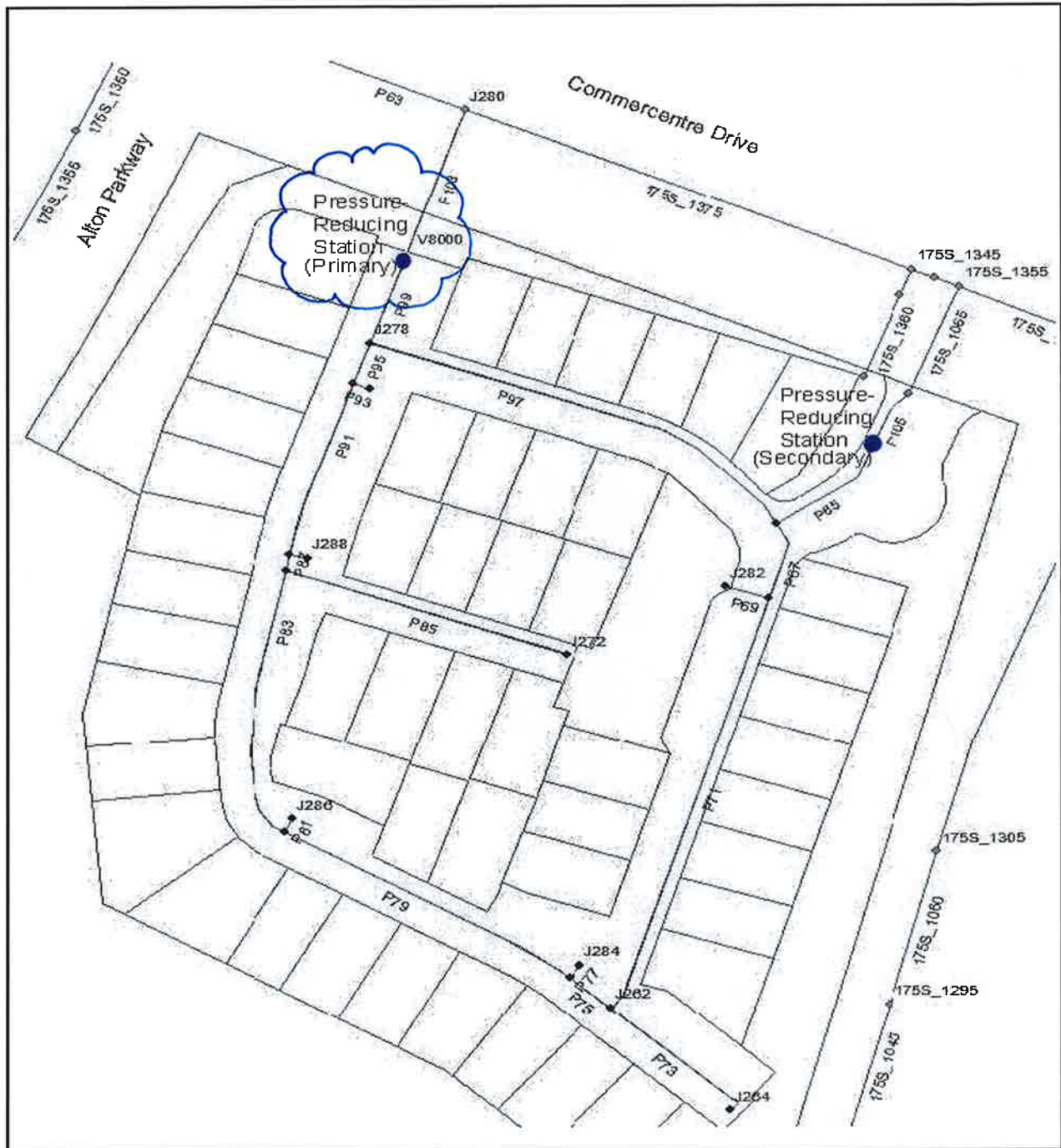


EXHIBIT "B"

File No. 7513

REIMBURSEMENT AGREEMENT BETWEEN
IRVINE RANCH WATER DISTRICT
AND MERITAGE HOMES
FOR
A PRIMARY DOMESTIC WATER PRESSURE REGULATING STATION
IN COMMERCENTRE DRIVE BETWEEN ALTON PARKWAY AND CALLE ELEGANTE

This Agreement is made and entered into as of this ____ day of _____, 2016, by and between IRVINE RANCH WATER DISTRICT, a California water district formed and existing pursuant to the California Water District Law of the State of California, hereinafter referred to as "DISTRICT," and MERITAGE HOMES OF CALIFORNIA, INC., a California corporation, hereinafter referred to as "BUILDER."

W I T N E S S E T H:

WHEREAS, BUILDER proposes to construct utility improvements within Commercentre Drive between Alton Parkway and Calle Elegante (the "Project"), within the jurisdictional boundaries of DISTRICT and the City of Lake Forest; and

WHEREAS, prior to or in conjunction with BUILDER's construction of the Project, IRWD desires to construct, within or adjacent to the street improvements that comprise the Project, the following capital facilities and appurtenances thereto: one primary pressure regulating station per the DISTRICT'S standard drawing W-15 (not including any site improvements such as demolition, grading, and retaining walls) as depicted on Exhibit "A" attached hereto incorporated by reference herein (hereinafter referred to as the "IRWD FACILITIES"); and

WHEREAS, the parties have determined that it would be more expedient for BUILDER to construct the IRWD FACILITIES rather than for DISTRICT to do so; and

WHEREAS, DISTRICT is amenable to the design and construction of the IRWD FACILITIES by BUILDER, at the cost of BUILDER, which cost is to be reimbursed by DISTRICT; and

WHEREAS, except as otherwise provided herein, upon the completion of the IRWD FACILITIES, the IRWD FACILITIES shall become the property of DISTRICT in accordance with the terms and conditions hereinafter set forth.

NOW, THEREFORE, the parties hereto, in consideration of the mutual promises and covenants hereinafter set forth, do agree as follows:

SECTION 1. IRWD FACILITIES. In conjunction with the Project, BUILDER agrees to initiate and diligently pursue to completion the design and construction of the IRWD FACILITIES.

SECTION 2. PLANS. BUILDER agrees that the IRWD FACILITIES shall be completed pursuant to approved project plans and specifications (the “Plans and Specifications”) which shall be approved by DISTRICT and used in awarding the construction contract. Prior to commencement of preparation of the Plans and Specifications, BUILDER shall submit its design engineer’s proposal for the design of the IRWD FACILITIES to DISTRICT. DISTRICT will have a period of five (5) calendar days from its receipt of such design proposal to review and either indicate its approval or request changes. In the event the DISTRICT does not provide approval or requested changes to BUILDER within such ten (10) calendar day period the design as provided to the DISTRICT shall be deemed approved. BUILDER shall cause its design engineer to review and respond to any requested changes. Any resubmittal of the plans following requested changes by the DISTRICT shall be governed by the process outlined above, including the time periods of review and deemed approval for failures to respond. The Plans and Specifications shall be deemed to incorporate the applicable portions of DISTRICT’s latest edition of “Construction Manual for the Construction of Water, Sewer, and Reclaimed Water Facilities” (the “Construction Manual”). The IRWD FACILITIES shall be contracted by BUILDER together with non-reimbursable work to be completed by BUILDER within the Project pursuant to plans prepared by BUILDER’s design engineer.

SECTION 3. BIDDING AND AWARD. The parties agree that the construction of the IRWD FACILITIES shall be included in BUILDER’s contract(s) awarded for the Project and that the IRWD FACILITIES shall be bid as a separate item or items that can be deleted. During the bidding process, BUILDER shall deliver to IRWD one (1) complete set of the bid documents that include the IRWD FACILITIES, including all related addenda concurrently with the distribution thereof to prospective bidders. Upon opening of bids by BUILDER, BUILDER will

submit the bids or a spread sheet summary of the bids to DISTRICT. DISTRICT will have a period of ten (10) calendar days from its receipt of the bid results for review and approval of the IRWD FACILITIES bid item(s) submitted by the bidder identified to DISTRICT by BUILDER as BUILDER's proposed successful bidder. BUILDER agrees that bids received for the construction of the IRWD FACILITIES bid item(s) shall be subject to the approval of DISTRICT prior to award of the Project construction contract(s) that include the IRWD FACILITIES; and further agrees that in the event DISTRICT does not approve such bids, either party may terminate this Agreement upon twenty-four (24) hours' prior written notice, in which event BUILDER shall have no further obligation to construct the IRWD FACILITIES, and DISTRICT may elect to install the IRWD FACILITIES with its own contractor. If DISTRICT approves of the IRWD FACILITIES bid item(s) of BUILDER's successful bidder, BUILDER agrees to cause the IRWD FACILITIES to be constructed as part of the contract awarded to such bidder. The total estimated construction cost for the IRWD FACILITIES is \$150,000, provided, however, the amount to be reimbursed by DISTRICT shall be based on the actual costs of construction. Upon award of the construction contract, BUILDER shall provide DISTRICT with one (1) original copy of the fully executed contract documents and one (1) copy of the bid package relating to the IRWD FACILITIES received from the successful bidder.

SECTION 4. DESIGN REVISIONS AND CHANGE ORDERS. BUILDER agrees that if, during design or construction, BUILDER requests or initiates any revision to the Plans and Specifications that would increase the cost of the IRWD FACILITIES, such additional costs shall be borne by BUILDER, and shall not be reimbursed by DISTRICT, except for such revision(s) and cost(s) that are determined necessary to construct IRWD FACILITIES in accordance with the Construction Manual and could not reasonably have been foreseen at the time bids were received. The cost of any such necessary and unforeseeable revisions, and the cost of any revisions requested or initiated by DISTRICT shall be reimbursed by DISTRICT as provided herein.

BUILDER shall promptly furnish DISTRICT with copies of any proposed change orders to the Project contract within five (5) working days of initiation of changed conditions to such contract, which change orders shall be subject to DISTRICT approval if and to the extent any of the IRWD FACILITIES are affected thereby. DISTRICT will review and respond to proposed change orders affecting the IRWD FACILITIES within ten (10) working days of receipt by DISTRICT. The DISTRICT will be deemed to have approved such change orders in the event the DISTRICT does not respond with such ten (10) working day period.

SECTION 5. REIMBURSEMENT. DISTRICT agrees to reimburse BUILDER for the following costs (collectively, the "Costs"): the actual costs of design and construction of the IRWD FACILITIES, including, but not limited to all permits, bonds, and legal fees (excluding the costs of preparation of this Agreement) incurred by BUILDER for the design and construction of the IRWD FACILITIES. BUILDER shall keep a separate accounting of all Costs incurred by BUILDER in relation to the IRWD FACILITIES.

Within sixty (60) days of DISTRICT's acceptance of the IRWD FACILITIES as provided in Section 8, a final accounting of the Costs shall be made by BUILDER and submitted to DISTRICT along with an invoice for the Costs and any supporting documentation necessary to show the amounts which represent Costs of IRWD FACILITIES. Amounts paid pursuant to progress payment invoices shall be subject to adjustment in the final accounting. Within thirty (30) days of said final accounting, DISTRICT agrees to pay to BUILDER the total amount of the Costs.

SECTION 6. LAWS, ORDINANCES, RULES AND REGULATIONS. BUILDER shall require in its contract for the construction of the IRWD FACILITIES that its contractor be fully informed of and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable requirements of the California Labor Code, prevailing wage laws, the Construction Manual, and the Rules and Regulations of DISTRICT, in connection with the construction of the IRWD FACILITIES.

SECTION 7. INSPECTION. DISTRICT shall have sole and absolute discretion as to all aspects of design and construction of the IRWD FACILITIES, and DISTRICT shall be entitled to inspect the construction of IRWD FACILITIES as it deems necessary to assure compliance with the Plans and Specifications, including shop drawing review and material inspection thereof. DISTRICT shall have access to all phases of the Project work to be performed by BUILDER for the purpose of such inspection; provided, however, all questions regarding the work being performed will be directed to BUILDER's resident engineer. DISTRICT will promptly notify BUILDER of any portion of the work on the IRWD FACILITIES which appears not to conform to the Plans and Specifications. The determination of DISTRICT as to conformity of the IRWD FACILITIES with the Plans and Specifications shall be made in DISTRICT's sole and absolute discretion. DISTRICT agrees not to unreasonably withhold its approval as to such conformity of the IRWD FACILITIES with the Plans and Specifications. BUILDER shall require its contractor to construct the IRWD FACILITIES so that the IRWD FACILITIES conform to the Plans and Specifications. BUILDER agrees to assume full

responsibility for certifying or obtaining certification of the compaction of backfill material over the IRWD FACILITIES.

SECTION 8. ACCEPTANCE. DISTRICT agrees to accept the IRWD FACILITIES when the IRWD FACILITIES have been completed by BUILDER in accordance with all requirements of the Plans and Specifications, including any change orders approved by DISTRICT as provided in Section 3 hereof. At the time of completion and acceptance of the IRWD FACILITIES, BUILDER agrees to furnish DISTRICT with one (1) copy of the contractor's redlined set of "record" drawings (showing all revisions, manufacturer and type of valves, pipe and fittings as required by DISTRICT) and one (1) copy of the compaction reports and certificate, survey notes and cut sheets.

SECTION 9. OWNERSHIP. It is mutually agreed between the parties hereto that notwithstanding the fact that BUILDER shall accomplish the construction of the IRWD FACILITIES subject to reimbursement, the IRWD FACILITIES to be completed hereunder, together with the necessary franchises, licenses, easements, rights-of-way, and other privileges, shall at all times be subject to the applicable rates, rules and regulations of DISTRICT, as modified or amended from time to time. Subject to receipt of reimbursement, BUILDER hereby disclaims any interest in the IRWD FACILITIES and does hereby transfer and assign to DISTRICT any and all right, title, and interest it may have in the IRWD FACILITIES. DISTRICT shall own, operate and maintain the IRWD FACILITIES following acceptance thereof.

SECTION 10. GUARANTEES. BUILDER will, pursuant to the requirement(s) of the Plans and Specifications, cause its contractor(s) for the IRWD FACILITIES to warrant the IRWD FACILITIES against defects in workmanship and materials for a period of one (1) year from the date of acceptance by BUILDER, which acceptance shall be given only after acceptance by DISTRICT as provided in Section 8. It is further agreed that BUILDER shall its contractor(s) to cause the IRWD FACILITIES to be brought or restored to full compliance with the requirements of the Plans and Specifications, including any test requirements, for any portions of the IRWD FACILITIES which during said one (1) year period are found not to be in conformance with the provisions of the Plans and Specifications. This warranty is in addition to any and all other warranties, express or implied, from BUILDER's contractors or material manufacturers, with respect to the IRWD FACILITIES. The warranties and obligations under this section shall in no way be relieved by DISTRICT's inspection and/or acceptance of the IRWD FACILITIES. This section sets forth the entire warranty of BUILDER with respect to the

IRWD FACILITIES. The express or implied warranties of other persons with respect to IRWD FACILITIES shall in no way be limited by the warranty of BUILDER contained in this section. If requested by DISTRICT, BUILDER agrees to assign to DISTRICT the contractor's guarantee and/or any other guarantees or warranties relating to the IRWD FACILITIES.

SECTION 11. INDEMNIFICATION. BUILDER shall indemnify, defend and hold DISTRICT, its officers, agents, employees, and engineers harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen during construction of the IRWD FACILITIES as a result of any work or action performed by BUILDER or on behalf of BUILDER, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any act, omission, or negligence of DISTRICT, its officers, agents, employees or engineers or by any act or omission for which DISTRICT, its officers, agents, employees or engineers are liable without fault.

DISTRICT shall indemnify, defend and hold BUILDER, its officers, agents, and employees, harmless from any expense, liability or claim for death, injury, loss, damage or expense to persons or property which may arise or is claimed to have arisen either (i) as a result of any acts performed by DISTRICT, its officers, agents, or employees, with respect to the IRWD FACILITIES construction; or (ii) following DISTRICT acceptance of the IRWD FACILITIES, with respect to maintenance and operation of the IRWD FACILITIES, save and except to the extent such expense, liability or claim is proximately caused in whole or in part by any negligence of BUILDER, its officers, agents, employees or engineers, or by any act or omission for which BUILDER, its officers, agents, employees or engineers are liable without fault.

SECTION 12. INSURANCE AND BONDING. BUILDER shall cause its contractor(s) to provide performance and payment bonds for the construction of the Project including the IRWD FACILITIES and to obtain insurance coverage sufficiently broad to insure the matters set forth in this Agreement and to include DISTRICT, its officers, agents, employees and engineers, as additional insureds on all insurance policies that BUILDER requires its contractor(s) to provide. As evidence of such insurance coverage, BUILDER shall, prior to commencement of construction of the IRWD FACILITIES, provide DISTRICT with certificates of insurance and insurance endorsements from BUILDER's contractor(s) in a form acceptable to DISTRICT.

SECTION 13. TERMINATION. DISTRICT shall have the right to terminate this Agreement at any time, subject to the provisions of this section, by providing five (5) business

days' prior written notice to BUILDER, except as noted in Section 3. If at the request or direction of a party other than BUILDER, the construction of the IRWD FACILITIES is not accomplished or completed, DISTRICT shall remain obligated for the actual amount of the Costs incurred by BUILDER to the date of termination.

If BUILDER's Project is canceled or modified so as to eliminate the necessity of the construction of the IRWD FACILITIES, BUILDER shall have the right to terminate this Agreement and thereby terminate its obligation to construct the IRWD FACILITIES, by providing five (5) business days' prior written notice to DISTRICT. In such case, DISTRICT will not be obligated for any design or any other Costs incurred by BUILDER. If IRWD elects to construct the IRWD FACILITIES, DISTRICT may, but shall not be obligated to, acquire the design or other work from BUILDER by separate agreement.

SECTION 14. NOTICE. Any notice or other written instrument required or permitted by this Agreement to be given to either party shall be deemed received when personally served or twenty-four (24) hours after being deposited in the U.S. Mail, postage prepaid, registered or certified and addressed as follows:

DISTRICT: Irvine Ranch Water District
15600 Sand Canyon Avenue
P.O. Box 57000
Irvine, CA 92619-7000
Attn: General Manager

BUILDER: Meritage Homes of California
1250 Corona Pointe Court, Suite 210
Corona, CA 92879
Attn: Peter Vanek

SECTION 15. SUCCESSORS AND ASSIGNS; INTEGRATION; AMENDMENT.
This Agreement shall be binding upon and inure to the benefit of the successor and assigns of BUILDER and DISTRICT. This Agreement constitutes the entire Agreement between BUILDER and DISTRICT and supersedes all prior understandings and agreements between the parties with respect to the subjects hereof. This Agreement may be modified only in writing signed by both parties hereto.

SECTION 16. LEGAL FEES. In the event of any declaratory or other legal or equitable action instituted between BUILDER and DISTRICT in connection with this Agreement, the

prevailing party shall be entitled to recover from the losing party all of its costs and expenses, including court costs and reasonable attorneys' fees.

SECTION 17. DEEMED APPROVAL. Unless a period for deemed approval is otherwise expressly set forth herein (in which event such express time period shall govern and control) any approval required to be given by either party pursuant to this Agreement shall be deemed given if no response to the party's request for such approval is received by the requesting party within fifteen (15) days following the written request for such approval.

SECTION 18. SEVERABILITY. If any term, provision, covenant or condition of this Agreement is held to be invalid, void or other unenforceable, to any extent, by any court of competent jurisdiction, the remainder of this Agreement shall not be affected thereby, and each term provision, covenant or condition of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

SECTION 19. APPLICABLE LAW. This Agreement shall be construed and enforced in accordance with the laws of the State of California.

SECTION 20. WAIVER. The waiver of any provision of this Agreement by either party shall not be deemed to be a waiver of any other provision or of any preceding or subsequent breach hereunder.

IN WITNESS WHEREOF, the parties to the Agreement have executed this Agreement
on the date herein above written.

IRVINE RANCH WATER DISTRICT

By _____
Paul Cook, General Manager

Dated _____

ATTEST:

By _____
Secretary/Assistant Secretary

Dated _____

APPROVED AS TO FORM:

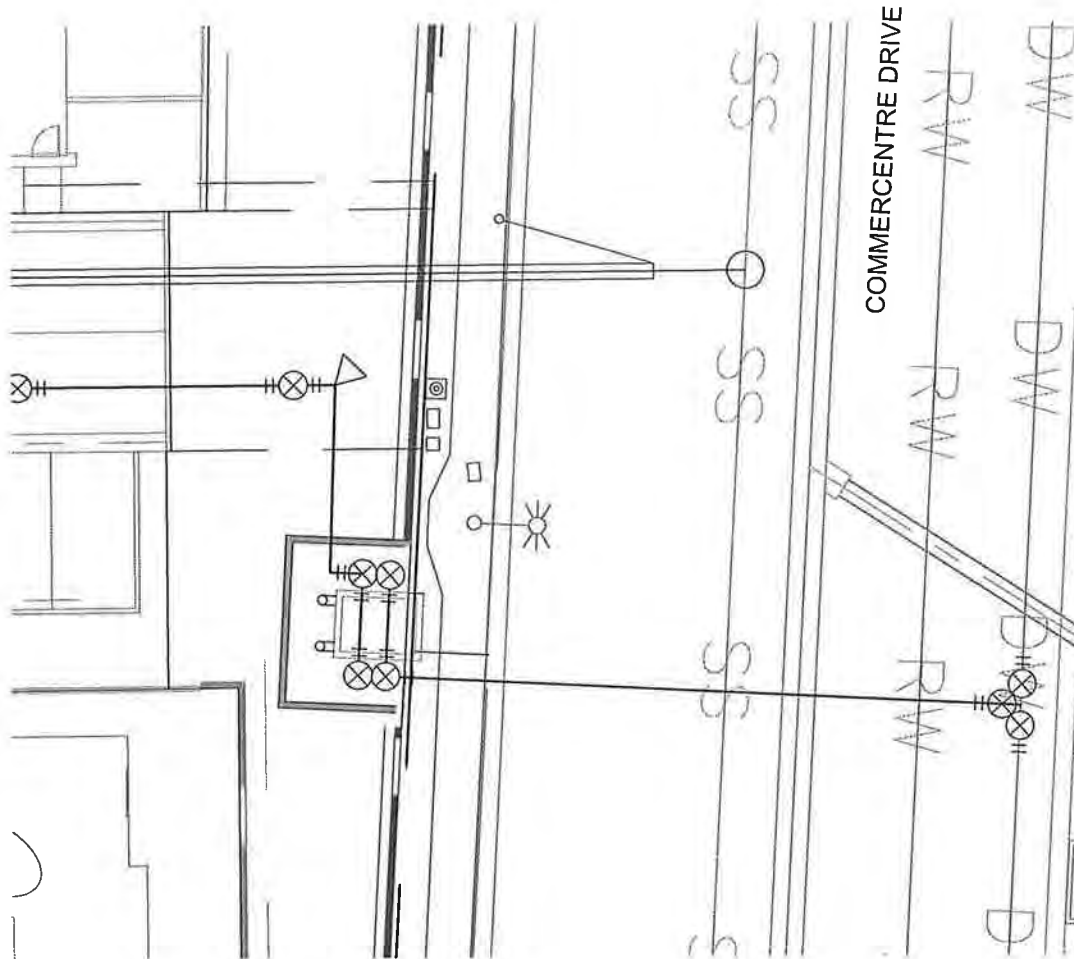
By _____
Legal Counsel, IRWD

Dated _____

BUILDER:

By _____
Title: _____

Dated _____



KEY MAP

PLAN PREPARED BY:

HUITT-ZOLIARS
Irvine
Huitt-Zollars, Inc.
2603 Main Street, Suite 400
Irvine, California 92614

Phone (949) 988-5815 Fax (949) 988-5820

PREPARED FOR:

MeritageHomes

1259 CORONA POINTE
COURT, SUITE 218
CORONA, CA 92679
PHONE: (951) 547-8339
FAX: (951) 547-8301

**PRIMARY PRV
LOCATION MAP**

SHEET

1 OF 1

DATE

5/27/2016

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IRVINE RANCH WATER DISTRICT EXHIBIT "C"

Expenditure Authorization

Project Name: LAKE FOREST ENCANTO COMMERCE CENTRE DOMESTIC PRV

EPMS Project No: 11967 **EA No:** 1

ID Split: Miscellaneous

Oracle Project No: 7513

Improvement District (ID) Allocations

Project Manager: LEW, KELLY

ID No. **Allocation %** **Source of Funds**

Project Engineer: RIOS, BELISARIO

135	100.0	CAPITAL FUND
-----	-------	--------------

Request Date: August 4, 2016

Total **100.0%**

Summary of Direct Cost Authorizations

Previously Approved EA Requests:	\$0
This Request:	\$255,200
Total EA Requests:	\$255,200
Previously Approved Budget:	\$0
Budget Adjustment Requested this EA:	\$255,200
Updated Budget:	\$255,200
Budget Remaining After This EA	\$0

Comments:

Phase	This EA Request	Previous EA Requests	EA Requests to Date	This Budget Request	Previous Budget	Updated Budget	Start	Finish
ENGINEERING DESIGN - IRWD	10,000	0	10,000	10,000	0	10,000	6/16	8/16
ENGINEERING DESIGN - OUTSIDE	20,000	0	20,000	20,000	0	20,000	6/16	8/16
DESIGN STAFF FIELD SUPPORT	5,000	0	5,000	5,000	0	5,000	6/16	8/16
ENGINEERING - CA&I IRWD	20,000	0	20,000	20,000	0	20,000	9/16	6/17
ENGINEERING - CA&I OUTSIDE	20,000	0	20,000	20,000	0	20,000	9/16	6/17
CONSTRUCTION FIELD SUPPORT	5,000	0	5,000	5,000	0	5,000	9/16	6/17
CONSTRUCTION	150,000	0	150,000	150,000	0	150,000	9/16	6/17
LEGAL	2,000	0	2,000	2,000	0	2,000	6/16	6/17
Contingency - 10.00% Subtotal	\$23,200	\$0	\$23,200	\$23,200	\$0	\$23,200		
Subtotal (Direct Costs)	\$255,200	\$0	\$255,200	\$255,200	\$0	\$255,200		
Estimated G/A - 185.00% of direct labor*	\$74,100	\$0	\$74,100	\$74,100	\$0	\$74,100		
Total	\$329,300	\$0	\$329,300	\$329,300	\$0	\$329,300		
Direct Labor	\$40,000	\$0	\$40,000	\$40,000	\$0	\$40,000		

*EA includes estimated G&A. Actual G&A will be applied based on the current ratio of direct labor to general and administrative costs.

EA Originator:

Kelly Lew 8/5/16

Department Director:

Kevin L. Burton 9/9/16

Finance:

Board/General Manager:

** IRWD hereby declares that it reasonably expects those expenditures marked with two asterisks to be reimbursed with proceeds of future debt to be incurred by IRWD in a maximum principal amount of \$336,000. The above-captioned project is further described in the attached staff report and additional documents, if any, which are hereby incorporated by reference. This declaration of official intent to reimburse costs of the above-captioned project is made under Treasury Regulation Section 1.150-2.

September 20, 2016

Prepared by: T. Lynch/J. McGehee/R. Mori

Submitted by: K. Burton *KLB*

Approved by: Paul Cook *[Signature]*

ENGINEERING AND OPERATIONS COMMITTEE

CONSULTANT SELECTION FOR SECOND ZONE 1 RESERVOIR

SUMMARY:

A second Zone 1 reservoir is proposed to be located on the site of the District's existing 15 million gallon (MG) Zone 1 reservoir. Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement in the amount of \$438,000 with Tetra Tech for engineering services for the Second Zone 1 Reservoir, Project 6401.

BACKGROUND:

IRWD's existing Zone 1 reservoir, located on Sand Canyon Avenue near Trabuco Road, provides storage for the Zone 1 system and serves as the forebay for both the East Irvine Zone 1-3 booster pump station (BPS) and the South County Zone 1-3 BPS. Other facilities at the site include both of the BPS facilities, associated pipelines, chloramination system, and cellular antenna tower.

In 2014, staff contracted with Harper & Associates Engineering to survey and evaluate the structural integrity and coating systems of the existing Zone 1 reservoir. The evaluation identified corrosion of the interior roof, structural members and center support cone, severe corrosion of the center rafters and access ladder, and cracking of the interior coating; Harper & Associates recommended that the reservoir interior be recoated. Staff contacted various coating contractors to determine the anticipated time it would take to complete the recoating activities as the reservoir would need to be taken out of service for the entire period. Based on feedback from the contractors, the recoating work could take up to nine months to complete.

Using the recently updated hydraulic model, staff evaluated the impacts to the Zone 1 system with the reservoir offline. The modeling analysis identified elevated pressures throughout the Zone 1 system. The model confirmed that it would be possible to operate the Zone 1 system without the reservoir for a short period of time, which has been done in the past in response to emergency situations, but that this mode of operation would not be feasible for an extended period of time. Using the model results, staff confirmed that a minimum storage volume ranging between 2.8 MG and 4.8 MG would be needed to alleviate the issues associated with elevated pressures when the existing 15 MG reservoir is offline.

As an alternative to operating Zone 1 in pressure mode during the rehabilitation efforts, the feasibility of constructing a second Zone 1 reservoir at the site was evaluated. This alternative would allow for the removal of the existing tank from service, while also improving the overall storage reliability in the Zone 1 system. Several reservoir alternatives were developed, each of which included pipeline routing alignments, associated site improvements, and conceptual cost estimates. The feasibility study confirmed that the site could support a second reservoir with a volume of 2.8 MG, and may support a reservoir with a volume of 4.8 MG. This second reservoir would be designed to operate in series or in parallel with the existing 15 MG reservoir. The preferred location of the reservoir is at the northern corner of the site as shown in Exhibit "A".

Engineering Services Consultant Selection:

Staff prepared a Request for Proposal (RFP) for the design of the project with the intention of issuing the RFP after the consultant selection process for the Santiago Hills II Zone 6 reservoir was completed. For the Zone 6 reservoir, staff received proposals from only Kleinfelder and Tetra Tech, both of which demonstrated substantial experience and proposed experienced design teams familiar with prestressed concrete reservoirs. With the selection of Kleinfelder for the Zone 6 project, staff began discussions with Tetra Tech to develop a scope of work and fee for the Zone 1 reservoir design in lieu of issuing another RFP as originally planned. Tetra Tech has since finalized the scope of work, which is attached as Exhibit “B”, and staff has confirmed that the scope of work is appropriate for the work associated with this project. Staff also reviewed Tetra Tech’s proposed fee in the amount of \$438,000, and confirmed that it is less than its proposed fee for the Zone 6 reservoir described above. Construction phase services are not included in the scope of work as they will be negotiated at the completion of the design phase when the project is fully defined.

Staff recommends that the Board authorize the General Manager to execute a Professional Services Agreement in the amount of \$438,000 with Tetra Tech since its design approach, schedule, and staff hours are consistent with the project goals. In addition, Tetra Tech provides substantial experience with the design of prestressed concrete reservoirs and has extensive knowledge of the existing Zone 1 reservoir site from previous experience supporting the design and construction of the South County Zone 1-3 BPS.

FISCAL IMPACTS:

The Second Zone 1 Reservoir, Project 6401, is included in the FY 2016-17 Capital Budget. The existing budget is sufficient to fund engineering services.

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA). In conformance with the California Code of Regulations Title 14, Chapter 3, Section 15004, the appropriate environmental document will be prepared when “meaningful information” becomes available. It is expected that preliminary analysis will lead to preparation a Mitigated Negative Declaration for the project.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Professional Services Agreement with Tetra Tech in the amount of \$438,000 for engineering services for the Second Zone 1 Reservoir, Project 6401.

LIST OF EXHIBITS:

Exhibit “A” – Site Plan

Exhibit “B” – Tetra Tech’s Scope of Work and Fee for the Second Zone 1 Reservoir Project

Exhibit "A" Site Plan

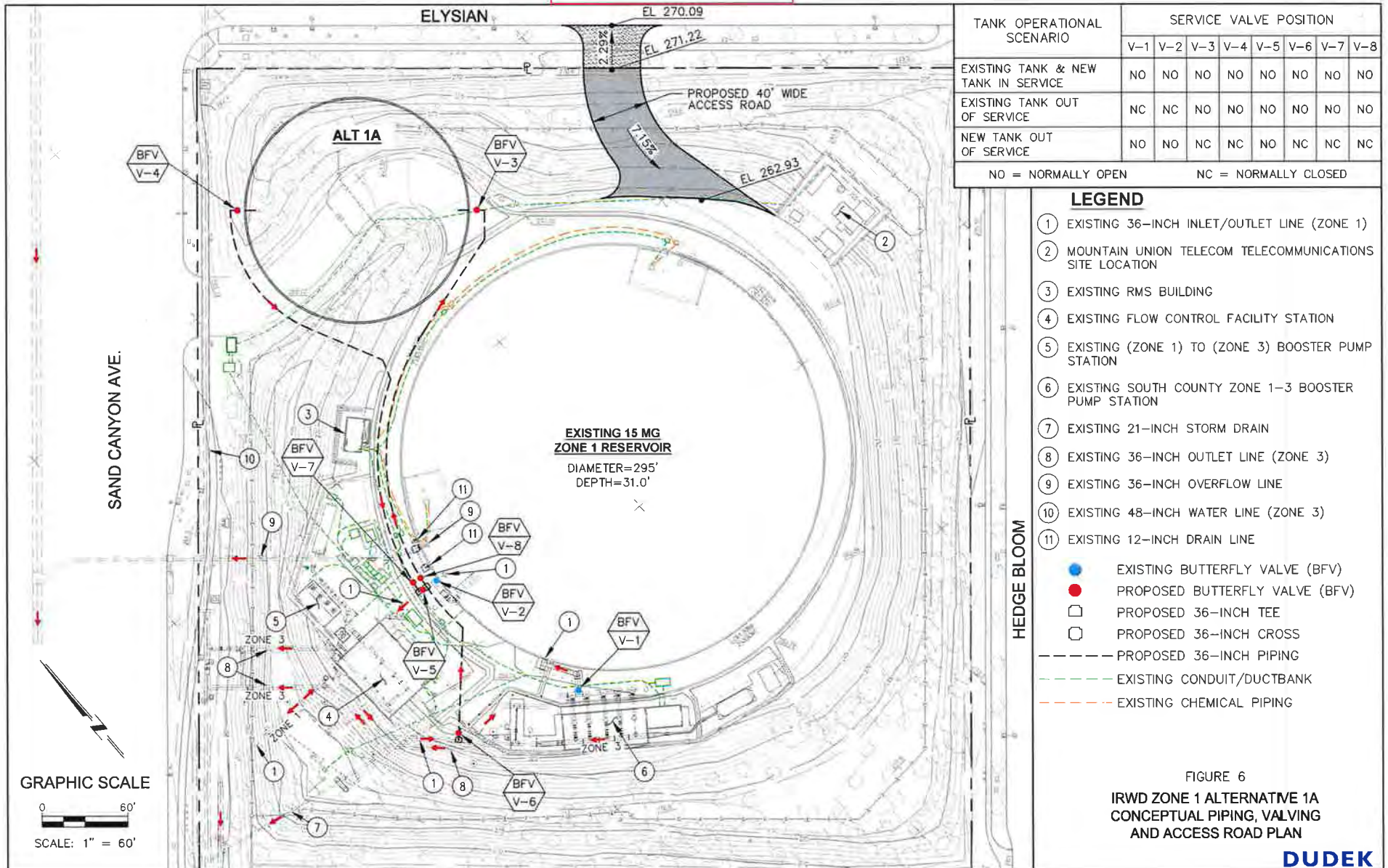


Exhibit "B" - Tetra Tech Scope of Work

ATTACHMENT

Engineering Services for the Second Zone 1 Reservoir Project

SCOPE OF WORK

Tetra Tech will provide the following detailed scope of services:

TASK 1 – PROJECT MANAGEMENT

Tetra Tech will conduct project management activities to ensure adherence to scope, schedule, and budget; to promote efficient communication between Tetra Tech, IRWD, and others as required; and to implement an effective quality assurance/quality control (QA/QC) program.

- A. **Preparation of Project Status Reports.** Tetra Tech will prepare weekly and monthly status reports. Each weekly status report shall consist of a brief (one or two paragraphs) e-mail summarizing the activities completed the previous week, the activities planned for the upcoming week, and critical decisions that need to be made. Each monthly status report shall provide more detail, summarizing the work completed and reviewing work status relative to budget and schedule. The project schedule shall also be updated on a monthly basis for inclusion in the monthly status report.
- B. **Meetings and Workshops.** Tetra Tech will organize, attend, and conduct meetings and workshops as required; prepare and submit meeting agendas for IRWD review and concurrence at least three (3) days prior to the meeting; and prepare draft and final minutes for all meetings and workshops and submit them to IRWD within one week of the meeting.

For budgeting purposes, Tetra Tech will budget for the following meetings at a minimum.

MEETING/WORKSHOP	DESCRIPTION
General project management and design development meetings	Four (4) two-hour meetings
Site visits	One (1) two-hour meeting
Coordination activities with jurisdictional agencies, including but not limited to, City of Irvine, and Southern California Edison	Five (5) two-hour meetings
Preliminary Layouts and Renderings (establish constraints and criteria)	One (1) two-hour meeting
Review Preliminary Site Layouts and Recommend Site Plan	One (1) two-hour meeting
Preliminary Design workshop	One (1) two-hour workshop
Present draft PDR	One (1) two-hour meeting
Present the 60% design, discuss IRWD's comments, and discuss how the outstanding items were addressed	One (1) two-hour meeting
Present the 90% design, discuss IRWD's comments, and discuss how the outstanding items were addressed	One (1) two-hour meeting
Present the 100% design, discuss IRWD's comments, and discuss how the outstanding items were addressed	One (1) two-hour meeting

- C. **Quality Assurance/Quality Control.** Tetra Tech will develop and implement proven QA/QC measures throughout the project to ensure ongoing and consistent quality control throughout all project phases. As part of the QA/QC measures, Tetra Tech will capture comments from review meetings and submittals and thoroughly check the work product to ensure that comments are addressed.

TASK 2 – PRELIMINARY DESIGN REPORT

Tetra Tech will perform the following subtasks as part of the preliminary design phase. The subtasks shall be documented and compiled into a Preliminary Design Report (PDR) as summarized below.

- A. **Background Information.** Tetra Tech will review the existing Siting Study, other existing reports, historic flow data, record drawings, system processes, and other information related to the project.
- B. **Site Master Plan.** As part of the PDR, Tetra Tech will provide a detailed site layout for the proposed 4.8 MG reservoir, which will include valve and meter vaults, maintenance access roads and new entry point, pipelines, storm drains and catch basins, all ancillary facilities, all facility relocations, and all existing facilities at the site. Site security will also be required for the reservoir site, which is anticipated to consist of site lighting, a motorized gate entrance, and replacement of all fencing around the perimeter of the site affected by the construction of the second reservoir. At this time, not sure a meter vault will be required (depends on location of connections).

The Site Master Plan subtask will document the proposed site configuration, site constraints, potential challenges, findings, and other information that Tetra Tech finds relevant. This task will also confirm the 4.8 MG proposed size is feasible, or recommend a different reservoir capacity that is feasible. At a minimum, Tetra Tech will develop and evaluate three (3) site layouts in collaboration with IRWD. As part of this task, Tetra Tech will conduct a workshop with IRWD to review initial findings in the Site Master Plan.

Tetra Tech will prepare preliminary renderings from Elysian (street level and from 2nd story) and from south bound side of Sand Canyon Avenue to assist in the evaluation of visual impacts of the new tank. In addition, Tetra Tech will provide preliminary options for architectural features to the tank wall and roof as well as the corresponding construction costs.

- C. **Zone 1 Reservoir.** IRWD anticipates using a DN Tank, partially buried, prestressed concrete reservoir. Tetra Tech will fully design and detail the reservoir and shall include all necessary plans, sections, and details in the construction plans. Performance based specifications for the reservoir will not be acceptable. The preliminary design should consider seismic requirements, performance, and ways to reduce concrete shrinkage and cracking and shall include a summary of proposed reservoir features including overflow provisions, venting, interior column sizing and spacing, subgrade preparation, foundation and footing requirements, pipe penetrations, ladders, hatches, guardrail, and reservoir sub-drain system. In addition, Tetra Tech will evaluate the key issues identified within our Approach Section of our proposal.

Tetra Tech will perform a preliminary structural design of the reservoir. The PDR will describe the design and construction of the circular pre-stressed concrete reservoir which will conform to AWWA D-110-13, Type I. Type I tanks have cast-in-place concrete core walls, internal vertical pre-stressing tendons and circumferential strand wrapping. The PDR will include: description of all design loads, including seismic requirements; features of the reservoir structure; structural calculations; steps required to obtain NSF 61 approval; proposed reservoir appurtenances; and preliminary foundation plan and typical reservoir section.

- D. **Reservoir Management System.** Tetra Tech will review record drawings associated with the existing Reservoir Management System (RMS) currently serving the 15 MG steel tank and provide recommendations, including building, piping, tanks, and electrical modifications, to add the RMS to the second zone 1 reservoir.
- E. **Onsite Pipelines.** Tetra Tech will provide a preliminary design for the inlet and outlet pipelines for the reservoir and associated piping for the onsite drainage and overflow pipelines including routing, sizing, and identifying connection points. We are assuming that due to congestion of utilities (electrical ducting) in front of the existing flow control facility, several of the proposed connections may be required to be made within the slope or on the east side of the existing reservoir.
- F. **Construction Phasing.** Tetra Tech will evaluate construction and siting requirements for the proposed reservoir and identify which existing facilities are required to be relocated or temporarily disabled, including but not limited to chemical and electrical lines to the RMS facility, electrical lines to the Mountain Union Telecommunications facility, and piping to the Zone 1-3 BPS and South County BPS.

Tetra Tech will prepare a phasing plan and recommend a sequence that identifies the order in which facilities will need to be relocated or temporarily disabled to minimize disruption to the Zone 1 system. As a minimum, the new access road from Elysian and the new power and telephone service for the cell tower will need to be constructed prior to excavating for the reservoir subgrade.

G. Geotechnical Investigation. Leighton Consulting, Inc. (as a subconsultant to Tetra Tech) will conduct a geotechnical investigation to adequately characterize the conditions at the proposed reservoir site. The following tasks, at a minimum, shall be conducted as part of the geotechnical investigation:

- Perform a geotechnical reconnaissance to observe site conditions and to locate exploratory borings.
- Leighton is proposing to drill, log, and sample two borings at the proposed reservoir location to a depth of 30 feet or auger refusal, whichever is shallower, to characterize the subsurface soils. The borings will be backfilled with soil cuttings and patched with cold mix asphalt where asphalt is penetrated.
- Plot the location of all soil borings on a map and attach the map to the Geotechnical Report.
- Conduct laboratory tests of selected samples to evaluate moisture content, density, gradation, Atterberg limits, consolidation, shear resistance, expansion, R-value, and corrosivity (chloride and sulfate content, minimum resistivity and pH).
- In addition, our structural engineer will require a site-specific response spectra for the design of the new reservoir. The site-specific response spectra will be developed for the project based on a uniform-hazard approach, which assumes the same level of hazard is uniformly applied to the entire response spectra. The spectral values will be developed for a seismic event associated with the Maximum Considered Earthquake with a return period of 2,475 years (2 percent chance of exceedance in 50 year), using attenuation relationships that describe the relation of ground motion levels with earthquake magnitude and distance (between the site and seismic source), site geology, and subsurface characterization. The response spectra will be developed for 0.5, 2 and 5 percent damping ratio and presented as tripartite plots and tabulated digitized values.
- Prepare a geotechnical report presenting findings, conclusions, and recommendations for the design and construction of the proposed facilities. The report shall include, at a minimum, (1) groundwater presence and levels, (2) construction dewatering requirements, (3) pipe bedding requirements, (4) trench shoring requirements, (5) settlement potential, (6) excavability of soils, (7) location of rock, (8) backfill suitability, and (9) backfill compaction. The report shall emphasize specific concerns regarding construction methods and the integrity of pipelines, pavements, and structures. The report shall make recommendations regarding the design of facilities. Recommendations shall include (1) active, at-rest, passive and dynamic earth pressures, (2) foundation type, (3) allowable bearing pressure, (4) coefficient of friction between the foundation and soils/subgrade, (5) foundation design data, (6) settlement potential, (7) pipe bedding, (8) maximum cut slope requirements, (9) structural needs, (10) groundwater dewatering well(s) design criteria, and/or (11) other standard design criteria.
- The report shall also consider the existing Zone 1 Reservoir and the proposed excavation next to the existing reservoir, and if necessary, recommend options for protecting the existing reservoir in place during construction.

Three (3) copies of the draft Geotechnical Investigation Report (GIR) shall be submitted for review. Upon resolution and incorporation of review comments, three (3) copies of final GIR and one (1) electronic copy in PDF on CD will be submitted.

H. Grading Plan. Tetra Tech will prepare grading concepts for the site for construction of the reservoir and for the completed site, access road, pipelines, and any other required ancillary facilities. The plan shall also address any geotechnical issues, and minimize environmental and aesthetic impacts, including maintaining the existing screening berms to the maximum practical extent. The final grading concept will also show the necessary requirements to comply with the Water Quality Management Plan (WQMP) requirements from the Santa Ana Regional Water Quality Control Board. Facilities may include bio-swales, percolation basins, or other low impact development features to meet the treatment and hydro-modification requirements.

- I. **Electrical and Controls.** Tetra Tech will develop electrical and controls design requirements associated with the proposed reservoir and RMS modifications. Tetra Tech will determine specific improvements to provide power and control systems as appropriate. This subtask shall also include the related electrical work associated with the security improvements described under the "Site Master Plan" subtask.
- J. **Topographic Mapping.** The existing topographic map provided by the District will be acceptable for the preparation of the grading plans.
- K. **Utility Research.** Tetra Tech will review the existing information and identify the location of existing underground utilities and/or other physical features in the immediate vicinity of the proposed facilities and appurtenances. Information on utilities including material, size, horizontal and vertical locations shall be identified. Tetra Tech has budgeted to pothole fifteen (15) existing utilities.
- L. **Permits.** Tetra Tech will make applications and secure all permits with appropriate agencies. The permit acquisition process shall be initiated as early as practical to avoid project delay. Copies of completed permits and approvals shall be inserted in the Appendix of the Project Manual.

IRWD will reimburse Tetra Tech for actual permit fees without surcharge. Tetra Tech has included a \$5,000 allowance within our budget for the payment of permit fees in addition to the labor effort described herein. The known permits and/or coordination with other agencies that are not identified elsewhere in this RFP include:

- a. Fire Master Plan. The existing Zone I Reservoir is equipped with a Reservoir Management System (RMS) that utilizes liquid sodium hypochlorite and aqueous ammonia. The Orange County Fire Authority (OCFA) previously reviewed and issued a Fire Master Plan for the facility. IRWD anticipates updating the Fire Master Plan to account for the new improvements, including modifications to the site access. Tetra Tech will create a new updated Fire Master Plan (assuming the District will not be able to find the existing Fire Master Plan) including the proposed improvements and secure OCFA approval.
 - b. Construction General Permit. IRWD anticipates that the project may require a Storm Water Pollution Prevention Program (SWPPP). Tetra Tech will determine the risk level for the project and prepare the SWPPP accordingly. It is IRWD's intent to assign monitoring and reporting to the Contractor as part of the construction contract. Tetra Tech will prepare and submit the SWPPP for the project site to comply with the State Regional Water Quality Control Board General Permit for Construction Activities. The SWPPP will be prepared by a Qualified SWPPP Developer (QSD) and will be submitted to the District for review and concurrence. Based on the site location and proposed construction, it is assumed the SWPPP will qualify as a Risk Level 1 project. Tetra Tech will assist the District in registering the project on the State SMARTs system and complete the Notice of Intent (NOI) for the project. It is assumed that all registration fees will be paid by the District.
 - c. City of Irvine Encroachment Permit. Tetra Tech will assist IRWD in obtaining an encroachment permit from the City of Irvine for all work performed in the public right-of-way (ROW) including preparation of traffic control plans and coordination with the City staff. The access road entry point relocation will require ROW and/or encroachment permits from the City of Irvine, as well as the relocation of the power and telephone service to the existing cell tower. Tetra Tech will prepare the permit application(s), provide necessary documentation for IRWD's execution and submittal, answer all review questions, and make necessary revisions to the permit documents.
 - d. Department of Drinking Water (DDW). Tetra Tech will submit the reservoir plans to the Department of Drinking Water (DDW). Tetra Tech has assumed that a meeting with DDW will not be required or will not require Tetra Tech's attendance.
- M. **CEQA Documentation.** IRWD will hire a CEQA consultant separate from this contract to prepare the CEQA documentation for this project. IRWD anticipates the preparation of a Mitigated Negative Declaration (MND). Tetra Tech may need to review portions of the environmental document, prepare exhibits, attend meetings, and/or provide project specific information. Tetra Tech will budget \$5,000 for supporting IRWD and the CEQA consultant through the CEQA documentation process.

- N. **Project Schedule.** Tetra Tech will include a project schedule, which shall include estimated schedules for both design and construction activities. The schedule shall include all critical factors impacting the project schedule including implementation, permitting, and coordination activities to ensure that the project is completed in accordance with the proposed schedule. The schedule shall be prepared in Microsoft Project.
- O. **Construction Plans and Project Manual.** Tetra Tech will provide a list of anticipated construction drawings and a table of contents of technical specifications that will be required for final design.
- P. **Opinion of Probable Construction Cost.** Tetra Tech will prepare a detailed and itemized opinion of probable construction cost for the proposed facilities. For the Preliminary Design, a contingency of 30% shall be used.
- I. **Preliminary Design Report (PDR).** The work described above shall be summarized and compiled into a PDR. At a minimum, the PDR shall summarize the results of the subtasks identified above along with additional design criteria identified by Tetra Tech during the preliminary design.

Five (5) copies of Draft PDR and one (1) electronic copy in PDF shall be submitted for review. Upon resolution and incorporation of review comments, five (5) copies of the final PDR and one (1) electronic copy in PDF shall be submitted. The final PDR shall be submitted prior to proceeding with the 60 percent design deliverable.

TASK 3 – FINAL DESIGN

The final design shall result in the preparation of the Contract Documents. In the final design phase, Tetra Tech will address the items discussed hereunder.

- A. **Project Manual.** Tetra Tech will prepare a Project Manual in standard IRWD format. IRWD's front end documents shall be utilized, and Tetra Tech will assess IRWD's documents to determine any needed supplemental general/special provisions that should be added to comply with IRWD's general provisions and front end requirements. The Project Manual shall describe the allowable shutdown durations and sequencing associated with any connections and tie-ins to existing IRWD facilities. The Project Manual shall also include the IRWD General Technical Specifications, modifications thereto, and any project specific technical specifications.
- B. **Construction Plans.** Tetra Tech will prepare detailed construction drawings in the latest version of AutoCAD and using NCS V4.0 layering standards, on 22-inch x 34-inch sheets utilizing IRWD's standard border template. Separate sheets with sheet index/location map/legend, general notes, index map, construction notes, condensed profiles, phasing, and detail connections shall be included. Construction notes shall be used (callouts on the plans are not allowed) on all construction drawings. Existing IRWD utilities shall be identified on the plan view by as-built plan set number with the pipeline material and IRWD pressure zone labeled. The index map shall include sheet legend, final alignment, valve locations, surrounding streets, and significant project site locations. Construction plans shall be prepared using the NAVD 88 and NAD 83 survey standards.

The following is a summary of the drawings that we envision for the project:

- General Sheets (4 sheets)
- Horizontal Control Plan
- Overall Site Plan
- Street Work Plan View – Phase I (new driveway, and electrical/telephone service to cell tower)
- Curb and Gutter Plan and Profile and Miscellaneous Details
- Demolition and Relocation Plans (electrical/telephone/and maybe RMS facilities)
- Reservoir Subgrade Grading Plan including shoring
- Reservoir Subgrade Cross Sections
- Precise Grading Plan including perimeter retaining wall and wall adjacent to access road.
- Precise Grading Reservoir Cross Sections
- Site Details (2 sheets)
- Retaining Wall Profile and Details
- Sand Canyon Avenue Final Street Plan (removal of driveway and parkway improvements)
- Miscellaneous Details including parkway improvements

- Yard Piping Plan (inlet/outlet piping; South County BPS piping; new tank interconnection piping)
- Drain, Subdrain, Overflow and Washdown Piping Plan
- Yard Piping Profiles – total of six (2 sheets)
- Subdrain Piping Details and Inspection Manhole
- RMS Conduit/Piping Plan and Details
- Connection Details (inlet/outlet; South County; future new tank interconnection; drain and overflow)
- Reservoir Piping Details (outlet; washdown; drain; level probe)
- Reservoir Inlet Piping Details (section, concrete pipe supports and thrust blocks)
- Reservoir Piping Details (overflow, overflow weir, pipe penetration, pipe supports)
- Reservoir Access Hatches/Ladders Details
- Miscellaneous Reservoir Details
- Piping Details
- General Structural Notes
- Structural Foundation Plan
- Roof Slab Plan
- Partial Roof Slab Reinforcing Plan
- Typical Tank Section
- Wall Section and Elevations
- Roof Slab Sections
- Typical Structural Details
- Foundation Details
- Wall Details
- Roof Slab Details
- Ladder and Platform Details
- Stair Elevation and Details
- Structural Details (Miscellaneous)
- Retaining Wall Structural Details
- Electrical Symbols and Abbreviations
- Relocation of Power and Control Conduits (cell tower)
- Existing Electrical Site Plan
- Electrical Site Plan (new reservoir)
- I&C Site Plan and Power Plan
- Single Line Diagram
- New Panel Schedule and Elevation
- Lighting and Grounding Plan
- Conduit and Fixture Schedules
- Electrical Details
- I&C Symbols and Abbreviations
- PLC Loop Diagrams
- P&ID
- Control Panel Layout

Total Number of Sheets: 60 sheets

- C. Topographic Mapping. The topographic map for the project will be provided by IRWD in AutoCAD format. NAD83 coordinates and NAVD88 county benchmark elevations were used for survey ground control and mapping at 1-foot contour intervals. Tetra Tech will confirm horizontal and vertical control and shall field locate obscured surface features as required to facilitate preparation of detailed plans. Tetra Tech will budget \$5,000 for additional field surveying as part of the topographic mapping process.

- D. Electrical/Instrumentation. Tetra Tech will prepare an operational scheme including P&IDs, single line diagrams, control equipment list, control loop descriptions, and method of integrating the proposed facilities into IRWD's existing SCADA system. Prior to this process, Tetra Tech will meet with IRWD electrical/automation staff to incorporate IRWD's standard operations, programming, and tagging requirements into the design.

Tetra Tech will develop and provide the operational scheme and functional descriptions (in plain English) for District review and approval. Tetra Tech will coordinate obtaining power and telemetry to the Project site. Tetra Tech will be responsible for obtaining SCE's approval for the proposed electrical services at the site, including the relocation of the power service to the cell tower facility.

- E. SCE Final Service Plan. Tetra Tech will coordinate with SCE early in the design process to obtain the Final Service Plan, which shall be inserted in the appendix of the Project Manual. This task shall include the coordination efforts necessary to communicate the project requirements, address any comments from SCE, and implement all requirements into the project design, including the relocation of the power service to the cell tower facility.
- F. Project Schedule. Tetra Tech will maintain and consistently update the project schedule, which shall include detailed schedules for both design and construction activities. The schedule shall include all critical factors impacting the project schedule including implementation, permitting, and coordination activities to ensure that the project is completed in accordance with the proposed schedule. The schedule shall be prepared in Microsoft Project.
- G. Liquidated Damages Spreadsheet. Tetra Tech will calculate the liquidated damages value for the construction project, should the contract time be exceeded. IRWD's standard liquid damage calculation form will be provided.
- H. Opinion of Probable Construction Cost. Tetra Tech will update and submit the opinion of probable construction cost developed during the preliminary design phase at each of the design deliverables described below.
- I. Final Design Deliverables. Deliverables will be made as follows:
1. Ten (10) 11"x17" bound copies of the 60 percent submittal and one (1) CD containing a single PDF file of the entire plan set. Show civil/site, preliminary reservoir plans and sections, mechanical, and electrical plans. Show basic mechanical equipment, structural and architectural layouts, pipeline alignments, preliminary profiles, and existing utilities at a minimum. Provide a complete table of contents for the Project Manual.
 2. Ten (10) 11"x17" bound copies of the 90 percent submittal and one (1) CD containing a single PDF file of the entire plan set. Show concepts of each component of the design such as civil, structural, mechanical, architectural, electrical and instrumentation. Show plan, profile, connections, details, and location of appurtenances. Plan and profile drawings and mechanical details/drawings will be developed to a high level of detail. Provide three (3) color coded copies of the 90 percent Project Manual, including all sections; contract documents, general provisions, special provisions, general requirements, technical specifications, and appendix.
 3. Ten (10) 11"x17" bound copies of the 100 percent submittal, one (1) CD containing AutoCAD files for the entire plan set, and one (1) CD containing a single PDF file of the entire plan set. Include complete plans and three (3) color coded copies of the Project Manual, a notebook with the design calculations (including, but not limited to, mechanical, civil, structural, electrical, pipe thickness and restraint), and one (1) CD containing all MS Word files used in the preparation of the Project Manual.
 4. One (1) full size final stamped and signed reproducible plan set on mylar and one (1) original signed Project Manual for District's signatures.
- J. Addenda Preparation and Pre-Bid Meeting. During the bidding period, Tetra Tech will assist with providing information and clarification of bid documents to prospective bidders. Tetra Tech will include budget for the preparation of up to three (3) addenda including revisions to the design plans and specifications and assistance with addressing bidder questions.

At a minimum, addenda preparation activities shall include:

- Plan Revisions: Tetra Tech will budget twenty (20) hours of appropriate staff time for plan revisions to the construction drawings.
- Specification Revisions: Tetra Tech will budget fifteen (15) hours of appropriate staff time for revisions or additions to the project specifications.
- Bidder Questions: Tetra Tech will budget fifteen (15) hours of appropriate staff time to address and respond to bidder questions.
- Pre-Bid Meeting: Tetra Tech will prepare for and conduct one (1) two-hour pre-bid meeting and will provide agendas, exhibits, sign-in sheet, and minutes for the meeting. This may include a site visit with potential bidding contractors.

SCHEDULE

Tetra Tech has reviewed the project scope of services and understand the importance of the schedule. We are familiar with the project site and understand the purpose of the work and the extent of our efforts which will be necessary to complete the project. In addition, our project team's familiarity with IRWD standards and our past experience with reservoir design will be valuable to meeting and accelerating your schedule. Tetra Tech has reviewed the current and planned workload for our project team. They are available to immediately begin work on this project.

Tetra Tech will meet the following significant project milestones:

Notice of Award (Design)	September 2016
Kick-off Meeting	1 st week after Award
Draft PDR Submittal	1 st week in December 2016
Final PDR Submittal	Last week in January 2017
60% Design Submittal	Last week in January 2017
90% Design Submittal	Mid May 2017
100% Design Submittal	Mid June 2017
Plans Approved	Early July 2017

FEE

Tetra Tech is proposing to perform the above scope of work on a hourly time and material basis with the following Not-to-Exceed Fee.

Task No.	Description of Work	Budget Amount
1	Project Management	\$ 44,000
2	Preliminary Design Report	\$ 161,400
3	Final Design	\$ 232,600
	TOTAL Not-to-Exceed	\$ 438,000

Attached is our estimated hours per task, subconsultant costs, reproduction and other direct costs. We have also included our proposed Hourly Rate Schedule.

2016
HOURLY CHARGE RATE AND EXPENSE REIMBURSEMENT SCHEDULE

Project Management

Project Manager 1	\$210.00
Project Manager 2	\$240.00
Sr Project Manager	\$305.00
Program Manager	\$305.00
Principal in Charge	\$340.00

Engineers

Engineering Technician	\$37.00
Engineer 1	\$96.00
Engineer 2	\$115.00
Engineer 3	\$130.00
Project Engineer 1	\$135.00
Project Engineer 2	\$165.00
Sr Engineer 1	\$170.00
Sr Engineer 2	\$175.00
Sr Engineer 3	\$210.00
Principal Engineer	\$300.00

Planners

Planner 1	\$104.00
Planner 2	\$115.00
Sr Planner 1	\$125.00
Sr Planner 2	\$151.00
Sr Planner 3	\$175.00

Designers & Technicians

CAD Technician 1	\$65.00
CAD Technician 2	\$75.00
CAD Technician 3	\$90.00
CAD Designer	\$100.00
Sr CAD Designer 1	\$118.00
Sr CAD Designer 2	\$125.00
CAD Director	\$150.00
Survey Tech 1	\$50.00

Health & Safety

H&S Administrator	\$95.00
Sr H&S Administrator	\$115.00
H&S Manager	\$145.00

Construction

Construction Project Rep 1	\$78.00
Construction Project Rep 2	\$85.00
Sr Constr Project Rep 1	\$100.00
Sr Constr Project Rep 2	\$115.00
Construction Manager 1	\$165.00
Construction Manager 2	\$185.00
Construction Director	\$233.00

General & Administrative

Project Assistant 1	\$67.00
Project Assistant 2	\$75.00
Project Administrator	\$95.00
Sr Project Administrator	\$110.00
Graphic Artist	\$130.00
Technical Writer 1	\$97.00
Technical Writer 2	\$124.00
Sr Technical Writer	\$155.00

Information Technology

Systems Analyst / Programmer 1	\$77.00
Systems Analyst / Programmer 2	\$115.00
Sr Sys Analyst / Programmer 1	\$130.00
Sr Systems Analyst / Programmer 2	\$196.00

Project Accounting

Project Analyst 1	\$90.00
Project Analyst 2	\$114.00
Sr Project Analyst	\$155.00

Reimbursable In-House Costs:

Photo Copies (B&W 8.5"x11")	\$ 0.15/Each
Photo Copies (B&W 11"x17")	\$ 0.40/Each
Color Copies (up to 8.5"x11")	\$ 2.00/Each
Color Copies (to 11"x17")	\$ 3.00/Each
Compact Discs	\$10/each
Large format copies	\$0.40 S.F.
Computer Usage: not to exceed	\$3.55/hour
Mileage-Company Vehicle	\$0.80/mile
Mileage-POV	\$0.55/mile*

*current GSA POV mileage rate subject to change

All other direct costs, such as production, special photography, postage, delivery services, overnight mail, printing and any other services performed by subcontractor will be billed at cost plus 15%.

Fee Proposal
Irving Ranch Water District
Second Zone 1 Reservoir Project
Submitted by Tetra Tech

Task Description	Sr. Project Manager (Tom E)	Project Manager (Laurence)	Project Engineer (Mike T)	Design Engineer	CADD	Word Processor	Total Hours	Fees		TOTALS
								Labor	Sub-Contractors Re-imburseables	
1 Project Management										
Project Status Report (40/10)	10	0	40	0	0	0	50	\$9,650	\$0	\$9,650
Meetings (16) and Workshops (1)	16	0	40	0	0	0	56	\$11,480	\$300	\$11,780
Constructability Review and QA/QC	74	0	0	0	0	0	74	\$22,570	\$0	\$22,570
Subtotal	100	0	80	0	0	0	180	\$43,700	\$300	\$44,000
2 Preliminary Design Report										
Review background information	0	4	4	0	0	0	8	\$1,500	\$0	\$1,500
Site Master Plan	2	0	8	8	0	0	34	\$5,530	\$0	\$5,530
Site Security	0	4	4	0	0	0	8	\$1,500	\$0	\$1,500
Site Layouts (3 layouts)	2	12	12	24	12	0	62	\$9,370	\$0	\$9,370
Renderings (3) & Architectural Features	0	4	4	12	40	0	60	\$7,880	\$10,000	\$17,880
Zone 1 Reservoir	2	4	6	16	4	0	32	\$4,780	\$0	\$4,780
Preliminary Structural Reservoir Design	4	16	32	40	24	0	116	\$17,460	\$0	\$17,460
Reservoir Management System	0	2	8	4	0	0	14	\$2,200	\$0	\$2,200
Onsite Pipelines	0	4	8	8	0	0	28	\$4,080	\$0	\$4,080
Construction Phasing	0	4	8	8	4	0	24	\$3,580	\$0	\$3,580
Geotechnical Investigation	0	2	0	0	0	2	4	\$640	\$21,275	\$21,915
Grading Plan	0	4	8	16	8	0	36	\$5,000	\$0	\$5,000
Preliminary Electrical and Controls	0	6	16	16	0	0	38	\$5,740	\$0	\$5,740
Utility Research	0	2	4	8	4	0	18	\$2,500	\$17,250	\$19,750
Permits	0	6	28	16	8	4	62	\$9,160	\$5,000	\$14,160
SWPPP	0	2	30	14	0	0	54	\$7,980	\$0	\$7,980
CEQA Documentation	0	0	16	14	4	0	36	\$5,000	\$0	\$5,000
Project Schedule	0	2	4	8	0	0	14	\$2,000	\$0	\$2,000
Opinion of Probable Construction Cost	2	4	8	8	0	0	22	\$3,630	\$0	\$3,630
PDR Preparation	4	8	16	8	8	4	48	\$7,900	\$0	\$7,900
Reproduction/ Mileage	0	0	0	0	0	0	0	\$0	\$385	\$385
Subtotal	16	88	224	228	142	10	718	\$107,490	\$53,910	\$161,400
3 Final Design										
Project Manual	0	12	24	0	0	0	52	\$9,800	\$0	\$9,800
Construction Plans										
General and Construction Notes (4 sheets)	0	4	12	16	30	0	62	\$8,410	\$0	\$8,410
Horizontal Control Plan	0	0	0	4	8	0	12	\$1,460	\$0	\$1,460
Overall Site Plan	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
Street Work, C&G Details (2 shts)	0	4	8	12	24	0	48	\$6,540	\$0	\$6,540
Demolition and Relocation Plans	0	2	4	8	16	0	30	\$4,000	\$0	\$4,000
Subgrade Plan/Sections (2 shts)	0	2	8	16	24	0	50	\$6,580	\$0	\$6,580
Precise Grading Plan/Sections (2 shts)	0	4	12	24	24	0	64	\$8,580	\$0	\$8,580
Site Details (2 sheets)	0	4	4	12	24	0	44	\$5,880	\$0	\$5,880
Retaining Wall Profile and Details	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
Sand Canyon Plan & Parkway (2 shts)	2	4	8	12	24	0	50	\$7,150	\$0	\$7,150
Vand Piping Plan and Profiles (4 shts)	0	4	10	20	48	0	82	\$10,790	\$0	\$10,790
Subdrain Piping Details/Inspection MH	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
RMS Conduit Piping/Plan and Details	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
Connection Details	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
Reservoir Piping Details (5 shts)	2	8	12	24	52	0	96	\$13,110	\$0	\$13,110
Piping Details	0	2	4	8	12	0	26	\$3,500	\$0	\$3,500
Structural Plans (15 sheets)	14	52	108	0	154	0	328	\$52,260	\$0	\$52,260
Electrical Plans (10 sheets)	0	20	60	120	0	0	200	\$27,900	\$0	\$27,900
Instrumentation Plans (4 sheets)	0	8	28	48	0	0	84	\$11,820	\$0	\$11,820
Topographic Mapping	0	0	30	0	0	0	30	\$4,950	\$50	\$5,000
SCE Final Service Plan	0	4	16	16	0	0	36	\$5,320	\$0	\$5,320
Project Schedule	0	2	8	8	0	0	18	\$2,660	\$0	\$2,660
Liquidated Damages Spreadsheet	0	0	4	4	0	0	8	\$1,120	\$0	\$1,120
Opinion of Probable Costs	2	4	8	8	0	0	18	\$3,130	\$0	\$3,130
Final Design Deliverables	0	0	8	16	16	2	42	\$5,380	\$0	\$5,380
Agenda Preparation and Pre-Bid Meeting	6	4	22	4	16	3	55	\$9,090	\$0	\$9,090
Reproduction/ Mileage	0	0	0	0	0	0	0	\$0	\$5,620	\$5,620
Subtotal	34	152	416	418	532	13	1565	\$226,930	\$5,670	\$232,600
Total	150	250	720	646	674	23	2463	\$378,120	\$59,880	\$438,000

September 20, 2016

Prepared by: T. Lynch/J. Moeder/R. Mori

Submitted by: K. Burton

Approved by: Paul Cook 

ENGINEERING AND OPERATIONS COMMITTEE

INITIAL DISINFECTION FACILITY SODIUM HYPOCHLORITE STORAGE AND FEED SYSTEM DESIGN VARIANCE AND CONSULTANT SELECTION

SUMMARY:

Carollo Engineers has completed the design for the Initial Disinfection Facility (IDF) Sodium Hypochlorite Storage and Feed System Project and the project is out for bid. During the final design phase, Carollo performed additional work that was above and beyond the initial design scope. Additionally, staff requested that Carollo submit a proposal for providing engineering services during construction. Staff has reviewed the proposal and recommends the Board:

- Authorize the General Manager to execute Variance No. 2 in the amount of \$22,428 with Carollo Engineers for additional final design engineering services, and
- Authorize the General Manager to execute a Professional Services Agreement in the amount of \$183,586 with Carollo Engineers for engineering services during construction for the Initial Disinfection Facility Sodium Hypochlorite Storage and Feed System.

BACKGROUND:

The IDF project provides initial disinfection of groundwater from the Dyer Road Wellfield to provide chlorine residual prior to chloramination at the Primary Disinfection Facility (PDF). The existing chlorine gas system consists of 16 one-ton chlorine gas cylinders, chlorinators, chlorine booster pumps, emergency scrubber system, and a fully enclosed containment area for truck unloading of the cylinders. This project includes the removal of the existing chlorine gas system and related appurtenances, and the installation of a new sodium hypochlorite storage and feed system within the existing chlorination building. The project is currently out for bid, and staff anticipates recommending the Board approve the construction award at its next meeting.

Variance No. 2:

Carollo submitted Variance No. 2, which is attached as Exhibit "A", which includes additional work related to modifying the lighting design in the chemical storage area and upgrading the existing programmable logic controller (PLC) to IRWD's current standards. After completing the preliminary design, staff discovered that the two proposed vertical sodium hypochlorite storage tanks would block access to the existing ceiling mounted lighting and requested Carollo to improve the lighting by designing wall mounted lighting around the perimeter of the chemical storage room. During the design phase and after detailed review of the existing PLC, staff confirmed that the existing PLC at IDF is outdated and would benefit from upgrading to IRWD's current PLC standards by realizing a faster processing speed. Staff has reviewed the variance and recommends the Board authorize the General Manager to execute Variance No. 2 in the amount of \$22,428.

Engineering Services during Construction:

With the design fully defined, staff requested Carollo to submit a proposal for providing engineering services during construction. Carollo's proposal, which is attached as Exhibit "B", includes meetings, review of submittals and requests for information, plan revisions, and preparing energy control procedures. Carollo recently provided similar construction phase support services for the Rattlesnake sodium hypochlorite conversion project that was brought online this past year. Staff reviewed the proposal and recommends that the Board authorize the General Manager to execute a Professional Services Agreement with Carollo in the amount of \$183,586 for engineering services during construction.

FISCAL IMPACTS:

Project 6213 is included in the FY 2016-17 Capital Budget. The existing budget is sufficient to fund the design variance and engineering services during construction.

ENVIRONMENTAL COMPLIANCE:

This project is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15301 which provides exemption for minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. A Notice of Exemption for the project was filed with the County of Orange on October 29, 2015.

RECOMMENDATION:

That the Board authorize the General Manager to execute Variance No. 2 in the amount of \$22,428 with Carollo Engineers for additional final design engineering services, and authorize the General Manager to execute a Professional Services Agreement with Carollo Engineers in the amount of \$183,586 for engineering services during construction for the Initial Disinfection Facility Sodium Hypochlorite Storage and Feed System Project, project 6213.

LIST OF EXHIBITS:

Exhibit "A" – Variance No. 2

Exhibit "B" – Carollo's Proposal for Engineering Services during Construction

IRVINE EXHIBIT "A" DISTRICT PROFESSIONAL SERVICES VARIANCE

Project Title: Initial Disinfection Facility Sodium Hypochlorite Storage and Feed System

Project No.: 11838(6213)

Date: 8/10/16

Purchase Order No.: _____

Variance No.: 2

Originator: ☒ IRWD ☐ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (*attach any back-up material*):

Current scope of supply provides preliminary and final design services for the project. Variance #2 will address added scope during the final design period.

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
Senior Engineer II	26	\$210	\$5,460			\$5,460
Project Engineer	40	\$189	\$7,560			\$7,560
Designer	64	\$147	\$9,408			\$9,408
Total \$ =						\$22,428

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
3	Final Design	180 days	30 days	210 days

Required Approval Determination:

Total Original Contract	<u>\$49,450</u>	☐ Director: Cumulative total of Variances less than or equal to \$50,000.
Previous Variances	<u>\$169,914</u>	
This Variance	<u>\$22,428</u>	☐ Executive Director: Cumulative total of Variances less than or equal to \$75,000.
Total Sum of Variances	<u>\$192,342</u>	
New Contract Amount	<u>\$241,792</u>	☐ General Manager: Cumulative total of Variances less than or equal to \$100,000.
Percentage of Total Variances to Original Contract	<u>388%</u>	☒ Board: Cumulative total of Variances greater than \$100,000.

ENGINEER/CONSULTANT: Carollo Engineers

IRVINE RANCH WATER DISTRICT

Company Name

[Signature]
Project Engineer/Manager

8/10/16
Date

[Signature]
Department Director

9/13/16
Date

[Signature]
Engineer's/Consultant's Management

8/10/16
Date

General Manager/Board

Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

[illegible]

August 11, 2016

Mr. Jacob Moeder, P.E.
Capital Projects Engineer
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine Ranch, CA 92619

Subject: Initial Disinfection Facility (IDF) Sodium Hypochlorite Storage & Feed System
Variance 2 Request

Dear Mr. Moeder:

This letter is to inform you of work considered to be out of scope for the subject project. The work is related to the mechanical and structural changes to the sodium hypochlorite storage and feed system, equipment and instrumentation tagging changes, additional electrical lighting design, and PLC replacement as requested by the District after the final design scope had been developed and approved.

The base scope for the final design assumed that lighting modifications within the building would entail removal of lights that would be directly above the new vertical storage tanks as discussed in the Basis of Design Report. At the final design kickoff meeting, it was discussed that the District may desire to replace all of the overhead lights with wall packs. After multiple discussions, the District directed us to proceed with the modification to replace the lights and improve the lighting above what was existing. The 90% submittal includes details for demolition of the existing lighting system and a detailed lighting plan.

The final design scope related to PLC work is based on detailing necessary modifications the new sodium hypochlorite controls system within the existing PLC. After discussions and field meeting with the District, Carollo was directed to provide design documents detailing replacement of the PLC. The District maintained concerns for the age and condition of the PLC. This effort requires additional drawings and drawing details, as well as additional specifications. Replacement of the PLC required replicating the control strategy for the existing Well 16 pump also.

As part of the 90 percent submittal review, tagging changes were requested for the new and existing equipment and instruments. Retagging takes some effort and effects instrumentation, electrical, and mechanical plans.

Per additional comments at the 90-percent submittal review meeting, changes were made to the previously selected tank layout and pipe configuration plan. These modifications required changes to structural, mechanical, and electrical plans.

Our estimated effort to complete the out of scope items is attached to this letter as Exhibit A. We have also included IRWD's Professional Services Variance as Exhibit C. We appreciate your consideration in approving the requested funds at the time the next variance is issued.

Mr. Jacob Moeder, P.E.
Capital Projects Engineer
August 11, 2016
Page 2

Sincerely,

CAROLLO ENGINEERS, INC.

A handwritten signature in black ink, appearing to read "Jeff Weishaar". The signature is fluid and cursive, with a large loop at the end.

Jeff Weishaar, JW

JW:JW

Enclosures: Budget Tables, Scope of Work (Exhibit A)
Professional Services Variance (Exhibit C)

cc: Rich Mori, P.E.
Jim Meyerhofer, P.E

Irvine Ranch Water District
Initial Disinfection Facility Sodium Hypochlorite Storage Feed System
Estimated Out of Scope Fee

Exhibit A

		Project Manager	Professional Engineers	Project Professional Engineer	Project Professional Engineer	Project Professional Engineer	Project Professional Engineer	Designer	Document Processing				
Item	Task Description	Meyerhofer	Weishaar	Doering	Morgan	Carreon	Hedlund	Designer	Document Processing	Task Hours	Task Subtotal	Reproduction	Task Total
	Final Design Out of Scope Task Items												
1	SH Storage, Containment Area and Mechanical Feed Reconfiguration			4	4		4	12		24	\$ 4,200	\$ -	\$ 4,200
2	Lighting Plan Reconfiguration						4	12		16	\$ 2,604	\$ -	\$ 2,604
3	Tagging Changes					6	6	12		24	\$ 4,158	\$ -	\$ 4,158
4	PLC P&ID Modifications					16	4	12		32	\$ 5,628	\$ -	\$ 5,628
5	Panel Layout Modifications					14	4	16		34	\$ 5,838	\$ -	\$ 5,838
	Task Subtotal	0	0	4	4	36	22	64	0	106	\$ 22,428	0	\$ 22,428
	Hours Total	0	0	4	4	36	22	64	0	106			
	Rate	\$ 229	\$ 195	\$ 210	\$ 189	\$ 189	\$ 210	\$ 147	\$ 111				
	Project Subtotal	\$ -	\$ -	\$ 840	\$ 756	\$ 6,804	\$ 4,620	\$ 9,408	\$ -		\$22,428	\$0	\$22,428

EXHIBIT "B"



August 18, 2016

Mr. Jacob Moeder, P.E.
Capital Projects Engineer
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine Ranch, CA 92619

Subject: Initial Disinfection Facility Sodium Hypochlorite Storage and Feed System
Proposal for Engineering Services During Construction

Dear Mr. Moeder:

Working with you and the IRWD staff, we have successfully completed the final design of the subject project. The contract documents are currently out for contractor bidding and we expect to open bids mid-September.

This letter serves as our proposal to provide engineering services during construction. Our proposed effort and fee are based on the level of effort required to complete similar services for the Rattlesnake Reservoir Sodium Hypochlorite Storage and Feed Project. We have also added tasks according to our conversations and the added scope requested.

The detailed scope is included with this letter as Exhibit A. The scope includes meeting attendance, shop drawing review, addressing requests for information, updating the conformed drawings, and preparing as-built drawings at the completion of construction. At your request, we have also included updating the facilities asset management database, preparation of energy control procedures, and as-needed general construction support.

Exhibit B provides a summary of our proposed fee. A total of \$183,586 is being requested. Your consideration in extending the project budget is very much appreciated. Please do not hesitate to contact us with questions or comments related to this request, or the overall project performance.

Sincerely,

CAROLLO ENGINEERS, INC.

Jeff Weishaar, P.E.

JM:JW

Enclosures: Exhibit A
cc: Rich Mori, P.E.

EXHIBIT A

SCOPE OF SERVICES

IRVINE RANCH WATER DISTRICT

INITIAL DISINFECTION FACILITY
SODIUM HYPOCHLORITE STORAGE AND FEED SYSTEM
ENGINEERING SERVICES DURING CONSTRUCTION

AUGUST 2016

BACKGROUND

The Irvine Ranch Water District (District) is in the process of replacing existing chlorine gas facilities with bulk sodium hypochlorite as a disinfectant. Chlorine gas is a hazardous chemical and requires additional training, inspections, permitting and safety measures for its safe use. The purpose of this project is to replace the chlorine gas system at the District's Initial Disinfection Facility (IDF). The District also has a desire to install a new surge tank at Well 16 on the IDF site. Carollo and the District are nearing completion of the final design and beginning the bid phase period. This exhibit provides the scope of work to provide engineering services during construction for the project.

SCOPE OF WORK

Task 1 Project Management

Task 1.01 – Project Status Reports

Weekly and monthly written status reports will be provided to the District. Monthly reports will accompany and supplement monthly invoices along with updated project schedules. These reports will provide a narrative summary of progress on the Project, including budget and schedule status. The report will discuss work completed on the Project for the reporting period and anticipated work for the next period. Critical decisions and outstanding action items will be documented and included with each report. Any out-of-scope work, if needed, will be identified in this progress report.

Task 1 Deliverables

- Electronic weekly status reports and monthly status reports submitted with the invoice.

Task 2 Construction Phase Services

Carollo will provide support and consultation to the District throughout the construction period, as outlined in the following tasks

Task 2.01 - Conformed Documents

Carollo will provide conformed documents (drawings and specifications) based on the bid documents and addenda released during the bid period. Conformed documents will be provided in electronic format (PDF). Conformed specifications will use track changes to highlight modifications made.

Task 2.02 – Project Meetings

Attend and conduct six (6) construction meetings throughout the duration of construction period. Draft agenda and supporting materials will be distributed for review approximately five days prior each meeting and workshop. Draft and final conference notes will be distributed to all attendees and other interested staff within one week of the meeting.

Task 2.03 – Request for Information

Respond to ninety (90) Requests for Information (RFIs) from the construction contractor. Clarifications, details, additional calculations for clarification or modification to original design drawings will be provided as requested by the District to provide clear and concise responses.

Task 2.04 – Minor Plan Revisions

A budget of up to forty (40) hours has been established to provide minor revisions to the contract construction drawings as required for Task 8.02 above or other needs.

Task 2.05 – Site Visits

Carollo will attend and conduct six (6) site visits throughout the construction period to review construction progress, resolve technical issues, and/or review overall project schedule, coordination, and progress with the District and the Contractor.

Task 2.06 – Shop Drawing Reviews

Review and approve for acceptance of at least eighty (80) shop drawing submittals. This task will include a second review of up to thirty-five (35) shop drawing submittal, if required.

Task 2.07 – Record Drawings

Prepare record drawings on full-size mylar at construction completion using Contractor's and IRWD's inspector's markups. Deliver final record drawings, reissued signed construction drawings in mylar hardcopy, a combined PDF electronic file, and AutoCAD electronic files.

Task 2.08 - Energy Control Procedures

Prepare Energy Control Procedures for each identified asset using IRWD's standard template. Procedures will be developed for new assets agreed upon between Carollo and IRWD. Procedures will be provided in Word file for IRWD review and comment. Budget is based on producing 12 ECPs, including the following:

1. SHC Tank 1
2. SHC Tank 2
3. SHC Tank 1 Isolation Valve
4. SCH Tank 2 Isolation Valve
5. SHC Pump 1
6. SHC Pump 2
7. SHC Pump 3

8. Chemical Flow Meter
9. Containment Sump Pump
10. Compressor
11. Compressor Control Panel & Solenoid Valves
12. Surge Tank

Task 2.09 – Asset Management Spreadsheet

Carollo will assist in updating the existing asset management spreadsheet for the IDF site. New asset information will be added to the spreadsheet including asset location, asset description, asset classification, asset type, material, size and unit, model number and serial number. Information will be based on contractor approved submittals. Carollo will identify assets that have been removed from the facility as a result of the project and provide the list for IRWD to review and remove. Existing assets will not be modified or added to the list and it is assumed that IRWD will provide the current spreadsheet already populated with asset information headers and asset information already filled out. The budget is based on addition of approximately 150 assets.

Task 2.10 – Miscellaneous Construction Support

Carollo will provide as-needed construction support as requested by IRWD. A budget of 100 hours has been established for this task.

Task 2 Deliverables

- Draft and Final Construction Meeting Agenda
- Draft and Final Construction Meeting Minutes
- Submittal Review Comments
- RFI Responses
- Plan Revisions, as required
- Record Drawings as mylar, PDF electronic file, and AutoCAD electronic files
- Energy Control Procedures
- Revised Asset Inventory Database for IDF.

Exhibit B
Irvine Ranch Water District
Initial Disinfection Facility
Sodium Hypochlorite Storage Feed System
Engineering Services During Construction

Task	Task Description	Meyerhofer	Weishaar	Assistant Engineer	Doan	Hedlund	Carreon	Designer	Document Processing	Task Hours	Task Subtotal	Reproduction	Task Total
1	Project Management												
1.01	Project Status Reports	0	12	0	0	0	0	0	0	12	\$ 2,340	\$ -	\$ 2,340
	Task Subtotal	0	12	0	0	0	0	0	0	12	\$ 2,340	\$ -	\$ 2,340
2	Construction Phase Services												
2.01	Conformed Drawings	0	2	12	4	4	4	24	8	58	\$ 9,006	\$ -	\$ 9,006
2.02	Project Meetings (6 Total)	0	12	6	0	6	0	0	0	24	\$ 4,440	\$ -	\$ 4,440
2.03	Requests for Information (90 Total)	0	54	80	40	48	48	0	0	270	\$ 49,450	\$ -	\$ 49,450
2.04	Plan Revisions (40 Hours Total)	0	8	12	0	0	0	20	0	40	\$ 6,360	\$ -	\$ 6,360
2.05	Site Visits (6 Total)	0	12	6	0	6	0	0	0	24	\$ 4,440	\$ -	\$ 4,440
2.06	Shop Drawing Review (115 Total)	0	60	140	48	48	48	0	0	344	\$ 61,480	\$ -	\$ 61,480
2.07	Record Drawings	0	4	40	2	2	2	60	0	110	\$ 16,970	\$ 2,500	\$ 19,470
2.08	Energy Control Procedures	0	4	24	0	0	0	0	0	28	\$ 4,500	\$ -	\$ 4,500
2.09	Asset Management Spreadsheet (150 assets)	0	4	40	0	0	0	0	0	44	\$ 6,980	\$ -	\$ 6,980
2.10	Miscellaneous Construction Support & Coordination	0	24	12	8	24	12	0	0	80	\$ 15,120	\$ -	\$ 15,120
	Task Subtotal	0	184	372	102	138	114	104	8	1022	\$ 178,746	\$ 2,500	\$ 181,246
	Hours Total	0	196	372	102	138	114	104	8	1034			
	Rate	\$ 229	\$ 195	\$ 155	\$ 195	\$ 195	\$ 195	\$ 147	\$ 111				
	Project Subtotal	\$ -	\$ 38,220	\$ 57,660	\$ 19,890	\$ 26,910	\$ 22,230	\$ 15,288	\$ 888		\$181,086	\$2,500	\$183,586

September 20, 2016

Prepared by: H. Cho/M. Cortez

Submitted by: K. Burton *KLB*

Approved by: Paul Cook *[Signature]*

ENGINEERING AND OPERATIONS COMMITTEE

DYER ROAD WELLFIELD WELL 3 REHABILITATION BUDGET ADDITION AND CONTRACT CHANGE ORDER

SUMMARY:

The Dyer Road Wellfield (DRWF) Well 3 Rehabilitation Project will rehabilitate the well to remove chemical and biological material from the well's louvers and restore its production capacity. Staff recommends that the Board:

- Authorize the addition of Project 4327 to the FY 2016-17 Capital Budget in the amount of \$1,112,100, and
- Authorize the General Manager to execute Contract Change Order No. 5 with General Pump Company in the amount of \$236,006 for the Dyer Road Wellfield Well 3 Rehabilitation.

BACKGROUND:

In November 2015, General Pump Company was awarded the construction contract for the Dyer Road Wellfield Well No. 3 Rehabilitation Project to remove chemical and biological material from the well's louvers and restore production capacity. A location map of Well 3 is attached as Exhibit "A". General Pump began rehabilitation activities in January 2016, and brushing and bailing, air bursting and sonar jetting activities were completed by March 2016. During chemical development of the well, the chemical injection swab became stuck near the bottom of the well due to sediment entering the well. This issue was recently resolved by General Pump and rehabilitation of the well is ready to proceed.

Contract Change Order (CCO) No. 5:

Video inspection of Well No. 3 has identified at least seven holes in the louvered area, as well as several cracks. The District's consultant, Richard Slade & Associates, and General Pump both recommended the installation of a liner, since proceeding with well rehabilitation work without a liner would likely cause additional damage to the well louvers and cause more sediment to enter the well.

Staff received a proposal from General Pump in the amount of \$236,006 and a second proposal from Best Drilling in the amount of \$215,000 for the installation of the well liner and associated gravel pack. Staff found that the proposals from General Pump and Best Drilling differed in scope as Best Drilling did not provide costs for sound panels, survey of the installed liner, airburst of the new gravel pack, bailing and disposal after the liner is installed, and video inspection after liner installation. Subtracting these items from General Pump's proposal for comparison, General Pump's total was \$183,404. Based on this, staff recommends the approval of CCO No. 5, which is attached as Exhibit "B", in the amount of \$236,006 with General Pump; The well liner has a delivery time of four weeks, and installation will take approximately two

weeks. Once the well liner is installed, completion of the remaining rehabilitation activities will take approximately eight weeks. Staff anticipates that construction will be completed by December 31, 2016.

FISCAL IMPACTS:

Project 4327 was originally scheduled to be completed by May 31, 2016 and was therefore excluded from the FY 2016-17 Capital Budget. Staff requests the addition of Project 4327 to the FY 2016-17 Capital Budget to fund the construction of the well liner as shown in the table below.

Project No.	Current Budget	Addition <Reduction>	Total Budget
4327	\$-0-	\$1,112,100	\$1,112,100

ENVIRONMENTAL COMPLIANCE:

This project is exempt from the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15301 which provides exemption for minor alterations of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. A Notice of Exemption for the project was filed with the Orange County Clerk/Recorder on May 29, 2015.

RECOMMENDATION:

That the Board authorize the addition of Project 4327 to the FY 2016-17 Capital Budget in the amount of \$1,112,100; and authorize the General Manager to execute Contract Change Order No. 5 with General Pump Company in the amount of \$236,006 for the Dyer Road Wellfield Well 3 Rehabilitation, project 4327.

LIST OF EXHIBITS:

Exhibit "A" – Location Map
Exhibit "B" – Contract Change Order No. 5

EXHIBIT "A"

DRWF Well No. 3

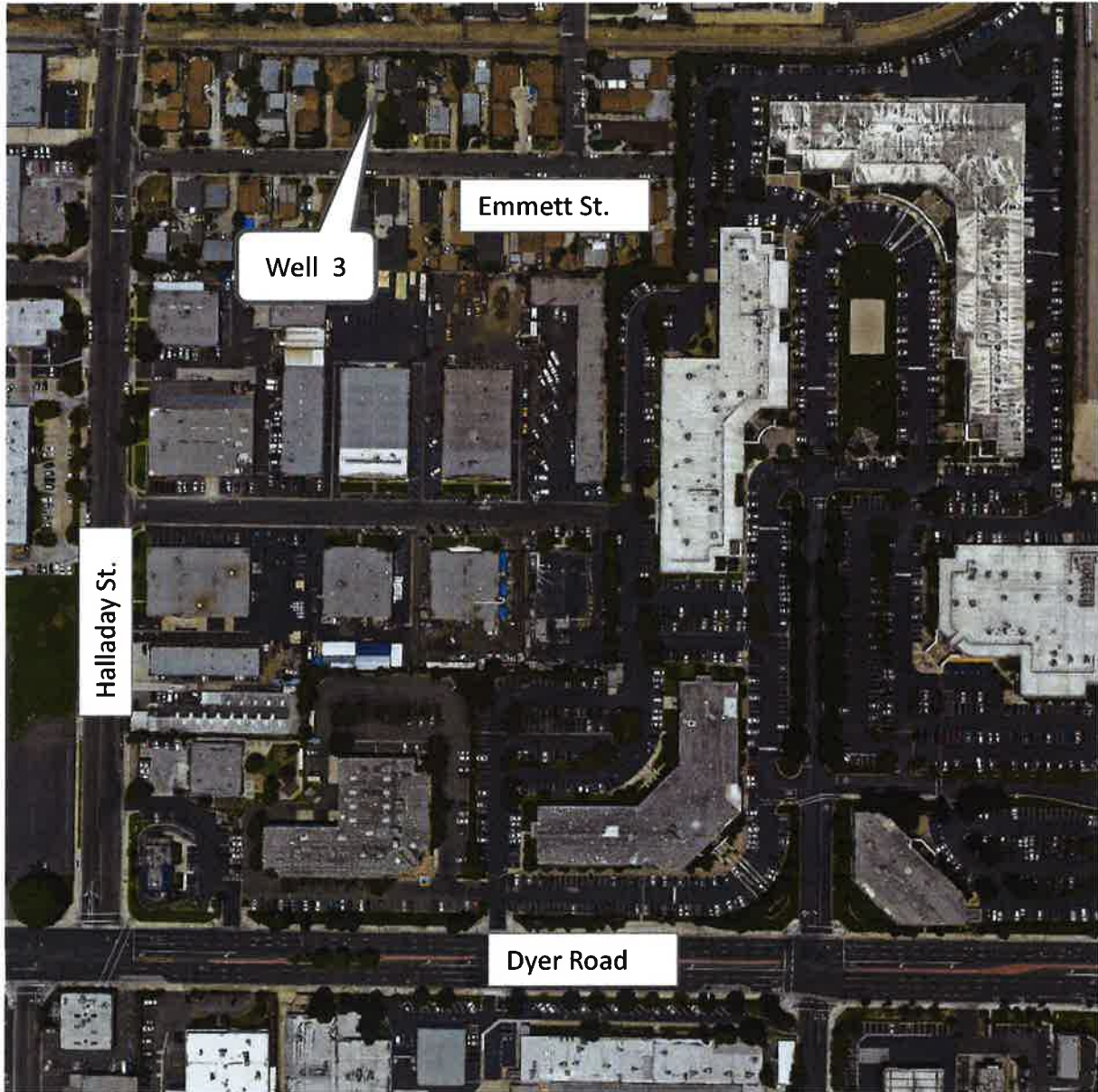


EXHIBIT "B"

CONTRACT CHANGE ORDER

IRVINE RANCH WATER DISTRICT
15600 Sand Canyon Avenue
Irvine, California 92619
(949) 453-5300



C.O. No. 5
☐ Final

Project No. 11672(4327)

Dyer Road Well Field Well 3 Rehabilitation
Project Title

Date: September 13, 2016

THE FOLLOWING CHANGE TO CONTRACT, DRAWINGS AND SPECIFICATIONS IS PROPOSED.	\$ ADDITIONS	\$ DELETIONS	DAYS +
1. Additional work to install a liner in the well and perform well development after the liner is installed as described in the attached documents. Non-compensatory time extension of 144 calendar days is included for the additional work.	\$236,006.00	\$-0-	144
The project completion date shall be revised from August 8, 2016 to December 30, 2016.			
TOTAL	\$236,006.00	\$-0-	144

	DAYS +
1. NET AMOUNT THIS CHANGE ORDER	\$236,006.00
2. ORIGINAL CONTRACT AMOUNT	\$477,657.00
3. TOTAL PREVIOUS CHANGE ORDER(S)	\$48,750.00
4. TOTAL BEFORE THIS CHANGE ORDER (2+3)	\$526,407.00
5. PROPOSED REVISED CONTRACT AMOUNT TO DATE (1+4)	\$762,413.00

We hereby agree to make the above change subject to the terms of this change order for the sum of:

Two Hundred Thirty Six Thousand Six and 00/100

Dollars

9/13/16
Date

General Pump Co
Contractor

[Signature]
By

SIGNATURE	DATE	APPROVAL LEVEL REQUIRED
<i>[Signature]</i> IRWD Engineer or Consulting Engineer	9/13/16 Date	Department Director Approval Required
<i>[Signature]</i> Principal Engineer	9/14/16 Date	Executive Director Approval Required
<i>[Signature]</i> Executive Director of Engineering & Water Quality	9/14/16 Date	General Manager Approval Required
<i>[Signature]</i> General Manager	9/14/16 Date	Board Approval Required
		Purchase Order No.

NOTE: The documents supporting this Change Order, including any drawings and estimates of cost, if required are attached hereto and made a part hereof. This Change Order shall not be considered as such until it has been signed by the Owner and the Contractor. Upon final approval, distribution of copies will be made as required. The parties mutually agree the pricing set forth in this Change Order are complete and fair compensation for the entirety of the work authorized under this Change Order and that no additional compensation is warranted nor shall it be allowed.

CHANGES: All workmanship and materials called for by this Change Order shall be fully in accord with the original Contract Documents insofar as the same may be applied without conflict to the conditions set forth by this Change Order. The time for completing the contract will not be extended unless expressly provided for in this Change Order.

CSG-02



159 N. ACACIA STREET * SAN DIMAS, CA 91773
PHONE: (909) 599-9606 * FAX: (909) 599-6238

CAMARILLO, CA 93010 * PHONE: (805) 482-1215
www.genpump.com

WELL & PUMP SERVICE SINCE 1952

Lic. #496765

Serving Southern California and Central Coast

August 18, 2016

Via Email

Irvine Ranch Water District
3512 Michelson Drive
Irvine, California 92612
Attn: Harry Cho

Subject: Dyer Well 3

Dear Mr. Cho:

General Pump Company is pleased to submit our quote to reline and perform some well development after the partial liner has been installed. It is requested that the entire site with the exception of the most northern lot boundary contain sound blankets to protect the homes in close proximity to the well location. Since this is a partial liner, gravel is to be placed through the pipe used to lower the liner into place. A release tool shall be fabricated allowing for gravel pack to gravity feed around the outside of the 12" diameter. Liner gravel is to be placed from approximately 1200' bgs to 450' bgs. Also due to site constraints, the liner will have to be installed in lengths not to exceed 20'.

Listed below is a summary along with the associated cost in connection with the liner and well development work at Dyer Well 3.

Cost

- Mobilization / Demobilization (bonds, insurance, welding materials, porta potty and miscellaneous).
- Set up / tear down sound panels. (Includes rental for one month).
- Perform dual gyroscopic survey, 3 rpm caliper, and submit AWWA calculations for misalignment and effective casing diameter. Pacific Survey (**IRWD Cost**)
- Submit final calculations, survey results, and CAD drawing of proposed liner inside of original casing for approval.
- Fabricate "J" hook release assembly.
- Supply and install 16" 304L stainless steel blank .25" wall, ASTM A778, spiral welded blank casing with centralizers.
- Supply and install new 12.75" OD continuous wire wrap screen, stainless steel 304, .050" slot, .165 wire x .0217" rod, weld rings with centralizers.
- Supply and install a 16" x 12" 304 stainless steel concentric reducer.



Mr. Harry Cho
Irvine Ranch Water District
August 18, 2016
Page -2-

- Supply and install 12.75" OD x .25" wall, ASTM A778, stainless steel type 304L blank pipe beveled ends per submittal.

Cost (Continued)

- Gravel pack well using SRI .250
- AirBurst® (no approved equal) for two (2) 8-hour days to consolidate the new gravel pack.
- Set up 18 cu/yd roll-off bin for bailed material.
- Analytical for proper disposal, plus disposal costs.
- Bail well back to bottom.
- Contain and properly dispose the bailed material.
- Video log well with two (2) DVD copies and reports using camera with slot scan capabilities.

Total Cost (includes Freight, Sales Tax, Shop Labor & Engineering) \$ 236,006

Should you have any questions or need additional information regarding the above summary and cost for the Dyer Well 3 project, please do not hesitate to contact us.

Thank you.

Sincerely,

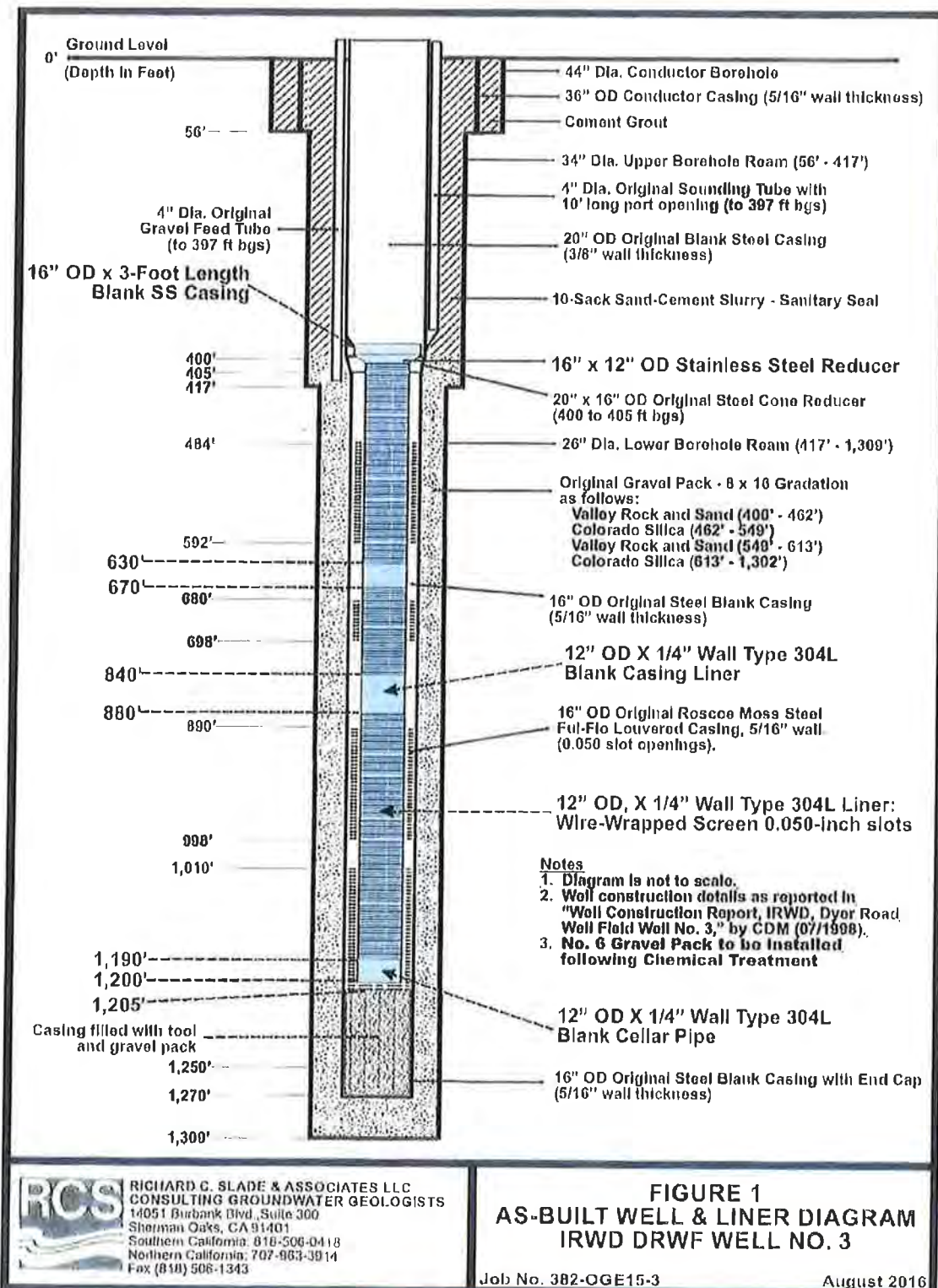
GENERAL PUMP COMPANY, INC.

Tom Nanchy

Tom Nanchy
Sr. Project Manager / Project Engineer

Michael Garcia

Michael Garcia
Asst. Project Manager / Project Engineer



September 20, 2016
Prepared by: L. Lewis
Submitted by: F. Sanchez/P. Weghorst
Approved by: Paul Cook 

ENGINEERING AND OPERATIONS COMMITTEE

FATS, OILS AND GREASE PROGRAM VARIANCE NO. 1

SUMMARY:

IRWD has used contract services to administer its Fats, Oils and Grease (FOG) Program since 2004. Currently, the District is undertaking a study to evaluate options for implementing new Discharge Pretreatment and FOG Programs. Recommendations from the study are expected to be available in spring 2017. One year of transition time may be required for implementation of the programs, depending on recommendations of the study. To maintain the operational continuity of the FOG Program during the evaluation and transition period, a variance with the current provider of FOG Program services is recommended. Staff recommends that the Board authorize the General Manager to execute Variance No. 1 with Environmental Engineering and Contracting, Inc. (EEC) in the amount of \$165,950 to provide FOG Program services for one year and for an optional additional year at \$165,950 as may be necessary to transition to the District's new Pretreatment and FOG Programs.

BACKGROUND:

When the District initiated the FOG Program in 2004, EEC was retained to develop a FOG characterization study. The scope of work of the study included inspection of food service establishments (FSEs), development of hot spot maps, FOG source characterizations and the design of a database management system for the program. The District's FOG Program has expanded over the last 10 years with over 1,000 FSEs currently in the system. EEC's scope of work has evolved to include overall program management, routine FSE inspections and enforcement support on behalf of the District.

In September 2014, staff sent a Request for Proposal (RFP) for FOG services to six potential service providers. Staff received three proposals and two of the firms did not meet the minimum experience requirements specified in the RFP. Based on this competitive process, EEC was selected to provide FOG Program services. In 2015, a Professional Services Agreement was executed with EEC to continue performing the FOG Program administrative services for a one-year term. This agreement expires on October 31, 2016.

EEC has provided FOG Program management services to over 30 cities and sewer collection and treatment districts. The company is also nationally recognized as a FOG control expert and has provided excellent services to the District.

Evaluating Options for Pretreatment and FOG Programs:

In August 2016, staff issued an RFP for a consultant to evaluate IRWD's options for implementing new Pretreatment and FOG Programs. The evaluation will assess the resources necessary to meet regulatory requirements for both programs, and recommend whether the programs should be brought in-house, outsourced or a combination of both. The

recommendations from the evaluation are not expected to be available until early spring 2017. It is expected that it will take another year to implement the recommendations through a transition process.

Variance No. 1 with EEC:

To maintain program continuity and compliance with regulatory requirements during the evaluation and transition periods, staff recommends that EEC continue to provide FOG Program services for one additional year with an option for the District to extend the contract for a second year as may be necessary to transition to a new program. Staff has negotiated with EEC in the preparation of Variance No. 1 and a related scope of work to continue EEC's work. The variance and scope of work are attached as "Exhibit A". Staff considers the cost of the services to be fair and reasonable.

FISCAL IMPACTS:

Funding for FOG Program Services is included in the adopted FY 2016-17 Operating Budget.

ENVIRONMENTAL COMPLIANCE:

Services provided by EEC will be in compliance with the District's FOG Control Program Manual and Grease Control Rules and Regulations that are included in the District's Sewer System Management Plan, the District's Rules and Regulations for Use of District Sewerage Facilities and consistent with the State Water Resources Control Board Statewide General Waste Discharge Requirements for Sanitary Sewer Systems under Water Quality Order Number 2006-0003.

RECOMMENDATION:

That the Board authorize the General Manager to execute Variance No. 1 with Environmental Engineering and Contracting, Inc. to provide Fats, Oil and Grease (FOG) Program services in the amount of \$165,950 for the period November 1, 2016 to October 31, 2017 and for an optional additional year at \$165,950 as may be necessary to transition to the District's new Pretreatment and FOG Programs.

LIST OF EXHIBITS:

Exhibit "A" – Variance No. 1 with EEC and Related Scope of Work

EXHIBIT "A"

IRVINE RANCH WATER DISTRICT PROFESSIONAL SERVICES VARIANCE

Project Title: Fats, Oils, and Grease (FOG) Program Services

Project No.: N/A Date: August 22, 2016
Purchase Order No.: 527613 Variance No.: 1

Originator: ☒ IRWD ☐ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (*attach any back-up material*):

Schedule and Cost Variance to extend FOG Program Services one year ending October 31, 2017, with an option to extend for a second year, ending October 31, 2018. See attachment.

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
See Attachment for scope of work and cost estimate FY16/17	1400					165,950
Optional FY 17/18 - also see attached scope of work	1400					165,950
Total \$=						331,900

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
All	FOG Program Services FY 16-17	10/31/2016	12 months	Complete by 10/31/2017
All	Optional FOG Program Services FY 17-18	10/31/2016	Up to 24 months	Complete by 10/31/2018

Required Approval Determination:

Total Original Contract	<u>\$ 165,950.00</u>	☐ Director: Cumulative total of Variances less than or equal to \$50,000.
Previous Variances \$	<u>0</u>	
This Variance	<u>\$ 331,900.00</u>	☐ Executive Director: Cumulative total of Variances less than or equal to \$75,000.
Total Sum of Variances	<u>\$ 0</u>	
New Contract Amount	<u>\$ 497,850.00</u>	☐ General Manager: Cumulative total of Variances less than or equal to \$100,000.
Percentage of Total Variances to Original Contract	<u>200</u> %	☒ Board: Cumulative total of Variances greater than \$100,000.

ENGINEER/CONSULTANT: EEC Environmental

IRVINE RANCH WATER DISTRICT

Project Engineer/Manager _____ Date _____

Department Director _____ Date _____

Engineer's/Consultant's Management _____ Date _____

General Manager/Board _____ Date _____

**IRVINE RANCH WATER DISTRICT
PROFESSIONAL SERVICES VARIANCE REGISTER**

Project Title: Fats, Oils and Grease (FOG) Program Services

Project No.: N/A Project Manager: Lyndy Lewis

[illegible]

Section 3.0 – Scope

3.1 FOG Program Management Support

EEC currently manages and supports FOG control programs for four Southern California agencies, including the District, utilizing comprehensive databases and GIS tools to collect, organize, analyze, and manage FOG data. Having been closely involved in the development and implementation of key FOG program tools and processes, EEC's technical and field staff is thoroughly knowledgeable with the field data acquisition systems and work flows currently employed by the District.

EEC will provide the following as-needed services under this task:

- Collect, organize, and manage the District's FOG Control Program data
- Review FSE inspection results for QA/QC
- Develop reports to summarize inspection results and compliance efforts
- Establish inspection schedules, and coordinate compliance and enforcement tasks with District staff
- Provide as-needed new FSE plan review/plan check support and District staff training
- Conduct regular meetings/calls with District staff to evaluate the FOG Control Program status, provide recommendations, and prioritize project efforts (minimum of bi-weekly)
- Provide monthly reports summarizing activities conducted and recommendations to the District's FOG Program Manager
- Provide follow-up documentation assistance and expertise to the FOG Program Manager
- Manage the FOG geodatabase and GIS files such as map documents
- Monitor the Orange County Health Care Agency's (OCHCA's) inventory of restaurants and append any updates, changes, or additions to the District's FSE inventory
- Obtain data and information to keep the FSE inventory up to date
- As needed, develop and coordinate evaluation of new and emerging grease control technologies, including GRE and chemical/biological additives
- Provide the District with experienced and knowledgeable professional staff
- Provide the district with inspectors equipped with proper identification including contractor badges

Additionally, based on our recognized FOG expertise, EEC is afforded the opportunity to work with agencies across the country, exposing the team to a variety of innovative ideas and concepts that can be shared with the District. EEC also works with some of the District's neighboring agencies and can share field intelligence regarding sewer investigations and FSE issues that might impact the District's programs.

3.2 FSE Inspections and Enforcement

EEC inspectors are fully trained on FOG inspection procedures and the District's specific FOG regulations. To ensure the efficiency, quality and consistency of our inspections, EEC will routinely perform QA/QC of FOG inspectors as well as the inspection data. EEC will closely monitor inspection progress to ensure the FOG control program tasks are on track to meet inspection and follow-up targets. EEC will also work

with the District's FOG Program Manager to evaluate implementation of FOG risk-based inspection prioritization processes to further optimize the District's inspection resources.

EEC will provide the following services under this task:

- Conduct on-site physical inspections of FSEs as determined by the FOG Program Manager (during the District's regular business hours)
- Provide recommendations for enforcement actions and support coordination and execution of these actions
- Provide outreach and educational materials to FSEs
- Provide the District with educational and BMP information
- Promote the importance of kitchen BMPs to the FSE community
- Require inspectors to clearly identify themselves both verbally and with proper identification badges as contract inspectors of the District
- Require inspectors to identify their vehicles as contract vehicles of the District (if requested)
- Coordinate and establish work schedules

Specific FSE inspection categories include the following:

1. Permitting Inspections. EEC will conduct initial permitting inspections for new, change-of-ownership, and remodeled FSEs. Through initial inspections, also referred to as FSE characterization, EEC will identify the type of food, cooking equipment, kitchen practices, and grease removal equipment utilized at each new FSE. Each FSE will be provided with educational materials and detailed verbal guidance to help the FSE understand the District's Program and minimize their risk for FOG discharge into the District's collection system.



An FSE's Cooking Equipment Inventory Undergoes FOG Inspection

2. Grease Removal Equipment Inspections. EEC will conduct GRE inspections for FSEs with a grease interceptor or grease trap to ensure each device is in good operational and maintenance condition and confirm that appropriate maintenance practices are implemented. The inspections are comprehensive and thorough to support potential enforcement efforts in the future.

Specifically, EEC inspectors will conduct the following:

- Measure the layer of floating FOG and settleable solids
- Determine conformance with compliance criteria
- Inspect the mechanical condition of the GRE
- Review the maintenance logs and record the last pump-out date
- Evaluate GRE pumping record-keeping
- Document and capture photographic evidence of all violations



Grease Interceptor is Opened for Inspection

3. Best Management Practice Inspections. Having conducted over 20,000 kitchen BMP inspections, EEC understands the importance of educating FSEs on proper BMPs. EEC will conduct BMP inspections to evaluate compliance with all required kitchen BMPs, including employee education and training practices. These inspections also provide an opportunity to provide new program educational materials.

Specifically, EEC inspectors will assess the following:

- Removal of food grinder
- Drain screens installed/maintained
- Kitchen signage (BMP poster) posted
- Scraping practices
- Food waste disposal practices
- Emergency spill response materials
- Utilization of drainage additives
- Segregation and proper storage of waste cooking oil
- Grease collection log maintained
- Employee training log maintained
- Lateral cleaning and spill log maintained



A Kitchen BMP Violation is Identified During Inspection

4. Compliance Inspections. ECC will conduct follow-up inspections for non-compliance issues as required by the District's FOG Program Manager. This may include issuance of notices of violation (NOV) to FSEs that are found to be in non-compliance of the FOG control regulations.

EEC will assist the District in managing enforcement actions for violations of the District's Rules and Regulations. For any FSE or critical source facility identified with deficiencies, EEC will meet with FSE managers/owners or property owners to discuss violations and enforcement and to help develop an appropriate corrective action plan to achieve and maintain compliance. Based on the results of follow-up inspections and issued notices of non-compliance, EEC will review, provide recommendations, and assist the District with elevated enforcement actions required as a result of violations of the District's FOG Rules and Regulations.

EEC understands the District's FSE inventory database and key FSE details necessary to determine each FSE's potential to discharge FOG into the sewer system (e.g., cooking equipment). Inspection results collected in the field are recorded in the geodatabase and used to determine and monitor each FSE's compliance status and history.



A Probe is Used to Measure the FOG Accumulation in a Grease Interceptor

3.3 Safety

EEC inspectors are extensively trained in inspection safety and have an impeccable safety track record. EEC inspectors also receive training in SSO response procedures and are readily familiar with the SSO emergency response procedures implemented by the District.

With over 20,000 facility and grease interceptor inspections conducted to date, EEC understands the potential hazards associated with conducting facility inspections. EEC inspectors adhere to safety protocols and safety equipment including, but not limited to, the following:

- Anti-slip steel toed boots
- Latex gloves
- Safety glasses
- Long pants
- Traffic safety vests
- Traffic cones
- Hand sanitizer

If requested, EEC can develop a Site Safety Plan specific to this project. The Site Safety Plan would outline the steps to be taken during each inspection to not only protect inspectors/public from harm, but also satisfy the District's specific requirements (if any). Such a Site Safety Plan would be kept in each inspection vehicle and provided to the District upon request.

3.4 Mapping Services

EEC fully understands the District's use of GIS and other systems to manage FOG program data and inspection tasks. EEC understands that the District is requesting mapping and GIS support services to continue use of these systems.

Since 2004, EEC has provided GIS support services to the District, including determining the most effective way to manage the District's FOG control program. EEC created and implemented the District's Esri's ArcGIS and MS Access system to manage inspections of the more than 1,000 FSEs and more than 400 GREs.



FSEs Located in IRWD's Service Area

EEC will provide the following services under this task:

- Manage and maintain FSE/GRE geodatabase
- Review FOG inspection results
- Generate reports and inspection statistics
- Maintain FSE and GRE feature classes
- Maintain map documents for Esri software

- Conduct geospatial analysis to determine FSE inspection priorities
- Provide GIS support as specified by the District
- Identify and address problems or errors in the GIS

The FOG program Geodatabase is also used to manage issuance of NOVs and subsequent compliance inspections. Using these GIS and database resources developed in-house, EEC will continue to provide effective and efficient inspection management services for the District.

EEC has also developed customized tools to query and review copious amounts of FSE data for analysis and reporting. For example, an inspector or manager can find an SSO or sewer hotspot in the GIS and readily identify the associated FSEs. Hyperlink tools in the GIS are provided to quickly query the FSE database to return pertinent information related to an FSE's inspection history, site pictures, and inspection reports.

3.5 Waste Discharge Requirement and Sewer Management Plan Support

EEC staff has comprehensive experience in conducting a wide range of program audits, including sewer system management plan (SSMP) audits. This broad experience has provided EEC with a unique insight to both a regulator's view on conducting audits and a regulated entity's view on being audited. Since the issuance of Order No. R8-2002-0014 by the California Regional Water Quality Control Board in 2002, and subsequent issuance of the current Statewide General Waste Discharge Requirements (SSS WDR) for Sanitary Sewer Systems (Order No. 2006-0003-DWQ) in 2006, EEC applied its insight to developing and implementing practical and defensible programs designed to reduce SSOs. EEC can provide continued support to the District with WDR and SSMP development and implementation as requested.



An SSO is Simulated During
SSO Response Training

EEC continues to serve local governments in developing, implementing, and monitoring sensible sewer system management programs tailored to address specific local conditions and ensure compliance with applicable WDRs. EEC has extensive expertise in key SSO mitigation strategies, including FOG control programs, overflow emergency response plans (ERP), and SSMP performance assessment and audits. EEC continues to assist cities and independent special districts, including the Cities of Santa Ana, La Habra, Buena Park, El Segundo, and Anaheim, as well as CMSD, with development, implementation, and/or audit of their key SSMP strategies.

As needed, EEC can support the District with the on-going efforts toward SSMP assessment and enhancement to ensure continued compliance with the SSS WDR. EEC's service capabilities range from cursory review/discussion of specific SSMP elements to a comprehensive audit and update of the entire SSMP program.

3.6 Training and Miscellaneous Support

EEC developed and currently conducts California's only Grease Interceptor Inspector Training Workshop for the California Water Environment Association (formerly conducted for CalFOG). To date, EEC has conducted seven workshops and trained more than 400 inspectors. EEC most recently provided specialized training for City Redondo Beach and South San Luis Obispo Sanitation District inspectors as well as City of Santa Ana Code Enforcement staff.

As needed, EEC can provide the District with FOG Program and inspection training services tailored to suit the District's current program needs as well as supporting the District's long-term program goals.

3.7 Summary of Deliverables

Based on the scope of services, the following deliverables are anticipated for this project:

- Up-to-date insurance certificate(s) addressing all District requirements including Worker's Compensation, General Liability, and Auto Liability (current District's Insurance certificate (Attachment C))
- FOG program protocols assessment reports and recommendations (as needed)
- Monthly inspection status reports summarizing inspections conducted, compliance status, and recommendations for follow-up and enforcement actions
- Quarterly program review/status meetings with District staff
- FOG outreach and educational materials procurement support and distribution (as needed)
- Updates of FSE inspection database with new FSE data from a variety of sources (as needed)
- FOG program initiative recommendations (as needed)
- Evaluation/assessment reports for emerging GRE devices and additives (as needed)
- Mapping document updates and recommendation reports (as needed)
- Work flow development recommendations (as needed)
- Memoranda/reports on emerging WDR/SSMP requirements (as needed)
- SSMP internal audit report and recommendations (as needed)
- Classroom and field training on a wide range of FOG/WDR/SSMP/GIS/CMMS topics (as needed)
- Monthly Invoices including number of hours by labor category and hourly rates (as included in the fee proposal)

**IRWD - Fats, Oils, and Grease (FOG) Program Services
EEC Environmental**

Fee Schedule – Year 1 (11/2016-10/2017)

The charge for all time required for the performance of the Scope of Work, including administrative, office, field, and travel time will be billed at the hourly rate according to the labor tasks set forth below:

Administrative Services	Hourly Rate	<u>\$ 150</u>
FOG Program - Analytical Services	Hourly Rate	<u>\$ 180</u>
FOG Program - Plan Check Review	Hourly Rate	<u>\$ 150</u>
FSE Field Inspections	Hourly Rate	<u>\$ 105</u>
FSE Compliance Inspections	Hourly Rate	<u>\$ 115</u>
GIS/Information Technology	Hourly Rate	<u>\$ 135</u>
Emergency Response – Business hrs.	Hourly Rate	<u>\$ 125</u>
Emergency Response – Non-Business hrs.	Hourly Rate	<u>\$ 200</u>

Projected Costs for 11/2016 - 10/2017

Labor Task	Projected Hours	Hourly Rate	Projected Year 1 Cost
Administrative Services - IRWD customer call support and coordination - FSE inspection planning and coordination	70	\$150	\$10,500
FOG Program – Analytical Services - Program development and management support - Enforcement recommendations and support - Special project coordination and planning support - Program status updates/meetings	90	\$180	\$16,200
FOG Program – Plan Check Review - New FSE plan review support - Plan processing and comment letter support	50	\$150	\$7,500
Field Inspections - New FSE Initial Inspections - Best Management Practice (BMP) inspections - Grease Removal Equipment (GRE) inspections - Inspection data processing	840	\$105	\$88,200
Compliance Inspections - Non-compliance follow-up inspections - Non-compliance coordination and data processing	240	\$115	\$27,600
GIS/Information Technology - Mapping support - Data/database management support - Status report support	70	\$135	\$9,450
Emergency Response – Business hours Private/Public SSO follow-up	20	\$125	\$2,500
Emergency Response – Non-business hours Private/Public SSO follow-up	20	\$200	\$4,000
Projected Total (11/1/2016 through 10/31/2017)			\$165,950

**IRWD - Fats, Oils, and Grease (FOG) Program Services
EEC Environmental**

Fee Schedule – Year 2 (11/2017-10/2018)

The charge for all time required for the performance of the Scope of Work, including administrative, office, field, and travel time will be billed at the hourly rate according to the labor tasks set forth below:

Administrative Services	Hourly Rate	<u>\$ 150</u>
FOG Program - Analytical Services	Hourly Rate	<u>\$ 180</u>
FOG Program - Plan Check Review	Hourly Rate	<u>\$ 150</u>
FSE Field Inspections	Hourly Rate	<u>\$ 105</u>
FSE Compliance Inspections	Hourly Rate	<u>\$ 115</u>
GIS/Information Technology	Hourly Rate	<u>\$ 135</u>
Emergency Response – Business hrs.	Hourly Rate	<u>\$ 125</u>
Emergency Response – Non-Business hrs.	Hourly Rate	<u>\$ 200</u>

Projected Costs for 11/2017 - 10/2018

Labor Task	Projected Hours	Hourly Rate	Projected Year 1 Cost
Administrative Services			
- IRWD customer call support and coordination - FSE inspection planning and coordination	70	\$150	\$10,500
FOG Program – Analytical Services			
- Program development and management support - Enforcement recommendations and support - Special project coordination and planning support - Program status updates/meetings	90	\$180	\$16,200
FOG Program – Plan Check Review			
- New FSE plan review support - Plan processing and comment letter support	50	\$150	\$7,500
Field Inspections			
- New FSE Initial Inspections - Best Management Practice (BMP) inspections - Grease Removal Equipment (GRE) inspections - Inspection data processing	840	\$105	\$88,200
Compliance Inspections			
- Non-compliance follow-up inspections - Non-compliance coordination and data processing	240	\$115	\$27,600
GIS/Information Technology			
- Mapping support - Data/database management support - Status report support	70	\$135	\$9,450
Emergency Response – Business hours			
Private/Public SSO follow-up	20	\$125	\$2,500
Emergency Response – Non-business hours			
Private/Public SSO follow-up	20	\$200	\$4,000
Projected Total (11/1/2017 through 10/31/2018)			\$165,950

September 20, 2016
Prepared by: S. Malloy
Submitted by: K. Burton
Approved by: Paul Cook 

ENGINEERING AND OPERATIONS COMMITTEE

MICHELSON WATER RECYCLING PLANT BIOSOLIDS AND ENERGY RECOVERY FACILITIES VARIANCES AND BUDGET INCREASE

SUMMARY:

Filanc/Balfour-Beatty (FBB) is constructing the Michelson Water Recycling Plant (MWRP) Biosolids and Energy Recovery Facilities (Biosolids Project). The Board approved Contract Change Order No. 45 in July 2016 which, among other items, extended the contractual date for final project completion to October 31, 2017. The services of various consultants are needed to supplement the construction management team of the Biosolids project through this time extension. Staff recommends that the Board:

- Authorize the General Manager to execute Variance No. 5 with Black & Veatch in the amount of \$3,564,215 for supplemental contract administration, construction phase, and start-up and commissioning services;
- Authorize the General Manager to execute Variance No. 1 with Arcadis, Inc. in the amount of \$1,345,755 for supplemental construction inspection, construction management, and document control system services;
- Authorize the General Manager to execute Variance No. 2 with HDR Engineering, Inc. in the amount of \$496,003 for supplemental construction inspection;
- Authorize the General Manager to execute Variance No. 1 with EI&C Engineering, Inc. in the amount of \$734,600 for supplemental process control system (PCS) construction management services, start-up testing, and development of PCS operation manuals and associated training presentations; and
- Authorize a budget increase in the amount of \$19,607,600, from \$196,465,500 to \$216,073,100, to the FY 2016-17 Capital Budget for the Michelson Water Recycling Plant Biosolids and Energy Recovery Facilities, Project 4286.

BACKGROUND:

Construction of the Biosolids Project was awarded to FBB in March 2013 in the amount of \$163,513,307. The Biosolids Project will provide biosolids digestion, dewatering, energy production, and on-site sludge drying. The project includes excavation for subsurface structures; installation of 3,009 foundation piles; three egg-shaped digesters; a state-of-the-art odor control system; a biogas conditioning system and power generation using micro-turbines; a fats, oil and grease receiving station; and new utility services. These facilities are being constructed on the land north of IRWD's existing Operations Center, maintenance shops, water quality laboratory, and warehouse.

Variance No. 5 with Black & Veatch:

Black & Veatch has provided contract administration, construction inspection, and construction management services since 2013. Variance No. 5 is summarized below:

- Additional Submittal Reviews – The number of submittals (2,048) through July 8, 2016 has significantly exceeded the allowance amount of 1,200 submittals in the scope of work (171% of allowance amount). The actual expenditures are approximately 150% of budget allowance. Since the submittal reviews will continue through project completion, Variance No. 5 projects the remaining labor and expenses required through approximately April 2017 when construction should be completed;
- Additional Request for Information (RFI) Reviews – The number of RFIs (2,132) through July 8, 2016 has exceeded the allowance amount of 1,200 RFIs in the scope of work (178% of allowance amount). The actual expenditures are approximately 130% of budget allowance. Since the RFIs will continue through project completion, Variance No. 5 projects the remaining labor and expenses required through approximately April 2017;
- Additional Schedule Review – Staff requested Black & Veatch to prepare a special parallel schedule for start-up and commissioning to compare with FBB's start-up/commissioning schedule. Staff also requested Black & Veatch to perform special evaluations for FBB's time impact analysis and claims for extended overhead. These special reviews were not included in the original scope of work. Finally, Black & Veatch has projected the additional labor hours to cover the additional schedule reviews through December 2017;
- Additional Electrical and Automation Field Engineering – Black & Veatch will provide additional services for electrical and automation field activities as a result of the time extension;
- Electronic Operations and Maintenance (O&M) Manual Development, Installation, and Training – Staff requested Black & Veatch to conduct technology transfer sessions for MWRP O&M staff. This task was not included in Black & Veatch's original scope of work. These additional 20 training sessions are needed due to staff turn-over, new hires, and promotions within the MWRP O&M departments, as most of the current staff did not participate in the design phase of this project. The technology transfer sessions will introduce new staff to the design basis, equipment provided, intended operations, alternate operations, and maintenance requirements. The sessions will be held in advance of and will supplement formal Black & Veatch and vendor training;
- Additional Asset Management Data Collection - Staff requested Black & Veatch to prepare 250 new computerized maintenance management software (CMMS) worksheets. The CMMS forms furnish additional information for plant staff regarding the manufacturer data, equipment details, equipment identification, maintenance summary, lubrication requirements, and spare parts data that are not included in the main asset management worksheet covered in the existing scope of work;
- Prepare New Standard Operating Procedure (SOP) Documents - Staff requested Black and Veatch to prepare SOPs for the new major biosolids systems. This was not included in the original scope of work. Black and Veatch will prepare SOPs for the following

major systems: 1) sludge pumping, screening, thickening, and feeding to the anaerobic digesters; 2) digested sludge conveyance, digested sludge storage, centrifuge dewatering, and cake feed to the dryer; 3) heat dryer operation process control, and 4) biogas treatment and microturbines; and fats, oil and grease receiving; and

- Additional Air Quality Permit Services - Air Quality Permit Support. Black & Veatch is providing support for the South Coast Air Quality Management District (SCAQMD) permit application and Federal Aviation Agency notification activities. These activities were not included in its original scope. The final SCAQMD air permit requirements for stack testing have changed since the original scope of work, and staff has provided recent input to Black & Veatch on the current stack testing requirements. Originally, two stack tests were anticipated: heat dryer and flare. There are now six different stack types that require testing: 1) biosolids receiving, heat dryer; 2) odor scrubber; 3) venturi wet scrubber and regenerative thermal oxidizer; 4) five microturbines; 5) two boilers; and 6) one flare. Black and Veatch will prepare emissions performance test specifications for the stack testing vendor who will be a third-party contractor for IRWD. The purpose of the stack tests is to determine compliance with the SCAQMD Permit to Construct.

Variance No. 5, shown as Exhibit “A”, with Black & Veatch in the amount of \$3,564,215 is for supplemental contract administration, construction phase, and start-up and commissioning services.

Variance No. 1 with Arcadis, Inc.:

Arcadis has provided construction inspection, construction management, and document control system services since the start of the Biosolids project. Through Variance No. 1, Arcadis will negotiate and prepare change orders and provide as-needed construction management support, assist with resolving project claims and delays submitted by FBB, and assist in project close-out activities. These services will be provided through March 31, 2018. Arcadis will also provide construction inspection services through October 31, 2017. Although the project schedule shows that Milestone 4B (Methane Digesters start-up) is scheduled to be completed on August 1, 2017, additional time will likely be needed for completion of punch list items. Arcadis will provide document control services until March 31, 2018, including assistance with the archiving of vital project documents. Variance No. 1 with Arcadis, Inc., attached as Exhibit “B”, is for construction management, construction inspection services, and document control support in the amount of \$1,345,755.

Variance No. 2 with HDR Engineering, Inc.:

HDR Engineering has provided construction inspection since the start of the Biosolids project. With Variance No. 2, HDR will provide construction inspection services through December 31, 2017. Although the project is scheduled to be completed on October 31, 2017, it is assumed that close-out activities such as punch list items and record drawings will require HDR’s assistance. Variance No. 2, shown as Exhibit “C”, with HDR Engineering in the amount of \$496,003 is for construction inspection services.

Variance No. 1 with EI&C Engineering, Inc.:

EI&C Engineering has provided technical oversight of the process control system (PCS) development. EI&C will continue to provide technical oversight of the PCS development through December 31, 2017. Additionally, EI&C will provide additional automation staff to supplement the start-up testing when it is anticipated that multiple start-up tests are scheduled simultaneously. EI&C will also provide technical writing support to prepare the operation manuals and associated training presentations. Variance No. 1, shown as Exhibit “D”, with EI&C Engineering, Inc. in the amount of \$734,600 is for supplemental PCS construction management services, start-up testing, and development of PCS operation manuals and associated training presentations.

FISCAL IMPACTS:

The MWRP Biosolids and Energy Recovery Facilities, Project 4286 is included in the FY 2016-17 Capital Budget. Staff requests a budget increase in the amount of \$19,607,600 for the above variances and future construction change orders as shown in the table below.

Project No.	Current Budget	Addition <Reduction>	Total Budget
4286	\$196,465,500	\$19,607,600	\$216,073,100

ENVIRONMENTAL COMPLIANCE:

The MWRP Biosolids and Energy Recovery Facilities is subject to the California Environmental Quality Act (CEQA) and in conformance with the California Code of Regulations Title 14, Chapter 3, Article 7, a Supplemental Environmental Impact Report, SCH # 2011031091, was certified by IRWD on October 22, 2012. The City of Irvine Planning Commission approved a conditional use permit for the IRWD Biosolids Project on December 6, 2012.

RECOMMENDATION:

That the Board authorize the General Manager to execute Variance No. 5 with Black & Veatch in the amount of \$3,564,215 for supplemental contract administration, construction phase, and start-up and commissioning services; authorize the General Manager to execute Variance No. 1 with Arcadis, Inc. in the amount of \$1,345,755 for supplemental construction inspection, construction management, and document control system services; authorize the General Manager to execute Variance No. 2 with HDR Engineering, Inc. in the amount of \$496,003 for supplemental construction inspection; authorize the General Manager to execute Variance No. 1 with EI&C Engineering, Inc. in the amount of \$734,600 for supplemental process control system construction management services, start-up testing, and development of process control system operation manuals and associated training presentations; and authorize a budget increase in the amount of \$19,607,600 from \$196,465,500 to \$216,073,100, to the FY 2016-17 Capital Budget for the Michelson Water Recycling Plant Biosolids and Energy Recovery Facilities, Project 4286.

LIST OF EXHIBITS:

- Exhibit “A” – Variance No. 5 with Black & Veatch
- Exhibit “B” – Variance No. 1 with Arcadis, Inc.
- Exhibit “C” – Variance No. 2 with HDR Engineering, Inc.
- Exhibit “D” – Variance No. 1 with EI&C Engineering, Inc.

EXHIBIT "A"

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE

Project Title: MWRP Biosolids & Energy Recovery Facilities – Construction Phase Services

Project No.: 21146 (4286)

Date: August 22, 2016

Purchase Order No.: 514248

Variance No.: 5

Originator: ☒ IRWD ☐ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (attach any back-up material): At the request of IRWD provide additional services associated with (1) project management, (2) submittal reviews, (3) RFI reviews, (4) schedule reviews, (5) electrical/automation field engineering, (6) electronic O&M manual documents, (7) standard operating procedure documents, (8) asset management CMMS forms, (9) startup testing coordination, and (10) air quality permitting services. This variance is due to an anticipated contract time extension to FBB resulting in an extension of B&V services for an additional 14 months and out of scope work items requested by IRWD. See attached detailed scope of work description.

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
See attached summary						
Total \$ =						3,564,215

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
All		October 28, 2016	14 months	December 31, 2017

Required Approval Determination:

Total Original Contract	\$ <u>12,509,031</u>	☐ Director: Cumulative total of Variances less than or equal to \$50,000.
Previous Variances \$	<u>2,046,835</u>	☐ Executive Director: Cumulative total of Variances less than or equal to \$75,000.
This Variance	\$ <u>3,564,215</u>	☐ General Manager: Cumulative total of Variances less than or equal to \$100,000.
Total Sum of Variances	\$ <u>5,611,050</u>	☒ Board: Cumulative total of Variances greater than \$100,000.
New Contract Amount	\$ <u>18,120,081</u>	
Percentage of Total Variances to Original Contract	<u>44.9%</u>	

ENGINEER/CONSULTANT: Black & Veatch Corp.
Company Name

IRVINE RANCH WATER DISTRICT

Project Engineer/Manager

August 22, 2016
Date

Department Director

9/12/16
Date

Engineer's/Consultant's Management

August 22, 2016
Date

General Manager/Board

Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

Project Title: MWRP Biosolids and Energy Recovery Facilities – Construction Phase Services

Project No.: 21146 (4286)

Project Manager: Steve Malloy

Variance No.	Description	Dates		Variance Amount
		Initiated	Approved	
1	Add a Field Electrical & Automation Engineer	02-05-14	03-25-14	\$664,600
2	Prepare an Odor Control Maintenance and Monitoring Program (OCMMP)	04-29-14	05-28-14	\$112,665
3	Add a Field Civil/Mechanical Engineer	10-06-14	11-10-14	\$899,000
4	Additional Startup Monitoring Activities	10-09-15	11-03-15	\$370,570
5	Additional Services for: (1) project management, (2) submittal reviews, (3) RFI reviews, (4) schedule reviews, (5) electrical and automation field engineering, (6) electronic O&M manual documents, (7) asset management CMMS forms, (8) SOP documents, (9) startup testing coordination, and (10) air quality permitting services.	08-22-16	pending	\$3,564,215

Construction Phase Engineering Services Modifications - Variance #5

Variance Task	Description
Task 1 - Project Management	IRWD and Filanc-Balfour Beatty (FBB) are currently negotiating a time extension for the FBB project completion date. The current FBB completion date is October 28, 2016. IRWD has requested that Black & Veatch (B&V) submit a variance that extends the period of services to December 2017 - a 14 month time extension. Additional project management services are projected based on this time extension.
Task 2.1 - Submittal Reviews	The number of submittals to review for this project in the engineering services agreement is 1,200 total. The actual number of submittals through July 8, 2016 was 2,048 and the actual expenditures through that date are 171% of the original budget. A variance was requested by IRWD to cover the additional submittals above the contract amount through December 2017.
Task 2.2 - RFI Reviews	The number of RFIs to review for this project in the engineering services agreement is 1,200 total. The actual number of RFIs through July 8, 2016 was 2,132 and the actual expenditures through that date are 178% of the original budget. A variance was requested by IRWD to cover the additional RFIs above the contract amount through December 2017.
Task 2.4 - Schedule Reviews	IRWD requested several special schedule reviews that were not in the contract scope of work: (1) prepare a special startup schedule that could be compared with the FBB startup schedule and (2) TIA and extended overhead claim evaluations. Also, the time extension anticipated for FBB through December 2017 also impacts the level of effort for this task and IRWD has requested a variance for these additional services.
Task 3.14 - Electrical/Automation Field Engineering	The time extension anticipated for FBB through December 2017 impacts the level of effort associated with electrical/automation field engineering services. IRWD has requested a variance to extend electrical/automation field engineering services through December 2017. Shawn Rohr and Sheila Moredo will continue to perform these services through the new completion date.
Task 4.1 - Electronic O&M Manual Development, Installation, and Training	A new task was requested by IRWD to conduct technology transfer sessions with the plant O&M staff. Most of the current plant staff were not present during the design phase of this project. These technology transfer sessions will introduce staff to the design basis, equipment provided, intended operations, alternate operations, and maintenance requirements. The presentation slides will be captured for later use by IRWD staff. Twenty sessions are anticipated.
Task 4.5 - Asset Management Data Collection	A new task was requested by IRWD to develop CMMS worksheets for plant staff. There are approximately 250 worksheets that will be required. This work will take approximately 500 hours to complete.
New Task 4.7 - Prepare Standard Operating Procedure (SOP) Documents	Standard Operating Procedure (SOP) documents were not included in the original scope of work. At the request of IRWD, Black & Veatch will prepare system SOPs for only the following systems based on example SOPs given to IRWD: System #1 - sludge pumping, screening, thickening, and feeding to the anaerobic digester system, System #2 - digested sludge conveyance, digested sludge storage, centrifuge dewatering, and cake feed to the heat dryer, System #3 - heat dryer operation process control, System #4 - biogas treatment and microturbines, and System #5 - FOG receiving station.
Task 5.3 - Startup Testing Coordination	The time extension anticipated for FBB through December 2017 impacts the level of effort associated with startup testing coordination services. The original duration for startup testing coordination was 14 months. The time extension adds 10 months to this task duration. It is estimated that Neil Massart will be utilized at 62.5% during these additional 10 months.
Task 5.7 - Air Quality Permit Support	IRWD requested air permit support services that were not in the contract scope of work: (1) support the SCAQMD permit application performed by Environ and IRWD, (2) support FAA notification activities, and (3) support additional air emissions equipment stack (source) testing in accordance with the final SCAQMD permit to construct (issued September 2015). IRWD has requested these additional services.

Engineering & Management Cost Impact - Variance #5

	Project Director/VP	Project Manager 3	Engineer 7	Engineer 6	Construction Manager 7	Construction Manager 6	O&M Specialist 6	O&M Specialist 4	Engineer 2	Clerical	Technician 3	Total Manhours	Expenses	Total \$
Hourly Rate	\$315	\$260	\$220	\$210	\$225	\$185	\$175	\$140	\$120	\$100	\$100			
Task 1 - Project Management	140	420	88	80	40					160	40	968	\$14,760	\$233,220
Task 2.1 - Submittal Reviews		200	1920	1920	800	1920			2400	120		9,280	\$28,119	\$1,740,919
Task 2.2 - RFI Reviews		240	360	480	300	540			720	96		2,736	\$1,639	\$507,439
Task 2.4 - Schedule Reviews	40	120	240		480	480			160	80		1,600	\$21,554	\$342,154
Task 3.14 - Electrical/Automation Field Engineering				800					1136			1,936	\$16,174	\$320,494
Task 4.1 - Electronic O&M Manual Development, Installation, and Training										400			\$0	\$40,000
Task 4.5 - Asset Maangement Data Collection								500				500	\$0	\$70,000
New Task 4.7 - Prepare Standard Operating Procedure (SOP) Documents						76	520					596	\$3,093	\$108,153
Task 5.3 - Startup Testing Coordination Services							800					800	\$11,500	\$151,500
Task 5.7 - Air Quality Permit Support		24	40	96					88			248	\$4,576	\$50,336
Total - Variance #5	180	1004	2648	3376	1620	3016	1320	500	4504	856	40	18,664	\$101,415	\$3,564,215

**IRVINE RANCH WATER DISTRICT
MWRP BIOSOLIDS & ENERGY RECOVERY FACILITIES
(BIOSOLIDS PROJECT)
CONSTRUCTION PHASE SERVICES
Project No. 21146 (4286)**

VARIANCE #5

SCOPE OF WORK

BACKGROUND

The Irvine Ranch Water District (IRWD) owns and operates the Michelson Water Recycling Plant (MWRP). New biosolids and energy recovery facilities are currently under construction by Filanc-Balfour Beatty (FBB), the construction contractor. IRWD and FBB are negotiating a time extension to FBB that apparently will extend the contract completion date such that B&V services will be extended to approximately December 2017 (14 month time extension). At the request of IRWD Black & Veatch will furnish additional project management, construction administration, construction field, electronic O&M manual, and training/commissioning/startup services to cover this additional time period granted to FBB and also cover out of scope work requested by IRWD.

BASIS FOR VARIANCE

The following events have occurred that resulted in this proposed variance for Black & Veatch:

- ***Additional Project Management Services ((Scope Task 1 – B&V Phase 101) -*** FBB has been in negotiations with IRWD to obtain an extension in the construction schedule. It is anticipated that the project completion date will be extended from the current date of October 2016 to December 2017 (14 month time extension). This time extension directly affects the project management services required and the additional labors hours have been projected through the new end date of December 2017.
- ***Additional Submittal Reviews (Scope Task 2.1 – B&V Phase 201) –*** The number of submittals (2,048) through July 8, 2016 has significantly exceeded the allowance amount of 1,200 submittals in the scope of work (171% of allowance amount). The actual expenditures were at approximately 150% of budget allowance on that date. Since the submittal reviews will continue through project completion there will be a significant cost overrun and a variance is necessary. B&V has projected the remaining labor and expenses required through approximately April 2017. Following are several reasons for the number of shop drawings exceeding the original estimate.
 - It is very challenging to estimate the number of submittals on large, unique, and complex projects.

- There are a large number of re-submittals that have occurred. To date, 890 re-submittals have occurred compared with 1,158 initial submittals – this represents a re-submittal rate of 77%. B&V assumed a re-submittal rate of approximately 20% during the scope/fee development for this project.
- There are a large number of programming/configuration submittals required for this project due to the very detailed specifications and specific IRWD standards – much higher than a normal B&V project. This was not fully recognized during the initial scope of work and engineering fee development.
- There have been a large number of submittals required for the Andritz heat dryer, including numerous seismic calculations that are not typical on B&V projects.
- IRWD has performed submittals reviews in parallel with B&V and this has resulted in identification of technical issues that needed to be resolved through additional research and meetings.
- ***Additional RFI Reviews (Scope Task 2.2 – B&V Phase 202)*** – The number of RFIs (2,132) through July 8, 2016 has exceeded the allowance amount of 1,200 in the scope of work (178% of allowance amount). As of March 11, 2016, the actual expenditures were at 130% of budget allowance. Since the RFI reviews will continue through project completion there will be a significant cost overrun and a variance is necessary. B&V has projected the remaining labor and expenses required through approximately April 2017. Following are several reasons for the number of RFIs exceeding the original estimate.
 - It is very challenging to estimate the number of RFIs on large, unique, and complex projects. Also, the number of RFIs experienced on projects is outside the engineer's control.
 - The number of RFIs varies significantly with individual contractors, and this contractor (FBB) has been very aggressive in submitting RFIs.
 - IRWD has initiated a number of owner generated RFIs. This provides excellent documentation but is beyond what we normally experience on our projects.
 - There are a large number of programming/configuration RFIs required for this project due to the very detailed specifications and specific IRWD standards – much higher than a normal B&V project. This was not fully recognized during the initial scope of work and engineering fee development.
 - In some cases, RFIs were submitted by the contractor just to clarify what was in the contract documents or request additional design information and did not represent a design change.
 - The contractor has initiated design revisions due to his lack of proper coordination.
 - In some cases RFIs have been submitted just to document decisions and without any changes to the project design.

- The contractor has also initiated additional RFIs because he has proceeded at risk with fabrication of some equipment without complete approved mechanical shop drawings, resulting in revisions.
- ***Additional Schedule Review (Scope Task 2.4 – B&V Phase 204)*** – B&V has now exceeded budget on this task due to several factors. The time extension through December 2017 directly affects the number of schedule reviews for this project. IRWD requested that B&V prepare a special parallel schedule for startup and commissioning in order to compare this with the FBB startup/commissioning schedule. IRWD also authorized B&V to perform special evaluations for FBB TIAs and FBB claims for extended overhead. These special reviews were not included in the original scope of work. B&V has projected the additional labor hours to cover the additional schedule reviews through December 2017 (14 additional months).
- ***Additional Electrical and Automation Field Engineering (Scope Task 3.14 – B&V Phase 307)*** – Additional services for electrical and automation field activities are a result of the time extension for FBB. The projected additional labor costs are based on assuming that Shawn Rohr will work at 40% utilization rate and that Sheila Moredo will work at a 60% utilization rate through December 2017.
- ***Electronic O&M Manual Development, Installation, and Training (Scope Task 4.1 and 4.2 – B&V Phase 401)*** - IRWD requested that B&V perform a new task to conduct technology transfer sessions for plant O&M staff, not included in the original scope of work. Most plant O&M staff did not participate in the design phase of this project. These technology transfer sessions will introduce the new staff to the design basis, equipment provided, intended operations, alternate operations, and maintenance requirements and these sessions will be held in advance of and supplement formal B&V and vendor training. The following sessions are anticipated:
 - Facility Electronic O&M Basics
 - Facility Electronic O&M Workshop
 - Milestone 1 Electronic O&M Workshop
 - Acid and Methane Digestion Operation Philosophy
 - Sidestream Treatment Philosophy
 - Strain Press, Thickening Centrifuges & Dewatering Centrifuges Philosophy
 - Biogas Treatment & Microturbines Philosophy
 - Cake Receiving/Loading, Pellet Loading Philosophy
 - FOG, Odor Control and Sludge Heating Philosophy
 - Acid and Methane Digestion
 - Odor Control
 - Centrifuge Operations
 - Cake Receiving/Loading and Pellet Loading
 - Biogas Treatment
 - Centrate Treatment
 - Microturbines and Heat Recovery
 - Dryer Process Control

- Dryer Air Handling Overview
- Dryer Solids Handling Overview
- Miscellaneous systems
- ***Additional Asset Management Data Collection (Scope Task 4.5 – B&V Phase 404)*** – IRWD requested a new activity associated with this task to prepare 250 new CMMS worksheets that are outside of the existing scope of work (populating the asset management worksheet). The CMMS forms furnish additional information for plant staff regarding the manufacturer data, equipment details, equipment IDs, maintenance summary, lubrication requirements, and spare parts data that is not included in the main asset management worksheet that is included in the existing scope of work. The CMMS forms are a useful tool for plant staff.
- ***Prepare New Standard Operating Procedure (SOP) Documents (New Scope Task 4.7 – New B&V Phase 406)*** – IRWD requested a new activity associated with this task – to prepare SOPs for the new major biosolids systems. This was not included in the original scope of work. B&V will prepare SOPs for the following major systems:
 - Sludge pumping, screening, thickening, and feeding to the anaerobic digesters.
 - Digested sludge conveyance, digested sludge storage, centrifuge dewatering, and cake feed to the dryer.
 - Heat dryer operation process control.
 - Biogas treatment and microturbines.
 - FOG receiving.
- ***Additional Air Quality Permit Services (Scope Task 5.7 - B&V Phase 506) – Air Quality Permit Support.*** Additional ongoing assistance has been provided per IRWD request to support the SCAQMD permit application that was not included in the original scope and fee. Also, per IRWD request, B&V provided additional services to support FAA notification activities and those activities were not included in the original scope and fee. Finally, the Final SCAQMD air permit requirements for stack testing have changed since the original scope of work and Richard Lao (IRWD) has provided recent input to B&V on the current stack testing requirements. Originally, two stack tests were anticipated (heat dryer and flare). There are now 6 different stack types that require testing: (1) biosolids receiving, heat dryer, (2) odor scrubber, (3) venturi wet scrubber & RTO, (4) five microturbines, (5) two boilers, and (6) one flare. B&V's role is to prepare emissions performance test specifications for the stack testing vendor who will be a third party contractor for IRWD. The purpose of the stack tests is to determine compliance with the SCAQMD Permit to Construct. Therefore, a variance is needed for this task as requested by IRWD.

SCHEDULE AND LEVEL OF EFFORT

The level of effort has been estimated by projecting expenditures through the end of the B&V services, a projected date of December 2017 (a 14 month time extension) for the tasks identified above – see Attachment A. The assumptions made for these projections are given in the attachment. The cumulative costs for each task on this project are shown

for the thirty-two (32) project tasks. Twenty-two (22) tasks are not affected by the time extension since the work effort is the same regardless of the timing of the work – these tasks are shaded in blue. Nine (9) tasks are affected by the time extension or IRWD requests for out of scope work and one (1) new task has been added for preparing SOPs. These tasks are listed above and shaded in pink in the attachment.

It is anticipated that the following B&V staff members will continue in their current role on this project as required, or through December 2017:

- Jim Clark – Project Director
- Dan Buhrmaster – Project Manager
- Mark Wilson – Engineering Manager
- Jon Hay – Onsite Design Team Representative
- Keene Matsuda – Electrical Field Inspector.
- Marc Zamora – I&C Inspector
- Daniel Cearley – Civil/Mechanical Field Engineer.
- Shawn Rohr – Electrical/Automation Field Engineer.
- Sheila Moredo - Electrical/Automation Field Manager.
- Doug Sutter – Schedule Reviewer
- Neil Massart – Startup and Commissioning Manager

B&V Phase/Task Description	B&V Phase No.	Cumulative Costs Thru June 2016	Projected Future Costs through December 2017	Projected Cumulative Total Costs	Approved Budget	Approved Budget Cost - Projected Cumulative Total Cost	Projected Percent Complete Versus Budget	Comments Regarding Remaining Work Assumptions Through December 2017 (18 months)
Task 1 - Construction Phase Project Management	101	\$989,335.33	\$309,864.42	\$898,419.75	\$ 665,200.00	(\$233,219.75)	115.1%	Assume current burn rate thru December 2017
Task 2.1 - Submittal Reviews	201	\$3,543,998.81	\$554,898.59	\$4,098,897.40	\$ 2,357,948.00	(\$1,740,949.40)	173.8%	Assume current burn rate thru September 2016 (3 months) then ramp to zero by April 2017 (7 months)
Task 2.2 - Requests for Information (RFIs)	202	\$1,198,759.11	\$2,795,837.18	\$1,438,596.15	\$ 921,157.00	(\$507,439.25)	155.1%	Assume current burn rate thru September 2016 (3 months) then ramp to zero by April 2017 (7 months)
Task 2.3 - Meetings/Technical Site Visits	203	\$406,771.84	\$496,676.16	\$908,400.00	\$ 908,400.00	\$0.00	100.0%	Assume no budget overrun
Task 2.4 - Schedule Review	204	\$322,124.33	\$245,299.65	\$555,753.98	\$ 213,650.00	(\$342,103.98)	260.2%	Assume current burn rate thru September 2017 (15 months)
Task 2.5 - Structural Observations	205	\$166,113.75	\$64,959.25	\$231,173.00	\$ 231,173.00	\$0.00	100.0%	Assume no budget overrun
Task 2.6 - Proposed Contractor Change Orders	206	\$52,033.75	\$413,236.25	\$473,310.00	\$ 473,310.00	\$0.00	100.0%	Assume no budget overrun
Task 2.7 - Claims Avoidance and Dispute Resolution Assistance	207	\$13,287.50	\$38,932.50	\$50,220.00	\$ 50,220.00	\$0.00	100.0%	Assume no budget overrun
Task 2.8 - Final Walk-Through	208	\$0.00	\$112,560.00	\$112,560.00	\$ 112,560.00	\$0.00	100.0%	No change - work is the same but pushed out to December 2017
Task 2 - Construction Administration Support Services					\$ 6,269,348.00			
Task 3.1 thru 3.8 - On-Site Design Team Representative & Document Control	301	\$1,147,765.00	\$477,797.00	\$1,625,562.00	\$ 1,625,562.00	\$0.00	100.0%	Assume burn rate continues for next 18 months
Task 3.9 - Electrical Inspection	302	\$364,436.25	\$427,813.75	\$792,250.00	\$ 792,250.00	\$0.00	100.0%	No budget overrun assuming Kema Matsuda ramps up to 80% thru April 2017 (10 months), then 80% thru December 2017 (8 months)
Task 3.10 - Instrumentation and Control Inspections	303	\$308,053.75	\$558,146.25	\$866,200.00	\$ 866,200.00	\$0.00	100.0%	No budget overrun assuming Marc Zamora ramps up to 80% thru April 2017 (10 months), then 80% thru December 2017 (8 months)
Task 3.11 - Edison Savings by "Design Grant" Application Support	304	\$29,373.75	\$20,026.25	\$49,000.00	\$ 40,000.00	\$9,000.00	100.0%	Assume no budget overrun
Task 3.12 - Control System Configuration & Programming Services (E&C)	305	\$349,640.00	\$30,360.00	\$380,000.00	\$ 380,000.00	\$0.00	100.0%	E&C work is complete and no further work under B&V needed per Steve Mulloy
Task 3.13 - Mechanical Inspections	306	\$21,818.63	\$16,341.37	\$38,160.00	\$ 38,160.00	\$0.00	100.0%	Assume no budget overrun
Task 3.14 - Electrical/Automation Field Engineering (Variance #1)	307	\$488,373.93	\$486,720.00	\$985,093.93	\$ 664,600.00	(\$320,493.93)	148.2%	Assume Shawn Rohr at 40% and Maria Morado at 60% through December 2017
Task 3.15 - Civil/Mechanical Field Engineering (Variance #2)	308	\$302,538.75	\$596,471.25	\$899,000.00	\$ 899,000.00	\$0.00	100.0%	No budget overrun assuming Dan Cearley at 100% thru December 2017 (18 months)
Task 3 - Construction Field Support Services					\$ 6,306,782.00			
Task 4.1 thru 4.2 - Electronic O&M Manual Develop, Install, and Training	401	\$251,739.00	\$ 163,813.00	\$415,552.00	\$ 375,593.00	(\$40,000.00)	110.8%	Assume budget is adequate for current tasks. Add new task to conduct technology transfer sessions for plant staff = \$40,000.
Task 4.3 - Energy Control Procedures (ECPs)	402	\$171,635.00	\$131,521.00	\$303,156.00	\$ 203,156.00	\$100,000.00	100.0%	Assume no budget overrun
Task 4.4 - Job Safety Analysis (JSA) Documents	403	\$43,100.50	\$377,754.50	\$420,855.00	\$ 420,857.00	\$0.00	100.0%	Assume no budget overrun
Task 4.5 - Asset Management Data Collection	404	\$67,462.50	\$ 116,537.50	\$184,000.00	\$ 114,000.00	(\$70,000.00)	161.4%	Assume budget is adequate for current tasks. Add new task to prepare 250 DMMAS worksheets = \$70,000.
Task 4.6 - Odor Control Maintenance & Monitoring Program (Variance #2)	405	\$65,613.59	\$47,093.41	\$112,665.00	\$ 112,665.00	\$0.00	100.0%	Assume no budget overrun
Task 4.7 - Prepare Summary Standard Operating Procedure (SOP) Documents	406	\$0.00	\$108,153.00	\$108,153.00	\$ 0.00	(\$108,153.00)	100.0%	New task requested by BRWO
Task 4 - Electronic O&M Manual					\$ 1,228,271.00			
Task 5.1 - Contractor/Vendor Training & Commissioning Meetings	501	\$0.00	\$81,454.00	\$81,454.00	\$ 81,454.00	\$0.00	100.0%	Assume no budget overrun
Task 5.2 - Pre-Startup Process Overview Training	502	\$80,725.41	\$129,382.59	\$210,108.00	\$ 210,108.00	\$0.00	100.0%	Assume no budget overrun
Task 5.3 - Start-Up Testing Coordination (including Variance #4 - \$370,570)	503	\$174,138.00	\$523,818.00	\$699,156.00	\$ 546,656.00	(\$152,500.00)	127.7%	Assume 3 additional months of startup assistance (February 2017 thru October 2017) at 62.5% utilization rate.
Task 5.4 - Factory Witness Testing	504	\$20,846.80	\$503,857.20	\$124,504.00	\$ 124,504.00	\$0.00	100.0%	Assume no budget overrun
Task 5.5 - 5.7 - Commissioning & Process Optimization Services	505	\$120,002.98	\$668,893.02	\$788,896.00	\$ 788,896.00	\$0.00	100.0%	Assume no budget overrun
Task 5.7 - Air Quality Permit Services	506	\$39,058.75	\$64,000.00	\$103,058.75	\$ 52,723.00	(\$50,335.75)	195.3%	Estimated remaining effort per new SCANMD permit requirements
Task 6 - Training, Commissioning, and Start-Up Services					\$ 1,894,341.00			
Task 6.1 - Post Start-Up Services	601	\$0.00	\$54,300.00	\$54,300.00	\$ 54,300.00	\$0.00	100.0%	Assume no budget overrun
Task 6.2 - Update Electronic O&M Manual	602	\$0.00	\$22,300.00	\$22,300.00	\$ 22,300.00	\$0.00	100.0%	Assume no budget overrun
Task 6.3 - Record Drawings & Atlas Update	603	\$0.00	\$170,792.00	\$170,792.00	\$ 170,792.00	\$0.00	100.0%	Assume no budget overrun
Task 6.4 - Project Closeout	604	\$0.00	\$43,712.00	\$43,712.00	\$ 43,712.00	\$0.00	100.0%	Assume no budget overrun
Task 6 - Post Construction Services					\$ 290,804.00			
		\$10,239,098.01	\$7,880,983.05	\$18,120,081.06	\$ 14,555,866.00	(\$3,564,215.06)	124.5%	
Variance #5 = \$ 3,564,215.06								

IRVINE EXHIBIT "B" ISTRICK PROFESSIONAL SERVICES VARIANCE

Project Title: MWRP Biosolids and Energy Recovery Facilities

Project No.: 4286

Date: August 29, 2016

Purchase Order No.: 521366

Variance No.: 01

Originator: ☐ IRWD ☒ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (*attach any back-up material*):

Provide supplemental construction management services through March 31, 2018 and construction inspection services through October 31, 2017

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
Sr. Construction Manager 2	3.598	\$209-221	\$775,345			\$775,345
Sr. Construction Inspector 5	2,704	\$157-243	\$433,006			\$433,006
Document Control System			\$88,334			\$88,334
Administration/ODCs						\$107,257
Credit from Original Contract						(\$191,600)
Total \$ =						\$1,345,755

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
	CM and Inspection Services	October 31, 2016	+15 months	Oct. 31, 2017 (Inspection)
				March 31, 2018 (CM)

Required Approval Determination:

Total Original Contract	\$ <u>2,931,368.00</u>	☐ Director: Cumulative total of Variances less than or equal to \$50,000.
Previous Variances \$ <u>0</u>		
This Variance \$ <u>1,345,755</u>		☐ Executive Director: Cumulative total of Variances less than or equal to \$75,000.
Total Sum of Variances	\$ <u>1,345,755.00</u>	
New Contract Amount	\$ <u>4,277,123.00</u>	☐ General Manager: Cumulative total of Variances less than or equal to \$100,000.
Percentage of Total Variances to Original Contract	<u>31.5%</u>	☒ Board: Cumulative total of Variances greater than \$100,000.

ENGINEER/CONSULTANT: Arcadis

IRVINE RANCH WATER DISTRICT

Company Name

[Signature]
Project Engineer/Manager

Date

9/1/2016

[Signature]
Department Director

Date

9/12/16

[Signature]
Engineer's/Consultant's Management

Date

9/1/2016

General Manager/Board

Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

Project Title: MWRP Biosolids and Energy Recovery Facilities

Project No.: 4286 Project Manager: Ron Esmilla

Variance No.	Description	Dates		Variance Amount
		Initiated	Approved	
01	Supplemental CM & Inspection Services	8/29/2016		\$1,345,755

Steve Malloy
Principal Engineer – MWRP Construction
Michelson Water Recycling Plant
3512 Michelson Drive
Irvine, CA 92612

Arcadis U.S., Inc.
320 Commerce
Suite 200
Irvine
California 92602
Tel 714 730 9052
Fax 714 730 9345
www.arcadis.com

Subject:
MWRP Biosolids and Heat Recovery Facilities PR 4286
Variance No. 1 – Service Extension to October 2017 (Inspection) and March
2018 (Construction Management)

Water - Construction

Date:
August 29, 2016

Dear Steve:

We are submitting Variance No. 1 to our scope of work to account for extended project duration and additional contract administration to satisfy prevailing wage requirements.

Contact:
Ron Esmilla

We have organized and listed the tasks below to follow the contract task numbering. This variance seeks to reconcile all remaining work items to arrive at a final project scope and budget based on the terms set forth in this letter.

Phone:
949-231-8971

The requested fee for Variance 1 is \$1,345,755, and is summarized in the attached Variance No. 1 Fee Summary. These attachments supplement the summary and descriptions below. Inspection services will be provided by Glenn Suchor (Senior Construction Inspector). I will provide the construction management services.

Email:
Ron.Esmilla@arcadis.com

Our ref:
01120038.0000

TASK 10000 – CONSTRUCTION MANAGEMENT SUPPORT SERVICES

I will provide construction management support services through March 31, 2018. I will negotiate and prepare change orders and provide as-needed construction management support, assist with resolving project claims and delays submitted by the Contractor, and assist in project close-out activities. My 2016 hourly rate is \$209; 2017 hourly rate is \$215; and 2018 hourly rate is \$221.

TASK 20000 – CONSTRUCTION INSPECTION SERVICES

Glenn will provide construction inspection through October 31, 2017. Although the project schedule shows that Milestone 4B is scheduled to be completed on August 1, 2017, we assumed that time is required for completion of punchlist items. We assumed full-time throughout this time period with an additional 20% of over time. His hourly wage will meet California Prevailing Wage requirements. For portion of 2016 remaining, Glenn's hourly rate is \$157 for regular time and

Malloy
August 29, 2016

\$236 for over time at 1.5 times regular pay. For 2017, Glenn's hourly rate will be \$162 for regular time and \$243 for over time at 1.5 times regular pay.

TASK 30000 – DOCUMENT CONTROL SYSTEM SUPPORT

Provide DCS support through March 31, 2018 including help with the archiving of vital project documents. This effort will also be for project close-out activities, coordinating with IRWD's information services and engineering library on capturing project documentation.

TASK 00000 – CONTRACT ADMINISTRATION/OTHER DIRECT COSTS

Per California SB 854, Arcadis must meet California Prevailing Wage requirements that include payroll tracking, reporting, certification, and payment to apprenticeship council. The variance amount for this task incorporates these costs. The ODCs also include the maintenance of computers and servers that store the document control system.

Sincerely,

Arcadis U.S., Inc.



Ron J. Esmilla, PE
Sr. Construction Manager

Copies:

Jon Westervelt, PE

Jim Cathcart, PE

Enclosures:

Attachments

- 1 Variance No. 1
- 2 Variance No. 1 Fee Summary

Irvine Ranch Water District
MWRP Biosolids and Heat Recovery Facilities
PR 4286
Variance No. 1 Fee Summary

Task	Description	Effort (Hrs)			Fee, Dollars			Fee, Dollars
		08-2016 to 12-2016	01-2017 to 12-2017	01-2018 to 03-2018	08-2016 to 12-2016	01-2017 to 12-2017	01-2018 to 03-2018	Total
10000	Construction Management	904	2152	542	\$ 189,840	\$ 464,832	\$ 120,673	\$ 775,345
20000	Inspection							
	Regular Time	904	1800	0	\$ 141,928	\$ 291,078	\$ -	\$ 433,006
	Overtime (20%) (1.5 X Regular)	181	378	0	\$ 42,307	\$ 91,106	\$ -	\$ 133,413
30000	DCS Support	100	240	23	\$ 21,500	\$ 53,148	\$ 13,686	\$ 88,334
	Subtotal				\$ 395,575	\$ 900,164	\$ 134,359	\$ 1,430,098
00000	Administration/ODCs (7.5%)				\$ 29,668	\$ 67,512	\$ 10,077	\$ 107,257
								\$ 1,537,355
	Credit - Remaining Budget							\$ (191,600)
	Variance No. 1 Request							\$ 1,345,755

EXHIBIT "C"

IRVINE RANCH WATER DISTRICT PROFESSIONAL SERVICES VARIANCE

Project Title: Michelson Water Recycling Plant, Biosolids Construction Management Services

Project No.: 4286

Date: September 9, 2016

Purchase Order No.: 521288

Variance No.: 2

Originator: ☒ IRWD ☐ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (attach any back-up material):

Additional construction support services to meet the contractor's new project completion date of December 31, 2017. See attached proposal for detailed breakdown.

Engineering & Management Cost Impact:

Classification	Manhours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
Additional Support through 12/31/17	3,999	Varies				\$496,002.50
Total \$ =						\$496,002.50

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
1	Additional Support	Feb 28, 2017	10 months	Dec 31, 2017

Required Approval Determination:

Total Original Contract	\$ <u>1,867,153.78</u>	☐ General Manager: Single Variance less than or equal to \$30,000.
Previous Variances \$	<u>(890,000.00)</u>	☐ Committee: Single Variance greater than \$30,000, and less than or equal to \$60,000.
This Variance \$	<u>496,002.50</u>	☐ Board: Single Variance greater than \$60,000.
Total Sum of Variances	\$ <u>(393,997.50)</u>	☒ Board: Cumulative total of Variances greater than \$60,000, or 30% of the original contract, whichever is higher.
New Contract Amount	\$ <u>1,473,156.28</u>	
Percentage of Total Variances to Original Contract	<u>(21.1)%</u>	

ENGINEER/CONSULTANT: HDR Engineering Inc.
Company Name

IRVINE RANCH WATER DISTRICT

IRWD Project Manager

Date

Department Director

Date

Engineer's/Consultant's Management

Date

General Manager/Comm./Board

Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

Project Title: Michelson Water Recycling Plant, Biosolids Construction Management Services

Project No.: 4286 Project Manager: Steve Malloy

Variance No.	Description	Dates		Variance Amount
		Initiated	Approved	
1	Reduction in Scope		10/17/2014	(\$890,000.00)
2	Additional construction support through extended project duration.	9/9/2016		\$496,002.50



September 9, 2016

Mr. Steve Malloy, P.E.
Principal Engineer
Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, California 92618

Subject: MWRP Biosolids Construction Management Services - Variance No. 2

Dear Mr. Malloy:

HDR Engineering, Inc. (HDR) is requesting a variance to our scope of work to account for extended project duration and additional project management to satisfy prevailing wage requirements.

Per your request, we are preparing this additional scope of services as Variance No. 2 to the Michelson Water Recycling Plant (MWRP) Biosolids Construction Management (CM) Services contract. We have organized and listed the tasks below to follow the contract task numbering. This variance seeks to reconcile all remaining work items to arrive at a final project scope and budget based on a project completion date of December 31, 2017.

The requested fee for Variance 5 is \$496,002.50, and is summarized in the attached **Cost-to-Complete Estimate and Variance No. 2 Fee Summary**. These attachments supplement the summary and descriptions below. The estimates are based on the project completion date noted above. Inspection services will be provided by John Walker (Senior Inspector) at the rates described below.

This variance request also includes additional scope associated with Phase 2 close-out tasks that were previously allocated to an On-Call Services budget and deducted from this project budget.

TASK 1 – PROJECT MANAGEMENT

Project Management is a continuous activity during the project and provides project oversight, workload projections, staff management, budget, scope and schedule tracking, and on-going coordination to address project management issues.

The extended schedule is projected to have an impact on project management activities, including additional project controls and contract administration. In addition, California Prevailing Wage requirements include payroll tracking, reporting, and certification. The variance amount for Project Management incorporates these costs and estimates the fee based on a project completion of December 31, 2017.

Mr. Steve Malloy, P.E.
September 9, 2016

TASK 5 – INSPECTION SERVICES - 2016

The estimated cost to complete for this task includes full-time inspection (40 hours per week) and 20% overtime inspection at 1.5x overtime. The billable rate for John Walker for the remaining portion of 2016 is established at \$148 per straight time hour and \$197 per 1.5 overtime hour. We have assumed that double overtime will not be required, however a rate of \$247 per 2.0 overtime hour is established should it be required.

TASK 6 – INSPECTION SERVICES - 2017

The estimated cost to complete for this task includes full-time inspection (40 hours per week) and 20% overtime inspection at 1.5x overtime. The billable rate for John Walker for 2017 is established at \$155 per straight time hour and \$207 per 1.5 overtime hour. We have assumed that double overtime will not be required, however a rate of \$258 per 2.0 overtime hour is established should it be required.

TASK 8 –ON-CALL SERVICES

This task is established to cover as-needed and as-requested engineering support services for on-call consultation related to construction, start-up, operations, process, or other support work.

We appreciate the opportunity to continue provided inspection services for this important project. Please do not hesitate to contact either of the undersigned if you wish to discuss the proposed scope of services further.

Sincerely,
HDR Engineering, Inc.



Paul S. Skager, P.E.
Associate Vice President



Gregorio Estrada, P.E.
Project Manager

Enclosures: Professional Services Variance Form
Cost-to-Complete Estimate
Variance No.2 Fee Summary

Irvine Ranch Water District
Michelson Water Recycling Plant | Biosolids Construction Management Services
Cost-to-Complete Estimate



TASKS		LEVEL OF EFFORT, HOURS												FEE, DOLLARS			
No.	Description	Principal	Project Manager 2016	Project Manager 2017	Sr Insp. ST 2016	Sr Insp. 1.5 OT 2016	Sr Insp. ST 2017	Sr Insp. 1.5 OT 2017	Senior Engineer	Project Engineer	Acctg	Admin	Total Labor	Labor	Direct Costs	Total	CLIENT TOTAL
1	Project Management																
1.1	Project Management 2016, Aug-Dec	1	20								20	10	51	9,110	182	9,292	
1.2	Project Management 2017, Jan-Dec	1		48							48	24	121	21,950	439	22,389	
	Subtotal, Task 1 Project Management	2	20	48	0	0	0	0	0	0	68	34	172	31,060	621	31,681	31,700
5	Inspection Services 2016 (Aug - Dec)																
5.1	Inspection Services - Straight Time				904								904	133,792	904	134,696	
5.2	Inspection Services - 1.5 Overtime					181							181	35,657	181	35,838	
	Subtotal, Task 5 Inspection Services 2016 (Aug - Dec)	0	0	0	904	181	0	0	0	0	0	0	1,085	169,449	1,085	170,534	170,500
6	Inspection Services 2017 (Jan - Dec)																
6.1	Inspection Services - Straight Time						2,152						2,152	333,560	2,152	335,712	
6.2	Inspection Services - 1.5 Overtime							430					430	89,010	430	89,440	
	Subtotal, Task 6 Inspection Services 2017 (Jan - Dec)	0	0	0	0	0	2,152	430	0	0	0	0	2,582	422,570	2,582	425,152	425,200
8	On-Call Services																
8.1	On-Call Services								80	80			160	30,000	0	30,000	
	Subtotal, Task 8 On-Call Services	0	0	0	0	0	0	0	80	80	0	0	160	30,000	0	30,000	30,000
TOTAL, hours		2	20	48	904	181	2,152	430	80	80	68	34	3,999				
TOTAL, dollars														653,079	4,288	657,367	657,400

Irvine Ranch Water District
Michelson Water Recycling Plant | Biosolids Construction Management Services
Variance No. 2 Fee Summary



Original Authorization	\$2,834,476.00 a
Transfer to PO#515759 (9/3/2013)	\$400,000.00 b
Transfer to PO#515759 (10/14/2014)	\$350,000.00 c
Billed Through July 2014	\$217,322.22 d
Amount Authorized Under PO#521288	\$1,867,153.78 e = a - b - c - d
Scope Reduction (10/17/2014)	\$890,000.00 f
Available Authorization Under PO#521288	\$977,153.78 g = e - f
Total Cost-to-Date (through July 2016)	\$815,756.28 h
Remaining Authorization	\$161,397.50 i = g - h
Estimated Cost to Complete (Aug 2016 - Dec 2017)	\$657,400.00 j (see attached Cost-to-Complete Estimate)
Variance No. 2 Amount	\$496,002.50 k = j - i
Total Authorization with Variance No. 2	\$1,473,156.28 l = g + k

Tasks	Current Budget	Cost to Date July 2016	Remaining Budget	Cost to Complete	Variance No. 2	New Budget
Task 1 - Project Management	\$44,241.66	\$42,202.33	\$2,039.33	\$31,700.00	\$29,660.67	\$73,902.33
Task 2 - Inspection and Engineering Services - 2013	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Task 3 - Inspection and Engineering Services - 2014	\$238,500.00	\$294,242.03	-\$55,742.03	\$0.00	\$55,742.03	\$294,242.03
Task 4 - Inspection Services - 2015	\$303,012.12	\$299,610.92	\$3,401.20	\$0.00	-\$3,401.20	\$299,610.92
Task 5 - Inspection Services - 2016	\$309,900.00	\$179,701.00	\$130,199.00	\$170,500.00	\$40,301.00	\$350,201.00
Task 6 - Inspection Services - 2017	\$81,500.00	\$0.00	\$81,500.00	\$425,200.00	\$343,700.00	\$425,200.00
Task 7 - Inspection Services - 2018	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Task 8 - On-Call Services	\$0.00	\$0.00	\$0.00	\$30,000.00	\$30,000.00	\$30,000.00
Total	\$977,153.78	\$815,756.28	\$161,397.50	\$657,400.00	\$496,002.50	\$1,473,156.28
	(g)	(h)	(i)	(j)	(k)	(l)

EXHIBIT "D"

IRVINE DISTRICT PROFESSIONAL SERVICES VARIANCE

Project Title: MWRP Biosolids & Energy Recovery Facilities

Project No.: 4286

Date: August 16, 2016

Purchase Order No.: 518742

Variance No.: 1

Originator: ☐ IRWD ☒ ENGINEER/CONSULTANT ☐ Other (Explain) _____

Description of Variance (*attach any back-up material*):

Extend contractor for Construction Management Services due to project schedule extension. For detailed explanation of
Scope of Work see attached.

Engineering & Management Cost Impact:

Classification	Hours	Billing Rate	Labor \$	Direct Costs	Subcon. \$	Total \$
Process Control Startup Engineer	1440	160				\$ 230,400
Associate Automation Engineer	1440	130				\$ 187,200
Senior Automation Engineer	1680	150				\$ 252,000
Technical Writer	1300	50				\$ 65,000
Total \$ =						\$ 734,600

Schedule Impact:

Task No.	Task Description	Original Schedule	Schedule Variance	New Schedule
1	Construction Management Support	May 2014 – April 2017	April 2017 – December 2017	May 2014 – December 2017

Required Approval Determination:

Total Original Contract	\$ <u>1,239,007</u>	☐ Director: Cumulative total of Variances less than or equal to \$50,000.
Previous Variances \$	<u>0</u>	
This Variance	\$ <u>734,600</u>	☐ Executive Director: Cumulative total of Variances less than or equal to \$75,000.
Total Sum of Variances	\$ <u>734,600</u>	
New Contract Amount	\$ <u>1,973,607</u>	☐ General Manager: Cumulative total of Variances less than or equal to \$100,000.
Percentage of Total Variances to Original Contract	<u>59</u> %	☒ Board: Cumulative total of Variances greater than \$100,000.

ENGINEER/CONSULTANT: EI&C Engineering Inc.
Company Name

IRVINE RANCH WATER DISTRICT

Laura M. Thomas
Project Engineer/Manager

9/8/2016
Date

Stacy K. 2 Burt
Department Director

9/12/16
Date

Laura M. Thomas
Engineer's/Consultant's Management

9/8/2016
Date

General Manager/Board

Date

IRVINE RANCH WATER DISTRICT

PROFESSIONAL SERVICES VARIANCE REGISTER

[illegible]

August 16, 2016

Irvine Ranch Water District
Steve L. Malloy, PE
Principal Engineer, MWRP Construction
15600 Sand Canyon Avenue
Irvine, CA 92618-3101

Re: Proposal for Variance 1 for Purchase Order No. 518742
for the MWRP Biosolids and Energy Recovery Facilities Project

Dear Steve,

Enclosed is a proposal for a variance to extend the role of EI&C Engineering Inc. for construction management services for the Michelson Water Recycling Plant (MWRP) Biosolids and Energy Recovery Facilities Project the revised completion date for the project of December 2017. This variance include 3 tasks:

- Task 1 is to extend the role of the team for Process Control System (PCS) Construction Management Services that is already working on the project for an additional 36 weeks to the end of 2017.
- Task 2 is to provide budget for an additional Automation Engineer to supplement the team for startup testing when it is anticipated multiple start-up tests will be scheduled simultaneously.
- Task 3 provides budget for a technical writer to assist with the development of the PCS Operation manuals and associated training presentations.

Task	Role	Hours	Rate	Fee
1	Process Control Startup Engineer	1440	\$160	\$230,400
	Associate Automation Engineer	1440	\$130	\$187,200
2	Senior Automation Engineer	1680	\$150	\$252,000
3	Technical Writer	1300	\$50	\$65,000
Total				\$734,600

Enclosed is the scope of work, the schedule and fee breakdown, and resumes for your consideration. If you have any questions or need additional information please call me at 714-334-8912 or email me at lthomas@eiceinc.com.

Sincerely,

Laura Thomas

Laura Thomas, PE
CEO, Principal Engineer

Enclosure

Section 1

Scope of Work

Scope of Work

The schedule for the Biosolids and Energy Recovery Facilities Project (Biosolids Project) has been extended to the end of 2017. EI&C Engineering Inc. is actively working on the project to provide startup support services for the Process Control System (PCS). EI&C Engineering Inc. will support the testing of the PCS software. The activities include (1) reviewing the contractor's start-up plans; (2) providing oversight of Process Control System field testing; (3) supporting for the Process Control System training; (4) reviewing as-built documentation; and 5) developing deficiency lists and punch lists specific to process control.

- **Task 1: Extension of existing support staff to December 2017.** This variance extends the services already in place for the Biosolids PCS Startup Engineer (Laura Thomas), the Associate Automation Engineer (Pavan Mutyala).
- **Task 2: Additional Automation Engineer to support compressed scheduling of startup tests.** This variance provides for the as-needed support of a Senior Automation Engineer (Reza Afshin) who will augment staff during start-up testing when it is anticipated that multiple tests will be sequenced simultaneously in order to meet the project schedule.
- **Task 3: Additional Technical Writer support training of Operations staff.** This variance provides for a technical writer (Jennifer Larson) to assist with the compilation of PCS Operation manuals and associated training presentations.

Task 1a: Process Control Start-up Engineer

The role of Start-up Engineer would extend beyond software development to control system start-up testing and coordination. This role includes enhanced involvement during the early planning phase of construction. This role would allow the construction management team to retain the institutional knowledge gained during the Process Control System (PCS) software development throughout the field testing phase for the project.

The PCS Start-up Engineer will have the following duties:

- Participate in "Start-up testing" including but not limited to witnessed Process Control System field checks, communication network validation, and system functional testing.
- Attend project meetings.
- Coordinate key decisions with IRWD staff including operations and the CM team.

- Coordinate start-up testing with CM team members
- Review start-up submittals including test procedures and test schedules.
- Develop SCADA training program for operators including SCADA Operations and Maintenance Manual developed with as-built Process Control Descriptions, SCADA Operations and Maintenance training presentations and training videos showing operation of live SCADA screens.

Task 1b: Associate Automation Engineer

The Associate Automation Engineer will work under the direction of the Process Control Startup Engineer have the following duties:

- Witness the Process Control System bench-tests which test the PLC code and HMI screens again forced values.
- Witness the field testing for the Process Control System with live mechanical equipment, local control panels, and instrumentation.
- Witness functional acceptance testing of Process Control System where multiple systems are tested together under process conditions.
- Produce and maintain daily logs of test issues.
- Produce and maintain deficiency and punch lists for PCS related issues.

Task 3: Senior Automation Engineer

In order to meet the project schedule milestones it will be necessary for the contractor to perform field testing the PCS for several process areas simultaneously. A Senior Automation Engineer will join the team to support bench tests and field tests when it is anticipated that peak demand for staff to support witnessed testing will occur. This individual is very experienced in development and test of IRWD process control systems and will be able to efficiently be productive in these tasks and will be able to lead a separate start-up team to meet schedule when it is anticipated the roll-out of the startup testing will be compressed.

The Senior Automation Engineer will have the following duties:

- Lead witness testing for the Process Control System bench-tests which test the PLC code and HMI screens again forced values.
- Lead witness testing for the field testing for the Process Control System with live mechanical equipment, local control panels, and instrumentation.

- Lead witness functional acceptance testing of Process Control System where multiple systems are tested together under process conditions.
- Produce and maintain daily logs of test issues.
- Produce and maintain deficiency and punch lists for PCS related issues.

Task 4: Technical Writer

EI&C Engineering Inc. is developing the PCS Operation Manuals and conducting the training in concert with the Black and Veatch start-up team to provide training to IRWD operations staff. This technical writer will assist in writing and formatting of the PCS Operations manual which will be hyperlinked to the on-line Operations Manuals for all equipment and systems. In addition, this technical writer will assist in developing presentations that will be used during training sessions to familiarize operations staff with the operator interface for the plant controls. The following table is a list of project milestones.

Section 2

Schedule and Fee Breakdown

Schedule and Fee Breakdown

Purchase Order 518742 provides the budget for EI&C Engineering Inc. to provide support services full time until March 2017 for a Startup Engineer and Software Test Engineer. This variance includes the following three tasks:

- Task 1 is to extend the role of the team for Process Control System (PCS) Construction Management Services that is already working on the project for an additional 36 weeks to the end of 2017.
- Task 2 is to provide budget for an additional Automation Engineer to supplement the team when it is anticipated multiple start-up tests will be scheduled simultaneously.
- Task 3 provides budget for a technical writer to assist with the development of the PCS Operation manuals and associated training presentations.

Table 1: Schedule

Task	Role	Start	Finish	Weeks
1	Process Control Startup Engineer	April 1, 2017	December 31, 2017	36
	Associate Automation Engineer			
2	Senior Automation Engineer	December 1, 2016	December 31, 2017	56
3	Technical Writer	October 1, 2016	October 31, 2016	56

Table 2: Hourly Estimate for Tasks 1 and 2

The on-site resources that for Tasks 1 and 2 are anticipated to be utilized 100% until the end of the project. Therefore the estimate of the hours required is based on the number of weeks. Table 2 shows an hourly estimate for Tasks based on the scheduled number of weeks.

Task	Role	Weeks	Utilitization	Hours
1	Process Control Startup Engineer	36	100%	1440
	Associate Automation Engineer	36	100%	1440
2	Senior Automation Engineer	56	75%	1680

Table 3: Hourly Estimate for Task 3

The Process Control System Operations Manuals and associated training materials will be required for each startup. The following table is an estimate of the hours for the technical writer for each deliverable.

IRWD MWRP Biosolids and Energy Recovery Facilities Project
Variance 1 for PO 518742

E&C Engineering Inc.

Milestone	Ops Manual (Hours)	Training Powerpoint (Hours)	Total (Hours)
Milestone 1 (Primary Sludge and WAS Processing Facilities)	120	60	180
Milestone 2 (Sludge Thickening Facilities)	160	80	240
Milestone 3 (FOG Receiving Station)	40	20	60
Milestone 4 (Anaerobic Digestion Facilities)	200	80	280
Milestone 5 (All Class B Biosolids Facilities)	120	60	180
Milestone 6 (Microturbine Power Generation)	120	60	180
Milestone 7 (Class A Biosolids Facilities and All Other Work)	120	60	180
Task 3 Total	880	420	1300

Table 4: Fee Estimate for Variance 1

The total fee for this variance is based on the estimated hours shown in the previous tables. The following table shows fee breakdown:

Task	Role	Hours	Rate	Fee
1	Process Control Startup Engineer	1440	\$160	\$230,400
	Associate Automation Engineer	1440	\$130	\$187,200
2	Senior Automation Engineer	1680	\$150	\$252,000
3	Technical Writer	1300	\$50	\$65,000
Total				\$734,600

September 20, 2016
Prepared by: C. Spangenberg/M. Cortez
Submitted by: K. Burton
Approved by: Paul Cook 

ENGINEERING AND OPERATIONS COMMITTEE

DYER ROAD WELLFIELD WELL 7 AND IRVINE DESALTER PROJECT WELL 107 REHABILITATION CONSULTANT SELECTION

SUMMARY:

Dyer Road Wellfield (DRWF) Well 7 and Irvine Desalter Project (IDP) Well 107 have experienced decreased production over the years and need to be rehabilitated. Staff received proposals from hydrogeology consulting firms to prepare a rehabilitation design and to provide construction oversight for the rehabilitation of both DRWF Well 7 and IDP Well 107. Staff recommends that the Board:

- Authorize the addition of IDP Well 107 Rehabilitation in the amount of \$770,000 to the FY 2016-17 Capital Budget, and
- Authorize the General Manager to execute a Professional Services Agreement in the amount of \$130,500 with Richard C. Slade & Associates for design and construction phase services for the DRWF Well 7 Rehabilitation and IDP Well 107 Rehabilitation.

BACKGROUND:

Two IRWD wells, DRWF Well 7 and IDP Well 107, require immediate rehabilitation in order to improve their hydraulic performance. DRWF Well 7 was constructed in 1992 with copper bearing steel as the casing material. The specific capacity of DRWF Well 7 has decreased from 48 gallons per minute per foot (gpm/foot) of drawdown to the current specific capacity of 11.2 gpm/foot. A recent video survey has shown that the casing louvers have become plugged, and was taken offline in February 2016.

IDP Well 107 was constructed in 2012 and is one of five wells that provide a raw water source of supply to the IDP. The casing material is 316 stainless steel. Like DRWF Well 7, the specific capacity of IDP Well 107 has decreased over time. This well is located within the Irvine Sub-Basin where wells typically experience extensive bio-growth (iron-related bacteria) that result in plugging of the louvers. In addition, the sanding rate has increased fivefold since the well was constructed resulting in significant plugging and an increase in cartridge filter replacement at the Irvine Desalter membrane facility. The well completion summary report reflected that the well's original specific capacity of 8.7 gpm/foot has decreased to 4.2 gpm/foot. The average flow rate for IDP Well 107 last year was approximately 759 gpm; the current pumping rate has dropped to 588 gpm.

Consultant Selection:

Proposals for design and construction phase services for the rehabilitation of DRWF Well 7 and IDP Well 107 were received from Richard C. Slade & Associates (RCS), Thomas Harder & Company and Wood Rogers. Staff recommends awarding a Professional Services Agreement to RCS as its design approach and level of effort are consistent with the project goals. RCS has

extensive knowledge and experience with the geohydrology and rehabilitation of wells located in the Main Orange County Groundwater Basin and the Irvine Sub-Basin, and has worked on previous well projects including the successful rehabilitation of DRWF Wells 2 and 5, and Wells ET-1 and ET-2. Currently, RCS is providing hydrogeologist services for DRWF Wells 3 and 18. The Consultant Selection Matrix is presented as Exhibit "A". RCS's proposal is in the amount of \$130,500 and is included as Exhibit "B".

FISCAL IMPACTS:

DRWF Well 7 Rehabilitation, project 7093 is included in the FY 2016-17 Capital Budget and the existing budget is sufficient to fund the design of the project. Staff requests the addition of IDP Well 107 Rehabilitation, project 7589 to the FY 2016-17 Capital Budget as shown in the table below.

Project No.	Current Budget	Addition <Reduction>	Total Budget
7093	\$770,000	\$-0-	\$770,000
7589	\$-0-	\$770,000	\$770,000
Total	\$770,000	\$770,000	\$1,540,000

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA). In conformance with the California Code of Regulations Title 14, Chapter 3, Section 15004, the appropriate environmental document will be prepared when "meaningful information" becomes available. It is expected that preliminary analysis will lead to preparation of a Notice of Exemption for the project.

RECOMMENDATION:

That the Board authorize the addition of Irvine Desalter Project Well 107 Rehabilitation, project 7589, in the amount of \$770,000 to the FY 2016-17 Capital Budget, and authorize the General Manager to execute a Professional Services Agreement in the amount of \$130,500 with Richard C. Slade & Associates for the Dyer Road Wellfield Well 7 Rehabilitation and Irvine Desalter Project Well 107 Rehabilitation, projects 7093 and 7589.

LIST OF EXHIBITS:

Exhibit "A" – Consultant Selection Matrix

Exhibit "B" – Richard C. Slade & Associates Scope of Work and Fee Proposal

EXHIBIT "A"

EXHIBIT "A"

CONSULTANT SELECTION MATRIX

DRWF Well 7 and IDP Well 107 Rehabilitations

Item	Description	Weights	Richard C. Slade & Associates		Thomas Harder & Company		Wood Rogers	
A	<u>TECHNICAL APPROACH</u>	40%						
1	Overall Project Understanding / Approach	40%	1		2		3	
2	Scope of Proposal	60%	1		3		2	
	<u>Weighted Score (Technical Approach)</u>		1.0		2.6		2.4	
B	<u>QUALIFICATION AND EXPERIENCE</u>	60%						
1	Firm/Team	60%	1		2		3	
2	Project Manager	40%	Earl LaPensee-30 Years	1	Tom Harder-27 Years	2	Russell Kyle-19 Years	3
	<u>Weighted Score (Experience)</u>		1.0		2.0		3.0	
	<u>COMBINED WEIGHTED SCORE</u>		1.0		2.2		2.8	
	<u>Ranking of Consultants</u>		1		2		3	
C	<u>SCOPE OF WORK</u>							
TASK	Well 7		Task Hours	FEE	Task Hours	FEE	Task Hours	FEE
1	Review Video Surveys and Available Information		28	\$4,640	48	\$5,740	25	\$4,343
2	Prepare Technical Specifications and Project Manual		37	\$6,180	104	\$12,320	39	\$6,336
3	Provide Bid Phase Support		12	\$2,400	11	\$1,440	7	\$1,213
4	Construction Phase Services and Project Management		200	\$24,400	226	\$22,800	206	\$24,921
5	Preparation of Summary Reports		25	\$3,980	58	\$6,120	68	\$10,973
6	Miscellaneous Services			\$15,000		\$15,000		\$15,000
7	Optional Services			\$10,000		\$10,000		\$10,000
	Subtotal Well 7		302	\$66,600	447	\$73,420	345	\$72,786
	Well 107							
1	Review Video Surveys and Available Information		28	\$4,640	37	\$5,270	25	\$4,343
2	Prepare Technical Specifications and Project Manual		37	\$6,180	-	\$0	39	\$6,336
3	Provide Bid Phase Support		12	\$2,400	11	\$1,440	7	\$1,213
4	Construction Phase Services and Project Management		179	\$21,700	210	\$21,285	228	\$27,449
5	Preparation of Summary Reports		25	\$3,980	50	\$5,320	68	\$10,973
6	Miscellaneous Services			\$15,000		\$15,000		\$15,000
7	Optional Services			\$10,000		\$10,000		\$10,000
	Subtotal Well 107		281	\$63,900	308	\$58,315	367	\$75,314
TOTAL			583	\$130,500	755	\$131,735	711	\$148,100
D	<u>OTHER</u>							
	Sub Consultants	Hydrogeo	In-House		In-House		In-House	
	Exceptions taken to IRWD Std. Contract		None		None		None	
	Insurance (Professional & General Liability)		None		None		None	

9/15/2016

EXHIBIT "B"



RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

September 6, 2016

Mr. Carl Spangenberg
Irvine Ranch Water District
P.O. Box 57000
Irvine, California 92619-2016

Job No. 382-OGE16-7&107

Re: Proposal for Hydrogeologic Services
Rehabilitation of Dyer Road Well Field Well No. 7 and
Irvine Desalter Project Well No. 107
Irvine Ranch Water District, California

Dear Mr. Spangenberg:

Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), is pleased to submit this proposal for providing hydrogeologic office and field services for the rehabilitation of Irvine Ranch Water District (IRWD) Dyer Road Well Field (DRWF) Well No. 7 and Irvine Desalter Project (IDP) Well No. 107, located in the cities of Santa Ana and Irvine, respectively, in Orange County, California. This proposal is submitted in response to a request for proposals (RFP), dated August 18, 2016, and distributed by IRWD to various consultants. Appendix A of this proposal provides a statement of our qualifications and a summary of the various well construction and rehabilitation services that RCS has provided for many years on numerous municipal-supply wells in southern California.

RCS has considerable experience in performing evaluations of existing wells and in providing office and field monitoring services during well rehabilitation operations. Indeed, our firm has evaluated, assisted in the preparation of Technical Specifications and Bid Documents, and provided field oversight services for rehabilitation of several other IRWD wells, including DRWF Well Nos. 2 and 5, Wells ET-1 and ET-2, and Well No. 18. Currently, RCS is providing field services for the rehabilitation of IRWD Well No. 3. Further, RCS was present to oversee the original design and construction services on IDP Well No. 107 in 2011 and, thus, we are very familiar with its construction and original pumping characteristics.

We trust that our experience in well rehabilitation activities, as documented herein in Appendix 1, meets with your approval. We appreciate this opportunity to present our proposal for the rehabilitation of these two wells, and look forward to once again working with you and your staff on a groundwater-related project.

Respectfully submitted,
RICHARD C. SLADE & ASSOCIATES LLC

A handwritten signature in black ink, appearing to read "Richard C. Slade", is written over a horizontal line.

Richard C. Slade, President and
Principal Groundwater Geologist

14051 BURBANK BLVD., SUITE 300, SHERMAN OAKS, CALIFORNIA 91401
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UNDERSTANDING THE PROJECT

Well rehabilitation is a frequently necessary process to improve the efficiency and pumping capacity, and to extend the longevity of existing water-supply wells. Generally, a well may require rehabilitation for a number of observed conditions, including:

- The well loses its ability to pump at its former rate, or at the rate at which it was originally placed online, or it ceases to pump at all.
- The specific capacity of the well has declined considerably over time.
- The pumping water level in the well has declined either rather quickly or over a longer period of time, even though the pumping rate and the static water level have remained relatively constant over the same period of time.
- The well begins to pump sand and/or gravel pack.

The causes for these observed conditions can be due to many reasons, such as:

- Biological fouling of the perforations and gravel pack, resulting in plugged conditions, thereby decreasing the production rate and specific capacity.
- Development of holes in the well casing and/or enlargement of the perforations, resulting in the production of sand and/or gravel pack.
- Pump, motor, and/or electrical problems, resulting in decreased production rates.

When considering well rehabilitation, site-specific data from the well in question must be evaluated to determine possible causes of the newly-observed conditions. Therefore, it is imperative to obtain and review available data on historic and current static and pumping water levels, water quality, specific capacity tests, well construction, previous well rehabilitation work, production rates, video logs, etc. Review of such data can help identify the potential reason(s) for the decreases in well performance and the rehabilitation steps that need to be undertaken.

Generally, it is advantageous to separate the well rehabilitation program into two distinct phases and in the case of the two subject wells, possible well evaluation and rehabilitation options could be as follows:

Phase 1 – Initial Operations

1. Conduct a static (non-pumping) dynamic flowmeter (spinner) survey in both wells, prior to removing their respective pumps, in order to determine the current pre-rehabilitation intra-well flow regime. IRWD can perform these surveys by subcontracting a logger to perform such work.
2. Perform an initial video survey of IDP Well No. 107, after removing its pump, so a better evaluation of current downwell conditions can be made. DRWF Well No. 7 already had a video survey performed in May 2016 and that can be reviewed immediately.
3. When removing the pump motor, column and bowls from each well, inspect and measure all apparatus (both in the field and at the pumping contractor's shop);

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examine the scale from the pump apparatus and possibly send samples of the scale for specialized laboratory analysis.

4. Sound each well to determine the amount of sediment fill in the bottom of the casing, and then bail that sediment from the bottom of the casing; examine the collected sediments and possibly conduct laboratory analysis (if deemed necessary).
5. Review the video survey logs and the static and dynamic spinner surveys, and assess the current downhole condition(s) of each well. A Memorandum will then be prepared to discuss our findings, conclusions and recommendations, and to present the preliminary well rehabilitation options formulated for each well.

Phase 2 – Tentative Operations for Rehabilitation

The following lists specific but preliminary well rehabilitation operations that could be performed in each well. However, final well rehabilitation operations need to be determined following a more complete review of the newly-generated data and information (from the Phase 1 work). For this Phase 2 work, a set of Technical Specifications and Line Item Bid Sheets will be prepared to provide the final well rehabilitation operations that can be performed on the well. These operations may include:

1. Mechanical cleaning, including wire brushing and using the AirBursting® or Bore Blasting® methods.
2. It may be necessary to swage in patches or install a casing liner in DRWF Well No.7 and this will need to be determined prior to conducting any downwell work. However, IDP Well No. 107 will not need to have a swaged patch or casing liner.
3. Dual swab airlifting and swabbing, including chemical treatment, using appropriate available solutions or acids determined necessary by earlier findings from the initial Phase 1 operations.
4. Re-developing and re-testing the well with a temporary test pump to determine possible improvements in specific capacity.
5. Having the Contractor do the necessary repairs or replacement of the permanent pump, column, etc.
6. Installing the permanent pump, with the intake set at a depth that is deep enough for anticipated pumping levels, but still within a section of blank casing (if possible).
7. Testing the well with the permanent pump to obtain its current (new) specific capacity.

Further, it is understood that rehabilitation of the wells will be conducted in parallel. This assumes that both wells will be in a shut-down state at the same time. Such a parallel arrangement for the work might be feasible for performing video survey. However, based on our previous experience the well rehabilitation tasks will need to be performed sequentially, as the Contractor moves from site to site with equipment. Nonetheless, we are assuming in this proposal that rehabilitation of the wells will be performed in parallel.

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SCOPE OF HYDROGEOLOGIC SERVICES

Our proposed Scope of Hydrogeologic Services generally follows those tasks stated in the IRWD RFP. The recommended services described herein are based on our previous experience in the rehabilitation of wells with IRWD, which consequently has allowed RCS to develop, in conjunction with IRWD staff, an efficient and cost effective approach to conducting a well rehabilitation program.

Task 1 – Review and Evaluate Well Data & Prepare Memoranda

Under this task, RCS will prepare for and attend an initial, “kick-off” meeting with IRWD Staff with regard to discussing the goals and parameters of the rehabilitation project for the two wells. During this Kick-off meeting, RCS will conduct a visit to each site to further help assess current site-specific conditions for logistical considerations (such as access, discharge points, presence of utilities, storage room, and the presence of nearby residences).

Following the Kick-off meeting, RCS will review available data for each well, as provided by IRWD (including any video surveys), and assess previous work that may be conducted (above). Further, we will review our company files for any data and/or information on hydrogeologic conditions in the vicinity of the two wells. It is understood that Well No. 7 has a relatively recent video survey (performed in May 2016) that can be reviewed immediately by RCS. However, Well No. 107 has had no recent video survey, and it is recommended that such a video survey be performed for IRWD.

Following review of the data, a Memorandum for each well will be prepared with regard to its current observed downwell conditions. These Memoranda will include our preliminary recommendations as to what future rehabilitation options might be implemented in each well, and these will be used as guidance for our subsequent preparation of the Technical Specifications for Rehabilitation. We would like to note that RCS has already performed an evaluation of DRWF Well No. 7 and submitted a Memorandum in this regard to IRWD Staff in 2009.

Task 2 – Prepare the Project Manual for Rehabilitation of the Two Wells

Based on the available well data, and on the results of the site visits and on our review of the downwell surveys, RCS shall prepare the Project Manual. This document will include the Technical Specifications and Line Item Bid Sheets for well rehabilitation operations for each well. Only one Project Manual set will be prepared for the rehabilitation of both wells, and the work can then be bid out by IRWD and performed under a single contract.

The Technical Specifications portion of the Project Manual will generally include the following well rehabilitation elements:

1. Equipment to be utilized and size of work area needed.
2. The possible need for additional site security fencing.
3. The type of site preparation work needed at each site before the contractor mobilizes is equipment.
4. Sound/noise mitigation/security measures, if needed.

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5. Video surveys to be performed during and following rehabilitation of the wells.
6. The depth intervals of well casing to be rehabilitated.
7. The possible installation of a liner (to mitigate possible downwell sanding problems).
8. The type of mechanical well rehabilitation methods will be evaluated and included in the Technical Specifications, as needed. These methods could include the following:
 - o Wire brushing & bailing.
 - o Dual-swab airlifting and surging.
 - o "Air-Jetting", consisting of either the Airburst® or Bore Blast® methods.
9. The type of various chemicals and emplacement methods that might be needed during chemical rehabilitation (if deemed necessary). For each well, RCS has previously developed an effective chemical rehabilitation method for other IRWD wells using HercChemTec-formulated chemical mixes.
10. Discharge locations and treatment options/consideration for the discharge of all fluids generated from each well during all rehabilitation tasks (especially if chemicals are used).
11. Parameters for pumping development and well testing.
12. Discharge requirements and NPDES permit compliance.
13. A bid item for repair/replacement of the permanent pump by the Contractor.
14. Other work, if deemed necessary in subsequent review of well conditions (e.g., the need for well patches or liners, although these are not anticipated to be needed at IDP Well No. 107 but might possibly be necessary at DRWF Well No. 7).

A line item estimate for the probable cost of the rehabilitation work will also be prepared for each well. This will be provided to IRWD to permit comparison of bids received. The Technical Specifications will be prepared to account for the rehabilitation of both wells under a single well rehabilitation contract. We assume that IRWD will be sending out the entire well rehabilitation package for competitive bidding. This task also includes a meeting between RCS and IRWD Staff to review and discuss the final Project Manual.

Task 3 – Provide Bid Phase Support

RCS will provide bid phase support to IRWD. This support will consist of conducting a pre-bid meeting and the preparation of two bid addenda, as necessary. The purpose of the pre-bid meeting is to help potential bidders better understand site logistics such as access, available water supply, location of utilities, and fluids disposal options at each well site. Prime consideration will be focused on discharge of fluids from the rehabilitation and subsequent testing of each well.

RCS will prepare for and attend a single pre-bid meeting for both wells, provide pre-bid clarifications to the bidders and preparing the two bid addenda, if necessary. We will also assist IRWD in the review and analysis of bids received. Also, prior to commencement of field activities, RCS will attend an initial pre-rehabilitation meeting with the Contractor (a single

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meeting for both wells). This will be to acquaint the Contractor selected by IRWD with the project goals and discuss final scheduling issues and lines of communication.

Task 4 – Field Monitoring of Well Rehabilitation Operations (IRWD Construction Phase Services)

Once a contract has been awarded to the successful bidder by IRWD, RCS geologists will be available to provide field observation of Contractor activities at each well site. This observation is to provide the IRWD with a record of Contractor activities at the site and to help document that the Contractor performed the work in compliance with the Technical Specifications. Tasks that RCS will perform during the rehabilitation project for the two wells could likely consist of the following:

- Subtask 4.1: Pump Removal. Observe the removal of the permanent pump from each of the wells.
- Subtask 4.2: Brushing and Bailing. Observe the wire brushing of each well casing and removal of sediment fill, via bailing. The RCS geologist will be present to measure the brush, to check if it is of the correct diameter, and observe this brushing. It is anticipated, at this time, that only one day of brushing and bailing will be performed in each well.
- Subtask 4.3: Downwell Surveys. Observe the Casing Inspection Thickness Measurement (CITM) tool surveys of each well. It should be noted here that the CITM is a heavy tool (weighing ± 250 lbs) and will need a crane to lift it. Thus, the use of this particular tool and the necessary crane will be provided for in the Technical Specifications for this well. This subtask will also include conducting at least three (3) interim downwell video surveys during the rehabilitation of each well.
- Subtask 4.4: "Air-Jetting".
Observe Air-jetting" methods conducted by the Contractor, for each well. At the current time, it is anticipated that the AirBursting® or BoreBlast® methods will be utilized by the Contractors. An RCS geologist will be present onsite when the selected method is being performed.
- Subtask 4.5: Chemical Development. Performing chemical development of the well. This chemical development will involve the use of HerChemTec-formulated chemical mixtures to be injected into each well by the contractor selected by IRWD to perform the work. The onsite RCS geologist will record the volumes and types of chemicals used in the process and during use of a dual-swab tool for chemical emplacement.
- Subtask 4.6: Swage and Liner Installation. It is anticipated that the installation of patches or a full casing liner may be needed for DRWF Well No. 7. Thus, RCS will be present to observe the installation of either these patches, or the full liner. This will include RCS time for reviewing the gyroscopic alignment survey to check the deviation of the casing.
- Subtask 4.7: Swabbing & Airlifting. Monitor dual swab airlifting and swabbing to removal the chemicals and help redevelop the wells.

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- Subtask 4.8: Pumping Redevelopment. RCS will be present on a part-time basis, during startup and near the end of pumping development at each well. RCS will obtain the pumping development sheets from the pumper, on a daily basis (via FAX or email), during the development process.
- Subtask 4.9: Pumping Tests. Pumping tests will follow pumping redevelopment. This testing will consist of a 12-hour step drawdown test and a 24-hour constant rate pumping test. Near the end of testing, it is possible that a dynamic spinner survey and depth specific sampling can be performed in each well. Thus, we are including time and costs for RCS field staff to be present for these end-of-test tasks.

Further, Title 22 water samples will be collected by the onsite field geologist who will then deliver the samples to the IRWD laboratory. In addition, RCS will temporarily equip each well with a downwell pressure transducer to record changes in water levels during testing. Further, the onsite field geologist will measure specific field water quality parameters while onsite, including temperature, electrical conductivity, pH, turbidity and other key field parameters, such as dissolved oxygen (DO) and the oxidation-reduction potential (ORP). It is assumed that the Contractor will obtain a National Pollutant Discharge Elimination System (NPDES) permit and will collect samples for analysis, and fulfill the reporting requirements of the permit. Near the end of pumping, a final dynamic spinner survey will be performed in each well to help determine if any changes in downwell flow regime have occurred, as a result of the recent rehabilitation work.

- Subtask 4.10: Final Video Survey and Well Disinfection. Following test pump removal, a final video and static spinner survey of each rehabilitated well will be performed to help document the final post-rehabilitation condition of the wells. An RCS field geologist will be present at each well to observe these final surveys.
- Subtask 4.11: Re-Installation of the Permanent Pump (IDP Well No. 107 Only). Upon installation of the final pump by the Contractor, RCS will monitor/observe the installation of the permanent pump in each well. The RCS field geologist will be present on a full-time basis to document the Contractor's activities during pump installation through daily field notes and photographs and help check for compliance with the Technical Specifications.
- Subtask 4.12: Additional Services. RCS will provide IRWD with additional hydrogeologic services at the request of IRWD Staff, on an as-needed basis. These services will be used if additional and/or unanticipated services are needed on the project. It is understood, through the RFP, that we are to establish a budget of \$30,000 for this task and that written authorization from IRWD will need to be obtained prior to any work requested by its staff. Our work during this task will be on a time & expense (T&E) basis.

Task 5 – Preparation of Summary Reports

Prepare a separate Summary of Well Rehabilitation Operations report for each well to help document its rehabilitation operations. Each report will discuss rehabilitation operations and summarize our observations regarding the actual rehabilitation work performed on each well.

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Final recommendations regarding new production rates will also be provided in the report. This report will consist of the following:

- A chronologic history of well rehabilitation operations.
- A description of each method used and the results of those methods.
- Daily field reports by the onsite field geologist.
- An evaluation/analysis of the final pumping tests in each well and an assessment of new pumping capacities and specific capacities.
- Recommendations for the pump depth setting and pumping rate for the permanent pump in each well.
- Discussion of the water quality conditions based on the final Title 22 sampling results.
- Photographs to help document rehabilitation methods.
- Supporting documentation on well rehabilitation operations, including but not limited to, the types and volumes of chemicals, the Contractor's daily records, pumping development and testing sheets, and laboratory results of collected water, bacteriological samples and/or scale samples.
- The reports will also have attendant tables, figures and drawings to help document work conducted on the two wells.

A Draft report will be submitted to the IRWD Staff for their review and comment. Following that review, IRWD comments will be incorporated and three (3) bound copies of the Final report along with an Adobe PDF file of the document will be submitted to IRWD.

Task 6 – Miscellaneous Services

The RFP has established a separate task for additional miscellaneous services. These services will be used only if there are additional unanticipated tasks that are not originally viewed as a part of the project. An amount of \$20,000 has been set aside by IRWD for this task and it is understood that this amount cannot be used by the consultant unless explicit approval is granted by IRWD Staff.

RFP ITEMS UNDER "PROPOSAL CONTENTS"

RFP Item No. 1: Scope

The Scope of Services proposed to be provided by RCS on this project is described in the previous section.

RFP Item Nos. 2 & 3: Team and Experience

The RCS Team has experience with similar types of well projects, and this experience is detailed in Appendix A.

RFP Item No. 4: Budget

An analysis of the estimated man-hours and costs, arranged by task and subtask, is provided in the Fee Proposal, which is submitted under separate cover per IRWD request.

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RFP Item No. 5: Joint Venture

Office and field monitoring of contractors performed on this project will be conducted solely by RCS geologists. There is no joint venture associated with this project.

RFP Item No. 6: Conflict of Interest

The firm of RCS does not current have any conflict of interest associated with IRWD or any other firm that may be contracted with IRWD for work on this project.

RFP Item No. 7: Insurance

RCS carries both general and professional liability (errors and omissions) in the amount of \$1,000,000, each. Proof of these limits will be provided to IRWD when needed.

RFP Item No. 8: Contract

RCS has reviewed IRWD's Agreement for Professional Services contract and takes no exceptions to it, except with respect to the \$2M dollar aggregate limit for Professional Liability coverage. Over the years, RCS has maintained a limit of \$1M for its Professional Liability coverage. All of our prior clients have accepted this limit; it is the industry standard. Nonetheless, it is understood that IRWD requires an aggregate of \$2,000,000 and RCS does currently have this type of coverage and, thus, can meet the requirements of the IRWD professional services agreement.

RFP Item No. 9: Public Work Requirements

It is understood that if the "Engineer" or any tiered level of its subconsultant(s) or subcontractor(s) performs work on the project, including but not limited to "geotechnical, surveying or inspection work" or any other work determined by the California Department of Industrial Relations (DIR) to constitute "public work," then the Engineer and its subconsultants and subcontractors must be registered with the DIR.

However, review of Senate Bill 854, which was enacted in June 2014, and other online information from the Department of Industrial Relations, with regard to Public Works Projects, reveals that there are no provisions for consultants on such projects. Rather, the regulations appear to apply solely to contractors and subcontractors that perform the actual construction activities.

As such, RCS is a consultant employing degreed and licensed geologists and professional groundwater geologists, who will not be involved directly with or assist in any construction activities, and will not employ any subcontractors to perform any work at the site. Further, as such, RCS does not use inspectors but, rather, field geologists to perform monitoring of contractor activities, which is strictly observational in scope. RCS will observe and monitor the work with regard to compliance to the Technical Specifications for the project.



RICHARD C. SLADE & ASSOCIATES LLC
CONSULTING GROUNDWATER GEOLOGISTS

FEE PROPOSAL
FOR HYDROGEOLOGIC SERVICES
DYER ROAD WELLFIELD WELL NO. 7 & IRVINE DESALTER PROJECT WELL NO. 107
IRVINE RANCH WATER DISTRICT

This Fee Proposal provides an estimate of consulting costs prepared by Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS), for field and office services with regard to rehabilitation of Irvine Ranch Water District (IRWD) Dyer Road Wellfield (DRWF) Well No. 7 & Irvine Desalter Project Well No. 107, in Irvine, Orange County, California. The estimated budget for our costs is submitted in response to a recent Request for Proposal (RFP) distributed by the IRWD.

COST ESTIMATE FOR HYDROGEOLOGIC SERVICES

Attached Table 1 provides details of the RCS's costs for each of the tasks listed in our Scope of Services, which has been provided under separate cover. For the proposed project Tables 1 and 2 provide our man-hour and cost analysis for each of the tasks and subtasks, for each well, listed in the Proposed Scope of Hydrogeologic Services, provided under separate cover. The cost for each well is as follows:

DRWF Well No. 7: \$66,600.00

IDP Well No. 107: \$63,900.00

It should be noted here that in Task 4, Subtask 4.12, a cost of \$30,000.00, and Task 6, a cost of \$20,000, has been assigned per the IRWD RFP. These amounts have been split between the two wells at \$15,000 and \$10,000 each, respectively, and adds to the overall cost of the fee for the two wells (see Tables 1 & 2). These costs will be used only if IRWD authorizes these amounts, due to potential but unforeseen cost overruns in the rehabilitation of the two wells.

Our services will be billed on a time-and materials basis, with the total estimated cost representing a not-to-exceed limit within the limits of our assumptions presented below. RCS and its geologists are committed to this project. RCS is a small company and our professional staff of six people consists of experienced groundwater geologists. Our estimated fees are realistic and well considered, and are based on our long-term experience in providing the same types of services required for your project.

Please note that we are willing and able to negotiate the cost of services on this project.

Our cost estimate for the above scope of work is virtually entirely dependent on third-party contractor operations for rehabilitation of the two wells. Invoices for the project will be submitted to IRWD on a monthly basis for review and processing. In addition to this invoice, a monthly status update report will be included outlining the work conducted to date and the percentage of the budget expended.

With regard to our on-call hydrogeologic services, our work will be billed at the same rates as shown in our attached Schedule of Charges and will be billed on a time & expense basis. It is understood that such work will not be performed unless specifically requested by IRWD and only upon written approval by IRWD Staff.



Key Assumptions & Contingencies for Well Rehabilitation

The cost estimate is based on the following key assumptions for third-party operations:

1. The costs assume and reflect that rehabilitation of the two wells are to be performed in parallel. That is, the selected contractor will have two rigs and two crews and schedule rehabilitation operations so that pump removal, brush and bailing, the CITM surveys and videos, chemical treatment, pumping development and testing, and the final pump re-installations will be performed simultaneously on the two wells.
2. RCS will only be present when actual rehabilitation work is being performed and not during setup of Contractor's equipment. Thus, RCS will keep in telephone or email communication with the Contractor during work on each well.
3. It is anticipated that the Contractor will apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges to the local storm drain system at each site. In addition, it is expected that the Contractor will provide for a laboratory, deliver the samples for laboratory analysis, and fulfill the monitoring and reporting requirements of the NPDES permit. RCS will assist the Contractor with the field sampling and monitoring.

Payment will be based on the hours worked and the hourly rates as described in the attached Tables 1 and 2, each detailing the man-hour breakdown for the listed tasks. Because the exact number of hours required to complete the different tasks for well rehabilitation are outside the direct control of RCS, we recommend that all field monitoring services be performed on a time and expense basis, and that if the periods required to complete these tasks are expected to exceed our estimates once well rehabilitation operations are underway, RCS will notify your office in a timely fashion.

TABLE 1
RCS MANHOUR AND COST ESTIMATE DETAIL
INDIVIDUAL COSTS FOR IRWD DRWF WELL NO. 7 REHABILITATION
SEPTEMBER 2016

TASK LISTING		PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MANHOURS	DIRECT COSTS	TOTAL TASK COST	
		BILLING RATES, HOURS AND COSTS													
		\$275		\$194		\$156		\$99		\$76					
		HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST				
TASK 1	Review and Evaluate Well Data & Prepare Memoranda	2	\$550	4	\$776	20	\$3,120	0	\$0	2	\$152	28	\$42	\$4,040	
TASK 2	Prepare Project Manual for Rehabilitation of Two Wells	2	\$550	8	\$1,552	25	\$3,900	0	\$0	2	\$152	37	\$26	\$8,180	
TASK 3	Provide Bid Phase Support	0	\$0	12	\$2,328	0	\$0	0	\$0	0	\$0	12	\$72	\$2,400	
TASK 4	Field Monitoring of Rehabilitation Operations														
Subtask 4.1	Pump Removal	0	\$0	1	\$194	1	\$156	4	\$396	1	\$76	7	\$92	\$884	
Subtask 4.2	Brushing and Bailing	0	\$0	1	\$194	1	\$156	12	\$1,188	0	\$0	14	\$98	\$1,096	
Subtask 4.3	Downwell Surveys (CITM & 3 Videos)	0	\$0	1	\$194	1	\$156	10	\$990	0	\$0	12	\$178	\$1,518	
Subtask 4.4	"Air-Jetting"	0	\$0	1	\$194	1	\$156	12	\$1,188	0	\$0	14	\$98	\$1,094	
Subtask 4.5	Chemical Treatment	1	\$275	1	\$194	2	\$312	30	\$2,970	0	\$0	34	\$169	\$3,920	
Subtask 4.6	Swage & Liner Installation (DRWF Well 7 only)	0	\$0	1	\$194	1	\$156	18	\$1,684	0	\$0	18	\$238	\$2,170	
Subtask 4.7	Swabbing & Airlifting	1	\$275	2	\$388	2	\$312	24	\$2,376	0	\$0	29	\$270	\$3,621	
Subtask 4.8	Pumping Redevelopment	0	\$0	2	\$388	2	\$312	8	\$792	0	\$0	12	\$122	\$1,614	
Subtask 4.9	Pumping Tests	1	\$275	2	\$388	2	\$312	12	\$1,188	0	\$0	17	\$249	\$2,412	
Subtask 4.10	Final Video Survey & Well Disinfection	1	\$275	2	\$388	2	\$312	6	\$594	0	\$0	11	\$162	\$1,731	
Subtask 4.11	Pump Re-Installation	0	\$0	1	\$194	1	\$156	30	\$2,970	0	\$0	32	\$0	\$3,320	
Subtask 4.12	Additional Tasks (T&E Cost)													\$15,000	
TASK 5	Preparation of Summary Reports	1	\$275	2	\$388	20	\$3,120	0	\$0	2	\$152	25	\$45	\$3,980	
TASK 6	Miscellaneous Services													\$10,000	
														ESTIMATED COSTS FOR RCS FIELD SERVICES, DRWF WELL NO. 7 >	\$66,600

Irvine Ranch Water District
RCS Job No. 382-OGE16 DRWF Well No. 7

**TABLE 2
RCS MANHOUR AND COST ESTIMATE DETAIL
INDIVIDUAL COSTS FOR IRWD IDP WELL NO. 107 REHABILITATION
SEPTEMBER 2016**

TASK LISTING	PRINCIPAL GROUNDWATER GEOLOGIST		SENIOR GROUNDWATER GEOLOGIST		STAFF GROUNDWATER GEOLOGIST		FIELD GROUNDWATER GEOLOGIST		CLERICAL PERSONNEL		TOTAL MANHOURS	DIRECT COSTS	TOTAL TASK COST
	BILLING RATES, HOURS AND COSTS												
	\$275		\$104		\$150		\$90		\$75				
	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST	HOURS	COST			
TASK 1 Review and Evaluate Well Data & Prepare Memoranda	2	\$550	4	\$776	20	\$3,120	0	\$0	2	\$152	28	\$42	\$4,840
TASK 2 Prepare Project Manual for Rehabilitation of Two Wells	2	\$550	8	\$1,552	25	\$3,900	0	\$0	2	\$152	37	\$28	\$8,180
TASK 3 Provide Bid Phase Support	0	\$0	12	\$2,328	0	\$0	0	\$0	0	\$0	12	\$72	\$2,400
TASK 4 Field Monitoring of Rehabilitation Operations													
Subtask 4.1 Pump Removal	0	\$0	1	\$104	1	\$150	4	\$360	1	\$75	7	\$56	\$908
Subtask 4.2 Brushing and Bailing	0	\$0	1	\$104	1	\$150	12	\$1,080	0	\$0	14	\$56	\$1,608
Subtask 4.3 Downwell Surveys (CITM & 3 Videos)	0	\$0	1	\$104	1	\$150	10	\$900	0	\$0	12	\$176	\$1,518
Subtask 4.4 "Air-Jetting"	0	\$0	1	\$104	1	\$150	12	\$1,080	0	\$0	14	\$56	\$1,604
Subtask 4.5 Chemical Treatment	1	\$275	1	\$104	2	\$312	30	\$2,700	0	\$0	34	\$167	\$3,918
Subtask 4.6 Swags & Liner Installation (DRWF Well 7 only)													
Subtask 4.7 Swabbing & Airlifting	1	\$275	2	\$368	1	\$150	24	\$2,160	0	\$0	28	\$241	\$3,436
Subtask 4.8 Pumping Redevelopment	0	\$0	2	\$368	1	\$150	8	\$720	0	\$0	11	\$172	\$1,508
Subtask 4.9 Pumping Tests	0	\$0	2	\$368	2	\$312	12	\$1,080	0	\$0	16	\$200	\$2,088
Subtask 4.10 Final Video Survey & Well Disinfection	1	\$275	2	\$368	2	\$312	6	\$540	0	\$0	11	\$77	\$1,649
Subtask 4.11 Pump Re-Installation	0	\$0	1	\$104	1	\$150	30	\$2,700	0	\$0	32	\$148	\$3,488
Subtask 4.12 Additional Tasks (T&E Cost)													\$15,000
TASK 5 Preparation of Summary Reports	1	\$275	2	\$368	20	\$3,120	0	\$0	2	\$152	26	\$46	\$3,980
TASK 6 Miscellaneous Services													\$10,000
ESTIMATED COSTS FOR RCS FIELD SERVICES IDP WELL NO. 107													\$63,900



SCHEDULE OF CHARGES
November 2015

Professional Services	Hourly Rates
Principal Groundwater Geologist	\$275.00
Senior Groundwater Geologist	\$194.00
Staff Groundwater Geologist	\$156.00
Field Geologist/Geologic Logging	\$ 99.00
Clerical, Graphics and GIS Work	\$ 76.00
Field Equipment	Charges
Pressure Transducers (water level & barometric pressure monitoring during pumping tests)	\$ 50.00/wk
Electric Tape Water Level Probe	\$ 25.00/day
Field Water Quality Probe (T, pH, EC)	\$ 50.00/day

Litigation, Depositions and Testimony

Depositions and trial testimony are charged at twice the hourly rate (4-hour minimum/day).

Travel Time and Mileage

Travel time for meetings and/or to job sites will be charged at our standard hourly rates.

Mileage is charged at the current Federal rate of \$0.575 per mile.

Outside Services

All services not ordinarily furnished by RCS, including subcontracted services (i.e., water quality laboratory testing), delivery services, reproduction and printing, etc., are billed at cost +15%. Reproduction costs for large format printing, and/or high volume reproduction and binding of hard copy reports performed in-house by RCS staff, will be billed at rates similar to comparable outside services.

Conditions

RCS reserves the right to update this Schedule of Charges on or about November 1 of each year (the beginning of our Fiscal Year). Invoices will be issued, at our option, on a monthly basis or when the work is completed. A service charge of 1 ½ % will be payable on any amount not paid within 30 days. Any attorney fees or other costs incurred in collecting delinquent charges shall be paid by the client.

Client will furnish rights-of-way to land as required for field visits and field operations, such as sampling or testing of water wells.