

**AGENDA**

**ENGINEERING COMMITTEE MEETING  
LEUCADIA WASTEWATER DISTRICT**  
Tuesday, January 7, 2020 – 9:00 a.m.  
1960 La Costa Avenue, Carlsbad, CA 92009

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1. **Call to Order**
2. **Roll Call**
3. **Public Comment**
4. **New Business**
  - A. Authorize the General Manager to execute Amendment No. 7 to Task Order No. 29 with Infrastructure Engineering Corporation for additional design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed \$117,690. (Pages 2 to 8)
  - B. Authorize the General Manager to execute Amendment No. 2 to Task Order No. 38 with Infrastructure Engineering Corporation for final design services for the Encinitas Estates Pump Station Replacement Project in an amount not to exceed \$73,880. (Pages 9 to 14)
5. **Information Items**
  - A. Batiquitos (B3) Discharge Section Replacement Project Update (verbal)
6. **Directors' Comments**
7. **General Manager's Comments**
8. **Adjournment**

## MEMORANDUM

**DATE:** December 31, 2019  
**TO:** Engineering Committee  
**FROM:** Paul J. Bushee, General Manager   
**SUBJECT:** Leucadia Pump Station Rehabilitation Project – Design Services

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**RECOMMENDATION:**

Staff requests that the Engineering Committee recommend that the Board of Directors:

1. Authorize the General Manager to execute Amendment No. 7 to Task Order No. 29 with Infrastructure Engineering Corporation for additional design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed \$117,690.
2. Discuss and take other action as appropriate.

**BACKGROUND:****Tactical Goal: Infrastructure and Technology / Leucadia Pump Station Rehabilitation**

In May 2018 the Board authorized Amendment No. 4 to Task Order 29 with Infrastructure Engineering Corporation (IEC) for engineering services to design the Leucadia Pump Station (LPS) Rehabilitation Project. The major design elements in Amendment No. 4 included the installation of five new dry pit submersible pumps, replacement of the check valves and associated piping and replacement of the discharge header (installed in 1971).

You may recall that this criteria was added to the project design because staff discovered extremely high levels of hydrogen sulfide (H<sub>2</sub>S) at the discharge end of the Leucadia (L2) Force Main, creating an extremely dangerous, odorous and corrosive environment. Field testing of several operational adjustments produced no significant H<sub>2</sub>S reduction. Therefore, an evaluation and redesign of the mechanical system was required to reduce the H<sub>2</sub>S levels. The installation of new pumps, check valves and associated piping altered the original project scope from a minor to a major pump station rehabilitation.

Subsequently, in February 2019 the Board authorized Amendment No. 5 for project design. This Amendment was for designing a permanently installed submersible pump in the LPS Emergency Basin. The primary advantage of this design is the ability to rapidly start pumping operations out of the emergency basin in emergencies. Additionally, the Amendment included preliminary siting for a super-oxygenation odor control system and flood proofing of the LPS dry well.

**DISCUSSION:**

In June 2019, as project design continued, the LPS Surge Tank Line failed. This ductile iron pipe was installed in July 2006. Although the spill was contained within the District's campus, staff requested that IEC include the replacement of the Surge Tank Line due to the questionable reliability of the line. Additionally, staff requested that a submersible recirculation chopper pump be installed in the wet well to prevent grease blanket formation. The installation of the recirculation pump was requested after successful field testing of a similar pump installation at the Batiquitos Pump Station.

IEC has been responsive to the changing design elements of the project and have successfully completed project design. They have submitted a proposal for their engineering services provided to complete project design, attached for your review. The Scope of Work includes:

**Task 2.1 – Additional Design Services**

- Additional scope and plan sheets addressing:
  - ❖ General
    - Modified system curve for revised surge tank piping and permanent submersible pump
  - ❖ Civil
    - Enlarged site plan
    - Revised conceptual bypass plan
    - Revised surge tank piping
    - Super-Oxygenation System requirements
  - ❖ Mechanical
    - Replacement and modification of surge tank piping
    - Fiberglass Reinforced Plastic platform for generator access
    - New submersible recirculation chopper pump in wet well
    - Super-Oxygenation System piping
  - ❖ Electrical and Instrumentation
    - New submersible recirculation chopper pump in wet well
    - Super-Oxygenation System electrical requirements
- Additional Structural Scope
  - New submersible recirculation chopper pump in wet well
  - Super-Oxygenation System foundation
- Surge Analysis for Surge Tank requirement and piping modification

IEC's proposed fee for the scope of this amendment is \$117,690 which includes services to support project design, such as electrical and structural engineering subconsultant design services. The current engineer's opinion of probable construction cost is \$3,464,000. The total project design cost with this amendment is \$500,436 or 14% of the estimated construction cost. Staff reviewed the proposal and believes it is fair and reasonable. Therefore, staff recommends that the Board authorize the General Manager to execute Amendment No. 7 to Task Order 29 with IEC for engineering design services for the Leucadia Pump Station Rehabilitation Project.

**FISCAL IMPACT:**

The FY 2020 budget contains sufficient funds to complete design services to be provided under this task order amendment.

rym:PJB

Attachment



December 10, 2019

Mr. Robin Morishita  
Leucadia Wastewater District  
1960 La Costa Avenue  
Carlsbad, California 92009

**RE: Proposal for Additional Engineering Services for Final Design of Leucadia Pump Station Rehabilitation Project**

Dear Mr. Morishita:

It has been our pleasure to assist the District with the Leucadia Pump Station (LPS) Rehabilitation Design Project. This letter requests an amendment (Amendment 7) for additional engineering services to add additional scope to the Leucadia Pump Station Rehabilitation Project including the addition of a submersible pump in the emergency wetwell, the addition of an odor control system (Liquid Oxygen, LOX), the edition of a submersible recirculation chopper pump, replacement of the surge tank piping, and other minor changes. This scope includes the final design for these items including plans, specifications and an Engineer's Opinion of Probable Construction Cost (EOPCC). The services requested under this sixth amendment supplement, and do not overlap with, services authorized under the original contract or other amendments.

### **SCOPE OF SERVICES**

#### **Task 2.1 - Additional Design Services**

IEC will prepare additional design for the addition of a submersible pump in the emergency wetwell, the addition of an odor control system (Liquid Oxygen, LOX), the edition of a submersible recirculation chopper pump, replacement of the surge tank piping, and other minor changes. The additional design items per drawing due to these additions are as follows.

#### **General**

- Drawing G-4. Pump Selection for new permanent submersible pump. Includes new modified system curve to account for revised surge tank piping, and pump selection.

#### **Civil**

- Drawing C-1. Updated and enlarged Civil Site Plan to account for LOX site, LOX sidestream piping, and trash enclosure relocation.
- Drawing C-2. Revised conceptual bypass plan to account for replacement of surge tank piping.
- Drawing C-3. Revised drawing to show redesign of surge tank piping (also referred to as new emergency forcemain for the proposed permanent submersible pump in the emergency wetwell. Design includes an above ground, supported pipeline with a new grating for access to the emergency generator.
- Drawing C-4. New lox side stream forcemain plan and profile.





- Drawing C-5. Drawing revised to include new details for LOX Civil Site plan, new trash enclosure and gate elevation, new wall for trash enclosure and LOX enclosure, fence section and gate post schedule.

#### Demolition

- Drawing D-1. New demolition includes the surge tank piping.

#### Mechanical Sheets

- Drawing M-1. New details to replace and modify the surge tank piping.
- Drawing M-2. Additional plan and sections for the permanent emergency pump and connections on the new surge tank piping.
- Drawing M-3. New plan and sections for modifications in the existing valve vault. Selection and specification of new sump pump for the existing valve vault.
- Drawing M-4. New plan and section for FRP platform to accommodate access to the generator over the new aboveground surge tank piping.
- Drawing M-6. Modified plan and created new section to accommodate the new conditioning pump (submersible chopper pump) in the existing wetwell.
- Drawing M-10. New plan and section of the flow meter vault to accommodate the LOX sidestream forcemain connection details.
- Drawing M-11. New plan and section detailing the new odor control equipment area.
- Drawing MD-2. New details for ground mounted pipe support, pipe bracket (detail 5), power control station pedestal, strain relief hook and temporary emergency overflow basin bypass pump.

#### Specifications Sections

- 04232 – Reinforced Concrete Block Masonry
- 09900 – Painting and Coating (modified)
- 11065 – Wet Pit Submersible Pump and Motor
- 11067 – Wet Well Recirculation Pump and Motor
- 11175 – Superoxygenation system
- 11307 – Sump Pump and Motor

#### Surge Analysis

Additional scope and fee to perform a surge analysis is included in this amendment. The surge analysis will consist of the following tasks.

- Task 1 – Information Review. Review of information including: pump station plans, sections, pump curves, valving, operations, etc.; existing force main profile, materials, diameters, and pressure classes.
- Task 2 – Model Development. Create a surge analysis model of the system including the two pump stations and one force main under maximum flow conditions for high and low water hammer wave speeds.
- Task 3 – Analysis and Recommendations. Perform surge analyses simulations for sudden pump trip and pump startup of the pump stations under maximum flow conditions assuming no surge protection for the system with high and low water hammer wave speeds. Based on the results of the analyses, analyze the system with the existing surge



protection installed and if necessary, recommend additional protection measures to protect the entire system from adverse pressure surges.

- Task 4 – Draft Technical Memorandum. Prepare and submit a Draft technical Memorandum summarizing the results and recommendations of the analysis.
- Task 5 – Final Technical Memorandum. Upon receipt and incorporation of comments, submit the Final Technical Memorandum.

#### Additional Structural Scope

Additional structural scope required to complete the design additions includes the following.

- Odor control and liquid oxygen tank and equipment foundation.
- Valve vault penetrations.
- Forcemain foundation and platform.
- New opening in top slab of overflow.
- 16" emergency bypass suction line support and penetration fill detail.
- New opening in top slab of pump station and modifications for grating penetration.
- New platform inside flow meter vault.
- Guardrail.

#### Additional Electrical and Instrumentation Scope

Additional electrical and instrumentation scope required to complete the design additions includes the following.

- E-2 - Revised partial site plan to include new LOX site. New detail for conduit to the LOX site.
- E-3 – Revised single line diagram to add odor control sidestream pump, emergency bypass pump, wetwell conditioning pump. Added same pumps to the MCC detail.
- E-4 – Revised upper level electrical plan to include conditioning pump and conduits to the new submersible bypass pump.
- E-5 – Revised to add new fixture in flow meter vault.
- E-6 – Revised to add new sump pump in flow meter vault.
- E-9 – Revised to add new submersible pump in overflow vault.
- E-10 – New plan for LOX odor equipment.
- E-15 – New control diagram for submersible pump in overflow vault.
- E-16 – New control diagram for wetwell conditioning pump.
- E-17 – Revised conduit schedule to add LOX equipment, conditioning pump, and new submersible pump in overflow vault.
- I-2 – Revised P&ID to add conditioning pump, and new submersible pump in overflow vault.
- I-5 – New P&ID for LOX equipment.



Mr. Robin Morishita  
Leucadia Wastewater District  
Page 4 of 4

**FEE**

The proposed level of effort and fee is indicated on the attached table. Billing will be in accordance with our current agreement for as-needed engineering services. We sincerely appreciate the opportunity to provide this proposal and assist the District with this project. Please contact me at (858) 842-6978 should you have any questions or need further information.

Sincerely,

Robert S. Weber, PE  
President

cc: Jamie Fagnant, PE

**FEE ESTIMATE  
LEUCADIA WASTEWATER DISTRICT  
Pump Rehabilitation Project - Final Design**

Task/ Subtask	Task/Subtask Description	<i>Sr. Project Manager</i>	<i>Project Manager</i>	<i>Sr. Project Engineer</i>	<i>Engineer II</i>	<i>Word Processor</i>	Subtask Labor- Hours	Subtask Labor Cost	Direct Cost	Subcontract (Electrical/Str uctual)	Total Cost
		\$190.00	\$180.00	\$160.00	\$120.00	\$75.00					
<b>TASK 2.1</b>	<b>Final Design</b>										<b>\$117,690</b>
	Additional Civil and Mechanical Design and Specifications	8	107	42	254	21	432	\$59,555			\$59,555
	Surge Analysis						0	\$0		\$15,400	\$15,400
	Additional Structural Design						0	\$0		\$27,775	\$27,775
	Additional Electrical and Instrumentation						0	\$0		\$14,960	\$14,960
		8	107	42	254	21	432				
		\$1,520	\$19,260	\$6,720	\$30,480	\$1,575		\$59,555	\$0	\$58,135	<b>\$117,690</b>

**TOTAL NOT-TO-EXCEED FEE: \$117,690**



## MEMORANDUM

**DATE:** December 31, 2019  
**TO:** Engineering Committee  
**FROM:** Paul J. Bushee, General Manager   
**SUBJECT:** Encinitas Estates Pump Station Replacement Project – Engineering Design Services

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**RECOMMENDATION:**

Staff requests that the Engineering Committee recommend that the Board of Directors:

1. Authorize the General Manager to execute Amendment No. 2 to Task Order No. 38 with Infrastructure Engineering Corporation for final design services for the Encinitas Estates Pump Station Replacement Project in an amount not to exceed \$73,880.
2. Discuss and take other action as appropriate.

**DISCUSSION:**

**Tactical Goal:** Infrastructure and Technology / Encinitas Estates Pump Station Replacement

In April 2014, Infrastructure Engineering Corporation (IEC) completed the District's pump stations assessment. As a result of the assessment, IEC recommended the replacement of the Encinitas Estates Pump Station (a Smith & Loveless packaged pump station) with a submersible pump station.

In the 2014 Pump Stations Assessment Report the estimated planning cost of construction to replace the pump station was \$842,000 and the estimated cost for pump station rehabilitation was \$592,000. Therefore, the cost difference between replacement and rehabilitation was \$250,000. Based on those cost figures, the rehabilitation of the pump station is 30% less than pump station replacement. However, replacing the Encinitas Estates Pump Station (EEPS) has several advantages and was recommended for the following reasons:

- EEPS is nearing the recommended 50 year life for its cast in place concrete wet well
- The mechanical equipment needs to be replaced
- The electrical components require upgrade
- Replacement will eliminate dependency on Smith & Loveless as a sole source vendor for pump station material and equipment
- A submersible pump station will provide a safer environment for field service staff
- Submersible pump stations are easier, safer and more efficient to maintain and operate
- The confined space in the current pump station makes equipment replacement and repair associated with maintenance and rehabilitation difficult

Staff believes that the advantages of replacement outweigh the additional expense over rehabilitation. Therefore, staff agrees with IEC's recommendation to replace EEPS.

Project design commenced in May 2019 with the issuance of Task Order No. 38 to IEC for survey and base mapping to site the replacement pump station. Project design is based on the similar and recently completed Village Park No. 5 Pump Station Replacement Project. To continue project design, staff requested that IEC submit a proposal for final project design. IEC submitted their proposal, attached for your review. The Scope of Work includes:

- Task 1 – Project Management and Administration  
IEC will attend two design/coordination meetings. Additional coordination will be addressed via e-mail and telephone.
- Task 3 – Final Design  
IEC and District Staff will develop project design in a collaborative manner. It is anticipated that this method will streamline project design and eliminate formal 50% and 90% design submittals and reviews. IEC will prepare one bid package. Plans, specifications, calculations and an engineer's opinion of probable construction cost will be submitted at the 100% and Final Design levels.
- Task 3.1 – Electrical Design  
Subconsultant will complete pump station electrical design including submersible pump connections, pump station controls and emergency generator and automatic transfer switch replacements.

IEC's proposed fee for design services is \$73,880 which includes services to support project design, such as electrical engineering subconsultant services. When combined with the \$68,871 previously authorized fees, the total design fee is \$142,751. This total fee is 16% of the updated estimated construction cost of \$900,000. Staff believes the proposal is fair and reasonable. Therefore, staff recommends that the Board authorize the General Manager to execute an agreement with IEC for engineering design services to complete the design for the Encinitas Estates Pump Station Replacement Project.

**FISCAL IMPACT:**

The FY20 Capital Improvement Projects budget contains sufficient funds to cover the design services to be provided under this agreement.

rym:PJB

Attachment



December 10, 2019

Mr. Robin Morishita  
Technical Services Manager  
Leucadia Wastewater District  
1960 La Costa Avenue  
Carlsbad, CA 92009

**Reference: Encinitas Estates Pump Station Replacement Project – Request for Amendment 2 – Final Design**

Dear Mr. Morishita:

It has been our pleasure to assist the District with the Encinitas Estates. This letter summarizes the project budget and requests an amendment to provide the District with additional engineering support services as necessary for the design of the proposed pump station replacement. The services requested under this amendment supplement, and do not overlap with, services authorized under the original task order.

**PROJECT BACKGROUND AND APPROACH**

In the 2014 Pump Stations Assessment Report prepared by IEC, it was recommended that the District consider systematically replacing the existing Smith and Loveless packaged pump stations with new submersible pump stations in order to provide a safer working environment for District staff, and to simplify pump station maintenance and operation.

We have prepared this scope and approach to provide design services for the Encinitas Estates Pump Station Replacement. We anticipate submittals will include a Pump Selection Memorandum, siting figures, design development coordination with the District, and finally one 100% and one final submittal with calculations, plans, specifications and engineer’s opinion of probable construction cost.

*Design Assumptions*

The following design assumptions have been taken into consideration in drafting our scope and approach:

- It is assumed that the project will include a parallel construction of a new pump station to minimize pump station bypassing operations. However, if lack of space precludes this option we will consider a phased bypass and pump station replacement in place.
- CEQA determination and environmental services are not included.
- Permitting assistance is not included.

### **SCOPE OF SERVICES**

The following detailed scope of services describes the specific tasks and deliverables that will be performed.

#### ***Task 1 – Project Management and Administration***

Provision is made in the project scope and fee for two (2) design/coordination meetings. Additional coordination, project status reports and schedule updates will be addressed via e-mail and telephone.

#### ***Task 3 – Final Design***

IEC proposes to address the design development of the pump station in a collaborative manner with District Staff and the District Engineer. Ongoing coordination on a weekly basis will apprise the District of the progress of the plans with regular submittal of the plans under development. This eliminates the need for formal 50% and 90% submittals, and streamlines the project such that review can be provided concurrent with the design to minimize the pausing of design efforts while review is provided and to minimize potential rework. It is intended for this collaborative approach to bring the civil and mechanical plans to a 90% design level prior to starting the subconsultant (structural, electrical and instrumentation) work on the project.

Included in the Final Design task is supplementary geotechnical investigation based on one boring to a depth of 25' on the pump station site to support the design of the pump station wet well.

IEC proposes utilizing existing survey from the Satellite Pump Station Replacement Project which included survey of the Encinitas Estates site. Additional plotting from existing aerials and field survey will extend the original survey to cover the proposed site location and field verify inverts of existing gravity sewers in the vicinity. IEC will obtain a title report for the property the pump station is located on, and provide a plat and legal description for the new easement and quitclaim.

IEC will prepare one bid package. Plans, specifications, calculations and an engineer's opinion of probable construction cost will be submitted at the 100% and Final Design levels. It is anticipated that this bid package will consist D-sized sheets, CSI format specifications, a calculations binder and an engineer's opinion of probable construction cost. The engineer's opinion of probable construction cost will be based on available bid results for similar construction projects and does not include a detailed cost estimate. The proposed drawings include the following:

#### **General**

- Title sheet
- General Notes
- Abbreviations and Legend
- Pump Curve

#### **Civil**

- Existing Site Conditions and Demolition
- Proposed Site Layout and Piping Plan
- Conceptual Bypass/Phasing Plan
- Civil Details (1)
- Mechanical Plan

- Mechanical Section
- Mechanical Details (2)

Electrical

- Standard Symbols and Abbreviations
- Electrical Site Plan
- Single Line Diagram/Elevations
- Pump Station Area Plan
- Control Diagrams
- Schedules
- Details
- RTU Elevation
- RTU Power Diagram
- RTU I/O Diagram (3)
- Electrical Demolition (2)
- Phasing Plan

***Task 3.1 – Electrical Design***

This phase covers subconsultant services to perform the electrical design for the pump station replacement. It includes design to cover the replacement of the existing pumps, floats, emergency generator and ATS.

**FEE**

The proposed level of effort and fee is indicated on the attached table. IEC has included a credit for the original proposed preliminary design scope and fee. The new collaborative design development approach replaces the original scope. Billing will be in accordance with our current agreement for as-needed engineering services. We sincerely appreciate the opportunity to provide this proposal and assist the District with this project. Please contact me at (858) 413-2400 should you have any questions or need further information.

Sincerely,



Robert S. Weber, P.E.  
Senior Project Manager

cc: Jamie Fagnant, P.E., IEC  
Preston "Skip" Lewis, P.E., IEC



**FEE ESTIMATE  
LEUCADIA WASTEWATER DISTRICT  
Encinitas Estates Pump Station Replacement**

Task/ Subtask	Task/Subtask Description	<i>Sr. Project Manager (Skip Lewis)</i>	<i>Senior Project Engineer (Jamie Fagnant)</i>	<i>Engineer I/ CAD I Designer</i>	<i>Word Processor (Annette Moore)</i>	Subtask Labor-Hours	Subtask Labor Cost	Direct Cost	Subcontract	Total Cost
		\$190.00	\$160.00	\$115.00	\$75.00					
<b>TASK 1</b>	<b>Project Management and Administration</b>									<b>\$4,010</b>
	Design Meetings (2)	4	8			12	\$2,040	\$250	\$0	\$2,290
	Project Status Reports/Coordination	4	6			10	\$1,720	\$0	\$0	\$1,720
<b>TASK 3</b>	<b>Final Design</b>									<b>\$36,540</b>
	Design Development	20	16	84	4	124	\$16,320	\$0	\$0	\$16,320
	100% Submittal	16	16	60	4	96	\$12,800	\$0	\$0	\$12,800
	Final Submittal	8	12	32	4	56	\$7,420	\$0	\$0	\$7,420
<b>TASK 3.1</b>	<b>Electrical Design</b>									<b>\$33,330</b>
	Electrical Design					0	\$0	\$0	\$33,330	\$33,330
		52	58	176	12	298	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
		\$9,880	\$9,280	\$20,240	\$900	<del>          </del>	\$40,300	\$250	\$33,330	<b>\$73,880</b>

**TOTAL NOT-TO-EXCEED FEE: \$73,880**