**NOTICE OF REGULAR MEETING**
**OF THE**
**SOUTH ORANGE COUNTY WASTEWATER AUTHORITY**

**ENGINEERING COMMITTEE**
**TELECONFERENCE MEETING**

**August 11, 2022**
**8:30 a.m.**

**Join Zoom Meeting by clicking on the link below:**

Join Zoom Meeting
https://socwa.zoom.us/

Meeting ID: 845 3925 5575
Passcode: 054856

One tap mobile
+16699006833,,84539255575#,,,,*054856# US (San Jose)
+16694449171,,84539255575#,,,,*054856# US

Dial by your location
+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 312 626 6799 US (Chicago)
+1 929 205 6099 US (New York)
+1 301 715 8592 US (Washington DC)

Find your local number: https://socwa.zoom.us/u/kbBNvMiElJ

NOTICE IS HEREBY GIVEN that a Regular Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee was called to be held by Teleconference on **August 11, 2022.** SOCWA staff will be present and conducting the call at the SOCWA Administrative Office located at 34156 Del Obispo Street, Dana Point, California.

*MEMBERS OF THE PUBLIC ARE INVITED TO PARTICIPATE IN THIS TELECONFERENCE MEETING AND MAY JOIN THE MEETING VIA THE TELECONFERENCE PHONE NUMBER AND ENTER THE ID CODE. THIS IS A PHONE CALL MEETING AND NOT A WEB-CAST MEETING SO PLEASE REFER TO AGENDA MATERIALS AS POSTED WITH THE AGENDA ON THE WEB-SITE WWW.SOCWA.COM. ON YOUR REQUEST, EVERY EFFORT WILL BE MADE TO ACCOMMODATE PARTICIPATION. IF YOU REQUIRE ANY SPECIAL DISABILITY RELATED ACCOMMODATIONS, PLEASE CONTACT THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY SECRETARY'S OFFICE AT (949) 234-5452 AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO THE SCHEDULED MEETING TO REQUEST DISABILITY RELATED ACCOMMODATIONS. THIS AGENDA CAN BE OBTAINED IN ALTERNATE FORMAT UPON REQUEST TO THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY'S SECRETARY AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO THE SCHEDULED MEETING.*

*AGENDA ATTACHMENTS AND OTHER WRITINGS THAT ARE DISCLOSABLE PUBLIC RECORDS DISTRIBUTED TO ALL, OR A MAJORITY OF, THE MEMBERS OF THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY ENGINEERING COMMITTEE IN CONNECTION WITH A MATTER SUBJECT FOR DISCUSSION OR CONSIDERATION AT AN OPEN MEETING OF THE ENGINEERING COMMITTEE ARE AVAILABLE BY PHONE REQUEST MADE TO THE AUTHORITY ADMINISTRATIVE OFFICE AT 949-234-5452. THE AUTHORITY ADMINISTRATIVE OFFICES ARE LOCATED AT 34156 DEL OBISPO STREET, DANA POINT, CA ("AUTHORITY OFFICE"), BUT ARE NOT OPEN TO THE PUBLIC DURING THE PERIOD OF STAY AT HOME ORDERS. IF SUCH WRITINGS ARE DISTRIBUTED TO MEMBERS OF THE ENGINEERING COMMITTEE LESS THAN SEVENTY-*

*TWO (72) HOURS PRIOR TO THE MEETING, THEY WILL BE SENT TO PARTICIPANTS REQUESTING VIA EMAIL DELIVERY. IF SUCH WRITINGS ARE DISTRIBUTED IMMEDIATELY PRIOR TO, OR DURING, THE MEETING, THEY WILL BE AVAILABLE IMMEDIATELY ON VERBAL REQUEST TO BE DELIVERED VIA EMAIL TO REQUESTING PARTIES.*

## ***AGENDA***

1. Call Meeting to Order

2. Public Comments

   *THOSE WISHING TO ADDRESS THE ENGINEERING COMMITTEE ON ANY ITEM LISTED ON THE AGENDA WILL BE REQUESTED TO IDENTIFY AT THE OPENING OF THE MEETING AND PRIOR TO THE CLOSE OF THE MEETING. THE AUTHORITY REQUESTS THAT YOU STATE YOUR NAME WHEN MAKING THE REQUEST IN ORDER THAT YOUR NAME MAY BE CALLED TO SPEAK ON THE ITEM OF INTEREST. THE CHAIR OF THE MEETING WILL RECOGNIZE SPEAKERS FOR COMMENT AND GENERAL MEETING DECORUM SHOULD BE OBSERVED IN ORDER THAT SPEAKERS ARE NOT TALKING OVER EACH OTHER DURING THE CALL.*

3. Approval of Minutes

   a. Engineering Committee Meeting of Apri 14, 2022
   b. Engineering Committee Meeting of May 12, 2022
   c. Engineering Committee Meeting of June 9, 2022

   **Recommended Action:** Staff recommends the Engineering Committee to approve Minutes as submitted.

4. Operations Report

   **Recommended Action:** Information Item.

5. One (1) Year Contract Extension Award to Miles Chemical for Ferric Chloride [Project Committees 15, and 17]

   **Recommended Action:** Staff recommends the Engineering Committee recommend to the PC 15 and 17 Boards to authorize the General Manager to provide a 1-year contract extension to Miles Chemical, Inc. for ferric chloride at a rate of $975.00 per dry ton for full loads (40,000+ dry tons), $1,095.00 per dry ton for loads of 20,000 to <40,000 dry tons and $1,216.00 per dry ton for loads of 10,000 to <20,000 dry ton.

6. Use Audit Flow and Solids Methodology – Annual Update FY 2021-22

   **Recommended Action:** Staff recommends approval of the Use Audit calculated results for close of the Use Audit for disbursement or collection of additional funds in fiscal year 2021-22.

7. Capital Improvement Construction Projects Progress and Change Order Report (*August*) [Project Committee Nos. 2, 15 & 17]

   **Recommended Action:**

   a. Staff recommends that the Engineering Committee approve the Olsson Construction Change Orders as stated in the staff report for a total of $49,080.37, with no additional days, and a revised contract value of $18,217,037.97 for the J.B. Latham Package B Project: and

   b. Staff recommends that the Engineering Committee recommend that the PC 17 Board of Directors approve the JR Filanc Change Orders as stated in the staff report for a total of $65,337.02 with no additional days, and a revised contract value of $1,812,531.02 for the RTP Aeration Diffuser Project.

8. Coastal Treatment Plant Consequence of Failure Analysis Final Report [Project Committee 15]

   **Recommended Action:** Information item.

9. NPDES Asset Management Plans Update

   **Recommended Action:** Staff is requesting Member Agency review and comment on the AMP approach as outlined in report by August 17, 2022. Staff is also requesting Member Agency provide resources to work with SOCWA staff directly on the completion of the AMPs by August 17, 2022.

**Adjournment**

I hereby certify that the foregoing Notice was personally emailed or mailed to each member of the SOCWA Engineering Committee at least 72 hours prior to the scheduled time of the Regular Meeting referred to above.

I hereby certify that the foregoing Notice was posted at least 72 hours prior to the time of the above-referenced Engineering Committee meeting at the usual agenda posting location of the South Orange County Wastewater Authority and at www.socwa.com.

Dated this 5th day of August 2022.

B. Burnett

Betty Burnett, General Manager/Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

# Agenda Item 3

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**FROM:** David Baranowski, Director of Engineering

**SUBJECT:** Approval of Minutes

---

**Overview**

Minutes from the following meetings are included for review and approval by the Engineering Committee:

- Engineering Minutes of April 14, 2022
- Engineering Minutes of May 12, 2022
- Engineering Minutes of June 9 2022

**Recommended Action:** Staff recommends the Engineering Committee approve Minutes as submitted.

**MINUTES OF REGULAR MEETING**
**OF THE**
**SOUTH ORANGE COUNTY WASTEWATER AUTHORITY**

**Engineering Committee**

DRAFT

**April 14, 2022**

The Regular Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee Meeting was held on April 14, 2022, at 8:30 a.m. via teleconferencing from the Administrative Offices located at 34156 Del Obispo Street, Dana Point, California. The following members of the Engineering Committee were present via Zoom Meeting:

| | |
|---|---|
| DAVID SHISSLER | City of Laguna Beach [arrived @ 8:41 a.m.] |
| STEVE MAY | City of San Juan Capistrano |
| HANNAH FORD | El Toro Water District |
| ROD WOODS | Moulton Niguel Water District |
| DON BUNTS | Santa Margarita Water District |
| MARC SERNA | South Coast Water District |

Absent:

| | |
|---|---|
| DAVE REBENSDORF | City of San Clemente |
| MIKE DUNBAR | Emerald Bay Service District |
| KEVIN BURTON | Irvine Ranch Water District |
| LORRIE LAUSTEN | Trabuco Canyon Water District |

Staff Present:

| | |
|---|---|
| BETTY BURNETT | General Manager |
| JIM BURROR | Director of Operations |
| AMBER BAYLOR | Director of Environmental Compliance |
| DAVID BARANOWSKI | Senior Engineer |
| RONI YOUNG | Associate Engineer |
| JEANETTE COTINOLA | Procurement & Contracts Manager |
| MATT CLARKE | IT Administrator |
| MARY CAREY | Finance Controller |
| KONSTANTIN SHILKOV | Senior Accountant |
| DANITA HIRSH | Executive Assistant |

Also Present:

| | |
|---|---|
| TRACIE STENDER | Procopio Law |
| TARYN KJOLSING | South Coast Water District |
| DENNIS CAFFERTY | El Toro Water District |
| SHERRY WANNINGER | Moulton Niguel Water District |
| MARK BUTIER | Butier Engineering |
| MATT COLLINGS | Moulton Niguel Water District |

1. Call Meeting to Order

   Mr. Burror, Director of Operations, called the meeting to order at 8:33 a.m.

2. Public Comments

   None.

3. Approval of Minutes

   a. Engineering Committee Meeting of February 10, 2022

ACTION TAKEN
Motion was made by Mr. Bunts and seconded by Mr. Serna to approve subject Minutes as submitted.

| | |
|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 1, Absent 5 |
| Director Shissler | Absent |
| Director Rebensdorf | Absent |
| Director May | Abstain |
| Director Dunbar | Absent |
| Director Ford | Aye |
| Director Burton | Absent |
| Director Woods | Aye |
| Director Kjolsing | Aye |
| Director Bunts | Aye |
| Director Lausten | Absent |

   b. Engineering Committee Meeting of March 10, 2022

ACTION TAKEN
Motion was made by Mr. Woods and seconded by Mr. Bunts to approve subject Minutes as submitted.

| | |
|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 1, Absent 5 |
| Director Shissler | Absent |
| Director Rebensdorf | Absent |
| Director May | Abstain |
| Director Dunbar | Absent |
| Director Ford | Aye |
| Director Burton | Absent |
| Director Woods | Aye |
| Director Kjolsing | Aye |
| Director Bunts | Aye |
| Director Lausten | Absent |

4. Operations Report

Mr. Burror, Director of Operations, reported that the DAFT No. 2 at the J.B. Latham Plant is starting up. He stated there had been a couple of challenges but DAFT No. 2 should be fully online within the next week.

Ms. Amber Baylor, Director of Environmental Compliance, updated the committee on the virtual inspections that occurred at several of the facilities related to obtaining the NPDES Permits.

Ms. Katie Greenwood, Source Control Manager, gave a PowerPoint presentation on SOCWA's Pretreatment Program and Rules for Clean Water Discharges to Sewerage Facilities.

This was an information item; no action was taken.

5. Capital Improvement Construction Projects Report [Project Committee 2 and 15]

ACTION TAKEN by PC 2
Motion was made by Mr. Bunts and seconded by Mr. Woods to recommend that the PC 2 Board of Directors approve Olsson Construction Change Order No. 42 for $12,885.18, No. 43 for $2,774.58, and No. 44 for $1,009.86, for a total of $16,669.62, and a revised contract value of $18,714.842.00 for the J.B. Latham Package B project.

| | | |
|---|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 0, Absent | |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Aye |

ACTION TAKEN by PC 15
Motion was made by Mr. Shissler and seconded by Mr. Serna to ratify JR Filanc Change Order No. 24 for a time extension of 51 days for the Coastal Treatment Plant Export Sludge Force Main Replacement project (at no additional cost).

| | | |
|---|---|---|
| Motion carried: | Aye 2, Nay 0, Abstained 1, Absent 1 | |
| | Director Shissler | Aye |
| | Director Dunbar | Absent |
| | Director Woods | Abstain |
| | Director Serna | Aye |

6. Revise Contract to Hazen & Sawyer for the Design Services for the J.B. Latham Electrical System Study and Design Project [Project Committee 2]

ACTION TAKEN by PC 2
Motion was made by Mr. Bunts and seconded by Mr. Woods to recommend that the PC 2 Board of Directors approve Amendment No. 2 to Hazen and Sawyer in the amount of $19,980 for a total revised contract amount of $243,916 for the design services for the J.B. Latham electrical System Study and Design Project.

| | | |
|---|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 0, Absent | |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Aye |

7. J.B. Latham Package B Update [Project Committee 2]

Mr. Mark Butier of Butier Engineering updated the committee on the ongoing construction management, inspection, and other services he will be providing on behalf of the J.B. Latham Package B Project. An open discussion ensued.

This was an information item; no action was taken.

8. An Amendment to the Butier Engineering Contract for Construction Management, Inspection Services and Other Related Services for the JBL Package B Project [Project Committee 2]

   ACTION TAKEN by PC 2
   Motion was made by Mr. Bunts and seconded by Mr. Woods to recommend that the PC 2 Board of Directors approve Amendment No. 2 to Butier Engineering contract in the amount of $392,535 for construction management and inspection services for the J.B. Latham Package B Project.

| | | |
|---|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 0, Absent | |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Aye |

9. CIP Budget Update for FY 2022-23

   Mr. Burror gave an updated presentation on the proposed SOCWA CIP Budget for Fiscal Year 2022-2023. An open discussion ensued.

   This was an information item; no action was taken.

Adjournment

There being no further business, Mr. Burror adjourned the meeting at 10:14 a.m.

I HEREBY CERTIFY that the foregoing Minutes are a true and accurate copy of the Minutes of the Regular Meeting of the South Orange County Wastewater Authority Engineering Committee of April 14, 2022, and approved by the Engineering Committee and received and filed by the Board of Directors of the South Orange County Wastewater Authority.

_____
Betty Burnett, General Manager/Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

**MINUTES OF SPECIAL MEETING**
**OF THE**
**SOUTH ORANGE COUNTY WASTEWATER AUTHORITY**

**Engineering Committee**

DRAFT

**May 11, 2022**

The Special Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee Meeting was held on May 11, 2022, at 8:30 a.m. via teleconferencing from the Administrative Offices located at 34156 Del Obispo Street, Dana Point, California. The following members of the Engineering Committee were present via Zoom Meeting:

| | |
|---|---|
| HANNAH JOHNSON (BROIDA) | City of Laguna Beach |
| STEVE MAY | City of San Juan Capistrano |
| HANNAH FORD | El Toro Water District |
| KEVIN BURTON | Irvine Ranch Water District |
| ROD WOODS | Moulton Niguel Water District |
| DON BUNTS | Santa Margarita Water District |
| MARC SERNA | South Coast Water District |

Absent:

| | |
|---|---|
| DAVE REBENSDORF | City of San Clemente |
| MIKE DUNBAR | Emerald Bay Service District |
| LORRIE LAUSTEN | Trabuco Canyon Water District |

Staff Present:

| | |
|---|---|
| BETTY BURNETT | General Manager |
| JIM BURROR | Director of Operations |
| AMBER BAYLOR | Director of Environmental Compliance |
| DAVID BARANOWSKI | Senior Engineer |
| RONI YOUNG | Associate Engineer |
| MATT CLARKE | IT Administrator |
| MARY CAREY | Finance Controller |
| KONSTANTIN SHILKOV | Senior Accountant |
| NADYN KIM | Accountant |
| DANITA HIRSH | Executive Assistant |

Also Present:

| | |
|---|---|
| TRACIE STENDER | Procopio Law |
| TARYN KJOLSING | South Coast Water District |
| DENNIS CAFFERTY | El Toro Water District |
| SHERRY WANNINGER | Moulton Niguel Water District |
| MARK BUTIER | Butier Engineering |
| JESUS GARIBAY | Moulton Niguel Water District |

1. Call Meeting to Order

   Mr. Burror, Director of Operations, called the meeting to order at 8:34 a.m.

2. Public Comments

   None.

3. Operations Report

Mr. Burror, Director of Operations, reported that staff is working through warranty items and asked David Baranowski, Senior Engineer, to give an update on the RTP Aeration Diffuser Replacement startup.

Mr. Baranowski reported that the first tank of six went online two weeks ago with the new EDI diffusers and have had a great impact on water quality and plant efficiencies. An open discussion ensued.

Mr. Burror also informed the committee that he circulated the Capital Spending Plan via email to the member agency Finance Officers and the Board Members noting comments and questions are welcomed.

Ms. Baylor, Director of Environmental Compliance, stated she wanted to follow up with the committee due to some additional information requested regarding the Asset Management Plan. She noted that she had been working with the Regional Board in getting answers to the questions that she received. An open discussion ensued.

This was an information item; no action was taken.

4. Capital improvement Construction Projects Report [Project Committee 2, 15, and 17]

Mr. Baranowski reported that there were no Change Orders to discuss for PC 15 and 17. He noted a few changes that were made to the Change Order report to make it easier to read and follow.

Ms. Roni Young, Associate Engineer, gave an update on the Package B Project. She stated the project was in the last phase of bypass, and that the Plant One Effluent Channel bypass is anticipated to take two weeks until completion. She also noted Olsson Construction is working in the Primary Tanks Five and Six and is at demobilization for DAFT Number One and will later perform electrical work to Digester One. Ms. Young stated there are two change orders: 45 in the amount of $10,762.85, and 46 in the amount of $5,389.66 to present to the committee for consideration. An open discussion ensued.

ACTION TAKEN by PC 2
Motion was made by Mr. Woods and seconded by Mr. Serna to approve Olsson Construction Change Orders for a total of $16,152.51 and a revised contract value of $18,730,994.51. Staff will report approved changes to the Board of Directors at the next Regular meeting.

| | | |
|---|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 0, Absent 0 | |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Aye |

///

///

///

5. Regional Treatment Plant Consequence of Failure Analysis, Dudek Engineering in the amount not to exceed $58,970.00 [Project Committee 17]

   ACTION TAKEN
   Motion was made by Mr. Woods and seconded by Mr. Serna to recommend that the PC 17 Board of Directors authorize the General Manager to execute a contract with Dudek Engineering for the Regional Treatment Plant Consequence of Failure Analysis (47224C-000) for a fee not to exceed $58,970.00.

| | | |
|---|---|---|
| Motion carried: | Aye 4, Nay 0, Abstained 0, Absent 1 | |
| | Director Dunbar | Absent |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Aye |

6. BioRad QX200 Instrument Purchase for $159,214 (plus tax and shipping) [Project Committees 5 and 24]

   ACTION TAKEN
   Motion was made by Mr. Bunts and seconded by Mr. Woods to recommend to the PC 5 and PC 24 Board of Directors to authorize a small capital budget in the amount of $80,500 (PC 5), and $80,500 (PC 24), and staff is authorized to adjust the budget as needed to cover tax and shipping, and authorize the purchase of the BioRad ddPCR QX200 in the amount of $159,214 (plus tax and shipping to be determined at the time of shipping).

| | | |
|---|---|---|
| Motion carried: | Aye 7, Nay 0, Abstained 0, Absent 2 | |
| PC 24 | Director Johnson | Aye |
| PC 5 | Director May | Aye |
| PC 24 | Directory Ford | Aye |
| PC 24 | Director Burton | Aye |
| PC 5 & 24 | Director Woods | Aye |
| PC 5 | Director Bunts | Aye |
| PC 5 & 24 | Director Serna | Aye |
| PC 5 | Director Rebensdorf | Absent |
| PC 24 | Director Dunbar | Absent |

7. Director of Engineering Recruitment Question Solicitation

   Ms. Burnett provided a status update on SOCWA'S recruitment for the position of the Director of Engineering. She asked the Committee to notify her of anyone who might be interested in applying for the position. An open discussion ensued.

   This was an information item; no action was taken.

Adjournment

There being no further business, Mr. Burror adjourned the meeting at 9:18 a.m.

I HEREBY CERTIFY that the foregoing Minutes are a true and accurate copy of the Minutes of the Special Meeting of the South Orange County Wastewater Authority Engineering Committee of May 11, 2022 and approved by the Engineering Committee and received and filed by the Board of Directors of the South Orange County Wastewater Authority.

_____

Betty Burnett, General Manager/Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

**MINUTES OF REGULAR MEETING**
**OF THE**
**SOUTH ORANGE COUNTY WASTEWATER AUTHORITY**

**Engineering Committee**

DRAFT

**June 9, 2022**

The Regular Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee Meeting was held on June 9, 2022, at 8:30 a.m. via teleconferencing from the Administrative Offices located at 34156 Del Obispo Street, Dana Point, California. The following members of the Engineering Committee were present via Zoom Meeting:

| | |
|---|---|
| MIKE DUNBAR | Emerald Bay Service District |
| HANNAH FORD | El Toro Water District |
| ROD WOODS | Moulton Niguel Water District |
| DON BUNTS | Santa Margarita Water District |
| MARC SERNA | South Coast Water District |
| LORRIE LAUSTEN | Trabuco Canyon Water District [arrived @ 8:45 a.m.] |

Absent:

| | |
|---|---|
| DAVID SHISSLER | City of Laguna Beach |
| DAVE REBENSDORF | City of San Clemente |
| STEVE MAY | City of San Juan Capistrano |
| KEVIN BURTON | Irvine Ranch Water District |

Staff Present:

| | |
|---|---|
| BETTY BURNETT | General Manager |
| JIM BURROR | Director of Operations |
| AMBER BAYLOR | Director of Environmental Compliance |
| DAVID BARANOWSKI | Senior Engineer |
| RONI YOUNG | Associate Engineer |
| MATT CLARKE | IT Administrator |
| MARY CAREY | Finance Controller |
| KONSTANTIN SHILKOV | Senior Accountant |
| NADYN KIM | Accountant |
| DANITA HIRSH | Executive Assistant |

Also Present:

| | |
|---|---|
| TRACIE STENDER | Procopio Law |
| TARYN KJOLSING | South Coast Water District |
| DENNIS CAFFERTY | El Toro Water District |
| SHERRY WANNINGER | Moulton Niguel Water District |
| MATT COLLINGS | Moulton Niguel Water District |

1. Call Meeting to Order

   Mr. David Baranowski, Senior Engineer, called the meeting to order at 8:32 a.m.

2. Public Comments

   None.

3. Salt and Nutrient Management Plan Update

Ms. Baylor, Director of Environmental Compliance gave an update on the status of the Salt and Nutrient Management Plan. An open discussion ensued.

This was an information item; no action was taken.

4. Operations Report

Mr. Burror, Director of Operations, reported that Southern CA Edison backup generators are still in use at the Coastal Treatment Plant, and an updated report will be provided to PC 15 in Closed Session following today's meeting. He also noted staff continues to support the construction at the three Treatment Plants. An open discussion ensued.

This was an information item; no action was taken.

5. Capital improvement Construction Projects Progress and Change Order Report (June) [Project Committee 2, 15, and 17]

Mr. Baranowski introduced changes to the progress report layout. An open discussion ensued.

ACTION TAKEN by PC 2
Motion was made by Mr. Bunts and seconded by Mr. Woods to recommend to the PC 2 Board of Directors to approve Olsson Construction Change Orders for a total of $228,647.63 with no additional days, and a revised contract value of 18,959,642.14 for the J.B. Latham Package B Project; and approve Change Order 1 to Hallsten Corporation for $16,715.25 with no additional days, for a revised contract value of $268,137.25 for the J.B. Latham Package B. Project.

| | | |
|---|---|---|
| Motion carried: | Aye 3, Nay 0, Abstained 0, Absent 1 | |
| | Director Woods | Aye |
| | Director Serna | Aye |
| | Director Bunts | Aye |
| | Director May | Absent |

6. Continuation of Meetings as Authorized Under AB 261

Mr. Baranowski gave an overall update of the purpose of the agenda item. He stated the Board of Directors referred the item to be discussed with each Committee to gather feedback on their preference for conducting future meetings in person, virtually or hybrid being a combination of both in person and virtually when permitted.

Ms. Tracie Stender, legal counsel for Procopio stated to the Committee specific clarifications in determining the findings to allow for continuation to meet virtually under AB361. Such as meeting in a room that will allow for social distancing when there is a fewer number of people in attendance. An open discussion ensued.

There was concurrence of the Engineering Committee to continue holding hybrid meetings being both in person and virtually when permitted as determined under AB361.

Adjournment

There being no further business, Mr. Baranowski adjourned the meeting at 9:18 a.m.

I HEREBY CERTIFY that the foregoing Minutes are a true and accurate copy of the Minutes of the Special Meeting of the South Orange County Wastewater Authority Engineering Committee of June 9, 2022 and approved by the Engineering Committee and received and filed by the Board of Directors of the South Orange County Wastewater Authority.

_____

Betty Burnett, General Manager/Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

# Agenda Item 4

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**FROM:** Jim Burror, Director of Operations

**SUBJECT:** Operations Report

---

**Overview**

Verbal update on operations and maintenance activities.

**Recommended Action:** Information Item.

# Agenda Item 5

| |
|---|
| **Budgeted:** Yes |
| **Budget amount:** PC 15 $70,000 PC 17 $336,004 |
| **Line Item:** PC15 & PC 17 Line 5008 |
| **Legal Counsel Review:** No |
| **Meeting Date:** August 11, 2022 |

**TO:** Engineering Committee

**FROM:** Jim Burror, Director of Operations

**SUBJECT:** One (1) Year Contract Extension Award to Miles Chemical for Ferric Chloride [Project Committees No. 15 and 17]

---


**Summary**

SOCWA has one last annual renewal under the current five (5) year contract for ferric chloride with Miles Chemical. This agenda item provides the recommendation to exercise the last year of the contract at $975 per ton, plus applicable fees and taxes, including applicable charges for split load deliveries.


**Discussion/Analysis**

The proposed increase from Miles Chemical for this 1-year extension is an increase of 40.0% over the current contract pricing. The increase would be from $625.00 to $975.00 per ton. The primary driver for the proposed increase in the costs is for hauling costs associated with increased diesel fuel prices.

Recent bids found online for ferric chloride range from $935 to $1,300 per ton. The lower-priced bids were for large single-site contracts, unlike SOCWA and the member agencies.

**Prior Related Project Committee or Board Action(s)**

None

**Fiscal impact**

The impact on each of the Project Committees will be a 40.0% increase over last year's expenses for ferric chloride. PCs 15 and 17 will consider approval of this increase at the September Board meeting. It is likely that prior to the close of the fiscal year, staff will be seeking a line item budget adjustment for this supply.

**Recommended Action:** Staff recommends the Engineering Committee recommend to the PC 15 and 17 Boards to authorize the General Manager to provide a 1-year contract extension to Miles Chemical, Inc. for ferric chloride at a rate of $975.00 per dry ton for full loads (40,000+ dry tons), $1,095.00 per dry ton for loads of 20,000 to <40,000 dry tons and $1,216.00 per dry ton for loads of 10,000 to <20,000 dry ton.

# Agenda Item 6

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**STAFF CONTACT:** Amber Baylor, Director of Environmental Compliance

**SUBJECT:** Use Audit Flow and Solids Methodology – Annual Update FY 2021-22

---


**Summary**

The Use Audit flow allocation methodology has relied on historical practice for allocation of costs. The intent of this agenda item is to review the methodology per project committee (PC) which is presented to the Engineering Committee members on an annual basis for review, comment, and approval for use in the annual Use Audit for FY 2021-22.


**Results**

Captured herein are the methodologies employed and the results by member agency based on the raw and calculated data. Please note that PC5 and PC24 are attributed to fixed costs.

**PC2**

Member agency average flows for the FY were used in the flow allocation and applied proportionally from the total combined flow from each tributary trunk line. The PC2 use audit uses FY flows and three-year FY average solid loadings to reconcile the budgeted amounts. Solids loadings are calculated from adding the average FY BOD and TSS and dividing by 2 and then multiplying the result by the flow and the 8.34 pounds conversion factor. In March 2018, PC2 members Moulton Niguel Water District (MNWD) and Santa Margarita Water District (SMWD) came to an agreement on how to allocate solids for budgeting and use audit purposes. The new method captures the influent loading at Plant 3A as it was recognized that this allocation would isolate MNWD's solids contributions to JBL to a single variable. SMWD solids to JBL would then be the balance of solids contributed by the Oso Creek Water Reclamation Plant, 3A and any other discharges to the Oso Trabuco line to JBL. Summary results for PC2 are included in Table 1. The total sum of the metered flows on the line influent into the JB Latham facility were 6.96mgd. Calculated values with the 1.4mgd constant from MNWD is 7.496mgd. Percent difference between metered and billing flows were within 10%.

///

///

///

| PC2 - JB Latham Plant | | | | | |
|---|---|---|---|---|---|
| Liquids Summary (mgd) | | | | | |
| | 2021-2022 | 2021-2022 | 2021-2022 | 2021-2022 | Total |
| Member Agency | Budgeted Flow (mgd) | Budgeted Percent | Total Avg. Flow (mgd) | Total Billing Flow (mgd) | Percent To Date |
| CSJC | 2.14 | 36.61% | 2.157 | | |
| MNWD | 1.40 | 23.62% | Constant | 1.400 | 18.68% |
| SCWD | 1.81 | 27.65% | 1.614 | 1.614 | 21.53% |
| SMWD | 1.62 | 12.11% | 3.725 | 4.482 | 59.80% |
| | 6.97 | 100.00% | 7.496 | 7.496 | 100.00% |

Please refer to the MNWD & SMWD Agreement from 2018 for flow/solids splitting in the Oso-Trabuco line.

| FY 21-22 Solids Summary Loading (mgd) | | | | | |
|---|---|---|---|---|---|
| | 2021-2022 | 2021-2022 | 2021-2022 | Total | Total |
| Member | Budgeted | Budgeted | Total | Avg. Loadings | Percent |
| Agency | Loading (pounds) | Percent | Avg. Loadings | Billing Loading | To Date |
| CSJC | 6046.63 | 23.90% | 6339 | | |
| MNWD | 2808.21 | 21.06% | Constant | 5264 | 17.83% |
| SCWD | 6238.48 | 18.08% | 6035 | 6035 | 20.44% |
| SMWD | 9697.16 | 36.96% | 17147 | 18222 | 61.73% |
| | 24330.19 | 100.00% | 29520 | 29520 | 100.00% |

Table 1: PC2 Liquids and Solids Summary Table

**PC12**

The PC12 method of production is detailed by member agency in the following narrative. San Juan Capistrano it is the acre-foot sum of the Rosembaum well, the Mission Street Well, and the total reclaimed water from the SMWD/CSJC intertie. For MNWD it is the amount of reclaimed water produced from the Regional Treatment Plant (RTP) and the 3A Treatment Plant (split with SMWD). South Coast Water District (SCWD) is the total reclaimed water produced from the Coastal Treatment Plant (CTP). The Santa Margarita Water District (SMWD) is the combined sum of reclaimed water produced from the 3A Treatment Plant (split with MNWD), the Oso Creek Water Reclamation Plant (OCWRP), the Chiquita Water Reclamation Plant (CWRP), and the Nichols Water Reclamation Plant (NWRP). The Trabuco Canyon Water District (TCWD) is reclaimed water produced from the Robinson Ranch Water Reclamation Plant (RRWRP). Summary results for PC2 are included in Table 2.

| PC 12 Recycled Water<br>Master Recycled Water Permit<br>2021-2022 | | |
|---|---|---|
| Member Agency | Region 9 Recyled Production FY 2021-2022<br>acft | % RW Produced FY 2021-2022<br>% |
| MNWD | 6812 | 43.18 |
| SCWD | 1100 | 6.97 |
| SMWD | 7305 | 46.31 |
| TCWD | 557 | 3.53 |
| **Total** | **15774** | **100.00** |

Table 2: PC12 Liquids and Solids Summary Table

**PC15**

Due to the lack of solids handling capacity at the Coastal Treatment Plant (CTP), allocation methodology is based on flows to the treatment plant. In addition, there is no current flow meters installed to account for any flow sent to CTP from MNWD, so no flow is being accounted for in this PC flow allocation methodology. The City of Laguna Beach (CLB) is the average annual flow into CTP (metered). The Emerald Bay Services District (EBSD) is the average annual flow into CTP (calculated from monthly meter read from the lift station divided by the days in the month). The South Coast Water District (SCWD) is the average annual flow into CTP (metered). The meter calibration is performed annually in June. Summary results for PC2 are included in Table 3.

///

///

///

///

| PC 15 Actual Flows<br>FY 2021-2022<br>Coastal Treatment Plant | | |
|---|---|---|
| Member Agency | Plant Flows MGD | Plant Flow Percent |
| CLB | 1.459 | 53.81 |
| EBSD | 0.064 | 2.36 |
| SCWD | 1.188 | 43.83 |
| MNWD | 0.00 | 0.00 |
| Total | 2.71 | 100.00 |

Table 3: PC15 Liquids and Solids Summary Table

**PC17**

PC17 has liquid and solids contribution. The liquid flow allocation is based on influent flow to the plant. The influent flow is solely contributed by the MNWD. Due to liquid flow from CTP, the centrate flow is divided by 5 and distributed to each agency then summed to create a total liquid flow to the RTP. The flows are then distributed on a proportional basis. The solids contribution is based on the total daily average pounds contributed by each agency distributed proportionally. Additional ETWD solids samples were programmed into the report. The meter calibration is performed annually in June. Summary results for PC17 are included in Tables 4 and 5.

| PC 17 Liquids<br>Regional Treatment Plant<br>FY 2021-2022 | | | | |
|---|---|---|---|---|
| Member Agency | Plant Flow (MGD) | Centrate Flow (MGD) | Total Flow (MGD) | Liquid Flow (%) |
| CLB | 0.00 | 0.015157 | 0.0082 | 0.110449 |
| EBSD | 0.00 | 0.000667 | 0.0000158 | 0.000213 |
| SCWD | 0.00 | 0.012304 | 0.0054 | 0.073032 |
| ETWD | 0.00 | 0.018058 | 0.0181 | 0.244546 |
| MNWD | 7.28 | 0.069068 | 7.3526 | 99.57176 |
| Total | 7.28 | 0.115254 | 7.38427 | 100.00 |

Table 4

| PC 17 Solids<br>Regional Treatment Plant<br>FY 2021-2022 | | |
|---|---|---|
| Member Agency | #/Day | % |
| CLB | 4548.86 | 13.13 |
| ETWD | 5262.45 | 15.19 |
| EBSD | 200.2514 | 0.58 |
| MNWD | 20943.3673 | 60.45 |
| SCWD | 3693.1194 | 10.66 |
| Total | 34648.04 | 100.00 |

Table 5

Table 4 & 5: PC17 Liquids and Solids Summary Tables

**Previous Committee Review**

This is the first time the use audit for FY 2021-22 will be before the Engineering Committee for discussion and comment.

**Recommended Action:** Staff recommends that the Engineering Committee recommend that the Board of Directors approve the Use Audit calculated results for close of the Use Audit for disbursement or collection of additional funds in fiscal year 2021-22.

**Attachment(s)**
FY 21_22 Use Audit distributed under separate cover.

# Agenda Item 7

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**FROM:** David Baranowski, Director of Engineering

**SUBJECT:** Capital Improvement Construction Projects Progress and Change Order Report (*August*) [Project Committee Nos. 2, 15 & 17]

---

**Overview**

*Active Construction Project Updates:*
Attached are the updated CIP reports. Please note that there are three new change orders for Olsson Construction for PC 2 J.B. Latham Package B project totaling $49,080.37 and three new change orders for JR Filanc for the RTP Aeration Diffuser project totaling $65,337.02.

This is informational for PC 15 member agencies.

**Recommended Action:**

a. Staff recommends that the Engineering Committee approve the following Olsson Construction Change Orders:

- Change Order 58 for $26,498.32, including 0 additional day(s)
- Change Order 59 for $4,290.48, including 0 additional day(s)
- Change Order 60 for $18,291.57, including 0 additonal day(s)

For a total of $49,080.37, with no additional days, and a revised contract value of $18,217,037.97 for the J.B. Latham Package B Project: and

b. Staff recommends that the Engineering Committee recommend that the PC 17 Board of Directors approve the following JR Filanc Change Orders:

- Change Order 1 for $5,748.01, including 0 additional day(s)
- Change Order 2 for $21,437.52, including 0 additional day(s)
- Change Order 3 for $38,151.49, including 0 additional day(s)

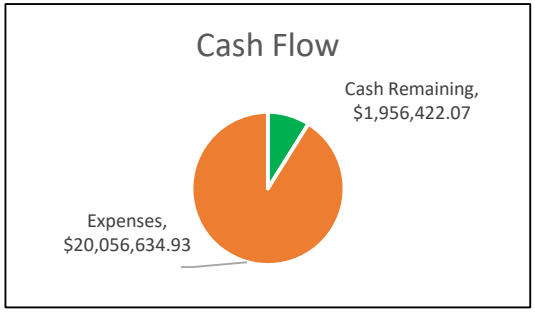
For a total of $65,337.02 with no additional days, and a revised contract value of $1,812,531.02 for the RTP Aeration Diffuser Project.

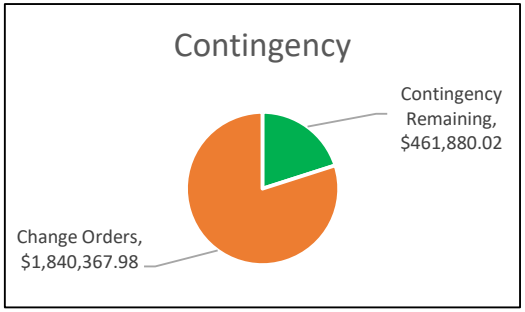
**Project Financial Status**

| | |
|---|---|
| Project Committee | 2 |
| Project Name | Package B |
| Project Description | Plant 1 basin repairs, DAF rehabilitation, Energy Building seismic retrofit and minor rehabilitation, Digester 4 rehabilitation |

**Data Last Updated**

August 2, 2022




**Cash Flow**

| | |
|---|---|
| Collected | $ 22,013,057.00 |
| Expenses | $ 20,056,634.93 |

**Project Completion**

| | |
|---|---|
| Schedule | 95% |
| Budget | 85% |

**Contracts**

| Company | PO No. | Original | Change Orders* | Amendments | Total | Invoiced |
|---|---|---|---|---|---|---|
| Olsson | 13497 | $ 17,325,000.00 | $ 892,037.97 | | $ 18,217,037.97 | $ 15,821,000.16 |
| Butier | 13647 | $ 895,727.00 | | $ 1,005,251.00 | $ 1,900,978.00 | $ 1,599,414.50 |
| Carollo | 13616 | $ 846,528.00 | | $ 616,037.00 | $ 1,462,565.00 | $ 1,195,668.86 |
| TetraTech | 13605 | $ 94,000.00 | | $ - | $ 94,000.00 | $ 93,344.70 |
| Ninyo & Moore | 14279 | $ 49,399.00 | | $ 30,000.00 | $ 79,399.00 | $ 42,227.27 |
| ADS Environmental | 16452 | $ 107,200.00 | $ - | | $ 107,200.00 | $ 41,625.00 |
| Hallsten | 16578 | $ 251,422.00 | $ 16,715.25 | | $ 268,137.25 | $ - |
| Dudek | 17401 | $ 48,360.00 | | $ - | $ 48,360.00 | $ 27,590.00 |
| | | **$ 19,617,636.00** | **$ 908,753.22** | **$ 1,651,288.00** | **$ 22,177,677.22** | **$ 18,820,870.49** |

**Values include change orders to be reviewed by Engineering Committee and deductive change orders*

**Contingency**

| Area | Project Code | Amount ** | Change Orders | Total Remaining | Percent Used |
|---|---|---|---|---|---|
| Liquids | 3220-000 | $ 719,679.00 | $ 669,491.72 | $ 50,187.28 | 93.0% |
| Common | 3231-000 | $ 38,120.00 | $ 3,305.76 | $ 34,814.24 | 8.7% |
| Solids | 3287-000 | $ 1,544,449.00 | $ 1,167,570.50 | $ 376,878.50 | 75.6% |
| | | **$ 2,302,248.00** | **$ 1,840,367.98** | **$ 461,880.02** | **79.9%** |

*** Amount reflects contingency for Construction Contracts only*

**Summary of New Change Orders**

| Change Order No | CSJC | MNWD | SCWD | SMWD | $ Amount |
|---|---|---|---|---|---|
| 58 | $ 8,153.33 | $ 6,115.00 | $ 7,643.75 | $ 4,586.25 | $ 26,498.32 |
| 59 | $ 1,320.15 | $ 990.11 | $ 1,237.64 | $ 742.58 | $ 4,290.48 |
| 60 | $ 5,628.18 | $ 4,221.13 | $ 5,276.41 | $ 3,165.85 | $ 18,291.57 |
| **Grand Total** | **$ 15,101.65** | **$ 11,326.24** | **$ 14,157.80** | **$ 8,494.68** | **$ 49,080.37** |

**Change Orders and Amendments**

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| **Within Contingency, to be reviewed by Engineering Committee** | | | | | | **$ 49,080.37** |
| 58 | Olsson | 3220-000 | Plant 1 Primary Basins 3 and 4 Existing Equipment Removal and Reinstallation | 8/11/2022 | | $ 26,498.32 |
| 59 | Olsson | 3220-000 | Plant 1 Secondary Basins Existing Embedded Metal Plates | 8/11/2022 | | $ 4,290.48 |
| 60 | Olsson | 3220-000 | Plant 2 Primary Baffle Frame Replacement | 8/11/2022 | | $ 18,291.57 |
| **Approved by Board of Directors** | | | | | **191** | **$ 2,510,960.85** |
| 1 | Olsson | 3287-000 | Addition of Loop Piping to the Existing Hot Water Lines Adjacent to Digester 3 | 12/12/2019 | 0 | $ 4,725.00 |
| 2 | Olsson | 3287-000 | Asbestos Gaskets in Boiler hazardous disposal | 6/4/2020 | 0 | $ 6,343.10 |
| 3 | Olsson | 3287-000 | Add Analog Infrastructure and Cabling | 6/4/2020 | 11 | $ 37,969.60 |
| 4 | Olsson | 3287-000 | Digester 4 Coating Additional Sealant | 6/4/2020 | 3 | $ 24,001.54 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 5 | Olsson | 3220-000 | Valve Handwheel Ergonomic extension | 8/6/2020 | 28 | $ 16,370.30 |
| 6 | Olsson | 3287-000 | Change to DeZurik Plug Valves to match existing | 8/6/2020 | 90 | $ 41,993.87 |
| 7 | Olsson | 3287-000 | Digester 4 Additional Concrete Repair | 8/6/2020 | 3 | $ 7,412.74 |
| 8 | Olsson | 3287-000 | Repair Existing Damaged Electrical Box | 8/6/2020 | 0 | $ (1,829.00) |
| 9 | Olsson | 3220-000 | Change the Telescoping Valve Boxes and Piping from Carbon Steel to Stainless Steel | 8/6/2020 | 0 | $ 18,677.63 |
| 10 | Olsson | 3287-000 | Duct bank J Interferences | 12/17/2020 | 18 | $ 73,639.42 |
| 11 | Olsson | 3220-000 | Blasting of Existing Influent Pipe Spools | 12/17/2020 | 5 | $ 20,868.52 |
| 12 | Olsson | 3220-000 | Duct bank K Interferences | 12/17/2020 | 0 | $ 15,567.08 |
| 13 | Olsson | 3287-000 | Digester 3/4 PLC Relocation | 12/17/2020 | 14 | $ 41,367.51 |
| 14 | Olsson | 3287-000 | Digester 4 Additional Tank Repair | 12/17/2020 | 18 | $ 33,642.75 |
| 15 | Olsson | 3220-000 | Duct bank O Interferences | 12/17/2020 | 0 | $ 1,686.88 |
| 16 | Olsson | 3287-000 | Digester 3/4 Control Building Roof Replacement | 2/4/2021 | 0 | $ 42,780.00 |
| 17 | Olsson | 3287-000 | MCC-D1 Modifications due to Change in Motor Size | 5/6/2021 | 0 | $ 34,392.02 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 18 | Olsson | 3287-000 | Integrator Additional Site Visits | 5/6/2021 | 0 | $ 7,571.97 |
| 19 | Olsson | 3287-000 | Multi-zone air conditioning unit in the Cogen MCC Room and Office | 6/3/2021 | 0 | $ 29,417.20 |
| 20 | Olsson | 3220-000 | Overhead Walkway Removal at Plant 1 Secondary Basins 5 through 9 | 6/3/2021 | 0 | $ 62,113.50 |
| 21 | Olsson | 3287-000 | Cogeneration PLC Modifications and Integration | 6/3/2021 | 0 | $ 42,922.67 |
| 22 | Olsson | 3220-000 | Plant 1 Secondary Basins UV Rated Wear Strips | 9/2/2021 | 0 | $ 28,965.33 |
| 23 | Olsson | 3287-000 | MCC-F1 Design Change | 9/2/2021 | | $ 481,290.42 |
| 24 | Olsson | 3287-000 | DAF 2 Investigation Work and Inspection Blast | 10/7/2021 | | $ 67,838.71 |
| 25 | Olsson | 3287-000 | New Fiber Conduit in West Blower Building | 10/7/2021 | | $ 4,957.71 |
| 26 | Olsson | 3220-000 | Plant 1 Primary Basin Conduit Obstruction | 10/7/2021 | | $ 8,444.20 |
| 27 | Olsson | 3220-000 | Plant 1 Influent Channel Additional Coating between Primary Basins 5 and 6 | 10/7/2021 | | $ 15,469.98 |
| 28 | Olsson | 3287-000 | MCC-F1 Lighting Changes | 10/7/2021 | | $ 7,843.04 |
| 29 | Olsson | 3287-000 | Digester 3 Ground Rod | 10/14/2021 | | $ 7,269.16 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 30 | Olsson | 3220-000 | New Fiber Conduits at East Electrical and Storm Water Buildings | 10/14/2021 | | $ 8,045.43 |
| 31 | Olsson | 3220-000 | Plant 2 Primary Influent Channel Repair Credit | 12/9/2021 | | $ (15,903.00) |
| 32 | Olsson | 3220-000 | Plant 1 and 2 Telescoping Valve Pipe Supports | 12/9/2021 | | $ 6,132.27 |
| 33 | Olsson | 3287-000 | 4" Gas Line Routing Modifications | 12/9/2021 | | $ 18,146.07 |
| 34 | Olsson | 3287-000 | Gas Mixer Conduit Conflict | 12/9/2021 | | $ 12,383.89 |
| 35 | Olsson | 3220-000 | P1 Primary Tanks 5 and 6 Temporary Power | 3/10/2022 | | $ 7,256.05 |
| 36 | Olsson | 3220-000 | P1 Primary Tanks Skimmers Starter Modification | 3/10/2022 | | $ 45,374.13 |
| 37 | Olsson | 3220-000 | P1 Primary Tanks Hopper Wall Coating | 3/10/2022 | | $ 34,505.41 |
| 38 | Olsson | 3220-000 | P1 Effluent Channel Conduit Conflict | 3/10/2022 | | $ 9,274.98 |
| 39 | Olsson | 3220-000 | P1 Primary Tanks Torque Limit Switch | 3/10/2022 | | $ 7,149.86 |
| 40 | Olsson | 3287-000 | Multi-zone air conditioning unit in the Cogen MCC Room and Office | 3/10/2022 | | $ (2,309.09) |
| 41 | Olsson | 3287-000 | DAFT 2 Repair | 3/10/2022 | | $ 59,403.53 |
| 42 | Olsson | 3287-000 | Digesters 1 and 2 Heat Exchanger Layout Reconfiguration Electrical | 6/2/2022 | 1 | $ 12,885.18 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 43 | Olsson | 3287-000 | Digester 3 Heat Exchanger Hot Water Loop Tie-In | 6/2/2022 | | $ 2,774.58 |
| 44 | Olsson | 3220-000 | Plant 1 Primary Basin 1 Shutdown Repair Work | 6/2/2022 | | $ 1,009.86 |
| 45 | Olsson | 3287-000 | Replace Compressor Line and Valve at Digester 4 | 6/2/2022 | | $ 10,762.85 |
| 46 | Olsson | 3220-000 | Plant 2 Influent Gates Removal and Concrete Demo | 6/2/2022 | | $ 5,389.66 |
| 47 | Olsson | 3287-000 | DAFT 2 Launder Support Detail | 6/9/2022 | | $ 45,682.30 |
| 48 | Olsson | 3220-000 | Plant 1 Primary Basins 1, 2, 5 and 6 Coating Removal | 6/9/2022 | | $ 111,101.16 |
| 49 | Olsson | 3220-000 | Plant 1 Primary Basins 1, 2, 5 and 6 Existing Equipment Removal and Reinstallation | 6/9/2022 | | $ 71,864.17 |
| 50 | Olsson | 3287-000 | Digester Mixing Pumps Control Programming Change | 8/4/2022 | | $ 4,397.77 |
| 51 | Olsson | 3220-000 | Plant 1 Primary Basins Skimmers I/O Connection and Programming Change | 8/4/2022 | | $ 14,237.83 |
| 52 | Olsson | 3287-000 | Fiber Patch Cables to Connect the Centrifuge PLC to the Centrifuge Patch Panel | 8/4/2022 | | $ 3,755.90 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 53 | Olsson | 3220-000 | Plant 1 Primary Basins 3 and 4 Coating Removal | 8/4/2022 | | $ 43,222.24 |
| 54 | Olsson | 3220-000 | Plant 1 Secondary Basins Concrete Structural and Basins 2 and 3 Drive Plate Rework | 8/4/2022 | | $ 20,860.16 |
| 55 | Olsson | 3220-000 | Plant 2 Primary Basins Repair and Rehab of Head-Shaft Bearings | 8/4/2022 | | $ 4,618.44 |
| 56 | Olsson | 3231-000 | Board SOCWA Front Office with Plywood to Cover Windows | 8/4/2022 | | $ 3,305.76 |
| 57 | Olsson | 3220-000 | Seal the Openings at Plant 1 Primary Influent and Effluent Channels | 8/4/2022 | | $ 25,491.03 |
| 1CM Common | Butier | 3231-000 | CM Change Order No. 1 | 7/13/2021 | | $ 48,995.00 |
| 1CM Liquids | Butier | 3220-000 | CM Change Order No. 1 | 7/13/2021 | | $ 294,125.00 |
| 1CM Solids | Butier | 3287-000 | CM Change Order No. 1 | 7/13/2021 | | $ 269,595.00 |
| 1ESDC Common | Carollo | 3231-000 | ESDC Change Order No. 1 | 6/3/2021 | | $ 18,210.00 |
| 1ESDC Liquids | Carollo | 3220-000 | ESDC Change Order No. 1 | 6/3/2021 | | $ 109,256.00 |
| 1ESDC Solids | Carollo | 3287-000 | ESDC Change Order No. 1 | 6/3/2021 | | $ 100,151.00 |
| 1G Common | Ninyo & Moore | 3231-000 | Geotechnical Services Change Order No. 1 | 2/3/2022 | | $ 5,400.00 |
| 1G Liquids | Ninyo & Moore | 3220-000 | Geotechnical Services Change Order No. 1 | 2/3/2022 | | $ 12,300.00 |

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| 1G Solids | Ninyo & Moore | 3287-000 | Geotechnical Services Change Order No. 1 | 2/3/2022 | | $ 12,300.00 |
| 2CM Liquids | Butier | 3220-000 | CM Change Order No 2 | 5/12/2022 | | $ 196,268.00 |
| 2CM Solids | Butier | 3287-000 | CM Change Order No. 2 | 5/12/2022 | | $ 196,268.00 |
| 2ESDC Common | Carollo | 3231-000 | ESDC Change Order No. 2 | 12/9/2021 | | $ 11,075.00 |
| 2ESDC Liquids | Carollo | 3220-000 | ESDC Change Order No. 2 | 12/9/2021 | | $ 196,440.00 |
| 2ESDC Solids | Carollo | 3287-000 | ESDC Change Order No. 2 | 12/9/2021 | | $ 180,905.00 |
| Duduct-Common | Olsson | 3231-000 | Energy Building Monorail System Descope (F1-F4) | 8/4/2022 | | $ (70,585.34) |
| Duduct-Liquids | Olsson | 3220-000 | Effluent Pump Station Descope (A1-A6) | 8/4/2022 | | $ (483,605.73) |
| Duduct-Solids | Olsson | 3287-000 | Energy Building Modifications Descope (G1-G2, & H1-H2) | 8/4/2022 | | $ (357,382.60) |
| HAL 01 | Hallsten | 3220-000 | Cover Layout Modifications | 8/4/2022 | | $ 16,715.25 |
| **Potential Change** | | | | | | **$ 432,432.51** |
| PCO 002 | Olsson | 3287-000 | Digester 4 Rail Coating | (blank) | | $ (1,000.00) |
| PCO 004 | Olsson | 3287-000 | Digester 4 Control Narrative | (blank) | | $ 5,000.00 |
| PCO 005 | Olsson | 3287-000 | TWAS Slab Modifications | (blank) | | $ 50,000.00 |
| PCO 009 | Olsson | 3287-000 | PLC East Headworks Integration | (blank) | | $ 10,000.00 |
| PCO 018 | Olsson | 3287-000 | Duct bank L Interferences | (blank) | | $ 10,000.00 |
| PCO 026 | Olsson | 3287-000 | Gas Hatch Lids Mating Connection | (blank) | | $ 7,771.00 |

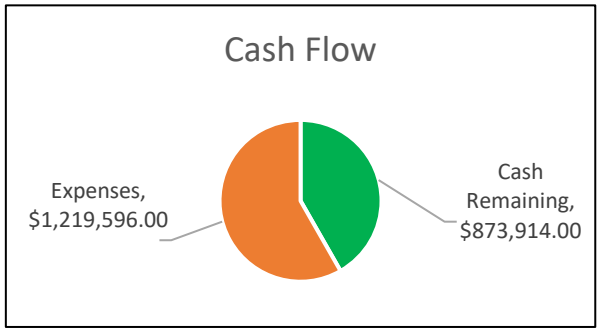
| Change Order No. | Vendor Name | Project ID | Description | Status Date | Days | Amount |
|---|---|---|---|---|---|---|
| PCO 039 | Olsson | 3220-000 | Diversion Structure Gate Actuator Power Feed Replacement | 8/13/2020 | | $ 5,000.00 |
| PCO 050 | Olsson | 3220-000 | Telescoping Valves Rework | 12/23/2020 | | $ 27,884.00 |
| PCO 066 | Olsson | 3287-000 | DAFT 1 Repair | (blank) | | $ 60,000.00 |
| PCO 081 | Olsson | 3220-000 | Plant 1 Primary Influent Channel Additional Cleaning | 7/27/2022 | | $ 19,667.41 |
| PCO 087 | Olsson | 3220-000 | Plant 1 Primary Basins Crack Injection | 7/18/2022 | | $ 77,641.65 |
| PCO 092 | Olsson | 3287-000 | Hot Water System Expansion Tank | 8/31/2021 | | $ 5,000.00 |
| PCO 094 | Olsson | 3287-000 | Additional Red Coloring Agent to Concrete | 9/1/2021 | | $ 5,000.00 |
| PCO 095 | Olsson | 3287-000 | Foul Air Rerouting at DAFT 2 | 9/2/2021 | | $ 5,000.00 |
| PCO 097 | Olsson | 3287-000 | Digester Hot Water Temperature Gauge Setting | 9/15/2021 | | $ 5,000.00 |
| PCO 098 | Olsson | 3220-000 | Plant 1 Bypass pumping Change | 10/12/2021 | | $ 74,226.27 |
| PCO 113 | Olsson | 3287-000 | Field Wiring Solenoid Valve for DAFT 2 Pressurization System | 3/15/2022 | | $ 25,061.07 |
| PCO 115 | Olsson | 3220-000 | Plant 1 Primary Basins and Channels Additional Solids Removal | 7/27/2022 | | $ 41,181.11 |
| Grand Total | | | | | 191 | $ 2,992,473.73 |

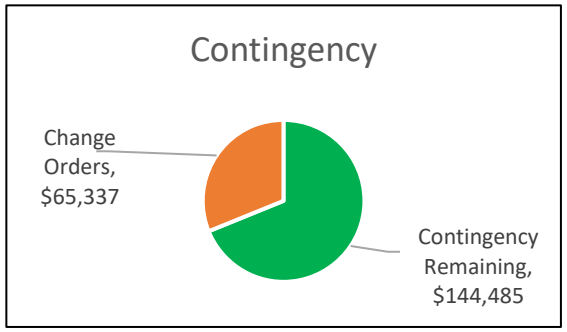
**Project Financial Status**

| | |
|---|---|
| Project Committee | 17 |
| Project Name | Aeration Diffuser Replacements |
| Project Description | Replacing panel diffusers with disc diffusers in all six aeration basins. Includes replacement of drop pipes and air distribution piping inside the basins. |

**Data Last Updated**

August 2, 2022




**Cash Flow**

| | | |
|---|---|---|
| Collected | $ | 2,093,510.00 |
| Expenses | $ | 1,219,596.00 |

**Project Completion**

| | |
|---|---|
| Schedule | 92% |
| Budget | 65% |

**Construction Contracts**

| Company | PO No. | Original | Change Orders | Amendments | Total | Invoiced |
|---|---|---|---|---|---|---|
| Filanc | 16306 | $ 1,747,194.00 | $ 65,337.02 | | $ 1,812,531.02 | $ 1,185,840.44 |
| Lee & Ro | 16119 | $ 37,738.00 | | $ - | $ 37,738.00 | $ 16,304.47 |
| | | | | | $ - | $ - |
| | | **$ 1,784,932.00** | **$ 65,337.02** | **$ -** | **$ 1,850,269.02** | **$ 1,202,144.91** |

**Values include change orders to be reviewed by Engineering Committee and deductive change orders*

**Construction Contingency**

| Area | Project Code | Amount | Change Orders | Total Remaining | Percent Used |
|---|---|---|---|---|---|
| Liquids | 3753-000 | $ 209,822.00 | $ 65,337.02 | $ 144,484.98 | 31.1% |
| | | **$ 209,822.00** | **$ 65,337.02** | **$ 144,484.98** | **31.1%** |

**Change Orders**

| Change Order No. | Vendor Name | Project ID | Description | Status Date | Amount | Days |
|---|---|---|---|---|---|---|
| **Within Contingency, to be reviewed by Engineering Committee** | | | | | $ 65,337.02 | 0 |
| 01 | Filanc | 3753-000 | Corroded Grating Angle Replacement | 7/14/2022 | $ 5,748.01 | 0 |
| 02 | Filanc | 3753-000 | Diffuser Support Modifications (Supply Chain Issue) | 7/14/2022 | $ 21,437.52 | 0 |
| 03 | Filanc | 3753-000 | Air Header Insulation | 7/14/2022 | $ 38,151.49 | 0 |
| **Potential Change** | | | | | $ - | 250 |
| PCO 02 | Filanc | 3753-000 | Diffuser Delivery Time Delay | 3/30/2022 | $ - | 250 |
| Grand Total | | | | | $ 65,337.02 | 250 |

# Agenda Item 8

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**FROM:** David Baranowski, Director of Engineering

**SUBJECT:** Coastal Treatment Plant Consequence of Failure Analysis Final Report [Project Committee 15]

---

**Overview**

Starting in 2020, SOCWA has been evaluating the consequences of failure and risks of failure at the three treatment plants. The Consequence of Failure Analysis (CoFA) at the J.B. Latham Treatment Plant was completed in August 2021. The CoFA at the Coastal Treatment Plant was recently completed. The CoFA at the Regional Treatment Plant will begin next month and will be completed by July 2023.

Staff will present a summary of the results from the most recent CoFA. The final report for the Coastal Treatment Plant CoFA is attached.

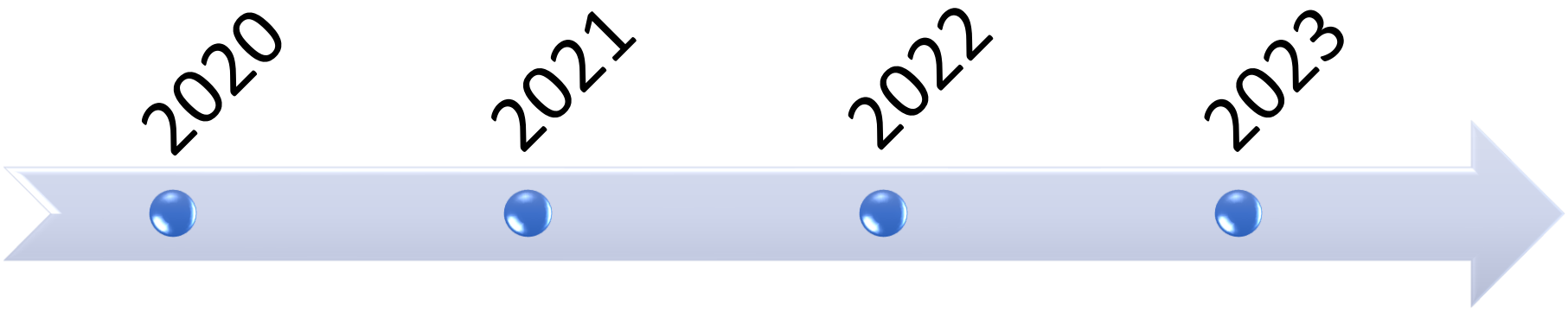
**Recommended Action:** Information item.

# Coastal Treatment Plant Consequence of Failure Analysis

Summary of Findings

August 2022

# CoFA Project History

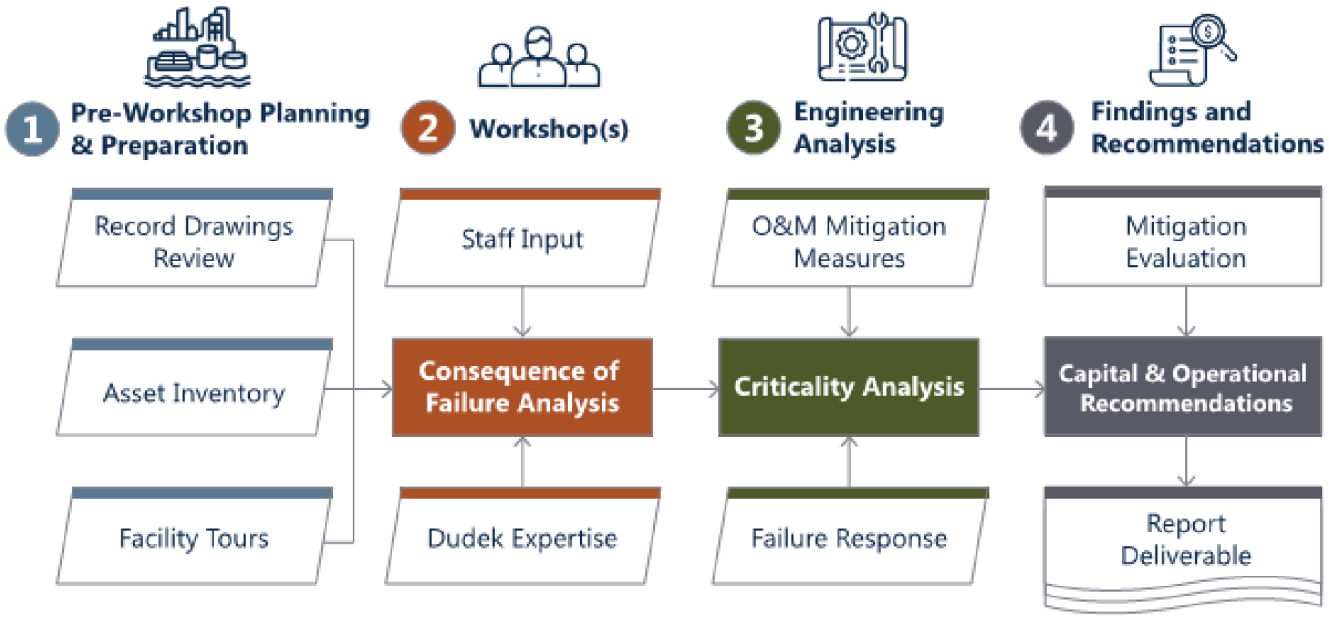



- JBL 2020 – 2021
- CTP 2022
- RTP 2022 – 2023

# CoFA Process

(Probability of Failure) x (Consequence of Failure) = Risk of Failure

*Also known as a risk assessment*






South Orange County Wastewater Authority

# Failure Criteria

| PoF | Likelihood of Occurrence | Current Probability of Condition Based Occurrence |
|---|---|---|
| A | Rare | 3+ years |
| B | Unusual | Within 1 – 3 years |
| C | Annual | Within 6 – 12 months |
| D | Occasional | Within 1 – 6 months |
| E | Common | Within 1 month |
| F | Certain - Ongoing | Daily |

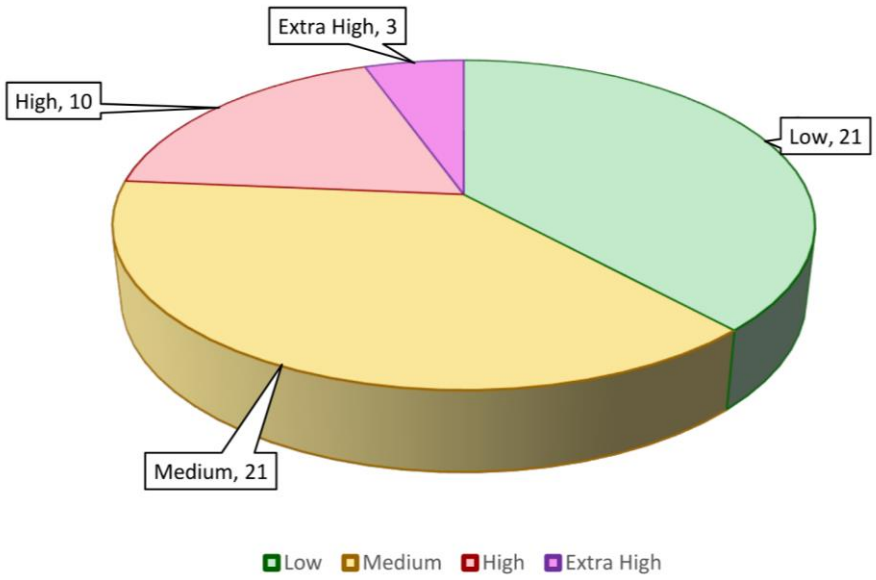
| CoF Categories | Weight Factor | Description |
|---|---|---|
| Health & Safety | 7 | Failure results in potential health and safety risk for Operations staff or visitors on WWTP site. |
| Treatment Performance/Regulatory | 5 | Failure results in treatment performance impacts and potential regulatory violations, penalties, fines, etc. |
| Economic/Personnel Resources | 5 | Failure results in economic resources cost and/or major staff time and resource allocation. |
| Public Image & Board Concerns | 3 | Failure results in potential negative public attention and scrutiny. |

# Risk Categories and Score

| PoF | Criticality | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-100 |
| A | L | L | L | L | L | M | M | M |
| B | L | L | L | M | M | H | H | H |
| C | L | L | M | M | H | H | H | E |
| D | L | M | M | H | H | E | E | E |
| E | L | M | H | H | E | E | E | E |
| F | L | M | H | H | E | E | E | E |

| Risk Designation | | Strategy for Risk Mitigation |
|---|---|---|
| L | Low | Reactive strategy is acceptable. The risk level does not suggest proactive monitoring strategies or capital improvement projects are necessary. Recommend that applicable CIP projects are maintained for current budget year or deferred. |
| M | Medium | Proactive strategy for monitoring performance and condition may be recommended. Mix of proactive and reactive strategies may also apply. Capital Improvement projects may be recommended to mitigate risk where applicable. Recommend that applicable CIP projects are maintained for current budget year. |
| H | High | Proactive planning and risk mitigation strategy is required. Capital Improvement projects will be recommended if operations and maintenance strategies are insufficient to mitigate risk to an acceptable level. Recommend that applicable CIP projects are maintained for current budget year or expedited where practical. |
| E | Extra High | Proactive planning and risk mitigation strategy is required immediately. Capital Improvement projects and operations and maintenance strategies must be developed and implemented as soon as possible to mitigate risk to an acceptable level. Recommend that applicable CIP projects are expedited where practical. |

# CTP Results




**55 potential failures assessed**

- 3 Extra High (5%)
- 10 High (18%)
- 21 Medium (38%)
- 21 Low (38%)

# CTP Results

| Failure Mode / Scenario | Criticality | Probability of Failure (PoF) | Risk Designation |
|---|---|---|---|
| Odor Control Scrubber Performance failure | 85 | D | E |
| Drainage Pump Station Performance failure | 81 | F | E |
| Odor Control Scrubber System Capacity Failure | 71 | F | E |
| Drainage Pump Station Structural failure | 81 | C | H |
| Aeration Basins Pump Drain System failure | 78 | B | H |
| DPS Fixed Pump Mechanical failure | 76 | C | H |
| Emergency Generator failure | 72 | B | H |
| Odor Control Foul Air Ducting failure | 68 | C | H |
| Influent CLB force main failure | 67 | D | H |
| West Aeration Basins Treatment Performance failure | 66 | D | H |
| West Aeration Basins Step Feed Channel Grating failure | 57 | F | H |
| Odor Control Water Softener failure | 56 | F | H |
| SCWD Influent Flow Meter failure | 45 | F | H |
| DSP Submersible Pump Mechanical failure | 59 | C | M |
| DAFT Access Stairs failure | 47 | D | M |
| Multistage Blower failure | 45 | D | M |
| Blower Air Flow Control failure | 45 | D | M |
| Odor Control Scrubber Pad failure | 45 | C | M |
| Potable Pump Station Mechanical failure | 41 | C | M |
| West Primary Clarifiers Weirs and Launders failure | 40 | D | M |
| East Primary Sludge Suction Piping failure | 40 | D | M |
| Aeration Diffusers Performance failure | 40 | D | M |
| Secondary Effluent Flow Meter failure | 40 | C | M |
| Communication/SCADA Systems failure | 40 | C | M |
| Headworks Building Upper Floor Leak Drain Plumbing failure | 39 | E | M |
| Grit Removal Performance failure | 37 | F | M |
| Potable Pump Station Canopy Structural failure | 37 | D | M |
| Grit Pumps Electrical failure | 35 | F | M |
| RAS Hydraulic Control failure | 35 | F | M |
| Sludge Holding/EQ Tank Liner failure | 35 | F | M |
| WAS System Plugging/Loss of Capacity failure | 35 | D | M |
| Non-potable 3W Water Piping System failure | 32 | D | M |
| Scum Pumping Plugging failure | 30 | E | M |
| West Secondary Clarifiers Scum Skimmers failure | 30 | D | M |

# Extra High Risk

| Failure Mode / Scenario | Criticality | Probability of Failure (PoF) | Risk Designation |
|---|---|---|---|
| Odor Control Scrubber Performance failure | 85 | D | E |
| Drainage Pump Station Performance failure | 81 | F | E |
| Odor Control Scrubber System Capacity Failure | 71 | F | E |

- The 3 Extra High Risk items are all in the current CIP and staff are already working on them

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| E | Odor Control Scrubber Performance failure | Staff report that acid washes are performed quarterly, and to maintain effectiveness they have doubled the volume of acid being used. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| E | Drainage Pump Station Performance failure | Routine inspection and maintenance. Staff installed the submersible pump as a mitigation measure for operational issues using the fixed pumps, but since it is a non-engineered temporary system, it has a higher probability of failure. Currently, the fixed pumps provide pumping redundancy as a mitigation measure for the submersible pump failure. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24. Fundamentally, the project needs to address the following issues: 1) location of the station and/or flood protection; 2) reliability of the station and design of pumps for the current operating conditions; 3) condition of existing structures, equipment, piping, and valves. |
| E | Odor Control Scrubber System Capacity Failure | Acid washes performed quarterly help to clean the scrubber media and restore airflow capacity temporarily until buildup and media clogging reduces airflow capacity again. The frequency of cleaning required to maintain system capacity is not practical so most of the time the system is underperforming. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |

# High Risk

| Failure Mode / Scenario | Criticality | Probability of Failure (PoF) | Risk Designation |
|---|---|---|---|
| Drainage Pump Station Structural failure | 81 | C | H |
| Aeration Basins Pump Drain System failure | 78 | B | H |
| DPS Fixed Pump Mechanical failure | 76 | C | H |
| Emergency Generator failure | 72 | B | H |
| Odor Control Foul Air Ducting failure | 68 | C | H |
| Influent CLB force main failure | 67 | D | H |
| West Aeration Basins Treatment Performance failure | 66 | D | H |
| West Aeration Basins Step Feed Channel Grating failure | 57 | F | H |
| Odor Control Water Softener failure | 56 | F | H |
| SCWD Influent Flow Meter failure | 45 | F | H |

10 High Risk

- 4 are related to the Extra High Risk items that are in current CIP
- 3 are aeration items and are included in current CIP
- 2 are related to influent flows and are in the current CIP
- Emergency Generator is the only item not in the current CIP (included in Ten Year Plan in FY30/31)… timing to be re-evaluated

# Next Steps

- Final Report included in packet. Let us know if you have any comments or questions.
- This information will be used to revise upcoming budgets and the Ten Year Plan.
- CoFA at RTP starts in September.

# Questions?

DUDEK

FINAL

# Consequence of Failure Analysis

## For Coastal Treatment Plant

*Prepared for:*

South Orange County Wastewater Authority
34156 Del Obispo St
Dana Point, CA 92629
*Contact: David Baranowski*

June 2022

INTENTIONALLY LEFT BLANK

# Table of Contents

## SECTIONS



## TABLES



## FIGURES



## APPENDICES

# Executive Summary

The South Orange County Wastewater Authority (SOCWA) contracted Dudek to prepare a Consequence of Failure Analysis (CoFA) for process areas and facilities within the Coastal Treatment Plant (CTP). The CoFA is intended to identify and prioritize risks within these facilities to guide strategic Operates and Maintenance (O&M) and Capital Improvement Program (CIP) planning and scheduling for SOCWA in in the short-term to mid-term future.

*Coastal Treatment Plant*

## Summary of Findings

The analysis found that the CTP has two top priority project needs requiring capital investment to mitigate risk (i.e. consequences and probability of failure) within the facilities. SOCWA is aware of the project needs and have budgeted for near-term CIP projects to address these needs. The majority of secondary and tertiary priority projects are addressed in SOCWA's current ten-year CIP, however, additional project needs and recommendations are made to either improve current budgeted project effectiveness or address a project need that is not currently identified in the CIP.

## Summary of Recommendations

It is recommended that SOCWA proceed with capital project planning, design, and construction of top priority projects followed by secondary and tertiary priority projects, as applicable. Where practical, it is recommended to implement O&M recommendations made herein to mitigate risk of critical systems. Top priority capital project needs are identified below along with the current CIP projects and/or recommendations to adjust priority and scope of those projects.

- Replace the existing odor control system and scrubber. The existing system is prone to media clogging, is undersized relative to the sulfide gas load, and as a result cannot achieve the airflow throughput and performance intended of the system. SOCWA CIP Project No. 15102 has budgeted $3.2M for replacement of the scrubber, foul air ducting, and ancillary fans beginning in FY 22/23. The existing budgeted CIP project appears to address the core project needs and schedule.
- Protect and upgrade the existing drainage pump station either by relocating the station to higher ground out of the 100-year floodplain or by reconstructing the station with flood protection levees around the existing station site. Alternatives will need to be evaluated in a preliminary design study and consider cost, regulatory considerations such as permitting and environmental impacts, and future risk related to O&M access and geotechnical stability due to proximity to Aliso creek. This project was not originally identified in SOCWA's 2019-2028 Ten Year Plan but was later added by staff to begin in FY 22/23.

It is recommended that adjustments are made to SOCWA's 10-year CIP implementation schedule and scope of projects to consider recommendations made in Section 3, pages 16-18. Top priority projects (i.e. projects that address one or more extra high risk failure modes) are consistent with SOCWA's current implementation schedule. The analysis recommends a combination of schedule adjustments and new scope in SOCWA's CIP related to secondary priority and tertiary priority projects. Refer to **Appendix A** for complete workshop notes and scoring for each process area and failure mode assessed as part of this Consequence of Failure Analysis.

# 1 Introduction

The South Orange County Wastewater Authority (SOCWA) contracted Dudek to prepare a Consequence of Failure Analysis (CoFA) for process areas and facilities at the Coastal Treatment Plant (CTP). The CoFA is intended to identify and prioritize risk within these facilities to guide strategic operations and maintenance (O&M) and capital investments for SOCWA in the short-term and mid-term future.

## Coastal Treatment Plant Facility Overview

The CTP is a wastewater treatment facility in Laguna Niguel, CA. The CTP is regulated by the State of California Regional Water Quality Control Board (RWQCB) San Diego Region, according to Waste Discharge Requirements (WDR) Order No. R9-2012-0013 and NPDES No. CA0107611. Currently, the CTP is permitted to treat and discharge 6.7 million gallons per day (mgd). The plant is a conventional activated sludge treatment facility that is designed to provide wastewater treatment for four SOCWA member agencies: South Coast Water District (SCWD), the City of Laguna Beach (CLB), the Emerald Bay Services District, and Moulton Niguel Water District. The City of Laguna Beach diverts nuisance, dry weather urban runoff from storm drains to the domestic sewer system and routes it to the CTP. A portion of the secondary effluent is reclaimed for irrigation. All effluent not reclaimed from the CTP is discharged to the Pacific Ocean through the Aliso Creek Ocean Outfall (ACOO).

Background description, function, and major equipment in each process area assessed as part of this CoFA are summarized in **Table 1-1**, which also served as the outline to the workshops for the CTP plant.

### Table 1-1. CTP Plant CoFA Unit Process and Major Equipment Summary

| Process Area | Description | Assets |
|---|---|---|
| Influent Sewer | Functions to convey raw, untreated wastewater to the CTP. There are two force mains feeding the CTP: one from South Coast Water District (SCWD) and one from City of Laguna Beach (CLB). Both force mains enter the CTP directly at the headworks. The project only considers the portions of the force main on the SOCWA property. | • Influent SCWD force main<br>• Influent CLB force main |
| Headworks | Functions to remove rags, grit, and other large materials from the influent wastewater before entering downstream processes. Influent flow through the headworks flows by gravity through mechanical rotary screens located in the headworks building. Screened wastewater flows by gravity to aerated grit chambers. Scrubber and HVAC system function to remove foul air, gases, and provide ventilation in the headworks building. | • Headworks building<br>• Influent flow meter<br>• Rotary drum screens<br>• Aerated grit chambers<br>• Low pressure blowers<br>• Grit pumps<br>• Odor Control Scrubber |
| Drainage Pump Station | Functions to collect all plant drainage, DAFT underflow, and filter backwash and pump it back to the grit chambers or primary influent channel. | • Drainage Pumps |
| Primary Treatment | Functions to remove settleable solids and floatable scum from plant influent before entering downstream secondary process. | • Primary clarifier tanks<br>• Sludge/scum collectors<br>• Primary sludge pumps |

| Process Area | Description | Assets |
|---|---|---|
| Secondary Treatment (Biological) | Functions to remove BOD and TSS from the wastewater utilizing a conventional activated sludge process. The plant has 2 parallel aeration basins (East and West). The process is intended to operate with a low SRT in order not to nitrify and denitrify based on current effluent waste discharge requirements. Aeration system consists of fine-bubble diffusers. Important parameters which control biomass growth rates and microbial communities are the Return Activated Sludge (RAS) and Waste Activated Sludge (WAS). | • Aeration basins<br>• Diffusers<br>• Blowers<br>• Secondary Clarifiers<br>• RAS Pumps<br>• WAS Pumps<br>• Secondary Scum Pumps |
| Tertiary Treatment | Functions to remove turbidity, residual total suspended solids (TSS) from secondary effluent and achieve Title 22 tertiary recycled water quality standards for irrigation. | • Sand Filters |
| Disinfection | Functions to inactivate pathogens and bacteria in the filtered effluent using sodium hypochlorite to meet regulatory disinfection requirements. | • Chlorine Dosing System<br>• Chlorine Contact Tanks |
| Final Effluent | Functions to convey treated wastewater to the plant outfall. | • Effluent Storage Tank<br>• Effluent Flow Meter |
| Sludge Thickening | Sludge holding tank functions to equalize sludge before it is pumped through the export sludge force main to SOCWA's Regional Treatment Plant. No chemicals are added to the sludge. DAFT functions to thicken WAS and scum before the sludge is sent to the sludge holding tank. | • Sludge Holding/EQ Tank<br>• DAFT<br>• Solids Export Pumps |
| Ancillary Systems | Functions to provide power, motor controls, and distribution to every individual plant process and equipment. Power, control, and the SCADA system are critical to plant operation and performance. | • Emergency generator<br>• Communication/SCADA Systems |
| Miscellaneous | Potable water pump station functions to provide additional pressure for potable water uses at the plant. Non-potable water system functions to provide water throughout the plant for O&M purposes, e.g. equipment cleaning. | • Potable Pumps<br>• Non-potable 3W water pumps |
| Site | Infrastructure required to provide safety, site access and evacuation, flood protection, and other features due to the location of the plant. The plant site is in a canyon with limited access. In the past, major flood events or wildfires have led to evacuation of the plant. | • Site access & evacuation<br>• Paved access road<br>• Unpaved access road<br>• Bridge<br>• Stormwater Channel |

## 1.1 Methodology

CoFA is a process that facilitates deliberate discussion and analysis of the criticality of process systems, drilling down to the component-level failure modes that may occur. Each process area identified for upgrade in the CIP is analyzed through the major assets and functions of that process and further by the failure modes of those assets. Through a workshop format, critical operations staff input is captured to expeditiously define a consequence of failure score and probability of failure score. **Figure 1-1** presents the CoFA flowchart.

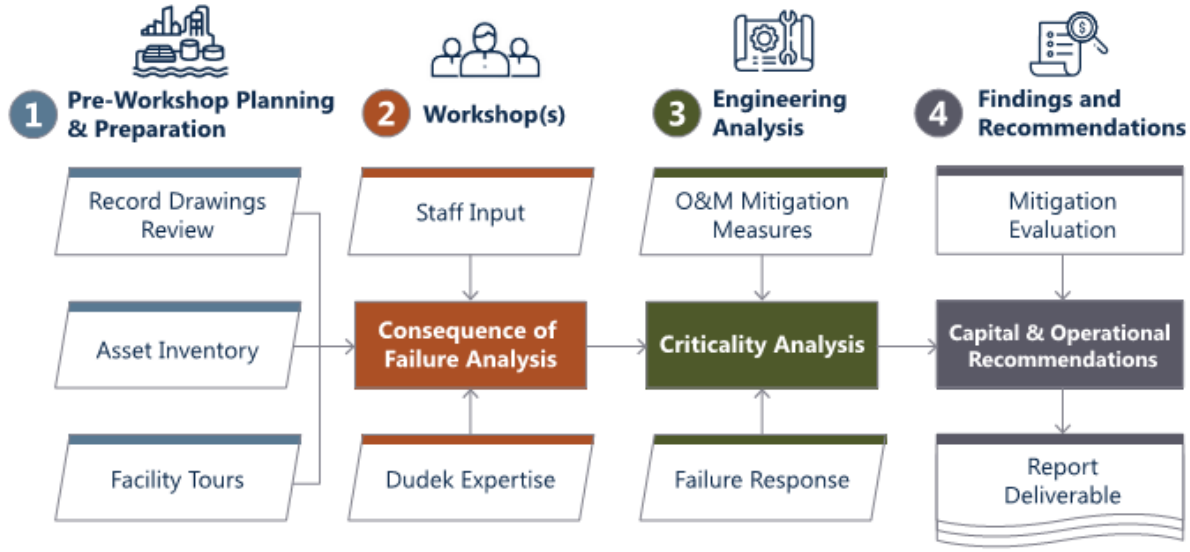



*Figure 1-1. Consequence of Failure Analysis Flow Chart*

Through the CoFA process, the project team establishes a risk profile of the facilities evaluated and provides conclusions and recommendations related to each process area and/or project. The outcomes of the CoFA process include:

- Prioritized list of CIP project needs based on mitigated risk vs. do-nothing alternative.
- Documentation of complete CoFA analysis and notes.
- O&M recommendations to mitigate risk, which may include process management adjustments, small projects, etc.
- Recommendations for adjusting scope of CIP projects, if applicable.

The Consequence of Failure (CoF) and Probability of Failure (PoF) are used to establish a risk designation that allows for the prioritization of risk-based strategic planning. Depending on the risk designation and the nature of the defined failure mode, operational-based and/or capital-based recommendations are made to mitigate the risk by either reducing the defined consequence and/or probability of failure.

### 1.1.1 Consequence of Failure

Consequence of Failure (CoF) is a scoring metric to provide context to the effect of a failure and are conventionally focused on capacity, level of service, and mortality. The effects of a failure are categorized among four distinct categories: Health and Safety, Treatment Performance/Regulatory, Economic/Personnel Resources, and Public Image. Each CoF category is weighted to align with the SOCWA's risk management priorities and philosophies. The CoF categories, weight factors, and descriptions are summarized in **Table 1-2**.

## Table 1-2. Description of Consequence of Failure Categories

| CoF Categories | Weight Factor | Description |
|---|---|---|
| Health & Safety | 7 | Failure results in potential health and safety risk for Operations staff or visitors on WWTP site. |
| Treatment Performance/Regulatory | 5 | Failure results in treatment performance impacts and potential regulatory violations, penalties, fines, etc. |
| Economic/Personnel Resources | 5 | Failure results in economic resources cost and/or major staff time and resource allocation. |
| Public Image & Board Concerns | 3 | Failure results in potential negative public attention and scrutiny. |

Each CoF category receives a numerical score, 1 to 5, for each failure mode based on the tolerance of failure of the process or equipment. The CoF scores for each category generally apply as follows:

1. Insignificant Consequence
2. Minor Consequence
3. Moderate Consequence
4. Major Consequence
5. Catastrophic Consequence

After the CoF score is determined for each category, the category scores are multiplied by the corresponding weight factor and summed (i.e., a sum-product is performed) to produce a comprehensive score defined as "criticality". The criticality of each unit process or asset is established by the criticality score(s) associated with its failure mode(s). The guidelines used to score each CoF category in detail are presented in **Table 1-3**. Using these weight factors, the highest possible criticality score is 100 and the lowest possible criticality score is 20.

The baseline (existing conditions) CoF scores were defined given the assumption that no activity is performed to mitigate the consequence of failure to the process. The baseline CoF score is important for prioritizing recommendations for O&M mitigation measures. Additional O&M and/or CIP recommendations have considered existing mitigation and/or activities that reduce the risk potential of a given failure mode.

Table 1-3. Consequence of Failure Scoring Guideline

| CoF Category | Weight Factor | CoF Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Health & Safety | 7 | Negligible Injury | Minor injury, medical attention required | Serious injury hospitalization required | Serious injury, extensive hospitalization and/or permanent health impacts | Loss of Life |
| Treatment Performance/ Regulatory | 5 | Insignificant loss of treatment performance | Minor loss of treatment performance, impacts on multiple processes. No regulatory violations. | One-time regulatory violation. | Major loss of treatment performance, extended violation or multiple violations, regulatory sanctions | Plant-wide catastrophic failure, treatment process uncontrollable for 48 hrs+ regulatory sanctions. |
| Economic/ Personnel Resources | 5 | <$5,000 | <$25,000 | <$50,000 | <$250,000 | >$250,000 |
| Public Image & Board Concerns | 3 | Insignificant effect or community/ Board concern | Minor community/ Board interest or complaints | Public community discussion and local paper coverage | Loss of confidence by community/ Board. Public agitation for action. | Public investigation, news coverage, management changes demanded. |

### 1.1.2 Probability of Failure

While Consequence of Failure evaluates the effects of failure modes it lacks the context of defining the likelihood of the failure scenario actually happening. Therefore, it is equally important to evaluate the probability of the failure mode to complete a comprehensive risk assessment. Probability of Failure (PoF) is qualitatively assessed by assigning a relative probability level derived primarily upon input from Operations staff regarding past failures, current condition assessment, and current operational procedures. Probability of Failure is ranked according to the system described in **Table 1-4**.

The baseline (existing conditions) PoF scores were defined given the assumption that no activity is performed to mitigate the probability of failure to the process or equipment (i.e. routine maintenance, preventative maintenance, condition assessment, etc.). The baseline PoF score is important for justifying current O&M practices and identifying needs for additional mitigation measures to reduce the risk of a given failure.

## Table 1-4. Probability of Failure Scoring Guideline

| PoF | Likelihood of Occurrence | Current Probability of Condition Based Occurrence |
|---|---|---|
| A | Rare | 3+ years |
| B | Unusual | Within 1 – 3 years |
| C | Annual | Within 6 – 12 months |
| D | Occasional | Within 1 – 6 months |
| E | Common | Within 1 month |
| F | Certain - Ongoing | Daily |

### 1.1.3 Risk Exposure Designation

Following the workshop from which CoF and PoF scores are established for each failure mode, a risk exposure designation is assigned by combining the two scores. The risk exposure designation represents the relative level of risk associated with the failure mode evaluated. Risk exposure is designated according to four levels described in **Table 1-5**.

## Table 1-5. Risk Exposure Designations

| Risk Designation | | Strategy for Risk Mitigation |
|---|---|---|
| L | Low | Reactive strategy is acceptable. The risk level does not suggest proactive monitoring strategies or capital improvement projects are necessary. Recommend that applicable CIP projects are maintained for current budget year or deferred. |
| M | Medium | Proactive strategy for monitoring performance and condition may be recommended. Mix of proactive and reactive strategies may also apply. Capital Improvement projects may be recommended to mitigate risk where applicable. Recommend that applicable CIP projects are maintained for current budget year. |
| H | High | Proactive planning and risk mitigation strategy is required. Capital Improvement projects will be recommended if operations and maintenance strategies are insufficient to mitigate risk to an acceptable level. Recommend that applicable CIP projects are maintained for current budget year or expedited where practical. |
| E | Extra High | Proactive planning and risk mitigation strategy is required immediately. Capital Improvement projects and operations and maintenance strategies must be developed and implemented as soon as possible to mitigate risk to an acceptable level. Recommend that applicable CIP projects are expedited where practical. |

These levels of risk designations are assigned to each failure mode according to the PoF ranking and criticality score generated through workshop discussion according to the matrix presented in **Figure 1-2**.

| PoF | Criticality | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-100 |
| A | L | L | L | L | L | M | M | M |
| B | L | L | L | M | M | H | H | H |
| C | L | L | M | M | H | H | H | E |
| D | L | M | M | H | H | E | E | E |
| E | L | M | H | H | E | E | E | E |
| F | L | M | H | H | E | E | E | E |

*Figure 1-2 – Risk Exposure Designation Matrix*

Recommendations for risk mitigation are prioritized based on the resulting risk designations. Mitigation measures are categorized as O&M procedural adjustments or as recommended CIP projects. Depending on the risk designation, the recommendations can be prioritized over the planning horizon. Items with significant risk potential that cannot be adequately mitigated by O&M measures are recommended for CIP projects which could supersede programmed replacement scheduling.

### 1.1.4 Analysis and Recommendations

Each unit process and asset failure mode is categorized and ranked according to the risk designation that it received. Failure modes designated to result in high-to-extra high exposure to risk are prioritized and mitigation measures aimed to reduce the probability or consequence of failure are identified to mitigate risk to an acceptable level. Capital project recommendations identified through the CoFA process should be prioritized according to their risk designation and the criticality score within the designation. In most cases, medium risk is acceptable for critical assets and unit processes, and a low-risk designation may not be achievable.

If a number of failure modes are designated to be high-risk, the priority of capital projects should be made to address the highest criticality scores as a first measure of priority and probability of failure ranking should be a secondary measure of priority.

# 2 Results

In total, 55 unique failure mode scenarios were identified and analyzed through the workshop process for the CTP. Of these 55 failure mode scenarios, 3 were identified as “Extra High” risk, 10 were identified as “High” risk, 21 were identified as “Medium” risk, and 21 were identified as “Low” risk. This breakdown is depicted in **Figure 2-1**. It should be noted that the electrical system was not evaluated as part of this CoFA because SOCWA completed a full plant electrical upgrade project within 6 months of the project. Staff are satisfied with the new electrical system, and it can be considered as a low risk.

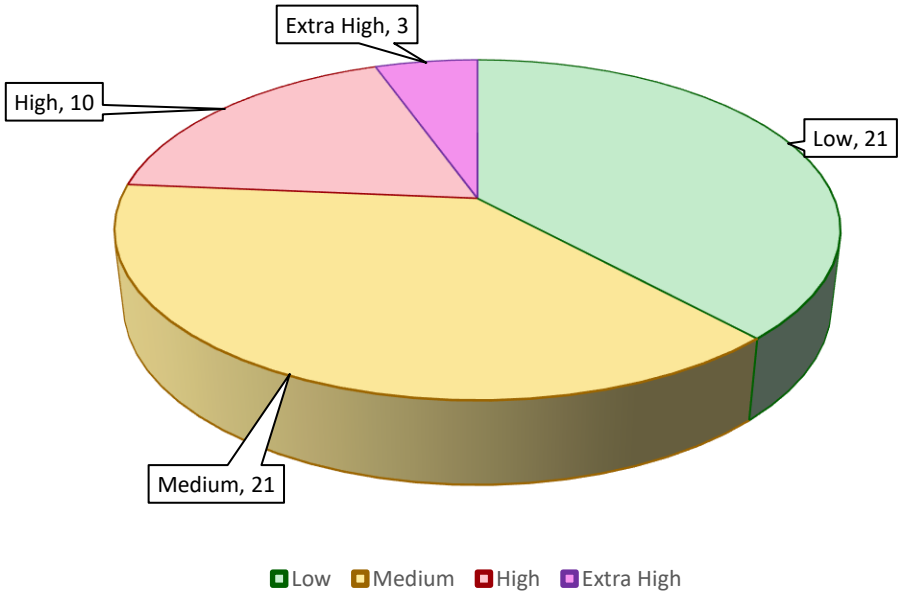



*Figure 2-1. Risk Designations by Failure Mode*

SOCWA faces a variety of treatment challenges as a result of aging infrastructure and equipment, previous process expansion design, location of the plant in terms of proximity to creek and accessibility, and inability to control influent flow conditions. Key plant challenges include capacity and performance of the odor control system, and the performance, condition, and location of the drainage pump station. Staff have taken appropriate and proactive measures to mitigate the consequences and probability of failure to critical process systems, however, despite best efforts, risks are present in process systems required to maintain compliance and safety.

Notes, scoring, and complete documentation of the workshops and recommendations are provided in full in **Appendix A** to this report. **Appendix A** documents all of the notes from the workshop, including current system performance and condition, current operations and maintenance mitigation measures, potential operational and maintenance adjustments that could be implemented by staff, as well as potential capital projects that could be used to mitigate risk and reduce consequences or probability of failure occurrence for each failure mode. Refer to the specific failure mode in **Appendix A** for more information.

The prioritized summary of Extra High, High, and Medium risk failure modes are summarized in **Table 2-1**.

# Table 2-1. Prioritized Summary of Extra High, High, and Medium Risk Failure Modes

| Failure Mode / Scenario | Criticality | Probability of Failure (PoF) | Risk Designation |
|---|---|---|---|
| Odor Control Scrubber Performance failure | 85 | D | E |
| Drainage Pump Station Performance failure | 81 | F | E |
| Odor Control Scrubber System Capacity Failure | 71 | F | E |
| Drainage Pump Station Structural failure | 81 | C | H |
| Aeration Basins Pump Drain System failure | 78 | B | H |
| DPS Fixed Pump Mechanical failure | 76 | C | H |
| Emergency Generator failure | 72 | B | H |
| Odor Control Foul Air Ducting failure | 68 | C | H |
| Influent CLB force main failure | 67 | D | H |
| West Aeration Basins Treatment Performance failure | 66 | D | H |
| West Aeration Basins Step Feed Channel Grating failure | 57 | F | H |
| Odor Control Water Softener failure | 56 | F | H |
| SCWD Influent Flow Meter failure | 45 | F | H |
| DSP Submersible Pump Mechanical failure | 59 | C | M |
| DAFT Access Stairs failure | 47 | D | M |
| Multistage Blower failure | 45 | D | M |
| Blower Air Flow Control failure | 45 | D | M |
| Odor Control Scrubber Pad failure | 45 | C | M |
| Potable Pump Station Mechanical failure | 41 | C | M |
| West Primary Clarifiers Weirs and Launders failure | 40 | D | M |
| East Primary Sludge Suction Piping failure | 40 | D | M |
| Aeration Diffusers Performance failure | 40 | D | M |
| Secondary Effluent Flow Meter failure | 40 | C | M |
| Communication/SCADA Systems failure | 40 | C | M |
| Headworks Building Upper Floor Leak Drain Plumbing failure | 39 | E | M |
| Grit Removal Performance failure | 37 | F | M |
| Potable Pump Station Canopy Structural failure | 37 | D | M |
| Grit Pumps Electrical failure | 35 | F | M |
| RAS Hydraulic Control failure | 35 | F | M |
| Sludge Holding/EQ Tank Liner failure | 35 | F | M |
| WAS System Plugging/Loss of Capacity failure | 35 | D | M |
| Non-potable 3W Water Piping System failure | 32 | D | M |
| Scum Pumping Plugging failure | 30 | E | M |
| West Secondary Clarifiers Scum Skimmers failure | 30 | D | M |

# 3 Conclusions & Recommendations

**Table 3-1** summarizes the current O&M mitigation measures, recommendations for O&M best practices, and associated capital improvement projects with additional considerations aimed to mitigate risk to an acceptable level at the CTP.

## Table 3-1. Summary of CTP Mitigation Measures and Recommendations

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| E | Odor Control Scrubber Performance failure | Staff report that acid washes are performed quarterly, and to maintain effectiveness they have doubled the volume of acid being used. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| E | Drainage Pump Station Performance failure | Routine inspection and maintenance. Staff installed the submersible pump as a mitigation measure for operational issues using the fixed pumps, but since it is a non-engineered temporary system, it has a higher probability of failure. Currently, the fixed pumps provide pumping redundancy as a mitigation measure for the submersible pump failure. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24. Fundamentally, the project needs to address the following issues: 1) location of the station and/or flood protection; 2) reliability of the station and design of pumps for the current operating conditions; 3) condition of existing structures, equipment, piping, and valves. |
| E | Odor Control Scrubber System Capacity Failure | Acid washes performed quarterly help to clean the scrubber media and restore airflow capacity temporarily until buildup and media clogging reduces airflow capacity again. The frequency of cleaning required to maintain system capacity is not practical so most of the time the system is underperforming. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| H | Drainage Pump Station Structural failure | Visual observation of the structure is performed as routine maintenance. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |
| H | Aeration Basins Pump Drain System failure | None. | Recommend placing a sign or temporary safety barrier around the drain system to reduce the risk of piping getting hit and broken during maintenance activities in the gallery. | Recommend to replace the drain system with an engineered, reliable solution. |
| H | DPS Fixed Pump Mechanical failure | Routine maintenance on the equipment is performed. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |
| H | Emergency Generator failure | Routine maintenance on the equipment is performed. The generator is run every 2 weeks. It is old but has low total runtime and the manufacturer claims it should not have problems. Controls on the engine are brand new. Annual service is done by a 3rd party. | No additional O&M measures are identified to mitigate this failure. | Standby power condition assessment scheduled for FY 23 / 24 and reconstruction scheduled for FY 31 / 32 |
| H | Odor Control Foul Air Ducting failure | None. | Periodically perform a ducting flow check either by in-house staff or contract third party HVAC to make damper adjustments and check for leaks. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| H | Influent CLB force main failure | None. | No additional O&M measures are identified to mitigate this failure. | None. |
| H | West Aeration Basins Treatment Performance failure | Staff report SRT and MLSS are kept low to stay out of partial nitrification. Staff run two primary settling tanks simultaneously during peak loading events in attempt to stabilize loading to the aeration basins and bleach the RAS line periodically to control filament growth. Staff can utilize nitrate probes at the downstream end of the aeration basins to monitor for nitrification activity and keep the process out of nitrification. | Current MLSS levels are unusually low, even for a non-nitrifying conventional activated sludge plant. Consider modeling and determining viability of running fewer aeration basins with a higher MLSS concentration, which should in theory provide improved process performance and stability. This may become more feasible if influent or primary effluent equalization is added to the process. | Consider constructing an equalization basin to offset incoming loading and better control the process. New diffusers are ordered and should be installed in FY 22/23. System performance will be re-evaluated after that. |

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| H | West Aeration Basins Step Feed Channel Grating failure | Staff do not walk on step feed channel grating | Place cones or other safety features around unsafe grating areas to avoid situations where staff or visitors could potentially step on unsafe grating surfaces. | Rehabilitate concrete and replace grating above the step feed channel. |
| H | Odor Control Water Softener failure | Staff is considering purchase of a new water softener or possibly small RO system to remove scale build up. | Consider purchase and installation of a new softener. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| H | SCWD Influent Flow Meter failure | Staff use the effluent flow meter for reporting and process control, which acts as a reasonably good substitute for influent flow. However, the effluent flow meter is now a single point of failure. Staff report they are looking into replacing the flow meter and are looking at alternative influent flow meter types that would not be subject to fouling. | No additional O&M measures are identified to mitigate this failure. | Replace flow meter with a different technology that is less susceptible to fouling and more suitable for the application. |
| M | DSP Submersible Pump Mechanical failure | The fixed pumps rotate into duty operation if the submersible pump fails. The fixed pumps also kick on when the submersible pump cannot handle the flow. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |
| M | DAFT Access Stairs failure | Staff avoid using the stairs where possible. | No additional O&M measures are identified to mitigate this failure. | Replace the access stairs. Staff are soliciting bids for replacement. It is a work in progress. |
| M | Multistage Blower failure | Blower redundancy provides mitigation for possible blower failure. Additionally, staff ordered new valves for each pass and for each tank to improve airflow and maintain the DO setpoint more efficiently with the current system. | No additional O&M measures are identified to mitigate this failure. | Recommend eventual replacement of the blowers with high-speed turbo blowers for improved energy efficiency and turndown capabilities. |

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| M | Blower Air Flow Control failure | Routine maintenance on the equipment is performed and new MOVs are ordered to improve airflow control. | No additional O&M measures are identified to mitigate this failure. | Recommend improvements to the existing aeration piping systems to isolate the east basins system from the west basins system. This will allow for better blower control and efficiency when paired with blower replacements and air piping improvements. |
| M | Odor Control Scrubber Pad failure | None. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| M | Potable Pump Station Mechanical failure | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | Replace remainder of the potable water pump station system and canopy structure. |
| M | West Primary Clarifiers Weirs and Launders failure | None. | No additional O&M measures are identified to mitigate this failure. | West PC system upgrade scheduled for FY 31 /32. East PC system sedimentation upgrade scheduled for FY 32 / 33 |
| M | East Primary Sludge Suction Piping failure | None. | Recommend pipe replacement and/or coating repairs to mitigate additional piping corrosion. | Primary sludge pump station upgrades scheduled for FY 28 / 29 |
| M | Aeration Diffusers Performance failure | Periodic cleaning of the diffusers. | No additional O&M measures are identified to mitigate this failure. | None. Diffuser replacement is already scheduled for 2022. |
| M | Secondary Effluent Flow Meter failure | Meter is calibrated as needed to maintain accurate readings. | No additional O&M measures are identified to mitigate this failure. Risk is primarily because the meter is being temporarily relied upon for influent flow reporting. | None. |
| M | Communication/SCADA Systems failure | There is a DSL backup with offsite communication by dialer. Currently have Verizon and T-Mobile as an internet source, plus DSL, and a program automatically selects for the best connection. Satellite phone is also maintained on site. | Investigate potential alternative sources of data and internet connection to the plant. | SCADA system reconstruction scheduled for FY 31 / 32 |

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| M | Headworks Building Upper Floor Leak Drain Plumbing failure | None. | Roof and ceiling inspection is recommended to identify any repair any deficiencies and defects. | None. |
| M | Grit Removal Performance failure | None. | Consider performing a grit characterization to determine the grit profile coming into and out of the grit chambers. This data can be used to optimize chamber performance or make adjustments to improve grit capture. | Grit handling upgrade scheduled for FY 24 / 25 |
| M | Potable Pump Station Canopy Structural failure | None. | No additional O&M measures are identified to mitigate this failure. | Replace remainder of the potable water pump station system and canopy structure. |
| M | Grit Pumps Electrical failure | Staff report they put old seals on new pumps to lower the power load or run two pumps at the same time to prevent high currents from shutting the pumps off. | No additional O&M measures are identified to mitigate this failure. | Consider replacing the grit pumps with new pumps with appropriate seals for the application. Recommend also installing a pump failure alarm signal. |
| M | RAS Hydraulic Control failure | Staff have the controls for SCADA to calculate RAS return rate, but it doesn't work correctly and staff are not sure why. Therefore, staff use the target return rate on SCADA as the setpoint and manually adjust the valves to get the target return rate. | Replace the current SCADA RAS return rate programming with new programming that can use the data from the pumps and MOV's to accurately hit the target RAS return rate without having to manually adjust the valves to compensate for errors. | None. |
| M | Sludge Holding/EQ Tank Liner failure | None. | No additional O&M measures are identified to mitigate this failure. | Perform a tank inspection and condition assessment. Based on recommendations, perform concrete rehabilitation and replace the liner. |
| M | WAS System Plugging/Loss of Capacity failure | Staff use a connection at the head of the 4 inch discharge pipe for cleaning due to absence of a cleanout on the suction side. | Install a cleanout for the suction side of the WAS piping. | WAS pump station condition assessment and upgrades scheduled for FY 22 / 23, 26 / 27, 28 / 29. |

| Risk | Failure Mode/Scenario | Current O&M Mitigation Measures | O&M Recommendations | Capital Improvement Project |
|---|---|---|---|---|
| M | Non-potable 3W Water Piping System failure | Routine leak repairs. Additionally, in case of a pipe failure, the 3W system recognizes the abrupt pressure drop and automatically shuts down. | No additional O&M measures are identified to mitigate this failure. | Non-potable 3W water system replacement scheduled for FY 30 / 31. |
| M | Scum Pumping Plugging failure | Staff have used a hose to break up the scum mat. | Consider installing a jet mixing system or chopper pump for the scum well to break up scum and mitigate plugging issues. | Install a scum line that bypasses the DAFT and feeds the export sludge holding tank directly. |
| M | West Secondary Clarifiers Scum Skimmers failure | None. | No additional O&M measures are identified to mitigate this failure. | Recommend replacement of secondary clarifier scum skimmers. |

SOCWA's Ten Year Capital Improvement Program (dated August 5, 2019) defines the capital improvement project list through 2028. SOCWA staff revisit the CIP periodically and make adjustments over time. Many of the considerations and recommendations made as part of the CoFA are addressed within the scope of currently budgeted CIP projects. The results of the CoFA are intended to prioritize current CIP projects and where applicable, recommend adjustments to their scope to address deficiencies and mitigate risk.

In summary, the following capital improvement project needs are identified by priority for consideration in SOCWA's Capital Improvement Program. Project recommendations are separated by priority based on risk designation and where practical, lower priority projects are integrated with higher priority projects for synergy to consider practical implementation. Where applicable, current CIP projects that address the project need and comments on priority are included in **(bold parentheses)**.

### Top Priority Projects (Address Extra High Risk Failure Modes)

- Replace the existing odor control system and scrubber. The existing system is prone to media clogging, is undersized relative to the sulfide gas load, and as a result cannot achieve the airflow throughput and performance intended of the system. Include a new water softener as part of the project. **(CIP Project No. 15102 includes replacement of the scrubber, foul air ducting, and ancillary fans beginning in FY 22/23. The existing budgeted CIP project appears to address the core project needs and schedule.)**
- Protect the existing drainage pump station either by relocating the station to higher ground out of the 100-year floodplain or by constructing flood protection levees around the existing station site. Alternatives will need to be evaluated in a preliminary design study and consider cost, regulatory considerations such as permitting and environmental impacts, and future risk related to O&M access and geotechnical stability due to proximity to creek. **(This project was not originally identified in SOCWA's 2019-2028 Ten Year Plan but was later added by staff to begin in FY 22/23.)**

### Secondary Priority Projects (Address High Risk Failure Modes)

- Recommend replacing the aeration basin pump drainage system with an engineered, more reliable solution. The current system is constructed of small diameter PVC piping not suitable for the location and application. **(Not included in any current budgeted CIP project. As a small project, it should be feasible to add this project to the CIP and complete design using on-call engineering services.)**

- Replace the emergency generator. The existing generator is grandfathered into compliance with SCAQMD; however, this model of generator has been banned in other AQMD jurisdictions and it is expected to be banned at some point in the future by SCAQMD based on this precedent. While there is no timetable for SCAQMD to ban the generator, it is likely only a matter of time before the generator will need to be replaced to meet updated emissions standards. **(Project No. 15144 Standby Power Condition Assessment scheduled for FY 23 / 24 and No. 15129 Reconstruction scheduled for FY 30 / 31 through FY 32 / 33 are budgeted to address generator deficiencies. However, reconstruction is likely not feasible for the existing generator, so it is recommended to replace the condition assessment and reconstruction projects with a generator replacement project to be completed within the next 3 years).**
- Construct an influent or primary effluent equalization basin to offset incoming flows and loads to the aeration basins and improve process control and stability. **(Not included in any current CIP project. If budget can become available for this project, it would present a high-value opportunity to address septicity, process instability and control challenges, energy efficiency, and performance deficiencies for the plant).**
- Rehabilitate concrete and replace grating above the west aeration system step feed channel. **(Not included in any current CIP project. As a small rehab/replacement project, it should be feasible to complete this project by hiring a grating vendor and contractor directly).**
- Replace SCWD influent flow meter with a different technology that is less susceptible to fouling and more suitable for influent flow. **(Included in Project No. 15131 Headworks Building Miscellaneous Improvements scheduled for FY 33 / 34. Recommend re-prioritizing this project or pulling the influent flow meter component of the project specifically for near-term implementation so that the plant is not reliant upon the effluent flow meter as a single point of failure.)**

### Tertiary Priority Projects (Address Medium Risk Failure Modes)

- Replace the DAFT access stairs as they present a potential safety concern for staff. **(Recommend implementing as an independent, small project prior to related scope in Project No. 15104 Dissolved Air Floatation System Rehabilitation budgeted for FY 30 / 31).**
- Recommend improvements to the activated sludge aeration air piping header system to allow for operations to isolate the east basins system from the west basins system. Additionally, recommend replacing existing aeration blowers with high-speed turbo blowers for improved energy efficiency, control, and turndown capabilities. Recommend dedicated blowers for both the west aeration basins system and east aeration basins system. **(Related to Project No. 3544-000. Recommend including in the project scope evaluation and improvements to aeration system piping to allow for better system isolation and evaluate high speed turbo blowers instead of new multistage centrifugal blowers).**
- Replace the potable water pump station and canopy structure and locate the facilities further away from the Aliso creek. **(Included in Project No. 15110 Potable Water Pump Station Relocation scheduled for FY 28 / 29).**
- Replace launders and weirs on the primary clarifiers. **(Included in Project No. 15112 West Primary Sedimentation System Upgrade scheduled for FY 32 /33 and No. 15114 East Primary Sedimentation System Upgrade scheduled for FY 33 / 34. Project timeline likely needs to be expedited due to current condition of equipment).**
- Upgrade the existing SCADA system and replace plant PLC's, cabinets, and communication cables. **(Included in Project No. 15117 SCADA System Reconstruction scheduled for FY 31 / 32. Current CIP project addresses the project need).**
- Recommend repairing leaks located at the headworks building at upper floor drain. **(Not included in any current CIP project. Building repairs for leaks can likely be done by a building contractor directly unless structural modifications are required).**

- Upgrade the grit removal system and associated equipment. **(Related to Project No. 15101 Grit Handling Upgrade scheduled for FY 25 / 26. Recommend adding scope to the project including evaluating existing grit chambers and their performance and if necessary, construct improvements to the grit chambers to improve performance).**
- Replace the current SCADA RAS return rate programming with new programming that can use the data from the pumps and MOV's to accurately hit the target RAS return rate without having to manually adjust the valves to compensate for errors. **(Not included in any current CIP project. May be able to be implemented by hiring a SCADA programmer directly as opposed to going through the capital budget).**
- Install a cleanout on the WAS line to mitigate clogging failures. **(Related to Project No. 15143 RAS/WAS Pump Station Condition Assessment scheduled for FY 22 / 23 and Project No. 15115 RAS and WAS Pump Station scheduled for FY 27 / 28. Cleanouts should be provided on sludge lines to improve maintenance and avoid clogging failures).**
- Perform an export sludge holding tank inspection and condition assessment and based on inspection recommendations, perform concrete rehabilitation, and replace the tank liner, as necessary. **(Not included in any current CIP project. The tank and liner are relatively new, but the liner has failed and should be replaced sooner rather than later to protect the newer concrete structure from premature degradation. This is a candidate project to be expedited relative to other tertiary project recommendations).**
- Replace the 3W water system. **(Related to Project No. 15111 Non-potable Water Pump Station Reconstruction scheduled for FY 31 / 32. Recommend expanding the project scope to include new 3W piping throughout the plant, due to the frequent failures of the existing piping system).**
- Install a scum line that bypasses the DAFT and feeds the export sludge holding tank directly. **(Related to, but not currently included in the scope of Project No. 15108 scheduled for FY 22 / 23. DAFT bypass for scum would likely become the normal operating condition and would mitigate scum-related failures of the DAFT system and equipment. Recommend adding this scope element to the project).**
- Recommend east primary sludge suction piping replacement. **(Included in Project No. 15116 Primary Sludge Pump upgrades scheduled for FY 28 / 29).**
- Recommend replacement of west secondary clarifier scum skimmers. **(Not included in any current CIP project).**

In conclusion, it is recommended that adjustments are made to SOCWA's 10-year CIP implementation schedule and scope of projects to consider recommendations made herein. Top priority projects (i.e. projects that address one or more extra high risk failure modes) are recommended for expedited design and implementation, consistent with SOCWA's current CIP schedule. SOCWA's schedule for certain secondary priority and tertiary priority projects may also need to be expedited based on the project needs and associated risk designation. Refer to **Appendix A** for complete notes for each process area and failure mode assessed as part of this Consequence of Failure Analysis.

# Appendix A

## Complete CoFA Table

| Unit Process / Asset / Failure Mode/Scenario | Consequence of Failure (CoF) | | | | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Health & Safety | Treatment Performance/ Regulatory | Economic/ Personnel Resources | Public Image | | | | | | | |
| | 7 | 5 | 5 | 3 | | | | | | | |
| **Influent** | | | | | | | | | | | |
| **Influent Sewer** | | | | | | | | The influent sewer functions to convey raw, untreated wastewater to the CTP WWTP. There are two force mains feeding the CTP: one from South Coast Water District (SCWD) and one from City of Laguna Beach (CLB). Both enter directly at the headworks. | | | |
| Influent SCWD force main failure | 1 | 5 | 4 | 5 | 67 | A | L | Staff report that historically the SCWD force main has failed and several leaks occurred at the plant. Recently, the force main was rehabilitated to address any ongoing issues. | None. | No additional O&M measures are identified to mitigate this failure. | None. |
| Influent CLB force main failure | 1 | 5 | 4 | 5 | 67 | D | H | Staff report that condition of the CLB force main is unknown. If the force main fails, the CLB does not have another way to get flows to the plant. Currently, the CBL and SCWD are in design to install an interconnection between the force mains as a backup in case of a failure. | None. | No additional O&M measures are identified to mitigate this failure. | None. |
| **Headworks** | | | | | | | | | | | |
| **Headworks Building** | | | | | | | | The headworks building functions to shelter and protect headworks equipment. | | | |
| Headworks Building Upper Floor Leak Drain Plumbing failure | 3 | 1 | 2 | 1 | 39 | E | M | Staff report that wash water leaks from the upper floor down to the lower floor, and in the past moisture has gotten into electrical panels. Staff suspect that leaks into the room are coming from a drainage pipe in the ceiling. | None. | Roof and ceiling inspection is recommended to identify any repair any deficiencies and defects. | None. |
| **Influent Flow Meter** | | | | | | | | Magnetic flow meter functions to monitor plant influent flow rates. | | | |
| SCWD Influent Flow Meter failure | 2 | 3 | 2 | 2 | 45 | F | H | Staff report that the influent magnetic flow meter does not function properly which renders the equipment unreliable. In the past, staff have investigated and found the magnetic field is being disrupted by build up of a slime layer that forms on the inside of the meter which causes unreliable and low readings compared to the actual influent flow. Inaccurate readings are an issue because flow measurement is a compliance point and is reported to the Regional Board. The current configuration of the meter is such that it cannot be cleaned easily and therefore is not feasible to maintain accuracy. | Staff use the effluent flow meter for reporting and process control, which acts as a reasonably good substitute for influent flow. However, the effluent flow meter is now a single point of failure. Staff report they are looking into replacing the flow meter and are looking at alternative influent flow meter types that would not be subject to fouling. | No additional O&M measures are identified to mitigate this failure. | Replace flow meter with a different technology that is less susceptible to fouling and more suitable for the application. |
| **Rotary Drum Screens** | | | | | | | | 3 rotary drum screens (typically 2 in service, 1 on standby) function to remove debris and other large materials from the influent wastewater before entering downstream processes. Screens were installed in 2007. | | | |
| Rotary Drums Screens Mechanical failure | 2 | 1 | 2 | 1 | 32 | B | L | Screens were installed in 2007. Staff report that the covers are falling apart due to frequent opening and closing. Historically, there were safety concerns when accessing screens and repairing/replacing parts of the equipment, however, these concerns have since been addressed. | Routine maintenance. Staff plans to replace bearings and gear boxes. As-needed repairs on the screens are performed in house. | No additional O&M measures are identified to mitigate this failure. | Headworks rotary drum screen replacement scheduled for FY 22 / 23. Screen washer / compactor system study assessment scheduled for FY 29 / 30. |
| Rotary Drum Screens Performance Failure | 1 | 1 | 1 | 1 | 20 | C | L | Staff report that rags and debris are still getting through the screens which may impact downstream processes, although this is not expected to cause any process upsets and regulatory violations. The sludge holding tank mixing system has a grinder on the entrance, therefore rags bypassing the screens are being recirculated and grinded to minimize risk of ragging and clogging of pumps. | Routine maintenance on equipment is performed. Grinders on sludge holding tank mixing system mitigate potential for ragging of sludge pumps. | No additional O&M measures are identified to mitigate this failure. | None. |
| **Aerated Grit Chambers** | | | | | | | | 3 aerated grit chambers (typically 2 service, and 1 on standby) function to separate inorganic solids and grease, and to reduce inorganic solids and scum loading rates to secondary treatment processes. | | | |
| Grit Removal Performance failure | 2 | 2 | 2 | 1 | 37 | F | M | Staff report that grit chambers are not believed to be very effective, and grit is passing through to the primary clarifiers. Grit pass-through can lead to wear on downstream processes such as abrasion to primary sludge pumps and clarifier scrapers. | None. | Consider performing a grit characterization to determine the grit profile coming into and out of the grit chambers. This data can be used to optimize chamber performance or make adjustments to improve grit capture. | Grit handling upgrade scheduled for FY 24 / 25 |
| Grit Washer Cyclone/Classifier/Hopper System failure | 1 | 1 | 1 | 1 | 20 | A | L | There are 3 washer cyclones/classifiers (1 in service, 2 in standby). Staff report they are satisfied with the new equipment and there have been no failures. Equipment was recently replaced. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | Grit handling upgrade scheduled for FY 24 / 25 |
| Grit Removal Tank Structure failure | 1 | 1 | 3 | 1 | 30 | C | L | Staff report some concrete degradation on tank interior structure e.g. some concrete aggregate and surface loss, potential damage to coating, cracking, and delamination. | None. | No additional O&M measures are identified to mitigate this failure. | Grit tank condition assessment scheduled for FY 22 / 23 |
| **Low Pressure Blowers** | | | | | | | | 2 low pressure, positive displacement (PD) blowers (typically 1 in service and 1 on standby) function to provide agitation air to influent channels, grit chambers, secondary treatment, but not to the aeration basins. Blowers are located in a separate small room and were manufactured Gardner Denver. The blowers were installed in 2020. | | | |
| Low Pressure Blowers failure | 1 | 2 | 3 | 1 | 35 | A | L | Staff report they are satisfied with blowers. There are no ongoing issues or failures. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | None. |
| Low Pressure Blowers - Agitation Air Piping and Diffusers failure | 1 | 2 | 3 | 1 | 35 | C | L | Agitation air piping is schedule 40 PVC piping that is prone to cracking and failure. Staff need to periodically replace failed agitation air piping. | None. | No additional O&M measures are identified to mitigate this failure. | None. |

| Unit Process<br>Asset<br>Failure Mode/Scenario | Consequence of Failure (CoF)<br>Health & Safety<br>7 | <br>Treatment Performance/ Regulatory<br>5 | <br>Economic/ Personnel Resources<br>5 | <br>Public Image<br>3 | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grit Pump Station** | | | | | | | | Grit pumps (2 in service, 0 on standby) function to pump grit slurry to grit washer/classifier. | | | |
| Grit Pumps failure | 1 | 2 | 3 | 1 | 35 | B | L | Staff report that grit pumps perform adequately. There is no redundancy as two pumps run at the same time. | Routine maintenance. | Recommend purchasing a shelf-spare grit pump to mitigate impacts from a potential failure. | Look into replacing the grit pumps with new pumps with appropriate seals for the application. Recommend also installing a pump failure alarm signal. |
| Grit Pumps Electrical failure | 1 | 2 | 3 | 1 | 35 | F | M | Staff report that new grit pumps have ongoing electrical load failure. The motors on the pumps are rated for 7 amps but pumps trip regularly which is thought to be caused by too much resistance from the new type of pump seals being used. If one pump is off, the current increases from 7 to 9 amps and trips an alarm. To have the 7 amperage that the pumps are rated for, both pumps have to be run at the same time at the same speed and therefore, there is no redundancy. Additionally, there is no alarm indicating pump failure. | Staff report they put old seals on new pumps to lower the power load or run two pumps at the same time to prevent high currents from shutting the pumps off. | No additional O&M measures are identified to mitigate this failure. | Consider replacing the grit pumps with new pumps with appropriate seals for the application. Recommend also installing a pump failure alarm signal. |
| **Odor Control Scrubber** | | | | | | | | Single duty chemical scrubber functions to remove foul air and gases from various plant locations. | | | |
| Odor Control Scrubber Performance failure | 4 | 4 | 5 | 4 | 85 | D | E | Staff report nuisance odors are an issue at the plant and they are not satisfied with the scrubber. The scrubber is overloaded and scale has built up inside the media rapidly. Scale build up is occurring at the top of the scrubber at stages 2 and 3, and in the nozzles, causing them to clog. Staff report that scrubber conditions have gotten worse over time and an acid wash for scale removal is difficult and scale will build back up in about 2 weeks. Public odor complaints have been reported in the past. | Staff report that acid washes are performed quarterly, and to maintain effectiveness they have doubled the volume of acid being used. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| Odor Control Scrubber System Capacity Failure | 2 | 4 | 5 | 4 | 71 | F | E | Staff report that the odor control system is undersized. The scrubber is designed for 20 ppm hydrogen sulfide but is typically loaded with 40 ppm. Design airflow rate is 20,000 scfm but once the scale builds up in the media, airflow drops to 12,000 scfm. | Acid washes performed quarterly help to clean the scrubber media and restore airflow capacity temporarily until buildup and media clogging reduces airflow capacity again. The frequency of cleaning required to maintain system capacity is not practical so most of the time the system is underperforming. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| Odor Control Water Softener failure | 2 | 4 | 2 | 4 | 56 | F | H | Existing softener was installed about 2 years ago. Regular failure has resulted in the softener being taken offline indefinitely. Evoqua inspected the softener and recommended purchase of a new one. Evoqua reported that the softener's mechanical and electrical components are corroded due to chemical exposure. | Staff is considering purchase of a new water softener or possibly small RO system to remove scale build up. | Consider purchase and installation of a new softener. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| Odor Control Scrubber Pad failure | 2 | 2 | 3 | 2 | 45 | C | M | The concrete scrubber pad exhibits concrete degradation, exposed rebar, and damage. Scrubber pad not likely to catastrophically fail before odor control system is reconstructed in the next couple years. | None. | No additional O&M measures are identified to mitigate this failure. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| Odor Control Foul Air Ducting failure | 3 | 4 | 3 | 4 | 68 | C | H | Air ducting is 20 years old and staff report that there are air leaks around the scrubber. Failure of air ducting results in inefficient odor control and potential release of odors, which could result in public complaints and exposure of staff to hydrogen sulfide gases. | None. | Periodically perform a ducting flow check either by in-house staff or contract third party HVAC to make damper adjustments and check for leaks. | Odor control scrubber / foul air system reconstruction scheduled for FY 23 / 24 |
| **Drainage Pump Station** | | | | | | | | A single-duty submersible pump (1 in service, 0 on standby) functions to remove all plant drainage, DAFT underflow, filter backwash. Two larger fixed pumps provide backup for the system if the submersible pump fails. | | | |
| Drainage Pump Station Performance failure | 3 | 4 | 5 | 5 | 81 | F | E | The drainage pump station is located in a 100 year flood plain. Staff report that there is limited access to the pump station during flooding or rain events due to inundation around the pump but not within the pump station. If it fails, then there is potential for a spill to the nearby creek. Staff report that they would like to build a retaining wall by the creek along the fence to separate the pump station from the creek and mitigate risk of flooding/overflow in case of an emergency. | Routine inspection and maintenance. Staff installed the submersible pump as a mitigation measure for operational issues using the fixed pumps, but since it is a non-engineered temporary system, it has a higher probability of failure. Currently, the fixed pumps provide pumping redundancy as a mitigation measure for the submersible pump failure. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24. Fundamentally, the project needs to address the following issues: 1) location of the station and/or flood protection; 2) reliability of the station and design of pumps for the current operating conditions; 3) condition of existing structures, equipment, piping, and valves. |
| DPS Fixed Pump Mechanical failure | 3 | 4 | 4 | 5 | 76 | C | H | Staff report that large pumps in the drainage pump station are not used except in rare circumstances or if the single duty submersible pump fails. They are too large for typical flows and will have a high number of starts and stops. | Routine maintenance on the equipment is performed. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |
| DSP Submersible Pump Mechanical failure | 2 | 4 | 2 | 5 | 59 | C | M | The submersible pump is a smaller pump that was installed as a retrofit to the wet well and is better sized for the flows currently seen at the drainage pump station. Failure of the submersible pump would lead to the fixed pumps rotating into duty operation. The system was not an engineered retrofit so the design is unorthodox and temporary in nature. Staff did not report any mechanical issues associated with the pump. | The fixed pumps rotate into duty operation if the submersible pump fails. The fixed pumps also kick on when the submersible pump cannot handle the flow. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |
| Drainage Pump Station Structural failure | 3 | 4 | 5 | 5 | 81 | C | H | Staff report concerns about the overall structural condition of the pump station. The above ground building has some issues but a professional condition assessment on the overall structure has not been performed, so the extent of structural defects, if any, is unknown. Relocating the pump station to higher ground should be considered and evaluated during preliminary design of the station upgrades CIP project. | Visual observation of the structure is performed as routine maintenance. | No additional O&M measures are identified to mitigate this failure. | Drainage pump station upgrades scheduled for FY 23 / 24 |

*CoFA - South Orange County Water Authority*
*Costal Treatment Plant (CTP)*

| Unit Process<br>Asset<br>Failure Mode/Scenario | Consequence of Failure (CoF)<br>Health & Safety<br>7 | <br>Treatment Performance/ Regulatory<br>5 | <br>Economic/ Personnel Resources<br>5 | <br>Public Image<br>3 | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Primary Treatment** | | | | | | | | | | | |
| **Primary Clarifiers** | | | | | | | | 5 identical rectangular primary clarifiers (typically 2 in service, 3 on standby) function to separate solids and grease, and to reduce solids loading to secondary treatment. Primary effluent flows from the clarifiers by gravity to the downstream aeration basins. | | | |
| Primary Clarifiers Scum Collectors failure | 1 | 1 | 3 | 1 | 30 | C | L | Staff report that helical skimmers have an ongoing issue with collecting floating material and are overall ineffective. Staff report the skimmers have not been modified or repaired and some parts are corroded. However the skimmer drivers were recently replaced. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | West PC system upgrade scheduled for FY 31 /32. East PC system sedimentation upgrade scheduled for FY 32 / 33 |
| Primary Clarifiers Sludge Collectors failure | 1 | 1 | 3 | 1 | 30 | B | L | Staff report that sludge collectors are fairly new and they are satisfied with the system's overall function and performance. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | West PC system upgrade scheduled for FY 31 /32. East PC system sedimentation upgrade scheduled for FY 32 / 33 |
| West Primary Clarifiers Weirs and Launders failure | 1 | 3 | 3 | 1 | 40 | D | M | Staff report that west launders are in poor condition and weirs are partially broken. Launders on the east side have never been replaced. If launders and weirs fail, then settling rates and hydraulic loading will be adversely affected, affecting treatment in the secondary process. | None. | No additional O&M measures are identified to mitigate this failure. | West PC system upgrade scheduled for FY 31 /32. East PC system sedimentation upgrade scheduled for FY 32 / 33 |
| **Primary Sludge Pumping** | | | | | | | | Primary sludge pumps function to pump primary sludge for further sludge treatment. All primary sludge goes through a grinder. Pumps were installed in 2022 to run on a timer and are brand new therefore they were not scored in the workshops. | | | |
| East Primary Sludge Suction Piping failure | 1 | 3 | 3 | 1 | 40 | D | M | Staff report that above grade piping on the east primary tanks are corroded. Corrosion is present on the portion of the line that goes into the tank and the hopper. Staff report that piping repairs can be performed in house. | None. | Recommend pipe replacement and/or coating repairs to mitigate additional piping corrosion. | Primary sludge pump station upgrades scheduled for FY 28 / 29 |
| **Secondary Treatment** | | | | | | | | | | | |
| **Aeration Basins** | | | | | | | | The CTP has two main activated sludge process trains, the older east basins (two total) and the newer west basins (three total). The east basins and west basins have different operating water levels, and the plant typically runs only the west basins unless maintenance or high flows require the use of the east basins as well. The aeration basins function as a biological treatment reactor to reduce BOD and TSS concentrations. | | | |
| West Aeration Basins Treatment Performance failure | 1 | 5 | 5 | 3 | 66 | D | H | The process is operated as a non-nitrifying conventional activated sludge process. Staff report that the average operating SRT is about 2.2 days and MLSS during winter months is between 600 and 900 mg/L and 300-400 mg/l during summer. Flowrates are variable in the summer due to high loading events.<br>Staff report several issues with the aeration basins. There is reported algae growth within the basins and there is limited ability to treat higher peak loads due to the retained biomass and blower size limitations. Therefore, on peak loading days staff will typically run 2 primary tanks instead of one to remove more BOD and TSS ahead of the aeration basins and stabilize treatment requirements. Staff report that if they wouldn't adjust operations during summer months, DO could decrease down to 0.1 - 0.2 mg/L. Low DO levels often lead to filamentous sludge bulking and inadequate treatment. Staff evaluated sludge filaments and found sulfides, which are believed to originate from septicity issues in the collection system. | Staff report SRT and MLSS are kept low to stay out of partial nitrification. Staff run two primary settling tanks simultaneously during peak loading events in attempt to stabilize loading to the aeration basins and bleach the RAS line periodically to control filament growth. Staff can utilize nitrate probes at the downstream end of the aeration basins to monitor for nitrification activity and keep the process out of nitrification. | Current MLSS levels are unusually low, even for a non-nitrifying conventional activated sludge plant. Consider modeling and determining viability of running fewer aeration basins with a higher MLSS concentration, which should in theory provide improved process performance and stability. This may become more feasible if influent or primary effluent equalization is added to the process. | Consider constructing an equalization basin to offset incoming loading and better control the process. New diffusers are ordered and should be installed in FY 22/23. System performance will be re-evaluated after that. |
| Aeration Basins Pump Drain System failure | 4 | 5 | 2 | 5 | 78 | B | H | The aeration basin drain line was retrofitted by staff in years past with a 4" PVC pipe with a PVC ball valve as a bypass for the existing ductile iron drain line. Staff believe this ball valve holds back the volume in the aeration tanks. This modification was not engineered and there is concern that if the pipe or valve is to fail, it could result in a spill of mixed liquor into the gallery area which would be difficult to stop. Potential risks are seismic activity or equipment work in the area that results in hitting and breaking the pipe. | None. | Recommend placing a sign or temporary safety barrier around the drain system to reduce the risk of piping getting hit and broken during maintenance activities in the gallery. | Recommend to replace the drain system with an engineered, reliable solution. |
| West Aeration Basins Step Feed Channel Grating failure | 4 | 1 | 3 | 3 | 57 | F | H | The grating above the step feed channel was observed to be in poor condition and a safety concern. Concrete degradation and exposed rebar was observed along the concrete edges at the grating support locations. Concrete rehabilitation and grating replacement is needed. | Staff do not walk on step feed channel grating | Place cones or other safety features around unsafe grating areas to avoid situations where staff or visitors could potentially step on unsafe grating surfaces. | Rehabilitate concrete and replace grating above the step feed channel. |
| **Diffusers** | | | | | | | | Diffusers function to deliver fine bubble diffused air to the aeration basins and support oxygen transfer efficiency to the biomass. They are scheduled to be replaced in 2022. | | | |
| Aeration Diffusers Performance failure | 1 | 3 | 3 | 1 | 40 | D | M | Staff report that the existing diffusers are not reliable and have poor oxygen transfer efficiency. Staff have placed an order for new diffusers. Diffuser replacement is scheduled to be completed in 2022. | Periodic cleaning of the diffusers. | No additional O&M measures are identified to mitigate this failure. | None. Diffuser replacement is already scheduled for 2022. |

*CoFA - South Orange County Water Authority*
*Costal Treatment Plant (CTP)*

| Unit Process / Asset / Failure Mode/Scenario | Consequence of Failure (CoF) | | | | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Health & Safety | Treatment Performance/ Regulatory | Economic/ Personnel Resources | Public Image | | | | | | | |
| | 7 | 5 | 5 | 3 | | | | | | | |
| **Blowers** | | | | | | | | Three (3) 150 HP centrifugal, Gardner Denver blowers (typically 1 in service, 2 on standby) function to deliver air to the aeration basins and supply dissolved oxygen to the activated sludge microorganisms. | | | |
| Multistage Blower failure | 1 | 2 | 5 | 1 | 45 | D | M | Staff report that the blowers were installed in 2004. Blowers are now 18 years old and are expected to reach the end of their useful life within the next 2 to 7 years. There is robust installed redundancy for the blowers, however, the centrifugal blowers are not as energy efficient and resilient in terms of turndown as modern high speed turbo blowers. Eventual replacement of the blowers should consider upgrade to the modern high speed turbo technology.<br><br>Blower control is based on DO setpoints in the aeration basins, however, due to limited turndown and effective control there are limitations on the process. Eventual replacement of the blowers should also consider an analysis of the air piping and control valves to confirm that the necessary range of airflow can be achieved in the process with the new blowers. | Blower redundancy provides mitigation for possible blower failure. Additionally, staff ordered new valves for each pass and for each tank to improve airflow and maintain the DO setpoint more efficiently with the current system. | No additional O&M measures are identified to mitigate this failure. | Recommend eventual replacement of the blowers with high speed turbo blowers for improved energy efficiency and turndown capabilities. |
| Blower Air Flow Control failure | 1 | 2 | 5 | 1 | 45 | D | M | Existing blowers do not have VFDs and are not compatible with VFDs. This makes adjusting and controlling airflows to match a DO setpoint more difficult and can lead to situations of both excess air being provided to the aeration basins and insufficient air being provided to the aeration basins. Additionally, since the east and west aeration basins operate with different hydraulic grade line elevations, it is different to control the air flow effectively to the east and west basins as they are on the same blower and system. | Routine maintenance on the equipment is performed and new MOVs are ordered to improve airflow control. | No additional O&M measures are identified to mitigate this failure. | Recommend improvements to the existing aeration piping systems to isolate the east basins system from the west basins system. This will allow for better blower control and efficiency when paired with blower replacements and air piping improvements. |
| **Secondary Clarifiers** | | | | | | | | 7 rectangular secondary clarifiers (currently 3 in service (west), 4 on standby (east)) function to settle solids from the activated sludge and waste those solids to DAF thickeners. Secondary effluent is pumped to the downstream tertiary filters or discharged to the Ocean Outfall for disposal. | | | |
| Secondary Clarifiers Sludge Collectors failure | 1 | 2 | 3 | 1 | 35 | A | L | Staff report that scum collectors are scheduled to be replaced and drives have failed in the past. Staff have already ordered new drives to replace the existing ones. | Staff is in the process of replacing drives. Clarifier redundancy provides mitigation of failure. | No additional O&M mitigation measures are recommended. | None. |
| West Secondary Clarifiers Scum Skimmers failure | 1 | 1 | 3 | 1 | 30 | D | M | Skimmers function to remove floatable scum from the top of the clarifier to the scum pit. Staff report that scum skimmers are in poor condition but still operating. | None. | No additional O&M measures are identified to mitigate this failure. | Recommend replacement of secondary clarifier scum skimmers. |
| **RAS Pumps** | | | | | | | | 4 RAS pumps (1 in service, 3 on standby) function to recirculate sludge from secondary clarifiers to maintain an adequate biomass population for treatment. RAS is periodically chlorinated at the plant to control filament growth and improve sludge settleability. | | | |
| RAS Pumps/Piping Mechanical failure | 1 | 2 | 2 | 1 | 30 | B | L | Staff report several issues. First, some piping under the grating is observed to be in poor condition with concern about potential failure. Second, it is challenging to control biomass quantities returned to each basin due to manual valve adjustments on the RAS line that feed each aeration basin. Failure of RAS pump/piping system leads to process imbalance and a loss of control. | Routine maintenance on the equipment is performed. Redundant pump units are available for operational backup and mitigate this failure. RAS flow is measured via a flow meter located on each RAS line. | No additional O&M measures are identified to mitigate this failure. | RAS pump station condition assessment scheduled for FY 22 / 23, 26 / 27, 28 / 29 |
| RAS Hydraulic Control failure | 1 | 3 | 2 | 1 | 35 | F | M | Currently, RAS is pumped into a common header and discharged to each basin manually. Staff would like to automate valves to balance the RAS remotely and have equal return to each basin. Staff report that RAS valves already have automatic controls on the influent side of the aeration tanks, but valves are still manually adjusted. Staff report that they have relatively new MOVs in place. | Staff have the controls for SCADA to calculate RAS return rate, but it doesn't work correctly and staff are not sure why. Therefore, staff use the target return rate on SCADA as the setpoint and manually adjust the valves to get the target return rate. | Replace the current SCADA RAS return rate programming with new programming that can use the data from the pumps and MOV's to accurately hit the target RAS return rate without having to manually adjust the valves to compensate for errors. | None. |
| **WAS Pumps** | | | | | | | | WAS centrifugal pumps (typically 1 in service, 1 on standby) function to waste sludge from the secondary clarifiers to the digesters to maintain biomass population and age. | | | |
| WAS Pumps Mechanical failure | 1 | 1 | 2 | 1 | 25 | B | L | Staff report they are satisfied with pumps. Performance, age, and condition are not a concern at this time. Full installed redundancy mitigates risk of failure. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | WAS pump station condition assessment and upgrades scheduled for FY 22 / 23, 26 / 27, 28 / 29. |
| WAS System Plugging/Loss of Capacity failure | 1 | 3 | 2 | 1 | 35 | D | M | Staff report ongoing issues with WAS piping. On the suction side, WAS piping is tied to RAS piping through a common header. On the discharge side, WAS piping is a separate line which goes to the DAFT. The condition of WAS discharge piping is unknown because it cannot be accessed easily to be inspected. | Staff use a connection at the head of the 4 inch discharge pipe for cleaning due to absence of a cleanout on the suction side. | Install a cleanout for the suction side of the WAS piping. | WAS pump station condition assessment and upgrades scheduled for FY 22 / 23, 26 / 27, 28 / 29. |
| **Scum Pump Station** | | | | | | | | Scum pumps function to transfer secondary scum from the scum pit to the DAFT. | | | |
| Scum Pumping Plugging failure | 1 | 1 | 3 | 1 | 30 | E | M | Staff report plugging concerns on the line going from the scum pit to the DAFT. Once scum gets to the DAFT, it plugs other equipment in the DAFT such as recirculation pumps and TWAS pumps. To avoid plugging, staff is interested in bypassing the DAFT and sending scum directly to the sludge holding tank. | Staff have used a hose to break up the scum mat. | Consider installing a jet mixing system or chopper pump for the scum well to break up scum and mitigate plugging issues. | Install a scum line that bypasses the DAFT and feeds the export sludge holding tank directly. |

*CoFA - South Orange County Water Authority*
*Costal Treatment Plant (CTP)*

| Unit Process<br>Asset<br>Failure Mode/Scenario | Consequence of Failure (CoF)<br>Health & Safety<br>7 | <br>Treatment Performance/ Regulatory<br>5 | <br>Economic/ Personnel Resources<br>5 | <br>Public Image<br>3 | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tertiary Treatment** | | | | | | | | | | | |
| **Sand Filtration** | | | | | | | | 8 Evoqua hydro clear sand filters (8 in service, 0 on standby) function to remove turbidity and residual TSS from secondary effluent. | | | |
| Sand Filtration Performance failure | 2 | 2 | 2 | 3 | 43 | B | L | Typically, the sand filter technology installed at the CTP does not provide much treatment value other than meeting Title 22 tertiary treatment standards. Staff have confirmed that the filters need to be loaded close to or below the NTU and TSS requirements for Title 22 standards to reliably meet the limits, since little treatment performance can be relied upon from the filters. Typically, feed NTU and TSS concentrations are below permit limits, so there are no performance issues. No chemicals are typically added to the filtration system, however, a coagulant dosing system is maintained in case influent NTU's get too high. | Primary mitigation measure is to feed the tertiary system with high quality secondary effluent, targeting NTU values below 2. | No additional O&M measures are identified to mitigate this failure. | None. |
| **Disinfection** | | | | | | | | | | | |
| **Chlorine Disinfection System** | | | | | | | | 2 chlorine contact basins (2 in service, 0 on standby with each basin capable of handling 50% of total flow) function to inactivate pathogens and bacteria in the filtered effluent using sodium hypochlorite, in order to meet regulatory disinfection requirements. | | | |
| CCC Dosing System Mechanical failure | 2 | 2 | 2 | 1 | 37 | A | L | Staff report no ongoing issues with the chlorine dosing system. While both CCC trains are in operation during the high demand season, dosing pump redundancy provides mitigation for failure. The CCC itself is not at risk of failure. | Routine maintenance on the dosing equipment is performed. | No additional O&M measures are identified to mitigate this failure. | None. |
| CCC Basin Performance and Structural failure | 1 | 2 | 4 | 3 | 46 | A | L | While there is no CCC redundancy, recycled water demand is seasonal, so during periods of low RW demand, a CCC train can be taken offline, drained and cleaned for maintenance. No known structural deficiencies exist with the CCC basins. | Cleaning can be completed if needed during periods of low RW demand. | No additional O&M measures are identified to mitigate this failure. | None. |
| **Final Effluent** | | | | | | | | | | | |
| **Effluent Storage Tank** | | | | | | | | The District repurposed the old digester tank for final effluent storage. An air diffusion system has been installed in the effluent storage tank for mixing. | | | |
| Effluent Storage Tank / Air Pipe Penetration failure | 1 | 1 | 2 | 3 | 31 | C | L | Staff report that last inspection was performed about three (3) years ago and there are concerns the staff have. First, the interior condition of the tank is unknown. Second, it is difficult to access the storage tank since there is no redundancy and the tank is always in operation. Third, there are some concerns about the condition of the air piping penetration. A failure of the air piping penetration would require a full bypass of the effluent storage tank. Staff report that the diffusers themselves perform well. | None. Last inspection was done about 3 years ago. | No additional O&M measures are identified to mitigate this failure. | Effluent Storage Tank inspection is recommended to determine condition of the tank interior and air piping penetration. |
| **Effluent Flow Meter** | | | | | | | | 1 flow meters (1 in service and 0 on standby) functions to measure effluent flow. The meter is an ultrasonic strap on meter which measures secondary effluent flow. | | | |
| Secondary Effluent Flow Meter failure | 2 | 2 | 2 | 2 | 40 | C | M | The effluent flow meter is currently being used for its intended purpose and in addition as a proxy for influent flow, since the influent flow meter cannot produce reliable readings. The meter is in fair condition, however, it is a single point of failure in the current system. | Meter is calibrated as needed to maintain accurate readings. | No additional O&M measures are identified to mitigate this failure. Risk is primarily because the meter is being temporarily relied upon for influent flow reporting. | None. |
| **Potable Pump Station** | | | | | | | | The potable water pump station provides additional pressure for potable water uses at the plant. The facility consists of two booster pumps and a bladder tank. | | | |
| Potable Pump Station Mechanical failure | 1 | 3 | 2 | 3 | 41 | C | M | Staff report that the two potable water booster pumps have recently been replaced, but the overall system needs to be upgraded. The remainder of equipment, piping, and valves other than the pumps is in poor to fair condition. In particular, the hydropneumatic tank is near the end of it's useful life. | Routine maintenance. | No additional O&M measures are identified to mitigate this failure. | Replace remainder of the potable water pump station system and canopy structure. |
| Potable Pump Station Canopy Structural failure | 3 | 1 | 1 | 2 | 37 | D | M | The canopy structure is not an engineered structure and appears flimsy and unstable. While no formal engineering assessment has been done on the structure, the structure appears to be at risk of failure if there is an extreme weather event such as an earthquake, wildfire, or potentially a high wind storm event. | None. | No additional O&M measures are identified to mitigate this failure. | Replace remainder of the potable water pump station system and canopy structure. |
| **Solids** | | | | | | | | | | | |
| **Sludge Holding/EQ Tank** | | | | | | | | One (1) 200,000 gallon sludge holding tank functions to equalize sludge before it is pumped through the export sludge force main to SOCWA's Regional Treatment Plant. No chemicals are added to the sludge. The sludge pumps operate at around 150 psig. Sludge holding time is 10 ~ 15 hr. Tank was built in 2014. | | | |
| Sludge Holding/EQ Tank Liner failure | 1 | 2 | 3 | 1 | 35 | F | M | Staff report that the condition of the tank interior is unknown and the original liner has failed in places. To perform any concrete rehab and liner replacement, the tank will need to be bypassed, which can be done using the old sludge export wet well and pumps. | None. | No additional O&M measures are identified to mitigate this failure. | Perform a tank inspection and condition assessment. Based on recommendations, perform concrete rehabilitation and replace the liner. |

*CoFA - South Orange County Water Authority*
*Costal Treatment Plant (CTP)*

| Unit Process<br>Asset<br>Failure Mode/Scenario | Consequence of Failure (CoF)<br>Health & Safety<br>7 | <br>Treatment Performance/ Regulatory<br>5 | <br>Economic/ Personnel Resources<br>5 | <br>Public Image<br>3 | Criticality | Probability of Failure | Risk Designation | General Notes | Current O&M Mitigation Measures | O&M Recommendations | Capital Project Ideas |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DAFT** | | | | | | | | 2 DAFT tanks (1 in service, 1 on standby) function to thicken WAS and secondary clarifier scum before the sludge is sent to the sludge holding tank. | | | |
| DAFT Mechanical failure | 1 | 1 | 4 | 1 | 35 | B | L | Staff report that solids are not thickened to the extent possible for the DAFTs. No coagulant is used and solids content is about 1 to 1.5% going to the sludge holding tank. Staff intentionally don't thicken aggressively because of concerns with export sludge pumping if the solids concentration gets too high. There have been historical issues with export sludge pumping when solids concentration gets above 2%. | DAFT redundancy provides mitigation for a DAFT failure. Staff perform routine inspection and maintenance on equipment. | With new sludge export force main and pumping system installed, recommend slowly increasing thickened sludge targets to see if the new system can handle a higher solids concentration. | DAFT system rehabilitation scheduled for FY 29 / 30. |
| DAFT Access Stairs failure | 3 | 1 | 3 | 2 | 47 | D | M | The access stairs are corroded and are a potential safety concern. Staff have discussed the need to replace the stairs and are currently working through the necessary procurement process. | Staff avoid using the stairs where possible. | No additional O&M measures are identified to mitigate this failure. | Replace the access stairs. Staff are soliciting bids for replacement. It is a work in progress. |
| **Solids Export Pump Station** | | | | | | | | 2 pumps (1 on service, 1 on standby) export sludge to the SOCWA Regional Treatment Plant for digestion, dewatering, and hauling. Pump station runs 24/7. | | | |
| Solids Export Sludge Pump System Mechanical failure | 1 | 1 | 3 | 1 | 30 | A | L | Export pump station and force main are relatively new and staff are satisfied with the performance of the system so far. Staff maintain a target solids concentration of 1% in the sludge holding tank to avoid pumping system issues that have previously occurred when solids concentrations got too high. | Export pumping redundancy provides mitigation for a potential pump failure. Routine maintenance on the equipment is performed. If the pumps or force main fails, staff will store sludge on site in the offline DAFT, and if necessary offline aeration basins and/or primary clarifiers. | No additional O&M measures are identified to mitigate this failure. | Export sludge system condition assessment scheduled for 26 / 27. Export sludge pump upgrade scheduled for FY 27 / 28. |
| **Ancillary Systems** | | | | | | | | | | | |
| **Emergency Generator** | | | | | | | | Electrical equipment functions to provide power, motor controls, and distribution to every individual plant process and equipment. Power and control is critical to plant operation and performance. | | | |
| Emergency Generator failure | 1 | 5 | 5 | 5 | 72 | B | H | The emergency generator is grandfathered into compliance, but does not comply with current air board standards. Staff says it is "Tier 0" and has been banned in other AQMD's. The generator could be banned in SCAQMD soon. Staff have looked into it and report it is impossible to bring the unit into compliance with current regulations. Staff also report that emergency generator may fail in the next 5 years. Failure of the generator would a compliance point and require emergency repairs. | Routine maintenance on the equipment is performed. The generator is run every 2 weeks. It is old but has low total runtime and the manufacturer claims it should not have problems. Controls on the engine are brand new. Annual service is done by a 3rd party. | No additional O&M measures are identified to mitigate this failure. | Standby power condition assessment scheduled for FY 23 / 24 and reconstruction scheduled for FY 31 / 32 |
| **Communication/SCADA Systems** | | | | | | | | SCADA functions to monitor, collect, and process data from sensors placed throughout the wastewater treatment plant. SCADA is critical to plant operation and performance. | | | |
| Communication/SCADA Systems failure | 2 | 1 | 3 | 2 | 40 | C | M | Staff report that the communication system works but it fails regularly. There is poor connectivity leading to loss of VoIP capacity. Additionally, cell service is limited in the plant. Remote access to the plant through SCADA outside the facility. | There is a DSL backup with offsite communication by dialer. Currently have Verizon and T-Mobile as an internet source, plus DSL, and a program automatically selects for the best connection. Satellite phone is also maintained on site. | Investigate potential alternative sources of data and internet connection to the plant. | SCADA system reconstruction scheduled for FY 31 / 32 |
| **Miscellaneous** | | | | | | | | | | | |
| **Non-Potable Water System** | | | | | | | | Non-potable water system functions to provide water throughout the plant for operation and maintenance (O&M) purposes, e.g. equipment cleaning. | | | |
| Non-potable 3W Water Piping System failure | 2 | 1 | 2 | 1 | 32 | D | M | Staff report that the 3W piping around the plant is an ongoing maintenance issue. On average, there is one 3W piping failure and leak that needs to be repaired each month. System operating pressure is 90 psi. Piping system is PVC pipes and above grade PVC piping is subject to UV degradation which accelerates failures. | Routine leak repairs. Additionally, in case of a pipe failure, the 3W system recognizes the abrupt pressure drop and automatically shuts down. | No additional O&M measures are identified to mitigate this failure. | Non-potable 3W water system replacement scheduled for FY 30 / 31. |
| **Site** | | | | | | | | The plant site is in a canyon with limited access. In the past, major flood events or wildfires have led to evacuation of the plant. Site security could be improved as historically members of the public have entered the plant. | | | |
| Site Access & Evacuation failure | 2 | 1 | 3 | 2 | 40 | A | L | There are two access roads: 1) main entrance and 2) emergency exit past the golf course. The key concerns for staff involve exit routes in the event of a wildfire or flood, which have happened in the past and required staff evacuation from the plant site. | SOCWA developed an emergency access & evacuation plan for the plant. In addition, staff avoid wildfire risk by not performing "hot work" (i.e. welding activities) on high wind (red flag) days. | Recommend a debrief, evaluation, and update of the emergency access & evacuation plan after each wildfire and/or flood event to improve upon the plan with lessons learned. | None. |
| Flood Channel failure | 2 | 2 | 3 | 3 | 48 | A | L | The plant's proximity to the creek is a flood risk, and heavy rain events have caused plant site flooding in years past. Staff report that they would like to build a retaining wall by the creek along the fence to protect the site from flooding, however, this may not be feasible due to environmental and permitting requirements. | None. | No additional O&M measures are identified to mitigate this failure. | Consider a flood protection feasibility study to evaluate flood protection alternatives. |

# Agenda Item 9

**Engineering Committee Meeting**

**Meeting Date:** August 11, 2022

**TO:** Engineering Committee

**FROM:** Amber Baylor, Director of Environmental Compliance

**SUBJECT:** NPDES Asset Management Plans Update

---

**Overview**

The San Juan Creek Ocean Outfall (SJCOO) and Aliso Creek Ocean Outfall (ACOO) NPDES permits require that SOCWA provide an Asset Management Plan (AMP) for each outfall system. There are ten discharge facilities on the SJCOO and eight discharge facilities on the ACOO. The SJCOO and ACOO AMPs are due to the San Diego Regional Water Quality Control Board (SDRWQCB) 180 days after the adoption of the NPDES permits. The SDRWQCB staff indicated that one AMP per outfall would satisfy the permit requirements. The AMP requirements are listed in both the ACOO and SJCOO NPDES Permit Section 6.3.5.7. SDRWQCB provided the U.S. EPA's AMP[1] guidelines and a copy of the Orange County Sanitation District's (OCSD) AMP[2] as guidelines for compliance. SOCWA prepared the outline below utilizing the OCSD template in order to meet regulator expectations. The outline below was created in consultation with SDRWQCB staff and SOCWA Engineering staff to address compliance with the permit requirements.

SOCWA will be reaching out to Member Agencies with requests for information and assistance to prepare the AMP. Please also note that through discussions with SDRWQCB staff, no new information other than what is readily available will need to be included in the Plan. Where information is not readily available, SOCWA will note that additional information will be forthcoming by that Member Agency.

The following is a preliminary timeline for completion and presentations:

- 8/11/22 Engineering Committee Meeting – Status update, AMP outline, and Excel Template for assets.
- 8/17/22 – Outline Comment Review due to SOCWA.
- 8/24/22 and 8/31/22 – AMP Workgroup Meetings for SJCOO and ACOO to address asset useful life.
- 9/8/22 Engineering Committee Meeting – Present working draft.
- 10/6/22 Board Meeting – Present Draft AMP.

---

[1] U.S. Environmental Protection Agency March 6, 2017. Asset Management Programs for Stormwater and Wastewater Systems: Overcoming Barriers to Development and Implementation. EPA Contract No. EP-C-14-003. Prepared by PG Environmental. https://www.epa.gov/sustainable-water-infrastructure/asset-management-programs-stormwater-and-wastewater-systems

[2] Orange County Sanitation District. 2021 Asset Management Plan. https://www.ocsan.gov/Home/Components/News/News/4656/270?npage=9

- 10/13/22 Engineering Committee Meeting – Present Final AMP.
- 10/18/22 – Submit the AMP to SDRWQCB through the CIWQS electronic submittal portal.

The following is a draft outline of the AMP report for the ACOO and SJCOO. Please note that the same outline will be utilized for compliance purposes for each of the outfalls.

1. Executive Summary
    a. Asset Management Plan Intent and Purpose
        i. Objectives: Proactive approach to repair, rehabilitation, and replacement, assets are reliable and operating when need, minimization of unplanned outages, management of risks associated asset or service impairment through asset performance optimization, development of cost-effective management strategies in the long-term, and striving for continual improvement of asset management practices.
    b. Overview of SJCOO/ACOO Discharge Facility Infrastructure.
    c. State of SOCWA and Member Agency Infrastructure.
    d. Budgetary Considerations.

2. Introduction
    a. Overview of SJCOO/ACOO Discharge Facility Infrastructure
        i. Map of SOCWA and Member Agency Facilities in Compliance with NPDES Section 6.3.5.7.3.
        ii. Collection Systems
            1. Links to Member Agency Sewer System Management Plans.
        iii. Reclamation and Treatment Plant Facilities
            1. NPDES permit facility descriptions and schematics.
        iv. Desalting/Treatment Unit Facilities
            1. NPDES permit facility descriptions and schematics.
        v. Outfall System
            1. NPDES permit facility descriptions.
    b. Facility Valuations
        i. Links to Member Agency Annual Comprehensive Financial Reports (ACFR).
    c. Asset Management Organization
        i. Predictive and Corrective Maintenance.
            1. Compliance Evaluation Inspection references to maintenance software evaluations related to preventative maintenance reviews.

3. State of SOCWA and Member Agency Infrastructure
    a. Asset Management System Summaries
        i. Excel Templates for Member Agency Review and Comment. Please note if information is not readily available, SOCWA will include language for follow-up for requests for information.
    b. Area Asset Management Summaries
        i. Facility Key Issues, Actions, and Recommendations – Summary Recommendation received from Member Agencies.

4. Program Monitoring and Improvements – In Compliance with NPDES Section 6.3.5.7.1

    a. Program Metrics
        i. Proactive Maintenance Software Metrics – Percent of preventative maintenance as a percent of all maintenance performed. Tables for each facility included in the excel templates.
    b. Maintenance Planning in Compliance with NPDES Section 6.3.5.7.2
        i. Projected Maintenance Costs – Obtained from Member Agency Input per facility. Included in Excel templates.
    c. Asset Management Program Accomplishments
        i. Condition Assessment Program Work.
        ii. Member Agency Collection System Asset Highlights.
        iii. Other Examples Member Agencies would like to include.
    d. Asset Management Program Improvement Opportunities
        i. Short-to-Medium Term Improvement Opportunities.
        ii. Longer-Term Strategy and Improvement Opportunities.

5. Budgetary Considerations in Compliance with Section 6.3.5.7.4 and Section 6.3.5.7.5

    a. Capital Improvement Expenditures
        i. SOCWA and Member Agency Capital Improvement Plan references.
    b. Maintenance Expenditures
        i. SOCWA and Member Agency Capital Improvement Plan references.
    c. Ten-Year Capital Planning
        i. SOCWA and Member Agency Capital Improvement Plan references.
6. Summary of Recommendations

**Recommended Action:** Staff is requesting Member Agency review and comment on the AMP approach as outlined in report by August 17, 2022. Staff is also requesting Member Agency provide resources to work with SOCWA staff directly on the completion of the AMPs by August 17, 2022.

**Attachment**: Excel Templates distributed under separate cover.