2021 NPDES SELF-MONITORING PROGRAM ANNUAL REPORT

NPDES PERMIT NO. CA0037869

East Bay Dischargers Authority City of San Leandro Oro Loma Sanitary District Castro Valley Sanitary District City of Hayward Union Sanitary District

January 26, 2022



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Section 1: Comprehensive Discussion of Treatment Plant Performance and Compliance

Major milestones and construction projects completed at the EBDA member treatment plants included the following:

- Oro Loma/Castro Valley Sanitary Districts (OLSD/CVSan)
 - Purchased new washer compactor units (2) to replace existing grinder units (2) at the headworks. Screened material will be removed and hauled offsite. Installation expected in Spring 2022.
 - Started a full scale sidestream nitrification process using Microvi's biocatalyst (April 2021). As constructed, approximately 100,000 gpd of belt press filtrate will be treated each day. The sidestream contains approximately 17% of the total influent nitrogen. To date, the process reduces ammonia concentrations by 70%. Staff continues to work to improve the performance with a 90% removal target. The process is designed to reduce ammonia to nitrite or nitrate, which is readily available for denitrification in the mainstream process.
 - Much of the Oro Loma Sanitary District's Capital Program spending has shifted to the collection system. The District plans to replace 40 miles of sewer pipe by 2029 at an approximate cost of \$60M. The District awarded three of ten planned contracts in 2021 and expects to award four more in 2022.
- <u>Union Sanitary District (USD)</u>
 - Completed the design of the first phase of the Enhanced Treatment and Site Upgrade Program, which includes nutrient removal options in the future. The construction for phase 1a is expected to commence in 2022, and the design for phase 1b will be completed by mid-2023. Phase 1a will modify the existing aeration basins, add an 8th aeration basin, and relocate existing administrative buildings to allow for phase 1b to be built. Phase 1b will construct new secondary clarifiers and new effluent pump station.
 - Digester #7 construction is ongoing, with completion anticipated by early 2022.
 - New Standby Generator system design is complete and construction will commence in 2022.
- <u>City of Hayward</u>
 - Recycled water membrane treatment system has been approved for startup by the State Division of Drinking Water and will be put in service during the first quarter of 2022. This will supply 300k gallons of recycled water to neighboring businesses.
 - The Headworks project was near substantial completion in 2021. This project replaced the old influent grinders with bar screens, which will help

protect the downstream plant equipment and processes. This project also included major reconstruction of the headworks building, foul air system upgrades, replacement of the biofilter bed, and a new Ferric Chloride dosing station.

- The 12KV Switch Gear replacement project has been awarded to Carollo Engineers, and design work has begun.
- <u>City of San Leandro</u>
 - Design phase of high strength waste receiving facility and renewable natural gas processing facility is approaching completion, and work will begin in early 2022. A related project to provide a "micro-grid" battery system to provide peak shaving and other energy efficiency improvements is in design, and work will begin in spring 2022.
 - Treatment Wetlands project has reached 100% design phase. An Administrative Draft of the NPDES permit has been issued and is expected to be approved in 2022. Final regulatory approval including CEQA will be completed in 2022. Construction will begin in 2023, pending funding approval.

EBDA's major projects in 2021 included the following:

- EBDA continues to implement its Asset Management Plan to ensure appropriate renewal and replacement of infrastructure. The estimated total restoration cost over 20 years is approximately \$11.3 million. This includes \$420,000 annually through 2030 (for a total of \$4.2 million) that EBDA is contributing for capital improvements to the Union Effluent Pump station, per EBDA's Amended and Restated Joint Powers Agreement.
- Improvements to the main switchboard at OLEPS are underway. In June 2021, a PG&E shutdown took place to facilitate the first phase of the project, which included removing the front panels of the Main Electrical Switchboard for cleaning and inspection, and taking detailed measurements for the new replacement breakers. A thermographic survey of the Main Electrical Switchboard was also completed. New breakers are currently being fabricated and will be installed in 2022 following wet weather. Upgraded power monitoring equipment will also be installed, allowing OLEPS instantaneous power usage to be displayed on EBDA's SCADA system.
- EBDA continued its key role in the Transforming Shorelines Project. This project, funded by an EPA Water Quality Improvement Fund grant, includes design of a full-scale horizontal levee south of Oro Loma ("First Mile" project), continued research at Oro Loma's horizontal levee pilot, advancement of pilot wetlands projects at San Leandro and Hayward, and building capacity for nature-based solutions among Bay Area wastewater agencies. In close coordination with East Bay Regional Park District, Hayward Area Shoreline Protection Agency, and San Francisco Estuary Partnership, EBDA has been managing the First Mile and Hayward projects, which kicked off in January 2021. A preliminary consultation

with the Bay Restoration Regulatory Integration Team (BRRIT) was held for the First Mile project in October 2021. The BRRIT presentation represented a key milestone for the project. Preliminary designs are now being advanced, and a parallel process to engage the BRRIT's Policy Management Committee on regulatory challenges associated with horizontal levees and other multi-benefit projects has also been launched. The goal is to use the First Mile project as a case study to work through regulatory and other barriers to multi-benefit shoreline project implementation.

- As part of the Amended and Restated Joint Powers Agreement negotiations, EBDA agreed to purchase encapsulating couplings and flexible internal seals and sleeves that can be used to repair the force main in the event of a failure. EBDA purchased three WEKO-Seals (14.5" wide) and one EPDM Sleeve (48" wide) for each of the different force main sizes: 48-inch, 60-inch and 96-inch. EBDA also purchased one 60-inch encapsulating coupling. This stockpile of parts will allow EBDA to repair several different combinations of leaks or failures.
- In late 2021, EBDA started a project to update programming and automation associated with sodium bisulfite (SBS) dosing at the Marina Dechlorination Facility (MDF). These updates are needed to implement the change to EBDA's effluent limit for total residual chlorine (TRC), which was adopted as a blanket permit amendment by the Regional Water Board in October 2021. EBDA's current TRC effluent limit is 0.0 mg/L or parts per million (ppm), expressed as an instantaneous maximum. Per the permit amendment, EBDA's new TRC effluent limit will be 0.98 mg/L measured as a one-hour average. The initial upgrades include programming changes to the programmable logic controller (PLC) that controls the station. The current PLC programming does not allow chlorine to be discharged to the Bay. The new programming will allow chlorine to be discharged and will start the SBS pumps when the chlorine residual is over a maximum target. The initial programming will also include starting the SBS pumps on a regular basis to ensure that the system is operational and available when needed. The new TRC effluent limit is expected to reduce SBS usage by approximately 85%, or a \$200,000 budgetary savings. As SBS has a relatively short shelf life, testing will also be conducted on the correct minimum SBS usage necessary to maintain the chemical's effectiveness.
- EBDA has been working closely with Cargill, Inc. to develop a project that would deliver mixed sea salt brine from Cargill's solar salt ponds in Newark to EBDA's transport system for dilution and discharge. In 2021, this work included an extensive analysis of potential corrosion impacts from the brine on EBDA's transport system. The team has developed several strategies for mitigating the impacts of corrosion, including extending the brine pipeline further north to avoid vulnerable segments of the EBDA system, or sliplining those segments to protect them from corrosion. As part of the Cargill project, EBDA implemented several force main shutdowns that allowed for inspection and condition assessment of key segments:
 - First, the southern portion of the transport system was shut down to assess the condition of the concrete pipe. EBDA took advantage of this shutdown

to replace the force main manway cover and the Air Relief Valve (ARV) isolation valve at that location, close to the USD plant.

- Working with San Leandro, EBDA implemented a shutdown of the northern portion of the transport system for eight hours in February to perform an inspection. During the inspection, core samples of the concrete pipe were collected and analyzed to assess chloride penetration and the susceptibility of the concrete to corrosion induced by the brine addition.
- An additional inspection was performed in May to take core samples from the force main upstream of HEPS at a high spot that is frequently exposed to air, thus increasing the risk of corrosion. These samples were assessed to establish a baseline corrosion level and tolerance to chloride addition.
- EBDA and the City of San Leandro's laboratory began joint implementation of a new Laboratory Information Management System (LIMS). The new LIMS will improve workflow and quality control at San Leandro, which also performs the sampling and analysis for EBDA common outfall compliance monitoring. The system will also become the compliance database for EBDA, making it easier to analyze data and plot trends.
- EBDA renewed its Master Agreement with the Livermore-Amador Valley Water Management Agency (LAVWMA). The adopted Amended and Restated Master Agreement governs discharges from LAVWMA through the EBDA system until 2040.
- EBDA also approved an agreement with Dublin San Ramon Services District governing brine discharges from Zone 7 Water Agency's demineralization facilities. This brine has been discharged through EBDA for a number of years, but prior to this agreement, there was no formal structure for managing and monitoring the discharge.
- EBDA's Member Agencies recycled approximately 570 million gallons in 2021. For consistency with recycled water totals submitted through GeoTracker, these totals include in-plant reuse. Also of note, there was no discharge to the Hayward Marsh in 2021, and this discharge is not expected to resume.

As shown in the following table, including the LAVWMA agencies, water recycling accounted for more than 3.1 billion gallons, about 14% of EBDA's outfall discharge last year of approximately 22.9 billion gallons. This is consistent with last year's totals and ratio.

Agency	2021 Recycled Water Production
	(MG)
Hayward	128.55
San Leandro	89.22
EBDA Skywest Project	12.06
Oro Loma Sanitary District	18.00
Union Sanitary District	323.15
EBDA Subtotal	570.98
USD Hayward Marsh	0
EBDA Total	570.98
Livermore	706
Dublin San Ramon Services District	1872.09
(DSRSD)	
LAVWMA Total	2578.09
Grand Total	3149.07

Bacterial Compliance

The chart that follows presents fecal pathogen data from samples through the year. Note that permit limits are calculated as monthly geometric means or monthly 90% ile samples. Sporadically, at random intervals, a high sample can be detected. This outcome is probably due to the sloughing of pipe biofilms into the sample line. These non-representative events are why permit compliance is determined by geometric means.

EBDA and its member agencies worked hard over the past few years to improve chlorine dosing to prevent periodic increases in bacterial contamination, which had occurred in prior years. This increased attention to chlorine dosing has led to consistent compliance with limits. EBDA began a Disinfection Master Plan Project in 2021. This Master Plan will assist EBDA in further optimizing chlorine dosing to prevent bacterial regrowth. EBDA expects to implement the recommendations of the Master Plan during the 2022 dry season.





EBDA Bacterial Performance

NPDES Permit Reissuance

EBDA submitted its Report of Waste Discharge and Application for NPDES Permit Reissuance on September 30, 2021. EBDA staff looks forward to working with Regional Water Board staff on reissuance of the permit in 2022.

Section 2: List of Analyses for Which the Discharger Is Certified

EBDA conducts no analyses of its own. Each member agency is certified by the State Water Resources Control Board for standard water quality tests such as BOD, TSS, pH, DO, enterococcus, and fecal coliform. City of San Leandro staff performs these analyses on the combined effluent.

All metals and organics analyses are performed by the Authority's contract laboratory, Caltest Analytical Laboratory. Caltest's lab is certified for these analyses. Caltest subcontracts for analytical work on some items, including dioxin and furan compounds and PCBs to other certified labs.

Pacific Eco-Risk Laboratory (PERL), also a certified laboratory, conducts the required acute and chronic toxicity testing for the Authority.

Copies of all laboratory reports are maintained on file at the Authority's office and are available for review upon request. Said reports are not included in this report.

Section 3: Plan View Drawing or Map Showing the Discharger's Facility, Flow Routing, Sampling and Observation Station Locations



Marina Dechlorination Facility

San Leandro Plant – Process Flow Diagram



San Leandro Plant – Sampling Locations



OLSD/CVSan Plant – Process Flow Diagram



OLSD/CVSan Plant – Sampling Locations





Hayward Plant – Process Flow Diagram

Hayward Plant – Sampling Locations



USD Plant – Process Flow Diagram



USD Plant – Sampling Locations



Section 4: Results of Facility Report Reviews

The tables in this section summarize the status of reviewing and updating the following documents: Operations & Maintenance (O&M) Manual, Contingency Plan, Spill Prevention Plan, and Wastewater Facilities Status Report.

EBDA Facilities

REPORTS	REVIEW DATE	REVIEW PROCEDURES	PLANNED ACTIONS	SCHEDULE
O&M Manual	Jan 2022	Updated on an as-needed basis and reviewed annually by the EBDA O&M Manager.	The Authority maintains a comprehensive O&M Manual for the joint-use facilities. Chapters of the Manual are regularly reviewed and updated. EBDA's Wet Weather SOP is reviewed annually and updated as needed.	Performed annually
Contingency Plan	Jan 2022	Updated annually by EBDA O&M and Administration Managers. EBDA is included in the Alameda County's Office of Emergency Service's Utility Unit.	The Emergency Operating Contingency Plan is supported by Operations & Maintenance Agreements between Member Agencies, which are compatible with their existing plans and known to all other local and county agencies for emergency purposes. Operation and maintenance activities are contracted with the Member Agencies for routine work. Emergency work is performed sometimes by Member Agencies and sometimes through contracts with private specialty firms.	Performed annually
Spill Prevention Plan	Jan 2022	Reviewed annually by EBDA O&M Manager	No major changes planned for 2022.	Performed as needed
Wastewater Facilities Status Report	Jan 2022	EBDA continues to implement a comprehensive Renewal and Replacement Program. The Authority has an Asset Management Plan that covers all critical equipment.	 In 2021, EBDA completed the following projects: UEPS payment #1 of 10 for a total of \$4.2 M Installed new OLEPS Hypo System Refurbished OLEPS Electric Pump motors and gear drives In 2022, the Authority is continuing work on the following upgrades to the EBDA system: Marina Dechlorination Facility (MDF) Automation Upgrades MDF Main Breaker and ATS Replacement HEPS Pump Replacement Project OLEPS Main Electrical Switchboard Upgrade OLEPS Emergency Outfall Evaluation OLEPS Pump Station Bypass Evaluation 	Anticipated Completion: MDF Automation Upgrades, December 2022 OLEPS Main Electrical Switchboard Upgrade, December 2022

Date			Scheuule
O&M Manual Sections C assigned a and n updated P throughout re the year S	O&M manuals and SOPs are written and revised as necessary by designated Plant Operators and reviewed by the Operations Supervisor and Plant Manager	Review O&M chapters and SOPs as needed. Continue developing and revising SOPs for plant processes. O&M is still a mix of electronic and older paper as we transition; we have fewer and fewer paper versions per year.	Performed continuously
Contingency January W Plan 2022 re a	WPCP management reviews, edits and approves	Contingency plan reviewed annually and updated as needed. Update employee list and emergency contacts along with contractor contacts.	Performed annually
Spill January W Prevention 2022 re Plan a	WPCP management reviews, edits and approves	Plan reviewed and updated. Training and review done annually, including: new employee orientation, 8 hour on- site level 1 responder training, and tailgate review on plan and emergency spill kits.	Performed annually
Wastewater Facilities Status Report		emergency spill kits. RFP to Update Sanitary Sewer Capacity Study and Master Plan Annual Street Overlay and Sewer Point Repair Project Construction will be completed for energy efficiency and resiliency project. This includes new high strength waste receiving facility, renewable natural gas production and storage facility, microgrid battery backup system and other energy efficiency improvements. Treatment Wetland project will receive regulatory approval, and the City will seek funding to begin construction in 2023. This project will treat 20% of the ADWF to remove nitrogen and other contaminants through both technological and biological processes. Install liner in secondary effluent pipe. Repair plant influent line and manway. Design and bid, Rehab. and upgrade of 3 sewer lift stations and force main.	Maintenance and project schedule for 2022

San Leandro Treatment Plant

Document	Review Date	Review Procedures	Planned Actions	Schedule
O&M Manual	Ongoing	New sections of the O&M for the Nutrient Optimization facilities were completed as expected in advance of start-up in Summer 2020.	The District has developed a computer based training program for the 25 unit processes in the treatment plant (including the EBDA OLEPS pump station). Staff will continue to train on the modules.	Ongoing
Contingency Plan	December 2021	Management team completed its review and updated document to reflect changes in contact information or equipment/facility changes.	Continue to make updates as needed, at least annually.	January 2021
Spill Prevention Plan	February 2019	The District updated its plan in 2019 to reflect changes to the day tank at the EBDA Pump Station at Oro Loma.	Continue to make updates as needed.	As needed
Wastewater Facilities Status Report	January 2021		The District continues to execute on its planned 10-Year, \$168M capital program. The program includes extensive sewer pipe renewal (1.5% of system/year), Digester Construction in 2025, and Cogeneration System Replacement in 2030.	10-Year Capital Plan (Updated December 2021)
			In 2021, the District obtained financing in the amount of \$50M from State (SRF) and Federal (WIFIA) sources for sewer replacement work. The District is working to replace 40 miles (15%) of its 270 mile collection system by 2029.	

Oro Loma/Castro Valley Sanitary District Treatment Plant

Hayward Water Pollution Control Facility

REPORTS	REVIEW	REVIEW	PLANNED ACTIONS	SCHEDULE
O&M Manual	Ongoing	WPCF electronic O&M manuals, including SOP's, are reviewed, and updated annually by staff. Revisions are made to Sections and SOP's.	8 SOPs were written or updated in 2021: Hach Cl2 analyzer calibration, Hach Cl2 analyzer membrane replacement, HEPS generator, Headworks bypass, GBT line cleaning, North vac line cleaning, HEPS CL2 analyzer cleaning and calibration, and Cl2 titration. The review of SOPs and O&M will be done as needed throughout 2022.	O&M Manual
Contingency Plan	January 2022	The entire plan is reviewed by the WPCF manager with updates and edits made by the Senior Secretary.	Continue to make updates as needed.	Contingency Plan
Spill Prevention Plan	January 2022	Plan reviewed by WPCF Manager every January. Changes made by Senior Secretary.	Make updates as needed.	Spill Prevention Plan
Wastewater Facilities Status Report	Jan 2022	The phase II Facilities Plan was completed in 2020. The city will implement projects as recommended in the 2020 Phase II Facilities Plan.	 Planned for 2022: Construction of the Headworks bar screen project is near substantial completion and the bar screens have been placed in service. In 2022 the biofilter, Ferric Chloride station, and air handling system will be placed in service. The Membrane Recycled Water Treatment system was completed and permitted to operate. It will be placed in service during the first quarter of 2022. When it is permitted the treatment system will have a capacity of 0.5 million gallons per day and a pumping capacity of 5 million gallons per day. The initial service demand is expected to be 300K gallons per day. The replacement of the effluent pumps is anticipated in 2022. Construction of the new 12KV switchgear update project will begin in 2022. There are several elements of the Phase Two WPCF Improvements that have been incorporated into the Sewer Replacement & Sewer Improvement CIP's, which will move forward in 2022. 	Wastewater Facilities Status Report

Document	Review Date	Review Procedures Planned Actions		Schedule
O&M Manual	Ongoing	Plant O&M documents are incorporated into the District's Competency-Based Training Program. USD utilizes Microsoft 		Each individual training module and SOP has a review frequency of 3 years.
Contingency Plan	December 2021	Plant Manager reviews and updates the Contingency Plan annually.	None. Contingency Plan was updated in December 2021.	Complete next review by December 2022.
Spill Prevention Plan	December 2021	Spill Prevention Plan is incorporated into our Contingency Plan and is reviewed at the same time.	None. Spill Prevention Plan was reviewed in December 2021.	Complete next review by December 2022.
Wastewater Facilities Status Report	December 2021	 USD's Master Plans address most of the Facilities Evaluation requirements. Our Plant Master Plan is updated every 5 years and Pump Station and Collection System Master Plans are updated as needed. Asset management data is updated on an ongoing basis. CIP and Operating plans and budgets are reviewed and revised annually. 2021 Projects Completed/in- progress: New Anaerobic Digester #7 (Construction in progress and almost complete.) Digester # 2 Rehabilitation (Complete) Alvarado Pump Station (Construction in progress.) Old Alameda Creek pipe improvements. (Construction in progress, almost complete) New High-speed blower. (In Construction) Calcium Thiosulfate pumps. (In progress, almost complete) 	Complete capital improvements in accordance with 20-year CIP plan. Implement annual rate adjustments for Sewer Service Charges and Capacity Fees in accordance with 10-year financial plan. 2022 Projects Planned: • Standby Power Upgrade. (Construction to commence) • WAS Gravity Belt Thickener (Complete Design) ETSU: Phase 1a • Aeration Basin Modification (Construction to commence) • Campus relocation (Complete Design & begin construction process) ETSU: Phase 1b • New Secondary Clarifiers. (In design). • New Effluent Pump Station (In Design)	 20-year CIP annual update in June. Master Plans: Alvarado Basin MP 2022-24 Newark Basin MP 2024-26 Irvington Basin 2026-28 Pump Station Asset Condition Assessment 2021-22 Plant Asset Condition Assessment 2022-24 Plant Solids System/Capaci ty Assessment 2025-27

Union Sanitary District Treatment Plant

Section 5: BACWA Watershed Permitting and Monitoring

EBDA participates in a number of group processes coordinated by the Bay Area Clean Water Agencies (BACWA) to fulfill permit requirements, including Receiving Water Quality Monitoring, TMDL/SSO Support, Mercury and PCBs Watershed Permit Support, Nutrients Watershed Permit Support, and Implementation of Copper Action. Participation in these items is described in an annual BACWA letter to the Regional Water Board found here:

https://bacwa.org/wp-content/uploads/2022/01/BACWA-NPDES-Permit-Letter-2022with-SFEI-attach.pdf

Section 6: Effluent Characterization Study and Report

EBDA regularly monitors and evaluates discharges from the common outfall and each contributing plant's effluent to identify any concerning trends. No significant increases over past performance were noted in 2021 data.

EBDA monitors monthly for metals and cyanide. Cyanide is rarely detected. As shown in Figure 2, five years of metals data continue to show flat or downward trends.





EBDA's five-year trend for copper shows that while individual member agency effluent concentrations have varied, EBDA's common outfall concentration consistently averaged less than 20 ppb, versus a permit limit of 53 ppb (see Figure 3).



Figure 3 – Effluent Copper Trend

EBDA's effluent mercury concentrations also continue to be well below permit limits, as shown in Figure 4.

Figure 4 – Effluent Mercury Trend

