



T&E AGENDA: 05/06/19  
ITEM: d(3)

## Memorandum

**TO:** TRANSPORTATION &  
ENVIRONMENT COMMITTEE

**FROM:** Kerrie Romanow

**SUBJECT:** SEE BELOW

**DATE:** April 17, 2019

Approved

Date

4-23-19

**SUBJECT: REPORT ON DISCHARGE REGULATIONS AND FUTURE IMPACTS ON  
THE SAN JOSE – SANTA CLARA REGIONAL WASTEWATER  
FACILITY**

### RECOMMENDATION

Accept the annual update on regulatory items related to the San José-Santa Clara Regional Wastewater Facility.

### OUTCOME

Provide an update to the Transportation and Environment (T&E) Committee on status of potential regulatory requirements that could impact the San José-Santa Clara Regional Wastewater Facility<sup>1</sup> (RWF).

### EXECUTIVE SUMMARY

The RWF is the largest advanced wastewater treatment plant in the western United States, serving a population of 1.5 million people and over 17,000 businesses across eight cities and the County. The RWF is the largest discharger into the San Francisco Bay, a large industrial air emissions source, and is continually faced with meeting increasingly stringent regulatory requirements. The RWF is regulated under two principal operating permits: A National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act,

<sup>1</sup> The legal facility name remains San Jose-Santa Clara Water Pollution Control Plant, but a new common name, San José-Santa Clara Regional Wastewater Facility, was approved in early 2013.

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administered by San Francisco Bay Regional Water Quality Control Board (Water Board), and an Air Operating Permit under Title V of the Clean Air Act, administered by Bay Area Air Quality Management District (BAAQMD).

NPDES permit requirements have become increasingly restrictive over the years, but the RWF has been able to successfully meet them through capital improvements and a robust pretreatment/source control program. Since 1997, the RWF has also had a South Bay Monitoring Program (SBMP), which tracks a variety of water quality and habitat data points to demonstrate that the RWF's discharge, or effluent, is not harmful to the South San Francisco Bay (Bay). Data from the SBMP has helped inform new regulations and facilitated a reduction in the requirements in recently issued NPDES permits. The SBMP also provides critical data that informs proposed water quality criteria that would be most protective for the Bay by the Water Board.

For air emissions, staff is focused on the California Air Resources Board (CARB) rulemaking for Toxic Air Contaminants and Greenhouse Gas (GHG) emissions, which could impact the RWF. Staff is also engaged with the BAAQMD in their implementation of a rule to limit human health risk and a second rule to limit GHG emissions from wastewater treatment facilities. Air emission regulations are typically focused on human health impacts in the vicinity of the source, but more focus on climate-related concerns where impacts are non-localized is a recent trend. Emissions reductions are typically achieved through end-of-pipe and fuel-cleaning control technologies. Like their wastewater counterparts, emissions reduction regulations can come with high costs. Staff continually evaluates new rules and proposed permit conditions and looks for the most cost-effective engineering and policy solutions.

In accordance with the adoption of Senate Bill (SB) 1383 in 2016, the California Department of Resources Recycling and Recovery (CalRecycle) is in the process of finalizing new regulations that attempt to reduce climate change pollutants, such as methane, that result from the landfill disposal of organic material. The latest proposed regulatory text includes biosolids in the definition of organic material and requires that biosolids only be transported for additional processing, composting, anaerobic digestion, or other recovery activities. This would alter the RWF's current practice of sending its biosolids to the nearby Newby Island Landfill for use as alternate daily cover (ADC), resulting in higher costs. To allow the City to position itself with the ability to pursue diversified disposition options, staff is conducting a regional biosolids market assessment.

New and pending wastewater regulations represent advancements in the identification of and detection of limits for water quality contaminants. Incremental improvements in overall water quality are not typically achieved by incremental investment in treatment technologies, if those even exist, so staff continues to monitor and participate in the formal rulemaking process on behalf of the rate payers in order to advocate for reasonable requirements. This report provides a summary of the more significant regulations that impact the RWF and discusses how ESD is advocating and often influencing these regulations, and also responding through capital improvements.

## **BACKGROUND**

The RWF is the largest wastewater discharger in San Francisco Bay and the largest advanced wastewater treatment plant in the western United States, serving a population of 1.5 million people (roughly one-fifth of the entire Bay Area population) and over 17,000 businesses across eight cities and the County. From industrial dischargers to residents and restaurants, the RWF is responsible for cleaning wastewater to the highest standards before it is discharged to the shallow waters of the South Bay. The RWF incorporates primary, secondary biological nutrient removal (BNR), filtration, and disinfection into its treatment processes.

Since 1956, the RWF has continually treated the majority of Silicon Valley's wastewater and protecting public health and the Bay environment. The RWF is sized to treat an average of 167 million gallons per day (MGD) during dry weather. Currently, the year-round average influent flow is 103 MGD. Average effluent flow into the Bay through the Artesian Slough is between 70 to 84 MGD, with an average of approximately 11 MGD diverted to the South Bay Water Recycling system to be used as recycled water in three cities.

Wastewater treatment at the RWF is accomplished by using a series of physical, biological, and chemical processes to treat the liquids stream and the solids stream. Separated solids (or sludge) from wastewater are thickened and processed through anaerobic digesters to reduce pathogen content, sludge volume, and create biogas for beneficial reuse. The digested sludge is then pumped to open air lagoons capped with water, and then to drying beds for further sludge volume reduction. The treatment, and stabilization of biosolids is completed over a four-year cycle. At the RWF, this process generates approximately 85 dry metric tons of biosolids per day. The dried solids are sent annually to the adjacent Newby Island Landfill to be used as Alternate Daily Cover (ADC).

The RWF is a critical regional asset while being a good steward of the environment and enabling recreational uses by and in the Bay. The Don Edwards National Wildlife Refuge is located right near the effluent discharge. Public trails winding along Artesian Slough accommodate day hikers and wildlife photographers. Fishing enthusiasts and seasonal duck hunters launch from the nearby Alviso Boat Launch to fish and hunt in waters flowing from the RWF.

The RWF is regulated under two principal operating permits:

- A NPDES permit under the Clean Water Act, administered by the Water Board. The current NPDES Permit was issued in September 2014 and will be up for renewal in September 2019. RWF staff submitted an application for reissuance by the application due date of February 1, 2019.
- A "Permit to Operate" under Title V of the Clean Air Act, administered by BAAQMD. The Air Permit was issued in March 2017 and will be up for renewal in March 2022.

### NPDES Permit

The NPDES Permit mandates water quality monitoring requirements for the RWF's effluent discharge to the Bay and sets specific concentration limits for a number of conventional wastewater pollutants, metals, and organic compounds. The NPDES Permit further requires that RWF effluent discharge may not cause or contribute to impairment of any beneficial uses designated for the Lower South Bay. The designated beneficial uses of the Lower South Bay are:

- Commercial and Sport Fishing
- Cold Freshwater Habitat
- Fish Migration
- Preservation of Rare and Endangered Species
- Fish Spawning
- Warm Freshwater Habitat
- Wildlife Habitat
- Contact Recreation
- Non-contact Recreation.

The RWF has been recognized in its NPDES Permit as supporting all of these beneficial uses and providing additional environmental enhancement to the Lower South Bay.

Over the last two decades, the United States Environmental Protection Agency (EPA) and the Water Board have developed water quality regulations related to a variety of pollutants. Regulatory focus through the late-1980s and early-1990s was on copper, nickel, and freshwater flows. In the late-1990s, this focus shifted to cyanide, legacy mercury, and Polychlorinated Biphenyls (PCBs).

### Title V Permit

The Title V program is designed to standardize air quality permits for major sources of emissions across the country and is required for facilities that emit more than the Major Source Thresholds (MSTs) of criteria pollutants. The criteria pollutants include carbon monoxide, ozone, lead, nitrogen oxides, particulate matter, and sulfur dioxide. The Title V permit incorporates the RWF's Permit to Operate, also issued by the BAAQMD, and all other applicable local, state, and federal air quality regulations.

The RWF tracks emissions from its engine generators through a combination of fuel consumption, source testing, and monitoring of pollutant levels in the digester gas fuel supply. These parameters are reported to the BAAQMD on an annual basis. In addition, the RWF submits a report of Title V compliance status semi-annually.

### ANALYSIS

Wastewater regulations typically evolve over multiple five-year NPDES and Air permit cycles but can have significant impacts to operational and capital costs that affect rate payers, so RWF

staff proactively engages with their regulators to advocate for the most cost-effective approaches. Staff is proactive in identifying issues on the horizon, collecting data, and building case studies to inform common sense, science-based solutions for the bay and the RWF.

Wastewater Regulations under Consideration or Development

***San Francisco Bay Nutrient Watershed Permit*** – In addition to discharging a variety of chemical constituents within the range allowed under each Publicly-Owned Treatment Works' (POTWs) NPDES permit, POTWs are also large dischargers of nutrient compounds to the Bay, specifically nitrogen and phosphorus. Nitrogen levels in San Francisco Bay are elevated compared to other urban water bodies, but the elevated nitrogen is not currently causing impairment of the Bay, which would manifest through effects like harmful algal blooms. Despite no currently observed impairment, regulators have considered a hard limit, or cap, on nutrient loads discharged to the Bay and not allowing any future increases, disregarding inherent increases due to expected population growth.

Through continued participation in the research and investigations into the impact of nutrients into the Bay and collective negotiation with Water Board staff, the RWF and partner wastewater agencies successfully delayed load caps in any form until 2024, at the earliest; and secured agreement from the regulators to factor in projected population growth and inherent load variability into any future load caps. The 2019 Nutrient Watershed Permit will instead include increased funding from dischargers, based proportionally on nutrient discharge volumes from each facility, to support regional studies to further evaluate nutrient impacts on the Bay, continue to monitor nutrient discharges from wastewater treatment plants, and to evaluate potential nutrient reduction strategies utilizing natural treatment systems (wetlands and horizontal levees) and increased recycled water.

It is anticipated that the Water Board will impose nitrogen limits that account for growth and variability in the 2024 Nutrient Watershed Permit in the form of effluent load caps. Similar load caps for phosphorus are not expected because it does not appear to pose a potential threat to Bay water quality. The load caps envisioned for 2024 should be immediately achievable in 2024 without any additional treatment upgrades or modifications, unless impairment to the Bay is identified sooner. However, if no further action is taken after 2024 to reduce nitrogen loads discharged from the RWF to the Bay, the RWF will likely exceed the future nitrogen load caps at some point between 2024 and 2029.

***Constituents of Emerging Concern*** – Constituents of Emerging Concern (CECs) is a term used to include a broad range of unregulated chemical components found at trace levels in many of our water supplies, and there is a concern that these compounds may have an impact on aquatic life. Examples of these components include pharmaceuticals and personal care products, which are increasingly being detected at low levels in surface water. The RWF is taking a proactive approach to CECs by engaging in regional science-driven efforts to understand the sources and environmental impacts of various CECs and integrating pollution prevention messaging into public outreach campaigns to educate the public on proper disposal.

*Poly- and per-fluoroalkyl Compounds*

The most recent regulatory focus has been on Poly- and per-fluoroalkyl compounds (PFAS), a large class of chemicals with a diverse number of applications in textiles, carpet treatment, metal plating, cookware coatings, food packaging, and firefighting foams. Because of its broad applications, PFAS are entering the wastewater stream through residential, commercial, and industrial pathways. PFAS are persistent in the environment and some forms accumulate in wildlife, potentially causing reproductive impairment or other toxic effects. With the recent scrutiny, the State Water Resources Control Board (SWRCB) announced initiation of a focused study to evaluate the risks of PFAS this past March.

The RWF, through active participation and leadership in proactive regional science programs, has measured concentrations of PFAS compounds in RWF effluent as part of three separate recent studies. RWF effluent is consistent with concentrations at other wastewater treatment plants in the region, meaning concentrations in RWF effluent are not likely to be the first sources targeted by regulators. This data will inform the state's investigative approach. Following the State's investigations and depending on the magnitude of PFAS in wastewater effluent relative to other PFAS sources, it is possible that future regulations of PFAS in treated wastewater effluent could be imposed.

*Microplastics*

A second category of CECs is microplastics. Microplastics are tiny particles of plastic that are smaller than 5 millimeters and are found in the form of microbeads, fragments, fibers, tiny plastic pellets called nurdles, or foamed plastic particles from packaging, cigarette filters and other items. Regardless of the form of microplastic, these particles originate from human use and are entering the environment because of human activities. Bay Area wastewater treatment plant effluent, including the RWF effluent, was analyzed for microplastics in 2015 and again in 2017. The results indicate that at least a portion of the microplastics in the sanitary waste stream pass through wastewater treatment plants, including those with advanced treatment technology and filtration like the RWF. The majority of microplastics in treated wastewater at the RWF were in the form of microfibers, which are present from laundering garments made with synthetic plastic fibers.

Wastewater treatment plants are not designed to remove such tiny particles from the waste stream, and technology to remove them at wastewater treatment plants is incredibly expensive due to the sheer volume of water that is treated at a centralized facility. However, detections of these microplastics in Bay water and in some fish is cause for concern since these particles are not food and could potentially contain chemicals that are toxic to aquatic organisms.

In December 2015, the Microbead-Free Waters Act of 2015 was signed into law by President Obama and the sale of products containing microbeads was banned starting in January 2018. While microbeads have been banned, the other types of microplastic particles such as fibers and fragments remain. Through the San Francisco Estuary Institute (SFEI), wastewater agencies, stormwater agencies, scientists, and regulators have partnered with representatives

from the garment industry and environmental groups to initiate further investigations into the environmental occurrence, sources, and environmental fate of microplastics.

***State Toxicity Plan*** – Monthly chronic toxicity testing is required under the current RWF NPDES Permit, but testing is for diagnostic purposes and results are not evaluated against numeric effluent limits, but instead against measured effects on a test species. Adoption of numeric toxicity limits under the State Toxicity Plan was expected in Fall 2018 but has been delayed until Summer 2019. Exceeding numeric toxicity limits would result in NPDES Permit violations if final limits are unreasonably stringent. RWF staff are in discussions with regulators about any future toxicity limits and testing protocols that may put the RWF at risk of non-compliance. The RWF has a nationally accredited environmental laboratory and has recognized expertise in chronic toxicity testing. Despite this expertise and experience, it is important to note that the causes of chronic toxicity intermittently detected at the RWF have never been successfully identified; no other wastewater facility has been successful either. Consequently, any response to future non-compliance events for chronic toxicity, as a result of the new limits, would be exceptionally hard to design.

#### Air Quality Regulations under Consideration or Development

***Toxic Air Contaminants*** – BAAQMD has begun implementing a new rule: Regulation 11, Rule 18 (Rule 11-18) is intended to assess and reduce human health risks associated with toxic air contaminant emissions from facilities throughout the Bay Area. The rule implementation has started with larger sources and has not yet affected the RWF. However, the RWF is among the sources subject to Rule 11-18 and will eventually be required to fund a Human Health Risk Assessment (HRA) for the entire RWF by an independent contractor under the guidance of BAAQMD.

A HRA conducted as part of the permitting process for the new Cogeneration Facility showed compliance with health risk standards under the strict HRA methodology, because the project includes Best Available Control Technology (BACT) that complies with the requirements of the new rule. The Cogeneration Facility will also allow the decommissioning of older emissions sources that could be subject to more stringent requirements. In addition, the new headworks project that is currently under design and the sludge thickening facility under construction will include emissions control equipment that will reduce emissions of toxic air contaminants. The HRA for the entire RWF conducted pursuant to Rule 11-18 is expected to be conducted after 2020. Staff will coordinate with BAAQMD to ensure that the most up to date emissions information is used in the HRA so that the health risks associated with the RWF are accurate.

***Greenhouse Gas Emissions / Cap and Trade*** – In the absence of federal action to reduce greenhouse gas (GHG) emissions, California has moved forward with state level programs, including a Cap and Trade program for GHG. The current program authorized by AB 32 in 2006 was set to expire in 2020 but was extended through 2030 with the adoption of SB 32 in 2017.

The RWF uses its digester gas as a fuel to power the facility but must blend it with large volumes of pipeline natural gas (a fossil fuel) to have sufficient fuel supplies. After five years of being



subject to the Cap and Trade program, the RWF was able to exit the program by purchasing electrical power from the utility grid rather than generating it onsite by using additional natural gas. This decreased GHG emissions generated onsite to less than the Cap and Trade threshold, but requires consistent management of emissions to remain under the cap. The RWF power generation system will change with the upcoming start-up of the new Cogeneration Facility. Staff is working on plans for the operation of the Cogeneration Facility with the goal of balancing overall GHG emissions below the Cap and Trade threshold, while powering the RWF in the most reliable and economical way for rate payers.

CARB is drafting a regulation to implement the directives of SB 32. The regulation to continue the Cap and Trade program will be similar in structure to the existing Cap and Trade regulation and will include the same 25,000 Metric Tons (MT) of Carbon Dioxide equivalents (CO<sub>2</sub>e) applicability threshold. However, the overall allowable Statewide emissions cap will decrease from approximately 350 Million MT of CO<sub>2</sub>e to 250 Million MT CO<sub>2</sub>e in 2030. This is expected to cause an increase in the cost of GHG emission allowances. The increased allowance cost would result in higher compliance costs for the RWF if allowance purchases are required in the future.

***Greenhouse Gas Emissions / BAAQMD Methane Rules*** – BAAQMD has begun rule development on measures intended to reduce methane emissions at Bay Area facilities. The first of these rules, Rule 13-1, is intended to require facilities to find and eliminate any large (defined as >10 pounds per day) methane leaks. Methane is an extremely potent GHG (21 times as potent as carbon dioxide) that is generated through the anaerobic decomposition of organic matter in processes such as the anaerobic digesters at the RWF. All biogas currently produced at the RWF is captured on-site and used to generate energy for the facility. In addition, as part of the RWF CIP, all biogas piping in the facility is being replaced and updated, eliminating potential leak sources and improving overall safety. The rule is expected to be adopted later this year. The effect of this rule on the RWF is expected to be limited to additional recordkeeping and reporting requirements.

BAAQMD also plans to begin development of Rule 13-4, targeting wastewater treatment facilities and anaerobic digesters for methane and nitrous oxide emission reductions. The intent of the rule would be to limit fugitive methane emissions and minimize the formation of nitrous oxide in the treatment process. Formal rulemaking for this rule is expected by the end of 2019. City staff and Bay Area Clean Water Agencies (BACWA) are working to educate BAAQMD personnel on wastewater treatment and anaerobic digester operations to help inform their rulemaking process. City staff and BACWA will monitor developments, provide comments, and participate in discussions with BAAQMD during the rule development process.

#### Other Wastewater-related Regulations

***Implementation of SB 1383*** – With the adoption of SB 1383 in 2016, CalRecycle is required to develop regulations that achieve specified targets for reducing organic waste in landfills with the goal of reducing short-lived climate pollutants, such as methane. The targets set by SB 1383 are a 50% reduction in the statewide disposal of organic waste from the 2014 level by 2020, and a



75% in the statewide disposal of organic waste from the 2014 level by 2025. SB 1383 also requires that regulations take effect on or after January 1, 2022, and that penalties not be imposed until two years after the effective date of the regulations. CalRecycle's latest draft regulatory text includes biosolids in the definition of organic waste and states that "biosolids generated at a POTW shall be transported only to a solid waste facility or operation for additional processing, composting, in-vessel digestion, or other recovery."

Implementation of the final SB 1383 regulations are expected to result in a major paradigm shift for POTWs, particularly those in the Bay Area. Based on recent data from the EPA, more than half of the biosolids from Bay Area POTWs are sent to landfills. At the RWF, biosolids are trucked during the fall each year to Newby Island Landfill to be used as ADC. Therefore, the final regulatory language will curtail the disposal of the RWF's biosolids at Newby Island Landfill (and all other California landfills) as soon as January 1, 2022.

In May 2015 and June 2015, the Treatment Plant Advisory Committee (TPAC) and City Council approved a Biosolids Transition Strategy, respectively, and as a result, the RWF is in the process of transitioning the biosolids handling process from the current open lagoon and drying bed process to a mechanical dewatering process. Construction of the new Digested Sludge Dewatering Facility will position the RWF to have diversified disposition options for its biosolids, optimizing future compliance success with the pending SB 1383 regulations. However, the RWF will not be able to fully empty and haul the biosolids from all the lagoons and drying beds until at least four years after the operational start of the new dewatering facility (estimated to be 2027). Depending on the final regulations, this could result in penalties or an increase in operational costs due to the need for interim disposition solutions. In preparation, staff is conducting a biosolids disposition market assessment and refining the phased approach for transitioning out of the current open-air lagoons and drying beds.

The RWF and partner agencies, such as California Association of Sanitation Agencies (CASA) and BACWA, are actively providing input to CalRecycle on the draft regulatory text. Staff submitted a letter with additional comments during CalRecycle's formal comment period that concluded in March 2019. Staff will continue to monitor the development and implementation of the proposed regulations and will refine the implementation plan for the biosolids transition in light of SB 1383.

## **EVALUATION AND FOLLOW UP**

Staff will continue to track regulatory discussions and advocate for the City's interest directly with regulators and indirectly through several regional groups including BACWA, CASA, San Francisco Bay Regional Monitoring Program (RMP), SFEI, and the San Francisco Bay Nutrient Management Strategy Steering Committee. Staff will plan to return to the T&E Committee on an annual basis with an update, and will bring forward recommendations on specific items, as appropriate.

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**PUBLIC OUTREACH/INTEREST**

This memorandum will be posted on the City's website for the May 6, 2019 Transportation & Environment Committee agenda.

**COORDINATION**

This report has been coordinated with the City Attorney's Office.

**COMMISSION RECOMMENDATION/INPUT**

This item is scheduled to be heard at the May 16, 2019 Treatment Plant Advisory Committee meeting.

**CEQA**

Not a Project, File No. PP10-0669 (a), Staff Reports.

/s/

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Director, Environmental Services

For questions, please contact Napp Fukuda, Assistant Director of Environmental Services, at (408) 793-5353.