Wet Weather Consent Decree
Implementation Update

Planning Committee

January 14, 2020
Agenda

- Background
- EBMUD Work
  - Regional Private Sewer Lateral (PSL) Program
  - Regional Technical Support Program (RTSP)
  - Capital Projects
- Compliance Progress
- Next Steps
• September 22, 2014 – EBMUD and Satellite agencies enter into Consent Decree

• Consent Decree is designed to remove inflow and infiltration (I&I) from the regional collection system to prevent discharging from Wet Weather Facilities (WWFs)

• Rehabilitation/repair/replacement to be performed by the responsible party
  – Homeowners/business owners responsible for PSLs
  – Satellite agencies responsible for public sewer mains/manholes
  – District is responsible for the Interceptor System
Background

I&I: Inflow and Infiltration
• Effective period of 22 years
• Key checkpoints throughout
  – Check-in #1 2022
  – Check-in #2 2030
  – Overall compliance 2036
• Failure to meet check-in targets results in revised work requirements with significant EPA discretion
EBMUD Work

- Regional PSL Program
- RTSP
- Capital Projects
  - Pump Station Q Force Main Flow Reversal Project
  - Urban Runoff Diversion Project
EBMUD Work
Regional PSL Program

- PSL is privately-owned pipe that conveys waste flows from property to publicly-owned sewer mains

- Collectively, PSLs in the region are equivalent in length to the publicly-owned regional collection system
Regional PSL Program includes all of SD-1, except for the City of Berkeley (which manages its own)

- Approx. 36,670 certificates issued since 2011
  - 28% of all parcels within program boundaries
  - Approx. 570 miles of PSLs certified leak-free
  - Certifications remain 20% behind projections
**EBMUD Work**

**RTSP**

- Program Components
  - Requires minimum of $2 million per year to identify sources of I&I
  - EBMUD identifies specific sources of I&I
  - Satellite communities pursue source elimination
EBMUD Work
RTSP Program Significance

- Technical approach to identify significant flow sources and understand system response to storms
- Supplements satellite mainline sewer rehabilitation and Regional PSL Program to achieve further flow reductions
- Critical to meet Consent Decree check-in targets and discharge elimination date
EBMUD Work
RTSP Investigations Performed

Unique Investigation Methodologies Used

- Manhole inspections
- Dye testing
- Flow isolation studies
- Smoke testing

Sewer main inspections
• Over 300 specific sources of I&I identified to date totaling over 15 MGD of peak flow during a storm event
  – Significant number of small sources have been identified throughout the regional collection system
  – Rate of identification has been increasing year-over-year
Compliance Progress

- Compliance at check-in is based on modeled discharge reductions at the WWFs relative to baseline
- Annual modeling is done to assess progress
- Fifth annual calibration completed in December 2019

<table>
<thead>
<tr>
<th>Facility</th>
<th>Baseline Volume (MG)</th>
<th>FY19 Volume (MG)</th>
<th>Reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point Isabel WWF</td>
<td>23.3</td>
<td>22.4</td>
<td>4%</td>
</tr>
<tr>
<td>San Antonio Creek WWF</td>
<td>13.2</td>
<td>9.8</td>
<td>26%</td>
</tr>
<tr>
<td>Oakport WWF</td>
<td>53.7</td>
<td>40.5</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>90.2</td>
<td>72.7</td>
<td>19%</td>
</tr>
</tbody>
</table>
Output Ratio = modeled current discharge/modeled baseline discharge

Point Isabel WWF remains at risk of not being in compliance for the 2022 check-in

FY19
Three-Year-Average Output Ratio = 97% (3% reduction)
San Antonio Creek WWF remains at risk of not being in compliance for the 2022 check-in

FY19
Three-Year-Average Output Ratio = 81% (19% reduction)
Oakport WWF remains at risk of not being in compliance for the 2022 check-in

FY19
Three-Year-Average Output Ratio = 80% (20% reduction)
• System-wide reductions have varied due to climatological impacts
  – FY15 was the fourth year of a drought
  – FY17 had 65% more rain than average
  – Last three year’s precipitation is close to that expected from four years
Compliance Progress

Summary

• System-wide, work has been effective at removing I&I
  - Localized reductions vary
  - Multi-seasonal climatological impacts have significant influence on annual results

• All three WWFs are currently at risk of not being in compliance at the 2022 check-in
  - Oakport WWF trended well for FY18 and FY19 compared to targeted levels and appears likely for meeting compliance
  - San Antonio Creek WWF, due to limited volume, looks promising
  - Point Isabel WWF is unlikely to achieve compliance
North Interceptor Relief Sewer

aka – Pump Station Q Force Main/Gravity Interceptor Reverse Flow

- Two CIP Underground Valve Vaults
  - Buchanan Street
  - Page Street

- Two Precast HDPE/FRP-lined Weir Structures at Virginia Street

- 23 LF FRP Rectangular Pipe

- 1,950 LF of 36-in PVC Pipe

- Five Precast HDPE-lined Manholes
EBMUD Work
Capital Projects

Point Isabel WWF

PS Q Force Main

North Interceptor

Buchanan St. Intertie Structure

Pump Station Q

Dual-mode pipeline

Eastshore Hwy Interceptor

Virginia St. Relief Structure

San Francisco Bay

MWWTP

Normal Dry Weather
Wet Weather
Relief Sewer
EBMUD Work
Capital Projects

- North Int. at Buchanan St.
- North Int. at Virginia St.
- Virginia St. Weir Structure
Urban Runoff Diversion Project

- Divert dry weather flow from Alameda County Stormwater pump station in Oakland (approx. 500,000 gpd)
- Mitigation project for ongoing operation of WWFs
- Over 300 MG diverted to the MWWTP
Next Steps

- Continue to implement and refine RTSP
- Continue implementation of Regional PSL Program
- Continue collaboration with Satellite agencies to locate and remove I&I
- Continue to monitor performance regarding flow reductions and prepare for the 2022 check-in
West County Wastewater District Recycled Water Supply Agreement

Planning Committee

January 14, 2020
Agenda

- Background
- Proposed Terms for New Water Supply Agreement
- Financial Analysis
- Next Steps
Water Recycling Facilities
Serving Chevron Refinery

- Richmond Refinery
- West County Wastewater District (WCWD)
- North Richmond Water Recycling Plant (NRWRP)
- Richmond Advanced Recycled Expansion (RARE) Water Facility
• Product water has been used in Chevron cooling towers since 1995

• Chevron cooling towers have sensitivity to ammonia
  – NRWRP not designed to remove ammonia
  – WCWD treatment plant not originally designed to consistently control ammonia
EBMUD Operational Challenges

• Increased chlorine dosing to oxidize ammonia
  – Ammonia levels varied greatly and were not predictable
  – Limited effectiveness, unreliable, costly

• Blended recycled water product with potable water to meet Chevron requirements (avoid plant shutdown)
  – Waste of potable water

• Chevron had ongoing concern with highly variable water quality
• Facility was upgraded to meet likely future nutrient requirements (i.e., ammonia limits)
  – Provides reliable water supply for NRWRP and Chevron needs

• Operational costs for WCWD will be higher to achieve lower ammonia limits
Key Concepts in New Agreement

- EBMUD pays operating costs (chemical and energy) to achieve lower ammonia concentration
  - These costs will decrease when WCWD has discharge permit that includes ammonia limits

- Payment based on actual quality of effluent delivered
  - Key new term in agreement
Payment Terms

<table>
<thead>
<tr>
<th>Monthly avg. effluent ammonia (mg/L)</th>
<th>Percent of monthly operating cost reimbursement to be paid by EBMUD to WCWD (%)</th>
<th>Approx. monthly operating cost reimbursement to be paid by EBMUD to WCWD ($/mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤2</td>
<td>100%</td>
<td>$17,000</td>
</tr>
<tr>
<td>&gt;2 &amp; ≤3</td>
<td>60%</td>
<td>$10,200</td>
</tr>
<tr>
<td>&gt;3</td>
<td>0%</td>
<td>$0</td>
</tr>
</tbody>
</table>

Additional incentive of $2,000 per month will be paid by EBMUD to WCWD if monthly average ammonia ≤1 mg/L

• Represents sharing chemical cost savings at NRWRP due to ammonia ≤1 mg/L
Financial Assessment

• Previous Agreement
  – EBMUD paid approx. $12k to $16k/month to WCWD for operational enhancements

• Proposed Agreement
  – EBMUD pays approx. $17k/month if ammonia < 2 mg/L
  – Amount is prorated if ammonia > 2 mg/L
  – Monthly cost adjusted annually based on unit cost changes for chemicals and energy
Summary

- WCWD upgrades provide greater capability for consistent, reliable water quality
- EBMUD pays increased operating costs for WCWD to achieve reduced ammonia concentrations
- Monetary incentives for WCWD to meet water quality criteria
  - Payment tied to actual quality of water delivered
Next Steps

• Agencies bring Agreement to their Boards for approval
Main Wastewater Treatment Plant Gas Flare Improvements Update

Planning Committee
January 14, 2020
Agenda

- Review Main Wastewater Treatment Plant (MWWTP) Digester Gas System
- Gas Flare Improvements Project Update
- Key Air Permit Conditions
- Nitrogen Oxides (NOx) Offsets
- Next Steps
MWWTP Digester Gas System
MWWTP Digester Gas System

• System Operation

  – Digester gas utilized in turbine, engines, and boiler for renewable energy
  – Power Generation Station (PGS) generates enough power to support plant loads and sells excess power to Port of Oakland
Gas Flare Procurement and Installation Project Timeline

2015
- District pre-purchased flares from ABUTEC

August 2015
- Began piping and flare installation project (SD-369)

2016
- Flares delivered and transferred to installation contractor
- June 2016
  - Flare manufacturer out of business before startup completed

Early 2017:
- Initial testing showed flares did not meet performance criteria for NOx and combustion zone temperature

2017
- Construction completed

February 2016
- Flares delivered and transferred to installation contractor
District Flare Improvement Efforts

Early 2017: Initial testing showed flares did not meet performance criteria for NOx and combustion zone temperature

July 2017: Flare performance improvement evaluation by consultants

November 2017: Formal flares compliance test did not pass

October 2017: Completed mechanical improvements

2017 to 2019:
1. Ammonia identified in digester gas
2. Ammonia is a large contributor to fuel-borne NOx emissions
3. District studied and tested digester gas for ammonia per BAAQMD request
4. District presented findings to BAAQMD; high ammonia concentrations in digester gas compared to other POTWs

April 2018:
DC Water (Washington DC, Blue Plains WWTP) had same issue with ammonia and Abutec flare and were granted permit changes by their local air board after a three year process

September 2019:
Completed control and programming improvements to better integrate the enclosed flares

October to November 2019:
Negotiated permit changes with BAAQMD and completed formal flare compliance test
Key Air Permit Conditions

- **Digester Air Permit Conditions**
  - No release of digester gas to atmosphere (unless limited exception applies)
  - Gas that is not used in turbine, engine and boiler **must** be flared
  - Digester gas production annual average limit is 3,400 scfm*
    - Average gas production is 2,300 scfm
    - Peak gas production is 4,000 scfm
  
*scfm = *standard cubic feet per minute*
Flare Permitting History

- Original flares installed in 1950s are grandfathered in (pre-Clean Air Act)
- New flares must meet current air regulations
  - Best Available Control Technology (BACT)
  - Emission limits
- Elevated ammonia in District digester gas is rare
  - Trucked waste and treatment process
Key Air Permit Conditions

- Flare Air Permit Conditions
  - Emission limits (based on BACT)
    - NOx – 0.06 lb/MMBtu
    - CO – 0.20 lb/MMBtu
  - Combustion zone temperature 1,500F, three hour average

- Not meeting NOx limit

- District engaged BAAQMD on permit issues
Key Air Permit Conditions

- Tentative New Flare Air Permit Conditions
  - Emission Limits
    - NOx – 0.12 lb/MMBtu
    - CO – 0.20 lb/MMBtu
  - Combustion zone temperature 1,200°F, 15 minute start-up exclusion
- November 7, 2019 test results met applicable emission limits
• Higher NOx limit requires additional offsets to be given to BAAQMD
  – The higher NOx limit will require giving BAAQMD 5.5 tons of NOx emission reduction credits
  – District already provided 5.5 tons of offsets to BAAQMD during initial permitting
NOx Offsets

- Only Bay Area emission reduction credits may be used to offset NOx emissions
  - Only about 25 credit certificate holders
  - Sold through brokers on open market
• Finalize tentative permit conditions with BAAQMD
  – Source test results from November 7, 2019 test submitted to BAAQMD in January 2020

• Purchase NOx offsets (February 2020)
  – Estimated market value is $15,000 to $18,000 per ton
  – BD-1 to Board on January 28, 2020 meeting for purchase
  – Request to spend up to $100,000 for offsets

• Finalize Permit to Operate
Facility Landscape Maintenance

Planning Committee

January 14, 2020
• Background
• Proposed work
• Union outreach
• Next steps
Background

- Vegetation management at over 400 facilities in the East Bay
- Includes water treatment plants, pumping plants, reservoirs, service centers, and administration buildings
- Methods include manual and mechanical weeding, mowing, contract labor (Civicorp), and contract goats
- Highly variable workload
Schedule and Resources

• Fire fuel abatement requirements
  – Typically between April and October
  – Work mandated by local fire codes

• Requires all resources to address, creating backlog of deferred work

• Workload and public expectations increasing
Staffing Levels

FY10 – FY20 Grounds Maintenance Staffing Levels

FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17 FY18 FY19 FY20

Funded  Filled
Proposed Agreement

- Address peak workload during fire season
  - Pruning, weeding, and planting activities
  - District administration buildings, service centers, and Oakport
- Provides equivalent of 2-3 FTE over 7 months
  - 2 person crew needed to accomplish the work
- Approximately $575,330 over 5 years
Affected Facilities

Red: Facilities requiring fire fuel abatement work.

Blue: Facilities covered under the proposed agreement.
Proposed agreement (3 years, with 2 potential annual extensions)
  - Approximately 1,720 hours per year

1.1 FTE used for comparison purposes, actual staffing would involve 2-person crew to efficiently perform the work.
• September 5, 2019 - Courtesy notification to Local 444

• September 6, 2019 - Local 444 Contracting Out notice

• October 3, 2019 - Local 444 Contracting Out committee meeting

• November 18, 2019 - Local 444 Contracting Out committee meeting
Next Steps

- Facility Landscape Maintenance Agreement for Board consideration at January 14, 2020 Board meeting
- Fill remaining Grounds Maintenance Specialist II position