

21st Annual New England Pretreatment
Coordinators Workshop
October 22-23, 2019

Charles River Case Study

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Charles River Pollution Control District



Background

- Operational since 1979
- Located in Medway, Massachusetts
- 11 Staff Members
- Regional wastewater plant serves the towns of Franklin, Medway, Millis and Bellingham
- Receives septage from seven additional towns
- 5.7 MGD design / 20 MGD peak design
- Activated sludge with tertiary treatment
- Collection system consists of over 240 miles of sewer, with 13 miles of District owned interceptors and one pump station

NPDES Permit

- Total Phosphorus Limits
 - April – October 0.10 mg/L monthly average
 - November – March 0.30 mg/L monthly average
- Total Ammonia-Nitrogen Limits
 - Varies months April – October
 - Report only November – March
- Total Copper - 13 ug/L monthly average
- Escherichia Coli Bacteria
- Total Chlorine Residual
- Carbonaceous BOD
- Total Suspended Solids
- Dissolved Oxygen
- Whole Effluent Toxicity
- Flow

Industrial Users

- 29 total
 - 3 SIU's (2 CIU's)
- 4 Zero dischargers
- 22 Permitted IU's

Types of Industries

- Significant Industrial Users (SIU)
 - Medical Device Manufacturer
 - Steam Electric Power Generator
 - Dairy
- Other Industrial Users
 - Metal Finisher
 - Car Wash
 - Marijuana Grower
 - Hydroponic Farm
 - Distillery
 - Paint Manufacturer

Current Local Limits

Parameter	Limit (mg/L)
Cyanide	0.23
Arsenic	1.02
Cadmium	0.06
Chromium	3.48
Copper	1.05
Lead	0.08
Mercury	0.03
Nickel	0.79
Selenium	0.14
Silver	0.35
Zinc	1.32
Oil & Grease	150
pH	5 – 12 s.u.

Sewer Use Ordinance

No current conventional limits in SUO.

“Specific Discharge Prohibitions

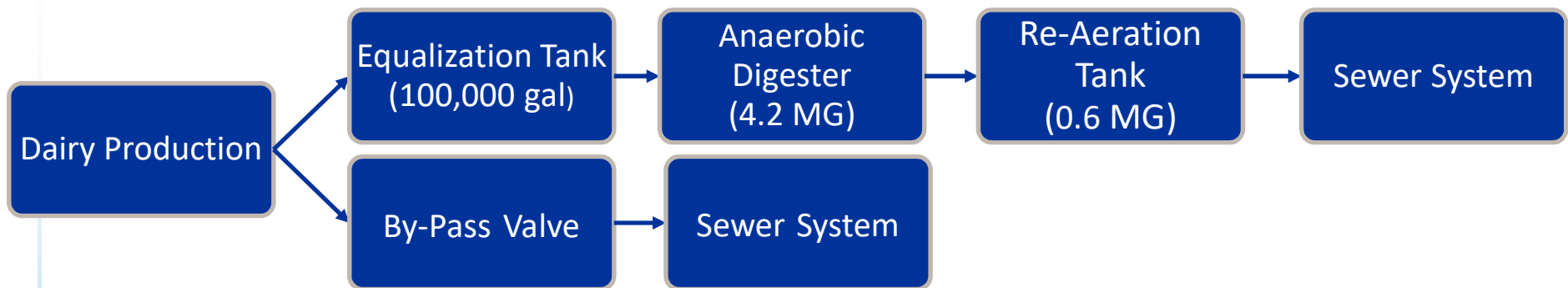
The following discharges to the Facility are specifically prohibited:

- Any pollutants, including oxygen demanding pollutants (BOD, etc.) released in a discharge at a flow rate and/or pollutant concentration which will cause Interference to the Facility.”

SIU Information

- Location: Franklin, MA
- Primary Concern of Business: Dairy
- Permit Information
 - Permit Effective: 01/01/18 - 12/31/19
 - Permitted Flow (GPD): 450,000 gpd
 - Average Recent Flow Rate (GPD): 280,000 gpd
- Permit Effluent Limits
 - Local Limits (shown previously)
 - cBOD
 - 2,000 ppd daily max
 - 1,000 ppd weekly average

SIU Pretreatment System



- By-Pass Valve
 - Ability to open “bypass” valve to 100% bypass the pretreatment system and send untreated waste to sewer system

Timeline of Events

- August 2018, SIU plant in Lynn, MA closed and merged with Franklin plant
- September 2018, District started to see an impact at plant due to increased influent loadings from SIU
 - District issued a compliance schedule to reduce loadings
- October 2018, SIU had issues with pretreatment system. The Town of Franklin received numerous odor complaints from residents surrounding SIU
- November 2018, MassDEP inspected SIU due to odor complaints. SIU's digester had settling and gas build-up problems and requested several bypasses to provide relief as floating membrane on digester was filled with gas

Timeline of Events (continued)

- November 19, 2018 SIU requested to open “bypass” valve for up to three days, the District could not handle untreated wastewater and denied the request
- November 21, 2018 SIU’s digester membrane ripped, causing sludge to overflow the digester tank and requiring them to fully open the “bypass” valve and send raw dairy to the District

Why did this happen?

- SIU failed to investigate the effects the merger would have on pretreatment system
 - SIU started processing heavy whipping cream that used to be sent to the Lynn facility – increase in organics to the pretreatment system
- Equalization tank was offline for maintenance
 - All wastewater sent directly to anaerobic digester, lost ability to buffer the loading to the pretreatment system
- Untrained staff was not properly sealing caps to silos filled with cream. The silos would empty and flow directly into the anaerobic digester causing slug loads that the digester could not handle
 - Dairy staff did not notify pretreatment operator of this
 - Days before “event” there were multiple large spills on consecutive days
- Opening the by-pass valve allowed SIU to temporarily relieve the gas build-up, after the District denied request for bypass, it only took 2 days for their digester cover to fail

Impact at the POTW During Bypass

- Aeration capacity maxed out with all blowers at full speed and all aeration tanks online—having trouble maintaining 2.0 mg/L DO
- District increased wasting from the Primary and Secondary Clarifiers which resulted in extra sludge trucks and added additional ferric chloride and hydrated lime
- Loading to the plant was exceeding the plant design capacity for max monthly BOD
 - BOD ~ 148% of design capacity
- District was able to remain in compliance with NPDES permit
 - Less stringent winter permit limits in effect

Loading at POTW During Bypass

Parameter	SIU Loading (ppd)	District Design Loading* (ppd)
BOD	17,000 – Daily Max 15,250 – Monthly Avg	16,517 – Daily Max 13,533 – Monthly Avg
Total Suspended Solids	24,078 – Daily Max 7,115 – Monthly Avg	20,040 – Daily Max 14,807 – Monthly Avg
Total Phosphorus	200 – Daily Max 136 – Monthly Avg	587 – Daily Max 526 – Monthly Avg
Total Ammonia	450 – Daily Max 261 – Monthly Avg	1733 – Daily Max 1539 – Monthly Avg

* 2035 Future Design Loading

Timeline (continued)

- November 28, 2018 District amended permit to reflect new sampling location (at “bypass” valve) and to increase sampling to daily for cBOD and O&G
- December 11, 2018 SIU received DEP/District approval to start adding hydrogen peroxide to aid in DO consumption
- December 26, 2018 SIU closed “bypass” valve and returned to sending 100% of its raw dairy to its pretreatment system
- December 28, 2018 District amended permit back to original monitoring point (post pretreatment)
- April 1, 2019 District amended permit back to original sampling frequency

Local Pretreatment Violations

- 76 IP Permit violations during the period of November 2018-January 2019
 - cBOD (44), O&G (30), flow (2)
- SIU in SNC for 4th period 2018 and 1st period 2019 evaluations
- Notification Violations
 - Failed to notify POTW of an unintentional discharge (slug load) that “has potential to cause a problem” at the POTW.
 - Failed to provide notification to the District of merger with Lynn facility which had significantly changed the quantity and quality of wastewater being discharged
 - Failed to notify District and provide letter of non-compliance occurrence

Timeline – Enforcement and Settlement

- April 2, 2019 District issued a NOV and Notice of SNC for 4th quarter 2018 which included a fine for \$360,000 and compliance schedule
 - Based upon the 4th period evaluation of 72 violations at \$5,000/day/violation
- April 29, 2019 SIU Counsel contacted District to request an informal meeting with Board of Commissioners and provided letters outlining their position
- May 1, 2019 Meeting was conducted with District, SIU and both legal counsels
- May 23, 2019 District sent SIU a letter that rebutted the claims made by SIU' and also offered to reduce fine to \$230,000
- June 4, 2019 SIU counter offer with \$200,000
- June 13, 2019 Final settlement was \$215,000

Enforcement Discussion

- We worked with District's Board of Commissioners and legal counsel to issue and negotiate fine
 - Counsel relied heavily on the District's IP Permit, Sewer Use Ordinance and Enforcement Response Plan
- EPA and MADEP were both major assets to the District when SIU was by-passing and while working through the enforcement case

Current Actions Taken by SIU as Result of Event

- Updated SCADA and added inline monitoring of pretreatment
- Retrained and licensed staff
- Added additional chemical injection points to their pretreatment system incase of emergency
- Added additional valves to be able to bypass digester only and send raw dairy through aeration tank for partial treatment
- Improved communication protocol with District
- Added signage to ensure properly sealed tanks

Current Actions Taken by POTW

- Developing Conventional Local Limits
 - BOD, TSS, Phosphorus, Ammonia
 - Met with IU's that will be affected by conventional pollutant limits
- Add provisions to SIU IP Permit
 - Incorporate language on by-pass valve: Specific monitoring requirements during by-pass and obtaining permission from District to open valve
 - Strengthen language to notify District when portions of the pretreatment system are offline and when large amounts of product are discharged directly to digester

Lessons Learned and Questions YOU should Ask Yourself

- Evaluate the Need for Conventional Pollutant Local Limits
- Strong and updated Enforcement Response Plan and Sewer Use Regulations
- Clear language in IP Permit about Penalties
- Detailed and thorough Notice of Violation letter with no reference to costs incurred
- Detailed notes for phone calls and inspections
- Utilize resources – EPA, DEP, other POTW IPP Coordinators
- Train additional employees on IP Program
- Language on use of “bypass” valve and separate monitoring point when using “bypass” valve

Questions

Charles River Pollution Control District

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