Novelty Ice Cream Plant

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Toxic Reduction and Control
Massachusetts Water Resources Authority
2.55 million people served
890,000 households served
5,500 businesses served
230 million gallons per day of water supplied to 51 water communities
350 million gallons per day of sewage treated from 45 sewerage communities
5,400 miles of local sewers transport the wastewater
228 miles of MWRA interceptor sewers.
ODOR AND CORROSION CONTROL PROJECT IN THE FRAMINGHAM EXTENSION SEWER
Evaluation of Contributing Sources

- MWRA study included:
  - Sampling of all industries discharging to FES
  - Study of shutdown period at Sulfate Discharger (July 2000)
  - Sampling in similarly-configured sewers (North Metropolitan and Randolph Trunk Sewers)

- MWRA consultant’s report submitted in January 2001
Sources Contributing to Odor and Corrosion

- High levels of sulfate and BOD from industrial dischargers
- Elevated levels of sulfide entering the MWRA’s system from the municipal collection systems
- Physical characteristics and wastewater travel time within the MWRA interceptor system
Contributions of Permitted Industrial Dischargers to BOD and Sulfate Loadings in the FES

- BOD at SL08: 47% Industrial Loadings, 53% Other Loadings
- BOD at SL17: 39% Industrial Loadings, 61% Other Loadings
- Sulfate at SL08: 76% Industrial Loadings, 24% Other Loadings
- Sulfate at SL17: 75% Industrial Loadings, 25% Other Loadings
Program Goals

- Peak H2S Levels < 100 ppm
- Average H2S Levels < 20 ppm
- Reduce/Minimize Odor Complaints
- Protect and Preserve Infrastructure
Regulatory Strategy

- Adopt “regional” Local Limits
- Public Outreach campaign
  - Public Meetings
  - Mailings
  - Work with communities to develop compliance schedules
  - Work with industries to develop compliance schedules
- Verify progress and compliance through sampling, reports
Industrial Users-BOD and Sulfate

- Study to determine appropriate controls
- Evaluation of universe
- 6 Industries met threshold
  - 5 BOD
  - 1 Sulfate
- Negotiated compliance schedules
- Amended permits
# Industrial Limits for BOD and Sulfate Established 11/7/01

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit (mg/l)</th>
<th>Estimated Reduction in the FES (lbs/day)</th>
<th>Resultant Conc. in the FES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD</td>
<td>2000</td>
<td>5,876</td>
<td>219-247 mg/l</td>
</tr>
<tr>
<td>Sulfate</td>
<td>500</td>
<td>6,308</td>
<td>28-41 mg/l</td>
</tr>
</tbody>
</table>
Industries Subject to BOD and Sulfate Requirements and Their Compliance Dates

- Biotechnology Company (BOD) – April 30, 2003
- Bottle Recycler (BOD) – Closed June 2003
- Soft Drink Manufacturer (BOD) - April 30, 2004
- Nanotechnology Company (sulfate)- April 1, 2005
- Paper Recycler (BOD)- May 31, 2006
- Novelty Ice Cream Company (BOD) – September 4, 2006
Novelty Ice Cream Company

- Average Flow: 205,000 gpd
- Only treatment: pH adjustment with CO$_2$
- Designated High Strength User
  - BOD and/or TSS >400 mg/L
  - Flow >25,000 gpd
  - Permitted SIU
- Increased FOG limit of 1300 mg/L granted in 1993.
(10) (a) In the Metropolitan Sewerage Service Area, waters or Wastes containing fats, wax, oil and grease, in excess of 300 mg/l (based on the materials recovered in the applicable EPA approved procedure, unless otherwise authorized or required by the Authority and EPA), or containing any substance which may solidify or become viscous at temperatures between 32°F (0°C) and 180°F (82°C). Waters or Wastes containing such substances, excluding normal household Waste, shall exclude all visible floating oils, fats and greases. The use of chemical, biological, or physical means to bypass or to release fats, wax, oil and grease into the sewer is prohibited. If a Person is unable to comply with the 300 mg/l requirement after treatment, the Authority may increase the limit on a case by case basis if the Authority and appropriate Municipality are satisfied that such increase will not contribute to nuisance conditions or an adverse impact on the Sewerage System, Receiving Waters, or the Authority’s Wastewater Residuals program. In no circumstance will the Authority increase the limit to allow a discharge of more than 300 mg/l of oil or grease of hydrocarbon or petroleum origin, including fuel oil, crude oil, and lubricating oil. The Authority may apply a monetary charge to any increase in the 300 mg/l limit to recover the costs it reasonably expects to incur as a result of the increase.
Timeline

- March 2000: Board adopted sulfide limit (0.3 mg/L) for area Towns, applied through Annual Municipal Permit.
- June 2001: Local Limits study concluded and Board approved limits for sulfate and BOD for facilities discharging more than 100 lbs/d BOD and/or sulfate.
- 2001-2002: Meetings and Letters requesting compliance schedules sent to industries.
- NICC submits schedule to install up to 8 CIP systems to reduce BOD (permit contains FOG limit of 1300 mg/l, approved in 1993).
- 2002: NICC Permit amended to incorporate compliance schedule with final compliance date of October 1, 2006.
- May 2004, Town describes problems with its sewer and pump station wet well receiving wastewater from NICC, requests FOG be limited to MWRA limit of 300 mg/l; reported issue to NICC and told them to address FOG.
May 2004 - January 2005: Meetings and Letters to NICC telling company to address FOG as well as BOD in permit application due in Spring 2005.


December 2005: Permit issued with compliance schedule that required design and installation of a pretreatment system. Permit required immediate compliance with FOG limit of 300 mg/L and compliance by October 1, 2006 with BOD limit of 2000 mg/L.

January 2006: NICC appealed terms of its permit and began adjudicatory process.

May 2006: First penalty issued for FOG violations for $200,500; Enforcement Order issued simultaneously.

October 2006: NICC installed pilot treatment system.

February 2007: NICC installed permanent treatment system.
Average FOG and BOD Levels Before and After Treatment

<table>
<thead>
<tr>
<th>FOG</th>
<th>BOD</th>
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<tbody>
<tr>
<td>5525</td>
<td>1628</td>
</tr>
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</table>

Before: FOG 5525 mg/L, BOD 1628 mg/L
After: FOG 580 mg/L, BOD 64 mg/L
Concentration of FOG Before and After Treatment at NICC

Before Treatment

After Treatment
Timeline (continued)

- June 2007: Second penalty issued for $500,600 for FOG, BOD and reporting violations.
- July 2007: NICC began compliance monitoring to demonstrate compliance; violations continued. Town reported presence of hundreds of foam blocks in downstream sewer.
- July – December 2007: NICC continued to tweak system (incl. repairs to air vents, installing screens to hold foam media in IBC.)
- December 2007: Settlement signed with NICC to pay $600,000 for two PANs and $33,500 for violations occurring after the PANs were issued; stipulated penalties for a period of 2 years; system adjustments if necessary.
April 2009: NICC announced it would close down its Framingham facility by December 2010.
Lessons Learned

- Never give anybody a 4 year compliance schedule!
- Document everything, every conversation, every meeting.
- Get buy-in from the Powers that Be.
- Every step takes at least 5 times longer than it should.
- Keep the legal team involved in early decisions.
- Regulations needed changes.
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