Case Study: The Role of Pretreatment in a Combined Sewer Overflow Basin

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What Are The Issues?

• Two Facilities With Different Chemicals of Concern Within The Same CSO Basin
• Discharge to Treatment Plant Not As Significant Concern As CSO Discharge
• As Pretreatment Control Authority, Focus Is On Treatment Plant and Conveyance System
• EPA Nine Minimum Controls For CSOs (i.e., #7 – Pollution Prevention)
• POTW Liability As NPDES Permitee For CSO
• **And The Big One** – Pretreatment Permit As Shield For Liability
Background Information

- **Treatment Plant:** West Point (Serves City of Seattle and Some Outlying Sewer Districts) – Avg. Flow: 100 MGD
- **CSO:** Hanford No. 2
  - Annual Average Volume: 203 MG
  - Average CSO Events: 19/Year
- **Receiving Water:** East Waterway of Duwamish River
- **Sediment Criteria:** Sediment Management Standards (Ch. 173-204 WAC)
  - **SQS:** Sediment Quality Standards
  - **CSL:** Cleanup Screening Levels
- **Chemicals of Concern:**
  - **14DCB:** 1,4-Dichlorobenzene (Source: Urinal Cakes From Chemical Toilet Decant Facility)
  - **PCBs:** Polychlorinated Biphenyls (Source: PCB-Containing Industrial Paint)
East Waterway – Sediment Remediation Site

- **Current Proposed Northern Boundary**
  - Previously Identified Northern Boundary
    - Established in the 2003 Phase 1 Removal Action EE/CA (Windward 2003b)
East Waterway – Sediment Remediation Site
1,4-Dichlorobenzene (14DCB) – Surface Sediment Results
Hanford No. 2 Trunk – Study Area

PCB Site

14DCB Site
14DCB – Wastewater Samples (µg/L)
Chemical Toilet Decant Facility

Address on face of bldg

A45341
14DCB - Conclusions

- Discharge Authorization Did Not Authorize Use of 14DCB and Did Not Contain Limits for 14DCB – Which Was A Good Thing.
- If Limits Were Applied, Procedures Manual Has Screening Concentration of 3.5 mg/L (Henry’s Law and Occupational Exposure) and Loading Limit of 0.8 lb/day (1 Std. Dev. of Influent Loading).
- At 8,000 gpd Discharge Volume Limit and 3.5 mg/L Screening Concentration, Loading Much Less Than 0.8 lb/day Limit (at 0.2 lb/day).
- 4.5 mg/L (4,500 µg/L) 14DCB value measured at the site was above 3.5 mg/L Screening Value – But Not By A Lot.
- After Discovery of Sediment Contamination, Special Screening Level for 14DCB Added to Discharge Authorization Because of CSO Issue – 25 µg/L (Based on Average WWTP Influent + 3 Std. Dev.).
- Discharger Decided To Eliminate 14DCB From All Operations
- Compliance Achieved More Through Potential Liability Under Superfund Rather Than Pretreatment Authority.
Treatment Plant – 14DCB in Wastewater

West Point Treatment Plant - 1,4-Dichlorobenzene

2001: Discharge Authorization Issued to Chemical Toilet Decant Facility

2009: Facility Notified of Sediment Contamination and Concerns Surrounding Use of Urinal Cakes w/14DCB
And Now For PCBs

CAUTION
CONTAINS
PCBs
(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency regulations 40 CFR 761. For disposal information contact the nearest U.S. E.P.A. Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center.

800-424-8802

Also Contact ________________________________
Tel. No. ________________________________
PCBs – Surface Sediment Results

Figure 3. Exceedances of SQS/CSL for total PCBs
Total PCBs – In-Line Sediment (µg/kg)
PCB Site – PCB-Containing Paint
PCB Site – PCB-Containing Paint

PCB-Containing Paint: ~2,300 ppm (~ 2,300,000 μg/kg)

Catch Basin PCBs: ~ 20 to 2,200 ppm (~ 20,000 to 2,200,000 μg/kg)

Combined Sewer Manhole Sediment PCBs: 347 ppm (347,000 μg/kg)

Aqueous Manhole PCBs:

- March 2008: 0.062 μg/L (0.44-Inch 24-hr Storm)
- June 2008 1.242 μg/L (0.58-inch 24-hr Storm)
- 2010: Line Cleaning
- 2011: Discharge Authorization Issued (w/Conditions)
- October 2012: 0.061 μg/L
- January 2013: <0.050 μg/L
PCB Paint - Conclusions

• The Federal Toxic Substances Control Act (TSCA) allows discharges to sewer at total PCBs < 3 µg/L \(^\text{Note:}\) Satisfies compliance with TSCA, not with CSO control, pretreatment, or Superfund).

• Our pretreatment program allocates mass of PCBs to industrial users based on the mass to create a biosolids detection, along with a safety factor.

• This mass allocation to industry (~1,000 mg/Aroclor/day) is further divided among 10 industrial users at any one time.
PCB Paint - Conclusions

• Discharge limits apply after treatment (including granular activated carbon).
• Discharge limits for industrial users can range from 0.1 to 1.0 µg/L (as Aroclor).
• For PCB paint site, aqueous concentrations per Aroclor 1254 ranged from 0.062 to 0.615 µg/L, but manhole sediment was 347,000 µg/kg.
• **Nugget Effect:** Aqueous concentrations are highly variable because of the impact from paint flakes.
PCB Paint - Conclusions

• Discharge authorization issued with conditions to control sources of PCBs and requirement for pretreatment program review of paint removal plans.
• Aqueous screening level of <0.1 µg/L applied along with annual monitoring of sediments for PCBs.
• As with the 14DCB site, compliance achieved more through Superfund liability than pretreatment authority.
• Not the kind of site that our pretreatment program would normally be involved with (i.e., a commercial property).
• Goal was to issue a control document that regulates the sources of PCBs at the site in a manner that is protective of East Waterway sediments as well as the treatment plant.
The End

Thanks!

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