

Using Best Management Practices (BMPs) to Achieve Pretreatment Goals

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OUTLINE

- Describe: What are “BMPs”?
 - Required BMPs
 - Site specific BMPs
- Explain why Pretreatment needs BMPs
- Methodology for developing BMPs
- Tenets for applying BMPs (enforceable)
- Goal: Show value of BMPs and their potential utility in protecting a POTW.





What are BMPs

What are BMPs?

- 403.3(e) Defines BMPs as: “ ..**Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices** to implement the general and specific prohibitions listed at 403.5(a)(1) and (b). BMPs also include **treatment** requirements, **operating** procedures, and practices to control plant site **runoff, spillage or leaks, sludge or waste disposal, or drainage** from raw materials storage.”
- EPA’s FS#7: In general they are **management & operational procedures** intended to prevent pollution from entering a facility’s wastestream or reaching a discharge point.



Best Management Practices Generally (BMPs) May Address:

- Practices and/or procedures for:
 - changing the chemicals used at a facility
 - controlling fugitive emissions, spills, leaks
 - storing & transferring materials
 - operating and maintaining the facility
 - minimizing, managing, & treating waste streams
 - meeting discharge prohibitions
 - managing sludges, solid/haz waste & stormwater
 - responding to spills, slug loads, or emergencies
 - keeping records showing BMPs are done



When are BMPs Required

- When Cat Stds Require Them
 - 442 TEC Pollutant Management Plans (when chosen ILO numerical limits)
 - 455 PFPR allows P2 Practices & treatment ILO “zero discharge” requirements, (see 455.67)
- To allow alternatives to numerical limits
 - Example: 40 CFR 433 Toxic Organic Management Plans v. TTO limits in permit
- When functional necessity of Cat Stds:
 - 437 CWT waste pre-approval, acceptance, and classification process



When are BMPs An Option

- When numerical limits are not the optimal means of control
- When numerical limits are not feasible
- When BMPs provide better outcomes
- When BMPs better assure compliance.
- When BMPs are a useful supplement to monitoring





Why Pretreatment Needs BMPs

Why BMPs are more Useful

- The number of chemicals brought to market, the difficulty of identifying them (proprietary) and the lack of information on the threat they pose (singly or in combination) often precludes pollutant specific limits.
- EPA has been unable to update categorical standards on 3-year cycle.
- Industries “grandfathered in” keep that “advantage” by resisting updated rules.
- An integrated approach often works better even when a traditional limit might be developed.



Why Did EPA Include BMPs in Streamlining?

- POTWs already could require BMPs in addition to other pretreatment req'ts.
- EPA was using BMPs for new PSNS and PSES, but hadn't defined SNC with these requirements (or BMPs generally)
- A rule change was needed to clearly define what EPA meant by "BMPs"
- Rule change was needed to define when POTWs could use of BMPs "IN LIEU OF" local limits.



EPA's Rationale for BMPs

- Streamlining FS#7 Suggests BMPs are “Appropriately Used” when:
 - A) Categorical Stds Require Them
 - B) POTW Uses BMPs ILO local limits or to meet prohibitions (403.5(a)&(b)) when
 - Complying with numeric limits impractical
 - Analysis is Impractical
 - Types of Pollutants Vary Greatly over Time
 - Discharges are Episodic
 - Other Controls are Inappropriate



Why would Complying with Numeric Limits Be Impractical?

- Sampling may be unduly burdensome for industry/sector – (e.g. no sample point), costly, or difficult (e.g. grease).
- It's unclear what parameter would be most indicative, and how to set limits.
- Effluent variability would suggest more frequent sampling than is practical.
- Sampling wouldn't be best use of resources for industry (or sector).



Analysis is Impractical

- Level of concern is below approved analytical methods (think PCB's)
- Wastestream of concern is highly diluted prior to "end of pipe" sampling point.
- Pollutant doesn't have approved method (or criteria by which to gauge compliance) e.g. surfactants (MBAS)



Types of Pollutants Vary

- Many uses of priority pollutants have been replaced by other chemicals w/o criteria
- Business may produce a number of products each with specific chemicals.
- Industry sector may use various chemicals (pharmaceutical numerical limits vs BMPs)
- Businesses discharging the chemical are rare and infrequent in the sector (boat hull repainting with tributyl tin – Have all boatyards sample for TBT vs BMPs)



Discharge is Episodic

- Often overlooked, but frequently problematic.
- Difficult to predict the activity schedule, frequency, and/or duration.
- Difficult to get a representative sample.
- Off-site disposal costly and, when reasonable steps taken, usually unwarranted.
- Examples: Fermented liquids, boiler water maintenance (descalants etc.), process tank cleaning & descaling, sanitizing pipes, stripping floors, range hood degrease, cart brightening, paint cleanup (etc.)



Permit Limits not Appropriate

- What are traditional controls:
 - Identify specific pollutants & set effluent limit
 - Periodically sample, analyze & report
 - Other chemical use & discharges prohibited
 - Other wastes disposed of off site
- Why might limits be inappropriate:
 - Chemicals used unclear, proprietary, complex
 - “Safe” discharge levels rarely established making setting limits for pollutants (per BPJ) contentious
 - Translating prohibitions to limits is difficult
 - Monitoring is expensive, difficult, ineffective
 - Offsite waste disposal costly, unreasonable



Potential Advantages of BMPs

- Can be cheaper (both for industry and POTW)
- Can be more effective at protecting the POTW
- Can be more “applicable” than dated Cat. Stds.
- Can establish a level playing field (gen. permit)
- Can foster a collaborative working relationship.
- Promotes holistic approach to manufacturing.
- Aligns with goals of P2 - reducing waste, operating efficiently, & reducing treatment needs.
- Empower Users to create and reinforces use of internal management systems (e.g. ISO 13000).
- Reduces sampling & analysis burden.



Situations Most Conducive to Facility Specific BMPs:

- History of permit violations or effects on the POTW not best addressed by numerical limits.
- Potential release or toxic, explosive, or hazardous chemicals not amenable to limits.
- Value in requiring IU to review and enforce the systems they use to assure compliance:
 - Chemicals used, and Pollutant sources
 - Potential for on-site recycle/reuse
 - Necessary treatment systems
 - Operation & Maintenance systems
 - Stormwater controls (& discharges to POTW)
 - Material handling exposures
 - Volatile & toxic pollutants





How to Develop BMPs

EPA Fact Sheet #7 Method:

- Fact sheet sketchy on how to develop:
 - POTWs must evaluate BMPs when doing Local Limits &
 - Compliance with BMPs must be verifiable.
- BMPs that are local limits under 403.5(c) must protect against Pass Through and/or Interference
- EPA pub. BMP Manual (1993) contains generic info – Manual now a bit obscure.



EPA's 1993 Manual on BMPs

- EPA 833-B-93-004 **Guidance Manual for Developing Best Management Practices (BMP)**
- With NPDES, not Pretreatment Publications
<https://www3.epa.gov/npdes/pubs/owm0274.pdf>
- Includes Chapters on:
 - **BMP Plan Development** (Chapter 2 – **57pp**)
 - Industry Specific BMPs (Chapter 3 – 61pp)
 - Resources Available for Determining BMPs
 - Appendixes: **BMP Development Checklist (18pp)**, Example Forms, BMP Plan Decision Process Example (5pp)



EPA 1993 Manual on BMP's

- Manual (202 pp) is **not specific to Pretreatment** (includes Stormwater).
- Chapter 2 (BMP plan development) still very relevant to Industry Developed BMPs
- Describes a logical processes (BMP committee, develop, integrate, evaluate, revisit, update (plan, check, repeat)
- ANSI uses ISO 9000(quality mgmt) and ISO 14000 (environmental mgmt systems)



Why with NPDES? -CWA 304(e)

- **CWA 304(e)** “The Administrator, ...may publish regulations, supplemental to any effluent limitations... ..for a class or category of point sources,... ..**to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage****associated with or ancillary to the industrial manufacturing or treatment process**... ..applicable controls... ..shall be included as a requirement... ..**in any permit issued to a point source...**” – i.e. put in NPDES Permit



CWA Cites BMPs in Section 319

CWA 319B (State Management Programs)

(2) SPECIFIC CONTENTS.—Each management program proposed for implementation under this subsection **shall include** each of the following:

(A) An identification of the **best management practices** and measures which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular **nonpoint source** designated under paragraph (1)(B), taking into account the impact of the practice on ground water quality.



Stormwater BMP's CWA 121(a)

- **SEC. 121. WET WEATHER WATERSHED PILOT PROJECTS.1 (a) IN GENERAL.**—The Administrator... ..may provide technical assistance and grants for treatment works to carry out pilot projects relating to... :
- ...**(2) STORMWATER BEST MANAGEMENT PRACTICES.**—The control of pollutants from municipal separate storm sewer systems for the purpose of demonstrating and determining controls that are cost-effective and that use innovative technologies in **reducing** such **pollutants from stormwater discharges**.



Pretreatment CWA 304(g)

- (g)(1) ...the Administrator shall publish..., ...guidelines for pretreatment of pollutants... ..not susceptible to treatment by POTWs.... ..to control and prevent the discharge... ..(either directly or through POTWs) of any pollutant which interferes with, passes through, or otherwise is incompatible with such works" (similar text at CWA section 307(b)(1))



Practices Traditional Subject to BMPs

- Activities ancillary to manufacturing processes (CWA 304(e))
 - Plant Site Runoff including Material Storage Areas & Loading/Unloading
 - Spills or Leaks
 - Waste Storage & Disposal Areas
- General BMP's (activity widely practiced)
- Site Specific BMPs (specific to facility)
- Developed by Industry, Third Party, Control Authority, or collaboration of these parties.



Ways to Develop BMPs

- **Collaborative Approach** (Industry or industry group develops the BMPs, and Permitting Authority OK's & includes as enforceable conditions of permit.
- **Unilateral Approach** (Permitting Authority develops and includes in permit.)
- **Third Party Approach** (Third party develops, and Permitting Authority includes in permit.



What BMP Approach is Best

- **Collaborative:** Useful for large Industry w/other quality management systems
- **Unilateral:** Small Industries with well established stds that address main differences (e.g. Grease Interceptors)
- **Third Party:** Small Industry w/ larger numbers, similar wastes, accepted practices (e.g. Dental, Coatings, Boilers, Breweries)



Collaborative Approach to BMPs Works by Finding Common Ground

- POTW Wants To:
 - Have assurances the IU won't cause them problems.
 - Foster growth of their industries
 - Avoid conflicts (work together w/ industry)
 - Use BMPs where traditional limits don't work as well
- Industry Wants To:
 - Do things in the most economical manner.
 - Reduce uncertainty
 - Avoid creating waste
 - Avoid production down time (O&M)
 - Avoid sampling
 - Use BMPs where they achieve these goals.



Third Party BMP Help - Green Certification Organizations

- Chapter 4 of the 1993 manual includes “resources” – no longer usable links
- Ecology listing of agencies certifying “Green products and Services” at:
- http://www.ecy.wa.gov/programs/swfa/epp/stand_certifications.html#organizations
- Best resource often other programs



BMP manual w/ “Permit Issuance Process” (program id=1)

https://cfpub.epa.gov/npdes/pubs.cfm?program_id=3



U.S. ENVIRONMENTAL PROTECTION AGENCY

National Pollutant Discharge Elimination System (NPDES)

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Pretreatment Home

Pretreatment Publications

- View Pretreatment publications by type:
 - [Example and General Permits](#)
 - [Fact Sheets and Outreach Materials](#)
 - [Policy and Guidance Documents](#)
 - [Program Status Reports](#)
 - [Technical and Issue Papers](#)
- [View all Pretreatment publications](#)
- [View all Archived Pretreatment publications](#) 
- [View all NPDES Publications in blocks of 25](#)
(Recommended for slower internet connections)

-or-

[View all NPDES Publications](#)



EPA Pretreatment Manuals Focus on P2

- Guides to **Pollution Prevention**: Municipal Pretreatment Programs (1993) 48pp (App. B missing)

https://www3.epa.gov/npdes/pubs/pretreatment_mun_guide.pdf

- **Pollution Prevention** at POTWs - Case Studies (1994) 22pp (mostly state grant synopses)

https://www3.epa.gov/npdes/pubs/pretreatment_pollution_prevention_casestudy.pdf

- Introduction to **Pollution Prevention**: Training Manual (1995) 182pp

https://www3.epa.gov/npdes/pubs/pretreatment_pollution_prevention.pdf

RELATED Ohio: Guide to **Industrial Assessments of P2** (w/case studies)

<http://www.epa.ohio.gov/portals/41/p2/IndustrialAssessmentsP2.pdf> (2001, 485pp)



What's More Important to Achieving

Pretreatment goals: BMP's or P2?

- Pollution Prevention (P2) typically focuses on optimizing industrial processes to produce good in the least polluting way. P2 often saves money by reducing waste, and reducing treatment costs.
- BMPs typically focus on managing and operating a facility so that pollution (or potential) is minimized. BMPs more directly relate to permit compliance.
- BMPs are typically more amenable to permitting actions.



Information Needed to Develop BMPs

- Developing or reviewing site specific BMPs requires understanding of:
 - **THE SPECIFIC THREATS:**
 - Chemicals on site that might reach sewers & how.
 - Potential for creating problems to the POTW.
 - Potential exposure to workers, public, inspectors.
 - **THE PARTICULAR SITUATION:**
 - Environment: Climate, rainfall, freezing conditions.
 - Age of facility, & potential for releases.
 - Processes employed for production, treatment, mgmt.
 - **THE HISTORY:**
 - Engineering designs & shortcomings
 - Environmental compliance record
 - **REASONABLE EXPECTATIONS**



Focus Areas for BMP's

- A. Housekeeping
- B. Treatment
- C. Maintenance & Inspections
- D. Operational Practices
- E. Security
- F. Employee training
- G. Recordkeeping & Reporting



(Good) Housekeeping Tenets

- Everything has its proper place, including residuals (trash, packaging).
- All activities have a time, place, and protocol for how they are performed.
- Everything is cleaned on a schedule.
- Everything, including wastes are labelled.
- Everyone is trained in the above rules.
- Specific individuals reinforce the rules.



Treatment BMPs

- Meeting pretreatment goals may require treatment of certain waste streams.
- BMPs can require such treatment & associated record keeping.
- “**Basic treatment**” - pH neutralization, flow equalization, blending, mixing, screening, gravity oil-water or grease interceptors, & **passive** systems. (**often use BMPs ILO monitoring**)
- “**Advanced treatment**” – involves operator judgment or sophisticated controls, more complex, e.g. coagulation, settling, filtration – including R.O., flocculation, etc. (**often use BMPs to augment monitoring, or reduce its frequency**)
- Washington requires IUs submit “Engineering Reports” (Chapter 173-240 WAC) describing the pollutants, treatment system, effluent quality, and capacity.



Maintenance & Inspections

- **Ecology mandates O&M Manuals** at Chapter 173-240 WAC as well.
- **Required content** includes operational instructions, maintenance procedures, and checklists for periodic inspections.
- **BMPs can reinforce O&M manual procedures** such as keeping completed inspection checklists, operational logs.
- **Permits** might require IU's to develop equivalent practices & procedures and reinforce them as BMPs.



Operational Practices

- The other half of the O&M Manual
- **BMP's relating to operation** address:
 - Equipment start up and shut down
 - Operation under different scenarios
 - How to switch production runs
 - How clean up is to be performed
 - Raw materials (including chemicals) use, storage, and the process for changing.
 - Prohibited chemicals and practices.



Security

- Not the most obvious BMP (to me)
- Relates to ensuring against both inadvertent and malevolent damages
- Control protocols for who (public, visitors, contractors, suppliers, employees) can go where, and how this is enforced, including area security
- Typically not reinforced in IU permits



Employee Training

- Lack of training is common cause of problem discharges to the sewer.
- Preventing such problems requires training every employee on each BMP that they need to know.
- Should be formal program for most industries (can involve OJT).
- Refresher training must also be done.
- BMPs may require developing plan for training employees with critical tasks (e.g. operating pretreatment devices)



Recordkeeping & Reporting

- Confirmation that most BMPs are being implemented is done through requiring recordkeeping (as a permit condition).
- Ideally, POTWs will reach a consensus with IU's on what records will be kept on-site and what records will be periodically sent to the POTW.
- Permit conditions should describe the process for IUs to follow to change these requirements should practices change.





How to Apply BMPs

Required For Enforcing BMPs

- 1) Legal Authority to apply and enforce BMPs as pretreatment requirements - PT Ordinance & Legal Sufficiency Statement
- 2) Approved Procedures for using BMPs including compelling the information required to develop BMPs:
 - Section 4.1 EPA 2012 “IU Permitting guidance Manual for POTWs”: “The Industrial User should be required to provide... information regarding any existing BMPs”
- 3) ERP Procedures for Enforcing



Streamling FS#7 Methodology

POTW should include in enforceable BMPs:

- A. Specific notice to IU's of requirements and how they will be applied and enforced (if gen permit).
- B. Requirements to provide treatment.
- C. Those practices, activities, or discharges which are required and which are prohibited.
- D. Requirements to properly operate and maintain the systems providing treatment
- E. The timeframes for completing required activities
- F. Reporting and certification & record keeping requirements.
- G. Provisions for revisiting or revoking BMPs.
- H. Other requirements determined by the POTW**



A: Specific Notice to IU's

- When issuing an individual permit, the requirements will be in the draft permit.
- The basis will be in the fact sheet.
- Permit conditions must describe how the IU is expected to show compliance.
- How BMPs will be enforced (cite ERP).
- Legal authority and standards in POTW's Sewer Use Ordinance.
- Develop General Permits using a process that provides notice of proposed BMPs –
- Ordinances usually involve such a public process, but not specific notice to IU (do both)



B: Provide/Install Pretreatment

- Criteria or specifications for equipment needed to satisfy BMPs
- For example, where oil-water separators are required, sizing or design criteria e.g. Uniform Plumbing Code, WA Uniform Plumbing Code.
- EPA's Proposed Dental Amalgam Rule
- Ecology's Guide to Photoprocessors



C: Required or Prohibited Practices

- **O&M Manuals** may inform prohibitions by setting a treatment system's capacity, describing the proper treatment chemicals, and describing the wastes the system can treat.
- **Include in permits** as required BMPs the practices (BMPs) the POTW believes necessary to protect the POTW and associated documentation & reporting.
 - **Required practices** might include things such as maintaining receipts for all off-site waste disposal
 - **Prohibited practices** may prohibit things such as discharge of separator water from a dry cleaner.
- **Include in Fact Sheets**, the basis for the requirements, & suggested practices.



D: O&M of Treatment Units

- POTWs are **NOT** expected to develop BMPs describing how to operate and maintain treatment equipment.
- BMPs can reinforce IU's **adhering to approved O&M manuals** and **documenting their O&M** (using and keep checklists & log books on file)
- Permit conditions requiring IUs to **perform O&M** usually either:
 - reference and reinforce expectations for IU's to follow procedures previously submitted to the POTW or
 - Include generic requirements to provide proper operation and maintenance.
- For design criteria set by code (e.g. grease interceptors and oil-water separators) ordinances sometimes set maintenance intervals and reporting requirements.



E: Timeframes for Key Activities

- POTWs must decide when IU's must begin any required BMPs & include the dates as permit conditions.
- This especially important when BMPs involve installing treatment systems, or changing existing practices.
- **Example:** Process Wastewater Handling: By (date) certify all collection troughs, pipes, and in-ground sumps are water tight and impervious to chemicals used, keep maintenance log of inspections.



F: Compliance Certification, Reporting and Records Retention

- Permit conditions should describe what IU's need to do to verify that they have implemented the BMPs.
- This includes initial certification, ongoing reporting & record keeping requirements.
- Example: Maintain daily inspection log book for three years, note when any required maintenance is done or needed, note when corrective actions are taken.



G: Provision for Reopening or Revoking the BMPs

- If the IU can't show they are doing the BMPs, the POTW needs to be able to require they do something else, e.g. sampling, cease discharge.
- It also may be that the BMPs need to be modified to be effective due to reasons not foreseen.
- Example: Metal finisher changes process to use zirconization rather than nitric acid passivation.



Summary

- BMPs can be extremely useful for a wide variety of situations where numerical pollutant limits are not best.
- EPA Manuals won't provide a lot of guidance, but borrowing from other programs may be fruitful.
- Whether used in individual permits or for an industry sector a collaborative process is recommended.
- Writing permits that rely on BMPs will take more knowledge of the industry.



Exercise (see web site)

- 4-Page handout with Ecology's BMPs for dental practitioners (adapted from pub)
- List whether each BMP relates to:
 - A. Housekeeping
 - B. Treatment
 - C. Maintenance & Inspections
 - D. Operational Practices
 - E. Security
 - F. Employee training
 - G. Recordkeeping & Reporting



Practical Exercise

Pretreatment BMP Development Practical Exercise: (Derived from Ecology's "Best Management Practices for Dental Office Waste" Nov, 2015)

<https://fortress.wa.gov/ecy/publications/publications/0604007.pdf>

For each below BMP place a number to the left indicating whether you believe it most closely relates to a:

- A. Housekeeping
- B. Treatment
- C. Maintenance & Inspections
- D. Operational Practices
- E. Security
- F. Employee training
- G. Recordkeeping & Reporting

Amalgam Separator Unit:

- Install amalgam separator certified compliant with ISO 11143 standards and sized appropriately to accept the wastewater generated from all operatories.
- Service the unit regularly - at least as frequently as the manufacturer recommends.
- Keep records of all maintenance and services performed for the last three years.





Questions and discussion



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