MERCURY POLLUTANT MINIMIZATION PROGRAM GUIDANCE
U.S. EPA Region 5, NPDES Programs Branch
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1. Background and Overview

The following Guidance has been developed in conjunction with the Region 5 states, to address situations where a Pollutant Minimization Program (PMP) is required in a state-issued NPDES permit as a result of the permittee receiving a variance from the underlying state water quality standard for mercury. Many of the specific recommendations are drawn from existing guidance and practices of the Region 5 states. As guidance, this document does not create any obligations enforceable by any party. Both industrial and municipal permittees may be required to develop PMPs; however, because of the more complex and indirect nature of mercury contributions within these systems, the recommendations in this guidance pertain primarily to Publicly Owned Treatment Works (POTWs). Each POTW affected by PMP requirements will need to determine how it intends to comply. To the extent that other nearby POTWs will be faced with the same requirements, however, EPA and the States strongly encourage POTWs to coordinate with other POTWs in both the development of their PMP Plans, and in their implementation activities to identify and reduce mercury loadings from source sectors.

While it is expected that specific permit language and conditions will vary (see Ohio sample PMP permit language, included in Attachment 1), there are a number of important elements for a mercury PMP.

1. A Program Plan, which lays out the POTW's commitments for:
   a. Identification of potential sources of mercury that contribute to discharge levels;
   b. Reasonable, cost-effective activities designed to reduce or eliminate mercury loadings from identified sources;
   c. Tracking mercury source reduction implementation and mercury source monitoring;
   d. Monitoring the POTW's influent, effluent and biosolids, including at least quarterly influent monitoring;
   e. Resources and staffing;
2. Implementation of cost-effective control measures for direct and indirect contributors; and
3. An annual status report submitted to the Permitting Authority, which includes:
   a. A list of potential mercury sources;
   b. A summary of actions taken to reduce or eliminate mercury discharges to enable the POTW to progress toward meeting the water quality based effluent limitation (WQBEL);
   c. Mercury source reduction implementation, source monitoring results, and influent, effluent and biosolids results for the previous year;
   d. Proposed adjustments to the Program Plan, based on the findings of 3.c.

The PMP is meant to be a self-revising process. Results from annual reports need to be used to make necessary revisions to the Program Plan and the implementation activities in subsequent years to address problems discovered, and investigate new areas where the pollutant might be found. The goal of the PMP is to move the POTW's effluent level towards, and to achieve as soon as is practicable the level specified by the underlying water quality based effluent limit necessary to comply with the mercury water quality criteria (which will generally be 1.3 ng/l in the Great Lakes Basin and elsewhere in the Region 5 states). When this goal is realized, that is, when the discharger can be reasonably expected to be in compliance with the WQBEL, then the PMP requirements can be removed from the permit. Where a POTW believes

it has identified all known sources of mercury, and has fully implemented control strategies with respect to those sources, yet remains unable to meet the underlying WQBEL, it should document those findings in its annual reports, and revise subsequent program plans accordingly.
Each element is discussed below.

2. Program Plans

2.1 Requirements to develop PMP Plans.

Requirements to conduct initial monitoring and develop a mercury PMP will be included in a POTW's NPDES permit at the time of reissuance (where a variance has been granted concurrently), as a condition for receiving a variance from the water quality standard on which the water quality-based effluent limit for mercury is based, or as triggered by results showing a reasonable potential for violating water quality criteria, based on monitoring conducted during the life of the permit. States have generally been allowing six to eighteen months for development and submittal of Program Plans, depending on the extent to which the state requires additional data collection in support of the Plan, and the POTW's previous experience with regard to mercury minimization.

2.2 Identification of potential sources of mercury that contribute to discharge levels (to be updated at least annually).

Sources of mercury within a POTW system can be identified using two basic methods: 1) review of existing information sources, and 2) sampling at various points within the sewer system. These activities can be done separately, but an initial review of types and locations of existing users within a system will help design a monitoring plan which focuses on the most potentially significant contributors. The Program Plan should therefore include a review of existing information regarding industrial, commercial and domestic users of a POTW system. For some source sectors, including most of those in the matrix in Table 1, all individual facilities should be considered likely sources of mercury. For others, such as manufacturing facilities or other Significant Industrial Users, review of production processes, materials usage and discharge information should be evaluated. Studies and other literature such as source sector analyses from other POTWs (see http://www.epa.gov/Region5/air/mercury/mercury.html and http://delta-institute.org/pollprev/mercury/mercury.php), and EPA development documents and Industrial Sector Notebooks on specific industrial categories can be useful sources of information.

Existing influent, effluent and biosolids data should also be evaluated, as well as other available information such as storm water inputs, groundwater (Inflow & Infiltration) inputs, and wastestreams or sewers tributary to the treatment plant. While some States and POTWs may be interested in establishing a mass balance of all mercury inputs so as to be able to characterize controllable versus uncontrollable contributions, it is recommended that the primary focus be on information indicating community sectors and/or geographic locations which are the source of potentially significant contributions.

2.3 Development of Control Strategies

The Program Plan next should describe the POTW's prioritized approach for development of Control Strategies for various source sectors, based on review of existing data and the results of subsequent monitoring. The Plan should also describe any other mercury reduction activities which have already been carried out in a community, as these activities may be substantial and will form a base for the additional activities that will need to be done. At minimum, the sectors in Table 1 reflect direct dischargers of mercury to POTWs, and should be addressed as part of a POTW's mercury PMP. Consideration should also be given to addressing the sectors in Table 2. Although mercury is generally not directly released to POTWs from these sources, they may still pose a significant threat to a POTW's

compliance with its mercury effluent limits. Accidental breakage of mercury-containing devices such as thermometers, while infrequent, may be enough to increase short-term loadings to a POTW. Where a POTW also receives stormwater runoff, mercury levels could be elevated if mercury-containing devices are left at locations such as demolition sites or scrap yards. **NOTE: While we believe that all of the activities listed in Table 1 can be valuable tools in reducing mercury discharges, specific activities and performance measures chosen by a POTW may vary from those recommended below in order to most efficiently implement effective mercury reduction outreach or other controls. These recommendations are based on current information and experience. They may be reevaluated if sector-specific or other relevant national guidance is developed.** Ultimately, activities should be selected by a POTW as part of its mercury control strategy based on the potential of those activities to reduce mercury loadings to its sewer system, and thus to its effluent and biosolids. Whatever approach is taken initially, progress should be monitored with respect to both participation levels and mercury loading reductions. This tracking may indicate the need to change course as necessary for a given sector.

In addition to describing the proposed activities for each sector, the Plan should also include a schedule for implementation which identifies milestones as appropriate.

Table 1 - Direct Contributors to Address in Mercury PMPs

Sector	*Activity*	*Performance Measure*	*Goal*
Medical- Hospitals, clinics, nursing homes, veterinarians	-Mail AHA BMP literature -Workshops -Onsite visits -BMP requirements -Permits	Date/content Participation Reduction Progress, quantity recycled Adoption/implementation	-Mercury-free wherever practicable -Spill management
Dental clinics	-Mail appropriate BMP literature -Mtgs with dentists -Onsite visits -Survey(s) -Adherence to ADA's BMPs (voluntary or mandatory) -Mercury recycling (voluntary or mandatory) -Adoption of removal equipment meeting ISO standards (voluntary or mandatory) -Permits	Date/content Participation Adoption/implementation Quantity recycled Adoption/implementation [Note: Certain facilities do not use or generate mercury, and some measures may not be applicable to them]	-Capture and recycle mercury used or generated -Minimize mercury discharges
Schools-Secondary	-Mail BMP literature -Workshops -Onsite visits -Permits	Date/content Participation Reduction progress Quantity of mercury recycled	-Mercury-free wherever practicable -Spill management

Sector	*Activity*	*Performance Measure*	*Goal*
Schools-Colleges/Technical, laboratories	see Medical and School sectors	see Medical and School sectors	
Other industries and businesses with potential for mercury contributions	-Mail chemical/equipment literature -Onsite visit during pretreatment inspection -Application of local limits and/or require BMPs/IU PMP in IU permits	Date/content Reduction progress Quantity of mercury recycled	-Phaseout of mercury containing devices and chemicals -Spill management
POTWs, **other municipal departments and agencies, hauled waste**	-Evaluate chemical /equipment usage -Evaluate domestic and nondomestic wastes hauled to POTW**,** *see activities from other sectors as appropriate*	Reduction progress Quantity recycled	-Phaseout of mercury containing devices and chemicals -Spill management
General public	-Promote mercury clean sweeps -Displays at community events - Public Service Announcements -Outreach at schools -Establish local mercury website	Date/contents Quantity of mercury recycled Website hits	-Reduced use of mercury containing products -Recycling of mercury products -Spill management

Table 2 - Indirect Contributors to Address in Mercury PMPs

Sector	*Activity*	*Performance Measure*	*Goal*
Thermostats-HVAC Wholesalers/Contractors, Retail stores	-Mail Thermostat Recycling Corp. literature -Workshop -Trade assoc. coordination -Onsite visits -Surveys	Date/content Participation Recycling progress Quantity of mercury recycled	-All captured and recycled -Spill management
Automobile and appliance switches	-Onsite visits-service centers -Replace hood/trunk switches -Onsite visits-scrap yards -Clip & Recycle switches	Date/content Participation Quantity recycled	-All captured and recycled -Spill management
Dairy manometers	-Mail information -Promote use of non-mercury manometers	Date/content Participation Quantity recycled	-All captured and recycled -Spill management
Outside POTW boundaries	see all sectors above	see all sectors above	see all sectors above

2.3.1. Stakeholder Engagement

To be Effective, control strategies should be tailored to the specific source sector. These strategies will need to include forming partnerships with stakeholders such as trade associations, industrial or commercial representatives, local solid and hazardous waste officials, municipal and county health officials, POTW treatment plant and pretreatment staff, environmental or other public interest organizations, technical assistance providers, academics, equipment vendors, analytical labs that run mercury samples, mercury recyclers and others. Participation in statewide or regional efforts (e.g. state dental or hospital associations**,** state and local school agencies and boards) will also greatly improve a POTW's ability to provide outreach and education to association members within its jurisdiction. In addition, local recognition of successful facility or sector mercury reduction activities has proven to be a popular means of encouraging facility participation, and should be strongly encouraged.

POTWs and other municipal departments can be sources of mercury, and can serve as role models for addressing mercury in their communities (see references under wastewater treatment plants and municipal departments).

Collection programs for community residents (e.g. bulk mercury from dentists, thermometer take-backs) have proven effective in removing stocks of mercury from the community that could otherwise end up in wastewater or the solid waste stream, and serve to raise awareness for the importance of mercury reduction efforts. The availability of mercury recycling vendors, whether public or private, is crucial to the success of these collection programs as well as recycling from other sectors, and should be identified, and established if necessary, early in program planning and implementation.

While existing authority should generally be adequate, legal authority issues may need to be considered for some of the strategies. For example, POTWs should evaluate their legal authority to ensure that they are able to require Industrial Users to:

- Develop mercury minimization plans;
- Comply with narrative BMP requirements;
- Apply numeric local limits to non-significant industrial users; and
- Permit non-significant industrial users.

In order to improve the efficiency of educational outreach and mercury product recycling efforts, municipalities should be encouraged to collaborate with others in their area in the preparation and implementation of Mercury PMPs, at least with respect to the control strategies.

2.4 Monitoring of potential sources of mercury

In addition to review of existing information, PMP plans should also lay out a POTW's plans for monitoring known and suspected sources of mercury. POTW monitoring of source reduction activities using the types of performance measures included in Tables 1 and 2 is one way for both the POTW and states to determine whether a POTW is meeting its PMP commitments. For example, Wisconsin has established a goal of schools becoming mercury-free. POTWs would be able to monitor and report their progress towards this goal by reporting the number of schools within their jurisdiction, the number of mercury assessments conducted at these schools, and the number that have become mercury free. Where this approach is taken, it is recommended that some spot-test or random sampling program be maintained to measure progress of educational programs, and to identify any odd "hot spots" that may show up.

POTWs should consider determining the baseline level of BMP implementation for various sectors, which may be important in establishing the potential mercury load reductions for these sectors.

The Water Quality Guidance for the Great Lakes System, 40 CFR 132, Appendix F, Procedure 8.D. requires semi-annual monitoring of potential sources of the subject pollutant, and quarterly monitoring of the wastewater treatment plant influent where a PMP is required due to a water quality-based effluent limit being below the quantification level. While the PMP and associated monitoring requirements in the federal Great Lakes rules are not directly applicable for state-issued mercury variances, they should nonetheless be considered in development of an effective monitoring plan.. Where there are large numbers of individual sources (like residential areas), representative sampling could be conducted to determine how much a given type of source adds to the system load, and to gauge the effectiveness of outreach efforts. In some situations, monitoring methods other than chemical analysis (such as mass- or materials-balance, which rely on assumptions of loadings per individual source rather than chemical analysis) may be appropriate, such as where there are a large number of facilities with low individual loadings, where individual effluent monitoring on a large scale is impractical, or for episodic dischargers such as dentists. In general, the plan should lay out a monitoring schedule that will allow the permittee to establish baseline levels, determine the effectiveness of various activities and track progress of the PMP.

To ensure that potential sources are not missed, it is also recommended that plans include an in-sewer monitoring scheme that begins with sampling main sewers coming into the treatment plant, and working back through the system to identify particular sources. This may need to include sampling of sediments within sewers or drainage ditches tributary to the sewers to determine if in-place pollutants are contributing to the loading.

Sampling and analytical methods used in conducting these monitoring plans may vary, based on the purposes for which the data will be used, and the location of the sample within the POTW. Given the need to compare results with variance-based limits and the underlying water quality-based effluent limits, methods 1669 and 1631 will need to be used for effluent monitoring. However, while these methods can be successfully run on Industrial User effluents and other points within a POTW, less sensitive methods and less-strict sampling protocol may be appropriate for some influent or collection system samples.

POTW influent levels are commonly in the 50 to 200 ng/L range. Collection system samples may be higher in certain parts of the system. EPA Methods 1669 and 1631 are performance based. This means that " alternate procedures may be used so long as these procedures are demonstrated to yield reliable results." Stated another way, less stringent procedures may be used as long as contamination levels are maintained at acceptable levels and sensitivity and other quality control requirements are maintained.

- Sample contamination - Method 1631E, Section 9.4.5.2 indicates that the field blank concentration must be no greater than 0.5 ng/L or one-fifth the level in the associated sample, whichever is greater.
- Method sensitivity - Method 1631E, Section 9.1.2.1 indicates that the Method Detection Limit (MDL) of the method used must be no greater than 0.2 ng/L or one-third the regulatory compliance level, which ever is greater.
- Other quality control - Requirements in Method 1631 regarding standards, method blanks, matrix spikes and matrix spike duplicates must still be followed.
- High concentration samples - Whenever possible, laboratories should be notified when high concentration samples are being submitted so they can select less sensitive procedures or perform necessary dilutions. Failure to identify high concentration samples may compromise the quality of low level results and shut down the instrument for extended periods while the laboratory decontaminates the system.
- Use of Less Sensitive Methods - Although samples may be diluted to bring sample concentrations into the working range for method 1631, it is also appropriate to select less sensitive methods for higher concentration samples. Section 9.1.2 of method 1631E allows certain modifications of the method when less sensitivity is required. Laboratories may substitute the detector with a cold vapor atomic absorption system (CVAAS) similar to that used in method 245.1. The initial preconcentration on the gold amalgam may be omitted, making the method functionally equivalent to method 245.7. For samples expected to have concentrations in excess of 500 ng/L (0.5 ug/L), the traditional dilutional method 245.1 can be useful. However, be aware that the potassium permanganate used in the method acts as a mercury scavenger, so results may have a high bias.

Typical Mercury Concentrations and Method Options For Wastewater Sources
[Estimates based on WDNR observations]

Source	***Typical Concentration***	***Method Options***
POTW wastewater influent	50 - 500 ng/L	1631 (dilution) 1631 modified (245.7*)
POTW wastewater effluent	1 - 20 ng/L	1631
POTW sludge or biosolids	0.2 - 30 mg/Kg (dry weight)	SW 846-7471B
POTW Collection System	50 - 1000 ng/L	1631 (dilution) 1631 modified (245.7) 1631 modified (CVAAS) 245.1 (optimized & dedicated instrument)
Industrial Effluent -general	Variable	1631 1631 modified (245.7) 1631 modified (CVAAS)
Industrial Effluent - mercury process or contaminated feedstock	Variable	1631 modified (245.7) 1631 modified (CVAAS) 1631 (dilution) 245.1
Surface Water	0.2 - 10 ng/L	1631
Dental office discharge **	episodic discharges ranging *from 1,000- 12,000,000* ng/L	245.1 1631 modified (CVAAS) 1631 modified (245.7)

***** Seattle Metro 1991; Massachusetts (MWRA) 1997; Barrucci (San Francisco) 1992, 1993; Pima County, AZ, 1991.***

Additional details on appropriate sampling and analytical procedures are discussed in WDNR's Guidance for Collecting Samples for Total Mercury Analysis to Meet Wastewater Permit Requirements in Wisconsin sampling guidance, (attachment 2).

2.5 Resources and Staffing

Lastly, Program Plans need to summarize the resources and staff that will be committed to implementation of mercury PMPs. Specifically, Plans should indicate the source and amount of funding that will be available to carry them out. They should also include the number and position of Full Time Equivalents that will be devoted to PMP implementation. Where other POTWs, municipal agencies, or trade associations will be helping to plan or implement mercury reduction activities, those resources and staffing estimates should be included as well.

2.6 State approval of the plans

The states will be reviewing and approving POTW PMP plans to ensure that implementation moves the POTW towards the goal of maintaining mercury concentrations at or below the WQBEL. As indicated in section 2.1, POTWs will generally be required to submit proposed plans within a reasonable period of time (typically 6-18 months) from reissuance of the POTW's NPDES permit, or as required by the permitting authority as a condition for receiving a variance.

Proposed plans should be reviewed based on addressing the specified elements discussed above. As indicated above, proposing activities in the "indirect contributors" section (Table 2) should generally not be accepted *instead of* activities in the "direct contributors" section (Table 1), although the value of addressing those additional sectors should be considered as part of the evaluation of adequacy of the overall plan. Similar consideration should be given to activities that address sources outside a POTW's jurisdictional boundaries. POTWs would need to address comments and make necessary revisions prior to state approval of the plans. Upon plan approval, implementation would be required as a condition of the POTW's NPDES permit. POTWs are encouraged, however, to begin implementation activities such as monitoring, outreach to dischargers and internal audits prior to final approval, or prior to a PMP being required.

An example of a PMP developed by a POTW in Michigan is included in Attachment 3.

3. Program Implementation

Upon approval of its Plan, the POTW will be responsible for carrying out and tracking implementation of its source reduction strategies, and conducting the specified monitoring. While U.S. EPA, the states and others are engaged in identifying the best approaches for addressing mercury sources in the various sectors, much work has been done in this area. POTWs should be encouraged to review available information, and to the greatest extent possible adopt approaches that others have found to be effective. Several of the States in Region 5 have already identified materials that can be used or revised as necessary for distribution to sources in several sectors; these materials are referenced in references and websites below. Other sources of mercury pollution prevention and waste minimization information are available at http://www.epa.gov/Region5/air/mercury/mercury.html.

4. Annual status reports

PMP reports are an important element of state approved plans, and will generally be required to be submitted one year after the Program goes into effect, and annually thereafter. For POTWs with pretreatment programs, these reports can be submitted with their Annual Pretreatment Report. Reports should include a summary of potential sources of the pollutant, a summary of all source control activities, and results of source reduction monitoring and wastewater sampling for the previous year. Proposed adjustments to the Program should also be included.

4.1 Potential mercury sources

The annual report should identify individual facilities or targeted groups within the various sectors covered by the plan. A list of new potential sources that have been identified as a result of monitoring or other evaluation should also be provided. Status of these facilities with respect to the goals laid out for the different sectors should be provided, as described in section 4.3 below.

4.2 Summary of actions taken to reduce or eliminate mercury discharges

This section would include actions taken in response to monitoring results discussed below, and in furtherance of the control strategies laid out in the Plan. Progress with respect to identified goals for the various sectors should be discussed. If no actions were taken to address an identified source or sector, an explanation should be provided. Historic mercury source reduction activities, as well as *recent* actions taken in the last year, should be included in this summary. This will give the municipality credit for all their activities to date regarding the various sectors, and will facilitate review of the annual report.

4.3 Source Reduction and Wastewater Monitoring results

All mercury data collected during the previous year should be included with the annual report. This would include tracking of source reduction activities with respect to established sector-specific performance measures as discussed in section 2.4, as well as influent, effluent, biosolids data, and data collected from potential sources. Sampling dates, method of analysis, the laboratory name, and appropriate units should accompany any wastewater monitoring results.

The Water Quality Guidance for the Great Lakes System calls for at least quarterly influent monitoring for POTWs implementing PMPs. Several of the states have viewed this as a minimum requirement for both influent and effluent, but have required additional, generally monthly monitoring, for larger POTWs (those with flows of greater than 5 million gallons per day). In addition, these states have generally required biosolids monitoring from one to four times per year, with the frequency varying based on the volume of biosolids generated. Collection of biosolids data is important in tracking progress in reducing mercury releases to the environment; tracking effluent levels alone will not fully indicate progress in reducing mercury releases to the environment.

4.4 Revision of plans

Finally, the Annual Report would need to include any proposed adjustments to a POTW's Program Plan where municipal activities have not been implemented as originally agreed to, source reduction implementation has not occurred, or source reduction implementation has occurred, but has not been effective in reducing mercury discharges (after accounting for sample variability).

5. Compliance determinations under state NPDES programs

Compliance with the permit provisions for a POTW with mercury limitations based on a variance from the water quality standard would be determined by evaluating two components of the permit. First, the concentration in the POTW's effluent would be compared to the currently achievable level as established through the state's variance process. Second, the facility would need to be in compliance with the PMP requirements of the permit. Specifically, it would need to have developed the PMP Plan, and then fulfilled the commitments established and agreed to in the approved Plan. After approval of the initial plan, compliance would be evaluated primarily through review of the annual status report, to determine whether the POTW had adequately identified known and potential mercury sources, had carried out the activities it committed to, and had satisfied the specific source reduction and wastewater monitoring requirements. Evaluations for subsequent years would need to take into account revisions described in the previous year's annual report. Where a POTW has coordinated with other POTWs, the reports from the communities should be reviewed as a group.

6. Approaches to Establishing Local Limits for Mercury

6.1 Background on local limits

Local limitations are generally developed by POTWs to implement the general and specific prohibitions of the General Pretreatment Regulations, 40 CFR 403, and are established to prevent discharges that cause pass through, interference, or which threaten worker health and safety. EPA's Local Limits Development Guidance (EPA 833-R-04-002A, July 2004) identifies fifteen pollutants, including mercury, which are presumed to be pollutants of concern, and should be evaluated to determine whether local limits should be established. Where established, local limits for mercury and other pollutants are typically expressed as daily maximum and/or a longer term average concentration.

The National Pretreatment Program, and the underlying General Pretreatment Regulations apply to Industrial Users (IU). An IU is defined as a source of indirect discharge, which in turn is defined as the introduction of pollutants into a POTW from any nondomestic source regulated under Section 307(b)(c) or (d) of the Clean Water Act (40 CFR 403.3(g)). Thus, all non-domestic users of a POTW, which would be considered any user except for a household or dwelling unit, are considered Industrial Users, and are thus subject to Pretreatment Standards and Requirements. And while many POTWs have established local limits for mercury, with some applying these limits to hospitals and other Significant Industrial Users (SIU), mercury local limits have generally not been enforced against "commercial" facilities such as dental clinics, schools, etc. Where these facilities have been addressed, it has generally been through voluntary outreach and education efforts. As discussed in this PMP guidance, promotion of voluntary source reduction will remain an integral part of PMPs. In order to increase participation in implementing Best Management Practices and other source reduction strategies to achieve the greatest possible mercury reductions, however, POTWs will need to consider application of local limits for these commercial users.

6.2 Best management practices (BMPs) as local limits

Ensuring compliance by all industrial and commercial facilities within a POTW's jurisdiction with uniform concentration-based mercury limits will generally not be desirable or feasible. As an alternative, some POTWs have established mercury limits that apply to all IUs, but then establish alternative methods that can be used by certain commercial or industrial sectors to demonstrate compliance with the limits.

The issue of using requirements for Best Management Practices instead of or in addition to numeric local limits was addressed in EPA's Pretreatment Streamlining Proposal (64 FR 39563, July 22,1999). As discussed in that proposal, the Pretreatment Regulations do not specifically address the use of BMPs as local limits, and are not clear as to whether BMPs can satisfy current requirements for development and implementation of local limits. However, as pointed out in the proposal, The Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program (EPA 833/B-87/202, December 1987) provides general information on the use of BMPs as local limits. Specifically, the guidance explains, ``The development and implementation of numeric local limits is not always the only appropriate or practical method for preventing pollutant pass through and interference, or for protecting POTW worker health and safety. Control of chemical spills and slug discharges to the POTW through formal chemical or waste management plans can go a long way toward preventing problems. A local requirement for an IU to develop and submit such a plan can be considered as a type of narrative local limit and can be a useful supplement to numeric limits."

Recognizing that some POTWs are already using BMPs to control certain wastewater discharges where they found it impractical to apply a numeric effluent limit, EPA proposed to clarify that best management practices developed by POTWs may serve as local limits required by 40 CFR 403.5(c)(3), and that such BMPs would be enforceable under 40 CFR 403.5(d). While this clarification has not yet been finalized,

U.S. EPA Region 5 believes that BMPs developed by POTWs to prevent pass through and interference would be considered enforceable local limits under 40 CFR 403.5(c), and supports this approach.

6.2.1 Sector-specific mercury BMPs

With respect to mercury, some cities are implementing formal regulatory programs for controlling mercury discharges from dental facilities, which were identified in a 2002 Association of Metropolitan Sewerage Agency study as the largest source of mercury to evaluated POTWs (Mercury Source Control & Pollution Prevention Program Evaluation (March 2002). Voluntary and regulatory programs, along with case studies, are discussed in the Binational Toxics Strategy Mercury Workgroup report Options for Dental Mercury Reduction Programs: Information for State/Provincial and Local Governments (updated April 2004). In general, these programs focus on implementation by dental facilities of BMPs such as those adopted by the American Dental Association (ADA), as well as installation of amalgam separators. Amalgam separators are devices that remove amalgam from wastewater before it leaves the dental clinic. As pointed out in a video developed by the ADA and the Naval Institute for Dental and Biomedical Research entitled "Dental Amalgam and Best Management Practices" (http://www.ada.org/prof/resources/topics/amalgam_bmp.asp), the use of amalgam separators can substantially reduce levels of dental mercury that reach wastewater treatment plants, and studies in several communities where separators have been adopted have shown marked reduction in mercury levels in municipal wastewater treatment plant sludge.

To control potential mercury releases from schools, Indiana, like some other states, has adopted legislation prohibiting schools from using or purchasing most mercury commodities, compounds or equipment. Satisfaction of these state requirements or implementation of state programs for inventorying and elimination of mercury in schools could be incorporated into local requirements for schools. Likewise, hospitals and medical clinics could be required to implement BMPs adopted by the American Hospital Association.

6.3 Incorporating BMPs into the technical evaluation of local limits

As discussed in the Pretreatment Streamlining proposal:

> For BMPs to be considered local limits under 40 CFR 403.5(c), they must protect against pass through and/or interference. This will require the POTW to evaluate the BMPs during the technical evaluation of its local limits. During the technical evaluation for local limits, the POTW will determine the maximum allowable headworks loadings (MAHL) for pollutants of concern. This MAHL will then be allocated to the different contributing sectors of the service area, such as domestic loadings, commercial loadings, industrial loadings and a safety factor.
>
> Based on these considerations, the POTW will decide how to control the different contributing sectors in order to protect against pass through and interference. Often the POTW simply allocates a portion of the loading to control industrial contributions; this is considered to be the maximum allowable industrial load (MAIL). The MAIL is then converted into the local limit which is often expressed as an across-the-board concentration applicable to all industrial sources or all "users of the POTW." This is not the only way local limits can be developed. Another option available to the POTW is to apply the MAIL to all industrial and commercial sources and to use a mixture of BMPs and numeric limits to control industrial and commercial sources of pollutants. Whatever the allocation scenario, the BMPs are developed by the POTW to protect against pass through and interference, and are local limits."

Thus, POTWs providing for use of BMPs by certain commercial or industrial sectors as an enforceable alternative to numeric mercury limits will need to review the basis of their underlying numeric limits. What may previously have been considered "uncontrollable" loadings from commercial facilities may now be considered "controllable" loadings. The recharacterization would result in the shifting of loading from the domestic background to the MAIL. Under ordinary circumstances, POTWs using BMPs as local limits would be able to provide an evaluation that implementation of the numeric limit plus implementation of BMPs for specific sectors should result in the calculated MAIL being met.

Available data, however, indicates that mercury local limits calculations for many Great Lakes dischargers would result in negative local limits. In other words, the domestic loading alone may exceed the MAHL, leaving no allowable loading to allocate to commercial or industrial users. This is mainly a function of the estimated domestic loading (the mercury loading from an "average" person multiplied by the number of residents), and the water quality based effluent limit (WQBEL) (A report prepared for the Association of Metropolitan Sewerage Agencies utilized a value of 17.2 ug/day/person (Mercury Source Control & Pollution Prevention Program Evaluation (March 2002)). This situation will pose a significant challenge to POTWs responsible for developing technically based local limits that prevent pass through and interference, as well as the States that must approve these limits. One option for addressing this situation would be to set the local limit equal to the POTW's NPDES limit, adjusted for the mercury removal efficiency (which appears to be above 90 percent at most POTWs). Thus, if the WQBEL is 1.3 ng/l, the local limit would be between 13 and 26 ng/l (1.3 ng/l /1-.9= 13 ng/l; 1.3 ng/l /1-.95=26 ng/l). The rationale in support of this approach is that facilities with such a limit would not be contributing to pass through. This approach appears to be more practical than other, even more stringent alternatives, and would serve as a clear incentive to meet BMPs instead of the numeric limit. Even under this approach, however, opportunities for reductions in mercury discharges may be very limited in some circumstances. Where a nondomestic user discharges above the local limit due primarily or entirely to mercury in sanitary waste, BMP requirements may not have an effect.

6.4 Structuring BMP-based limits

There are a variety of ways to set mercury local limits, from establishment of uniform concentration limits, to setting technology-based limits based on achievability using certain practices or treatment technologies for different sectors. Regardless of how the numeric limit is established, the Ordinance could then provide users an alternative means of demonstrating compliance with the limit through the use of BMPs. To be considered enforceable local limits under 40 CFR 403.5(c), mercury BMPs developed by POTWs should include the common elements listed below. Depending on the sector being controlled, however, certain elements such as installation of treatment or prohibitions on practices, may not be applicable.

- Specific notice to affected users of requirements and enforceability
- Installation of treatment
- Requirements for or prohibitions on certain practices, activities or discharges
- Requirements for operation and maintenance of treatment units
- Reporting and records retention for O&M activities
- Certification and reporting of compliance
- Re-opener for a permit and local limits to be applied at the POTW's discretion
- Other requirements as determined by the POTW

As discussed above, dentists could be given the option of satisfying locally-imposed ordinance and/or permit requirements by installing an ISO 11143 approved amalgam separator, and complying with other BMPs established under the Ordinance. Compliance in such cases would be determined by review of certifications by facilities that they are satisfying those requirements, and/or by random inspections and records review by the POTW. Under this approach, those choosing not to install this equipment or follow

the BMPs should be required by the Ordinance to obtain a permit within a specified time frame, and monitor and report their compliance with the numeric limit. The POTW would also determine compliance by these facilities with the numeric limit through traditional wastewater sampling.

Similarly, hospitals, schools and potentially even Significant Industrial Users could be allowed to implement BMPs specific to their sectors as an alternative to demonstrating compliance with a numeric local limit.

6.5 Timing of local limit evaluations

Normally, POTWs with Pretreatment Programs are required to conduct technical local limit evaluations within six to twelve months from the effective date of NPDES permit reissuance. In the case of mercury, the evaluation may be significantly influenced by information generated in the course of the PMP development process. Thus, we recommend requiring mercury local limit re-evaluations to be provided subsequent to submittal of PMP plans, although the plans should include the municipality's intentions and a schedule for data collection and proposal of revised numeric limits. Where a POTW plans on using BMP-based limits, the plan should also include a schedule for revising the Sewer Use Ordinance.

References

1. Pollutant Minimization Programs Guidance, Ohio Environmental Protection Agency, Division of Surface Water, August 13, 1998, http://www.epa.state.oh.us/dsw/guidance/guidance.html

2. The Use of Best Management Practices (BMPs) as Industrial Local Pretreatment Limits, Ohio Environmental Protection Agency, Division of Surface Water, August 13, 1998, http://www.epa.state.oh.us/dsw/guidance/guidance.html.

3. Municipal Mercury Pollutant Minimization Program (Mercury PMP), Wisconsin Department of Natural Resources, Bureau of Water
http://www.dnr.state.wi.us/org/caer/cea/mercury/index.htm.

4. Procedure for Reviewing Pollutant Minimization Programs, Michigan Department of Environmental Quality, Surface Water Quality Division, August 2002. Please contact Grace Scott, Pretreatment Coordinator, at 517/335-4107.

5. Mercury Source Control & Pollution Prevention Program Evaluation- Final Report, Association of Metropolitan Sewerage Agencies, March 2002.

Websites

General Mercury:

http://www.epa.gov/Region5/air/mercury/mercury.html

Medical Mercury:

http://www.h2e-online.org

http://www.michigan.gov/deq/0,1607,7-135-3585_4127_4175-35423--,00.html

Dental Mercury:

American Dental Association Best Management Practices, and
"Dental Amalgam and Best Management Practices" (Video), American Dental Association and the Naval Institute for Dental and Biomedical Research
http://www.ada.org/prof/resources/topics/amalgam_bmp.asp

http://www.dentalmercury.com

Options for Dental Mercury Reduction Programs: Information for State/Provincial and Local Governments, A Report of the Binational Toxics Strategy Mercury Workgroup Co-Chairs
http://www.epa.gov/region5/air/mercury/dentaloptions3.pdf

Evaluation of Amalgam Removal Equipment and Dental Clinic Loadings to the Sanitary Sewer, Metropolitan Council Environmental Services and Minnesota Dental Association, December 21, 2001.
http://delta-institute.org/pollprev/mercury/linkfiles/Separator%20Comparison%20Chart.htm

Schools:

http://www.mercuryinschools.uwex.edu

General Public:

http://www.epa.gov/mercury/

North Carolina Division of Pollution Prevention and Environmental Assistance
http://www.p2pays.org/mercury/

General Industry:

http://www.nwf.org/nwfWebAdmin/binaryVault/mercuryproducts.pdf

http://www.state.me.us/dep/mercury/lcspfinal.pdf

Dairy manometers:

http://www.dnr.state.wi.us/org/caer/cea/mercury/program.htm#Dairy

http://www.deq.state.mi.us/documents/deq-ead-p2-ag-richro.pdf

Wastewater Treatment Plants:

http://delta-institute.org/pollprev/mercury/mercury.php

http://delta-institute.org/pollprev/mercury/selfassess.php

Auto Switch:

http://www.dec.state.ny.us/website/ppu/p2autosw.html

http://www.deq.state.mi.us/documents/deq-ess-p2-mercury-michiganswitchstudy.pdf

[Note: The following attachments are intended as examples only, and are not intended to serve as models or templates]

Attachment 1- Sample NPDES Permit Language Regarding Mercury PMP Requirements, Ohio Environmental Protection Agency, Division of Surface Water
http://www.epa.state.oh.us/dsw/guidance/permit7.pdf

Attachment 2- Wisconsin DNR Guidance for Collecting Samples for Total Mercury Analysis to Meet Wastewater Permit Requirements in Wisconsin, 2003.
http://dnr.wi.gov/org/water/wm/ww/mercury/clean_hands.pdf

Attachment 3- Holly, Michigan Pollutant Minimization Program, March 2003.
http://www.epa.gov/region5/water/npdestek/MercuryHolly_PMP_4-03_final.pdf