

DOW 1.3.10 Mercury - SPDES Permitting, Multiple Discharge Variance, and Water Quality Monitoring

New York State Department of Environmental Conservation

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I. SUMMARY

This document provides technical guidance to NYSDEC staff for use when developing SPDES permits that regulate wastewater and stormwater discharges containing mercury and for use when performing mercury monitoring of water or wastewater.

Mercury is a bioaccumulative and persistent pollutant. At very low concentrations, mercury can accumulate in fish and cause health problems in people and wildlife that consume these contaminated fish. At higher concentrations, mercury can also be toxic to fish and cause health problems in people that drink contaminated water. New York State has established ambient water quality standards in regulation that protect the health of humans, wildlife, and aquatic life. Note that mercury is an element and therefore, while the form of mercury may change, mercury itself cannot be destroyed or eliminated from the environment as organic chemical pollutants can.

Studies show that most of the mercury entering the environment is emitted to the air. The primary source of these emissions is coal-fired power plants. Mercury released into the air may travel many miles before eventually being deposited on the earth's surface. Deposition of this mercury directly to water or indirectly by runoff from the land is the primary cause of water pollution. Secondary causes of water pollution include wastewater discharges, spills, and improper waste disposal practices. Mercury is present in the earth's crust and natural processes also contribute some mercury to the environment, e.g., soil erosion.

Available monitoring data suggests that: mercury is ubiquitous in the environment; there is

an international mercury water quality problem; mercury levels in State surface waters consistently exceed the water quality standard; there is widespread contamination of fresh water and marine fish and as a result there are multiple mercury-specific fish consumption advisories; and, mercury is present in all wastewater and stormwater discharges at concentrations that are problematic.

Considering the above, questions have arisen concerning appropriate control of mercury in wastewater and stormwater discharges, i.e., interpretation of the mercury water quality standards, translation of these standards to Water Quality Based Effluent Limits (WQBELs) in SPDES permits, the achievability of these WQBELs, and, appropriate analytical methods and sample collection techniques to use when monitoring for mercury.

This guidance document addresses the above issues by supplementing information contained in other documents to provide, in concert, the total guidance necessary for NYSDEC staff to draft SPDES permits that control mercury discharges. Guidance for performing mercury monitoring of groundwater, surface water, and wastewater is also included.

It is noteworthy that this guidance includes a multiple discharge variance for mercury developed in accordance with 6 NYCRR Part 702.17(h). This is the first such variance developed by the State. This variance is necessary because human caused conditions or sources of mercury prevent attainment of the water quality standard and cannot be remedied, i.e., mercury is ubiquitous in New York waters at levels above the water quality standard and compliance with a WQBEL for mercury cannot be achieved with demonstrated treatment technologies.

Many NYSDEC program areas share responsibility for addressing mercury pollution - from measuring levels in air, soil, water, and biota; to preventing pollution by regulating air emissions, use in society, waste disposal and cleanup, wastewater discharges, and educating and assisting businesses and consumers in finding mercury-free alternatives. The NYSDEC has established a multi-divisional mercury work group to coordinate its response to mercury-related issues. Some of the more recent mercury reduction initiatives include stricter limits on emissions from coal-fired power plants, restrictions on societal use of mercury-containing items, and regulation of mercury use by dentists.

There is a world-wide mercury contamination problem. While NYSDEC is working hard to address this issue, much of the State's pollution originates beyond State borders. Additional leadership on mercury reduction at both the national and international level is required to solve this problem. Furthermore, even if anthropogenic sources of mercury contamination could be completely eliminated, the global mercury cycle is such that additional time would be required before acceptable levels in water and fish & wildlife are restored. Consequently, it does not appear possible in the short-term for State efforts to achieve the surface water quality standard or to eliminate mercury-based fish consumption advisories. Be that as it may, meaningful mercury reduction will be achieved as the various initiatives being implemented by New York State and others are phased in. This guidance on SPDES permitting and monitoring supports New York State's effort to reduce mercury pollution.

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III. ACRONYMS LIST

AWQC – Ambient Water Quality Criteria

BWP – NYSDEC, DOW, Bureau of Water Permits

CAIR – Clean Air Interstate Rule

CAMR – Clean Air Mercury Rule

CFR – Code of Federal Regulations

CSO – Combined Sewer Overflow

DEP – NYSDEC, Division of Environmental Permits

DOW – NYSDEC, Division of Water

EBPS – Environmental Benefit Permit Strategy

ELAP – NYSDOH Environmental Laboratory Approval Program

GAC – Granular Activated Carbon

GLCA – General Level Currently Achievable

IDV – Individual Discharger Variance

ILCA – Individual Level Currently Achievable

ISOMET – Isolation Sampler For Trace Metals

MDL – Method Detection Limit

MDV – Multiple Discharger Variance

MGD – Million Gallons per Day

ML – Minimum Level

MMP – Mercury Minimization Program

MOA – Memorandum of Agreement between NYSDEC and USEPA Region 2

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi Sector General Permit

ng/L – Nanograms per Liter

NYCRR – New York State Codes, Rules and Regulations

NYSDEC – New York State Department of Environmental Conservation

NYSDOH – New York State Department of Health

ORF – SSO, Overflow Retention Facility

PCI – Private/Commercial/Institutional facility

PMP – Pollutant Minimization Program

POTW – Publicly Owned Treatment Works

PQL – Practical Quantitation Limit

RGGI – Regional Greenhouse Gas Initiative

SGAC – Sulfur-impregnated Granular Activated Carbon

SPDES – State Pollutant Discharge Elimination System

SSO – Sanitary Sewer Overflow

TBEL – Technology Based Effluent Limit

TMDL – Total Maximum Daily Load

TOGS – Technical & Operation Guidance Series

USEPA – United States Environmental Protection Agency

WQ – Water Quality

WQBEL – Water Quality Based Effluent Limit

IV. BACKGROUND, POLICY, and PROCEDURE

1. MERCURY WATER QUALITY STANDARDS

For New York State waters there exist several water quality standards based on the different water classes and best uses. These classes and best uses are in regulation at 6 NYCRR Part 701. The water quality standards themselves are in regulation at 6 NYCRR Part 703 and listed in guidance in *TOGS 1.1.1*. There is also a federal water quality standard for the Great Lakes System in regulation at 40 CFR 132.6(e). The various mercury water quality standards are summarized below in *Table 1*. These water quality standards provide a value against which to compare ambient monitoring results and are one of the two primary bases for establishing effluent limits in SPDES permits (the other being technology based effluent limits).

Water quality standards apply to all forms of a substance unless otherwise specified, i.e., the *total* amount. *Total* is the sum of undissolved (particulate) and dissolved fractions of the substance. *Dissolved* refers only to the fraction of the substance in solution. Unless noted otherwise, when the term mercury is used in this document the *total* form is being referred to.

The most stringent of the ambient surface water quality standards for mercury is 0.70 nanograms per liter (ng/L) *dissolved* mercury, which protects human consumers of fish.

The mercury ambient groundwater quality standard for class GA water is 700 ng/L *total* mercury, which protects human consumers of groundwater.

2. AVAILABLE MONITORING DATA

2.1 *Ambient Water Quality*

NYSDEC monitoring suggests that the mercury ambient surface water quality standard of 0.7 ng/L *dissolved* is exceeded in all surface waters in New York State. Compliance is also problematic for the 1.3 ng/L *total* and 2.6 ng/L *dissolved* ambient surface water quality standards. The average values for surface water measurements using low level analytical techniques are 9 ng/L *total* and 2 ng/L *dissolved*. Rain/snowmelt measurements collected in New York State during 2008 averaged 8 ng/L *total*¹.

Unlike surface water, there is no corresponding water quality problem in groundwater. This is due to the large difference between the 0.7 ng/L *dissolved* surface water standard and the 700 ng/L *total*

¹ Precipitation data from National Atmospheric Deposition Program (NRSP-3). 2009. NADP Program Office, Illinois State Water Survey, 2204 Griffith Dr., Champaign, IL 61820. Website - nadp.sws.uiuc.edu. The New York State value was determined by averaging the average values for monitoring sites NY06, NY20, NY43, NY68, and NY99.

groundwater standard. Available data suggests that the groundwater standard is only infrequently exceeded and that such cases typically result from localized waste disposal problems.

Data collected in other States indicates similar conditions nationwide.

2.2 Fish & Wildlife

NYSDEC monitoring shows widespread mercury contamination of fresh water and marine fish. Consequently, all fresh and marine surface waters of the State are under fish consumption advisory due to mercury pollution. Nationwide, more advisories have been issued for mercury than for all other pollutants combined.²

2.3 Wastewater Quality

NYSDEC has categorized wastewater discharges into three broad groups: industrial, municipal, and private/commercial/institutional (PCI). Further explanation of these groups is provided in *TOGS 1.2.2*.

Industrial wastewater mercury levels vary depending on past/present site operations and treatment system type. The statewide average and median maximum values of 149 industrial outfalls (including wastewater, stormwater, and combined outfalls) for which low-level mercury monitoring data (i.e., analysis by USEPA Method 1631) is available are 110 ng/L and 5.5 ng/L respectively. Note that if four facilities are excluded from this dataset the statewide average drops to 14 ng/L. It is also noteworthy that the focus of monitoring at industrial facilities has been on significant-class permits where the potential for mercury discharge is greater. If non-significant-class industrial permits were sampled proportionately the average industrial outfall concentration would likely be much lower. It appears that for facilities with significant mercury concentrations in their wastewater, the most effective treatment systems can achieve an effluent level of approximately 10 ng/L. Further information on mercury treatment is summarized below in section 6 of this guidance.

Municipal wastewater quality also varies, depending on the mix of residential, commercial, and industrial users tributary to the collection system and depending on the collection system type, i.e., separate or combined. Even so, municipal discharges from Publicly Owned Treatment Works (POTWs) are much more alike than industrial discharges due to the comparable treatment systems employed and the usual predominance of the residential/commercial component. POTWs typically achieve > 90% removal efficiency for mercury and the statewide average and median maximum discharge values of 94 POTWs for which low-level mercury monitoring data is available are 9.7 ng/L and 7.8 ng/L respectively. It is noteworthy that 6NYCRR Part 374-4 required a phased program for dentists to install amalgam separators by May 2008. Compliance is expected to have reduced

² See the New York State Department of Health publication, *Chemicals in Sportfish and Game, 2009-2010 Health Advisories* (www.health.state.ny.us/environmental/outdoors/fish/fish.htm). A summary of national fish consumption advisories is available from USEPA (epa.gov/waterscience/fish/advisories/).

mercury loadings to POTWs by as much as 50% compared to pre-2006 levels.³ NYSDEC predicts that the combined effect of amalgam separator installation, other State mercury reduction efforts, and more widespread application of improved sample collection techniques will reduce long-term average POTW discharges further.

Most PCI discharges are representative of residential/commercial activity and, lacking any industrial component, should generally contain less mercury than POTWs. One notable exception may be hospitals and some other institutions which, due to the use and/or disposal of mercury-containing products or equipment, may discharge higher mercury levels. The statewide average discharge value of 3 PCIs for which low-level mercury monitoring data is available is 2.5 ng/L.

2.4 Recommended Guidance

NYSDEC staff should assume the following, unless demonstrated otherwise:

- (a) All surface waters exceed the 0.7 ng/L *dissolved* surface water quality standard;
- (b) All groundwaters comply with the 700 ng/L groundwater quality standard;
- (c) All fish contain levels of mercury that preclude unrestricted safe consumption by humans;
- (d) All wastewater and stormwater discharges contain mercury levels exceeding 2.6 ng/L;
- (e) There is no demonstrated treatment technology that can consistently achieve 2.6 ng/L.

Some of the available mercury monitoring data has been summarized in *Appendix A*.

3. ANALYTICAL & SAMPLE COLLECTION METHODS

3.1 Analytical Methods

Due to the very low mercury surface water quality standard, analytical detection limits are an important consideration. Definitions of Method Detection Limit (MDL) and Minimum Level (ML) are provided in 40 CFR Part 136. Analytical results which are reported below the ML are generally considered to be qualitative, i.e., useful only for determining presence or absence. At or above the ML analytical results are generally considered to be quantitative, i.e., useful for determining numerical values. Because single samples are typically used to determine compliance with ambient water quality standards and effluent limits, both of which are usually numerical, only analytical methods which have a ML which is more sensitive than the standard or effluent limit of interest should be used for monitoring, if available. Otherwise, compliance assessments will not be conclusive. Note that USEPA MLs are considered to be equivalent to Practical Quantitation Limits (PQLs).

³ A March 2002 Association of Metropolitan Sewerage Agencies study entitled, *Mercury Source Control and Pollution Prevention Program Evaluation*, attributed 35-40% of the mercury coming into a POTW to dental offices. New York State regulations require dental offices to install and maintain separators which remove 99% of dental amalgam (95% if installed prior to effective date of regulation).

Historically, measurement of mercury in water and wastewater has been performed using USEPA Methods 245.1 (1974) or 245.2 (1974). Recognizing the need for more sensitive analytical methods, USEPA has more recently promulgated two additional methods for mercury measurement, Method 1631 (1999) and Method 245.7 (2007).⁴ Note that when an analytical method is referred to the currently approved version is meant unless otherwise indicated.

When USEPA Method 1631 was first promulgated there were few laboratories capable of performing the analysis. However, since that time many more laboratories now have this capability and laboratory availability is presently not a significant issue. The Method 1631 cost of analysis is greater than that for the other methods but it is not considered to be an expensive test.

An up-to-date list of laboratories certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) to perform analysis for each of these methods can be obtained from the NYSDOH, contact information is available via the NYSDOH website.⁵

3.2 Sample Collection Methods

One difficulty in accurately measuring mercury at the low levels necessary to perform compliance assessments is avoiding sample contamination during collection, transport, and analysis. To address this issue USEPA promulgated a sample collection method, USEPA Method 1669.⁶ While this method was developed for ambient monitoring it is commonly used for wastewater sampling too. Please note that sample collection using USEPA Method 1669 requires a higher level of expertise than traditional sample collection methods and typically two people are employed to collect these samples.

Environment Canada has designed a number of water-sampling systems for collection of low level metals samples known as ISOMET (isolation sampler for trace metals). Using ISOMET-type samplers is often the most simple and practical means of collecting “clean” samples in accordance with USEPA Method 1669. Descriptions of the ISOMET samplers and techniques can be found on the internet.⁷

NYSDEC Division of Water (DOW) has developed a sampler modeled after one of the Environment Canada ISOMET devices. A description of this sampler and recommendations for its use can be

⁴ www.epa.gov/waterscience/methods/method/mercury/

⁵ www.wadsworth.org/labcert/elap/elap.html

⁶ *Method 1669, Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, July 1996* (www.epa.gov/waterscience/methods/method/inorganics/1669.pdf).

⁷ www.canamglass.org/workshop/pdf/day2/1400_McCrea.pdf and [cronus.uwindsor.ca/units/stateofthestraight/softs.nsf/54ef3e94e5fe816e85256d6e0063d208/5f9c386cc6fcc407852573a30062ae66/\\$FILE/SOS%202004_Section%206.18.pdf](http://cronus.uwindsor.ca/units/stateofthestraight/softs.nsf/54ef3e94e5fe816e85256d6e0063d208/5f9c386cc6fcc407852573a30062ae66/$FILE/SOS%202004_Section%206.18.pdf)

found on the NYSDEC website.⁸ A standard operating procedure for use of the device can be found on the NYSDEC internal website.⁹

Recommendations for sample type and sample collection equipment are noted in the above websites and in the following section.

3.3 Recommended Guidance

Detection limits, estimated costs, and recommendations on method suitability for the four USEPA approved analytical methods are summarized below in *Table 2*. Recommendations on method suitability are based on a comparison of ambient water quality standards and WQBELs to method MLs. (Note - an explanation of effluent limit development is provided in section 4 of this guidance.) NYSDEC staff, NYSDEC contractors, permittees, and others should follow these recommendations.

Review of *Table 2* will reveal that USEPA Methods 245.1, 245.2, and 245.7 are not recommended for assessing either compliance with ambient surface water quality standards or compliance with SPDES permit surface water discharge limits and their use for these purposes should be phased out. While USEPA guidance and proposed regulation¹⁰ on this subject would appear to allow for use of methods other than Method 1631 for measuring effluents in cases where these methods are “sufficiently sensitive”, such use is problematic and is therefore not endorsed by the NYSDEC. For example, if a permittee used Method 245.7 and the sample result was <5 ng/L this would require repeating the analysis using Method 1631 resulting in additional monitoring expense and delay. Such delay could cause permittees to miss data collection/reporting deadlines and result in permit noncompliance. Method 245.7 is useful for monitoring influents and internal monitoring locations other than surface water SPDES permit compliance points. Method 245.7 may also be useful for other wastewater and water quality studies where compliance assessments are not critical. Any of the four methods is acceptable for monitoring ambient groundwater or discharges to groundwater, though the newer methods are preferred.

When performing permit limit compliance determinations analysis should be for the *total* form of mercury. When performing ambient surface water compliance determinations analysis should generally be for the *total* and *dissolved* forms of mercury. When performing ambient groundwater compliance determinations analysis should be for the *total* form of mercury. There is some lingering confusion about the term *total recoverable*. For metals determinations using USEPA

⁸ www.dec.ny.gov/chemical/58826.html

⁹ *SOP #501-06, Rev. 1.0 - Standard Operating Procedure For The Low Level Mercury Sampling Device, May 2006 (internal/home/dow/lowlevelhgsop.pdf).*

¹⁰ *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits, USEPA, August 23, 2007 (www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf). Federal Register / Volume 75, No. 120 / Wednesday, June 23, 2010 / Proposed Rules / pages 35712 – 35720.*

analytical methods, the terms *total* and *total recoverable* are synonymous.¹¹ Therefore, for the sake of consistency and brevity, *total* should be used where appropriate in SPDES permits and *total recoverable* should be discontinued.

When monitoring ambient surface water or wastewater discharges to surface water it is recommended that USEPA Method 1669 be followed. Sample type should be a single grab or multiple grabs can be collected and composited by the laboratory during analysis. Generally, single grab samples should be required unless significant effluent variability is expected. Use of automated sampling equipment is not recommended.

Groundwater standards are much less stringent so that potential low-level sample contamination is less of a concern. Use of standard techniques to minimize sample contamination should be sufficient when sampling groundwater or discharges to groundwater. Sample type may be either grab or composite. Use of automated sampling equipment is not recommended.

Note that both the 1990 version of *TOGS 1.3.7 - Analytical Detectability and Quantitation Guidelines for Selected Environmental Parameters* and the December 1988 guidance document referenced therein are obsolete and use of these for guidance should be abandoned.

4. SPDES PERMIT REQUIREMENTS

For pollutants of concern, SPDES permits typically specify numerical effluent limits, monitoring frequencies, and sample types. Permits may also require use of particular analytical methods and may specify other conditions. Permit writing procedures are detailed in *TOGS 1.2.1, 1.3.1, and 1.3.3*. Mercury-specific permit writing information is provided below.

4.1 Discharges to Groundwater

For discharges to class GA groundwater there is a 1400 ng/L *total* mercury groundwater effluent limit specified in 6 NYCRR Part 703.6. This level is well within the capabilities of existing treatment technology. For these discharges the permit writer should specify a limit of 1400 ng/L *total* mercury and set a monitoring frequency and sample type in accordance with *TOGS 1.2.1 or 1.3.3*. There is typically no need to specify use of specific analytical methods for discharges to groundwater as all methods (see *Table 2*) have acceptable detection capabilities relative to the 1400 ng/L effluent limit, though the newer methods are preferred.

The potential for sample contamination to significantly influence assessments of groundwater quality and compliance with groundwater effluent limits is considered low. Therefore, routine use of USEPA Method 1669 during sample collection is not recommended.

¹¹ *Guidance for Implementation and Use of EPA Method 1631 for the Determination of Low-Level Mercury (40 CFR part 136), page 5-2, USEPA, EPA 821-R-01-023, March 2001. Also, Method 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, page 3, USEPA, EPA-821-R-02-019, August 2002.*

Note that if a discharge is to groundwater and the groundwater is in close communication with surface water then, in accordance with *TOGS 1.2.1, Section II*, permit limits should be based on the surface water requirements.

As the recommendations for discharges to groundwater do not significantly differ from past practices, no special effort is deemed to be necessary to update these permits.

4.2 Discharges to Surface Water

Typically, for each pollutant the more stringent of technology based effluent limits (TBELs) or water quality based effluent limits (WQBELs) is included in the SPDES permit. In the case of mercury, the WQBEL will always be more stringent than any TBEL. Since the most stringent ambient water quality standard is assumed to be exceeded in all cases, no waste assimilative capacity is allowed and the WQBEL is set equal to this standard, i.e., 0.70 ng/L, and expressed as the *total* form (see also 40 CFR Part 132, Appendix F, Procedure 2(C)(3) which has equivalent consequences). It is also assumed that all permittees discharge mercury above this level and that none can achieve the WQBEL because treatment technologies have not consistently met such a limit. **It would be unreasonable to issue permits containing effluent limits which cannot be achieved. Therefore, requiring compliance with the WQBEL is generally not a realistic permitting option. Further, it is not feasible to prohibit such discharges since this would require cessation of all known wastewater and stormwater discharges in the State.**

The only other regulatory-compliant option for permitting mercury discharges is to grant a variance from the WQBEL. 6 NYCRR Part 702.17 authorizes two types of variances. One type of variance is an Individual Discharge Variance (IDV) which authorizes a single discharger. The other type of variance is a Multiple Discharge Variance (MDV) which may authorize many dischargers. Since it is assumed that no dischargers can achieve the WQBEL they should typically be authorized by a variance.

The MDV is the most economic variance option since this eliminates the need for each permittee to develop their own approvable IDV and for the NYSDEC and USEPA to review potentially thousands of such IDV requests. Therefore, the NYSDEC has determined that a MDV is necessary to address the statewide mercury surface water quality problem.

The MDV is described in section 4.2.1. IDV procedures are described in section 4.2.2.

Permittees that attempt to avoid mercury-related permit requirements by insisting their discharge contains no mercury should be required to successfully demonstrate this. Five rounds of intake, influent, and effluent sampling using USEPA Method 1631 should be sufficient to characterize each contested outfall for the purpose of determining the presence or absence of mercury. We do not expect any permittees to consistently achieve non-detect at the MDL of 0.2 ng/L.

Note that the NYSDEC is no longer applying 6 NYCRR Part 702.16(b) in the Great Lakes Basin in accordance with the 2000 MOA.¹²

4.2.1 Multiple Discharge Variance (MDV) and Recommended Permitting Strategy

6 NYCRR 702.17(h) authorizes the use of multiple discharger variances, stating that: “*Where the department determines that a multiple discharge variance is necessary to address widespread standard or guidance value attainment issues including the presence of a ubiquitous pollutant or naturally high levels of a pollutant in a watershed, the department, in lieu of the discharger, may conduct the variance demonstration requirements in subdivisions (b) and (c) of this section. Any permittee accepting such variance shall be subject to the provisions of subdivision (e) of this section.*”

6 NYCRR 702.17(b) specifies the factors on which a variance may be granted if the requester demonstrates that achieving the WQBEL is not feasible. The justification for granting a statewide multiple discharger variance for mercury is based on the rationale found under 6NYCRR 702.17(b)(3) whereby, “*human caused conditions or sources of pollution prevent attainment of the standard ... and cannot be remedied ...*”.

Section 1 of this guidance document identifies the mercury water quality standards. Section 2.1 indicates that the three most stringent standards are exceeded statewide. Section 2.3 shows that no dischargers can consistently meet WQBELs based on these three standards. Section 4.2.1.1 documents that the mercury problem is human caused. Section 6 demonstrates that the problem cannot be remedied, i.e., there are no demonstrated wastewater treatment technologies which can achieve these WQBELs and the mercury problem cannot otherwise be corrected in the foreseeable future. Additional details on the causes and magnitude of this problem, and the lack of short-term solutions can be found in the following documents: United Nations Environment Programme *Global*

¹² *Amendment To The National Pollutant Discharge Elimination System Memorandum Of Agreement Between The New York State Department Of Environmental Conservation And The United States Environmental Protection Agency, Region 2 Relating To Implementation Of The Requirements Of The Great Lakes Water Quality Guidance In The Great Lakes Basin, September 27, 2000.*

*Mercury Assessment, December 2002*¹³; *EPA's Roadmap for Mercury, July 2006*¹⁴; *NYSDEC Mercury Work Group Recommendations to Meet the Mercury Challenge, December 2006*¹⁵; and *Northeast Regional Mercury Total Maximum Daily Load, October 24, 2007 (TMDL)*¹⁶.

Based upon the above, NYSDEC concludes that human caused conditions or sources of mercury prevent attainment of WQBELs based on protection of human health (fish consumption) and wildlife. Note that while this MDV does not provide for a variance from WQBELs based on protection of human health (water supply) and aquatic life (acute & chronic) such WQBELs are of little practical consequence because the MDV effluent limits in section 4.2.1.2 are more stringent.

Although there is an increased risk to human health and the environment associated with granting the variance compared with compliance with the mercury WQBELs absent the variance, as described above there is no realistic alternative to the MDV. During this period the increased risks to human health are mitigated by fish consumption advisories issued periodically by both the NYSDOH and the United States Food and Drug Administration. Therefore, the NYSDEC has determined that the MDV is consistent with the protection of the public health, safety, and welfare.

The MDV will result in reasonable progress toward achieving the WQBEL by including meaningful, yet achievable, requirements in SPDES permits. All surface water SPDES permittees are eligible for authorization by the MDV. While long-term solutions are being implemented there will be a continuing need for this MDV. Specific elements of New York's MDV are explained below.

Mercury MDV permitting strategy summary:

- ▶ Mercury Total Maximum Daily Load;
- ▶ SPDES Permit Limits;
- ▶ Discharge Prioritization;
- ▶ Mercury in Intake Water;
- ▶ Mercury Minimization Programs;
- ▶ Analytical Methods;
- ▶ Permit Application Review;
- ▶ Anti-backsliding;
- ▶ Anti-degradation;
- ▶ General Permit Issues;
- ▶ MDV Term;
- ▶ Implementation Schedule.

Note - Proper MDV authorization requires that a permit be developed in accordance with the following sections. Permittees are considered to be authorized via the MDV only when their SPDES

¹³ www.chem.unep.ch/mercury/Report/GMA-report-TOC.htm

¹⁴ www.epa.gov/mercury/pdfs/FINAL-Mercury-Roadmap-6-29.pdf

¹⁵ http://www.dec.ny.gov/docs/permits_ej_operations_pdf/meetmercurychallenge.pdf

¹⁶ www.dec.ny.gov/docs/water_pdf/tmdlnehg.pdf

permit conforms exactly to the MDV guidance. Any deviation from this MDV guidance results in the need for authorization by an IDV, as described in section 4.2.2, or by a limit of 0.70 ng/L.

4.2.1.1 Mercury Total Maximum Daily Load (TMDL):

The USEPA-approved *Northeast Regional Mercury Total Maximum Daily Load, October 2007*, (TMDL)¹⁷ outlines the strategy for achieving the water quality goal in the northeast United States. The TMDL is a regional plan to reduce mercury entering into the State surface waters of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

Based on calculations in the TMDL, 98% of the mercury load to surface waters is the result of atmospheric deposition with the remaining 2% due to wastewater discharges. Logically, the TMDL focuses primarily on reductions in anthropogenic mercury emissions as a means of reducing atmospheric deposition of mercury and thereby improving water quality. According to the TMDL, a 98% reduction in atmospheric deposition of mercury is needed in order to meet water quality goals.

The TMDL does not assign individual loadings to wastewater and stormwater discharges. Rather, such load reductions are expected to be achieved via mercury minimization programs and the continuation of regional mercury reduction efforts. This approach has been endorsed by USEPA in its guidance¹⁸ and as evidenced by its approval of the TMDL.

In New York State these TMDL-related mercury reduction efforts include, but are not limited to, establishing mercury limits in SPDES permits consistent with the *NYSDEC Mercury Work Group Recommendations to Meet the Mercury Challenge, December 2006*¹⁹, which is incorporated into the TMDL by reference.

The next several sections explain how the TMDL will be implemented in New York State through SPDES permits.

4.2.1.2 SPDES Permit Limits:

Available low-level monitoring data was evaluated to determine a General Level Currently Achievable (GLCA) applicable to all discharges authorized by the MDV. Upon consideration of the monitoring data summarized in section 2.3 and *Table 5*, a value of 50 ng/L was selected as the GLCA, expressed as a daily maximum.

¹⁷ www.dec.ny.gov/docs/water_pdf/tmdlnehg.pdf

¹⁸ See page 12 of *Elements of Mercury TMDLs Where Mercury Loadings Are Predominantly From Air Deposition, September 29, 2008* (www.epa.gov/owow/tmdl/pdf/document_mercury_tmdl_elements.pdf). Also, *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, EPA-823-R-09-002, January 2009* (www.epa.gov/waterscience/criteria/methylmercury/pdf/guidance-final.pdf).

¹⁹ www.dec.ny.gov/docs/permits_ej_operations_pdf/meetmercurychallenge.pdf

The data indicate that 93% of POTWs and 82% of significant-class industrial outfalls (90% if four facilities are excluded) each have daily maximum values less than the GLCA. It is noteworthy that many POTW measurements were made prior to the May 18, 2008 installation deadline for dental amalgam separators. More recent POTW effluent samples show a decline in mercury levels and consequently we predict that 95% of POTWs should be achieving the GLCA at this time. NYSDEC expects that the combined effect of amalgam separator installation, other State mercury reduction efforts, and more widespread application of improved sample collection techniques will reduce POTW discharges further. NYSDEC also predicts that few, if any, non-significant-class industrial permits discharge mercury above the GLCA. When the non-significant-class industrial permits are factored in, the overall industrial compliance with the GLCA is estimated to be more than 90%. While PCI effluent data is lacking, as noted in section 2.3 above, these discharges are generally expected to contain less mercury than POTWs so predicted GLCA compliance is expected to be greater than that for POTWs. All stormwater runoff which is uncontaminated by site-related activity is believed to comply with the GLCA.

Any facility incapable of meeting the GLCA at the time of permit issuance should be assigned an Individual LCA (ILCA) as an initial permit limit. Where an ILCA is necessary and sufficient data exists, an ILCA should be calculated in accordance with the statistical procedures specified in *TOGS 1.2.1*. Where an ILCA is necessary and insufficient data exists to statistically calculate one (i.e., less than ten sample results) an estimated ILCA of 200 ng/L should be appropriate for most dischargers as 100% of POTWs and 92% of significant-class industrial outfalls each have daily maximum values less than 200 ng/L. When a permittee disputes the 200 ng/L estimated ILCA then they should be required to collect sufficient data to allow for calculation of an ILCA. In all cases, ILCAs which threaten compliance with water quality standards for human water supplies or either acute or chronic standards for aquatic life protection should be avoided.

Inclusion of ILCA limits which exceed the GLCA in permits should be accompanied by a higher monitoring frequency and by a requirement to achieve the GLCA within the shortest reasonable time²⁰ of permit issuance, generally three years or less. In such cases, the permit must specify both ILCA & GLCA-based permit limits and their dates of applicability. However, inclusion of an explicit compliance schedule with engineering milestones, as is common in most permits which include interim permit limits, is not necessary as the required mercury reduction schedule will be addressed via the Mercury Minimization Program (MMP) permit requirements (see section 4.2.1.5 below).

GLCA and ILCA limits may be established for industrial/PCI facilities at internal locations as recommended in *TOGS 1.2.1*.

The various LCAs and related recommendations are reflected in *Table 3*.

²⁰ See 6 NYCRR Part 750-1.14 (www.dec.ny.gov/regs/4585.html#16201).

4.2.1.3 Discharge Prioritization:

As of April 2010, the approximate number of SPDES permits in effect for discharges to New York State surface waters was 3400 individual permits, and, three general stormwater permits which authorize 9000 separate sites. Each of these facilities is assumed to discharge mercury at levels exceeding the WQBEL. Considering the large number of facilities, it is appropriate to focus resources on the ones which are likely to yield the greatest environmental benefit, i.e., the facilities which are significant sources, including those that use mercury in their processes, accept mercury containing wastewater, discharge stormwater runoff which is a vector for site-related mercury contamination, or otherwise generate significant concentrations of mercury unrelated to atmospheric deposition or water intake.

High priority is assigned to POTWs with a design flow of 5 MGD and greater, due to their higher flow rate and potential for these discharges to be influenced by industrial users and hauled wastes. The 5 MGD value is equivalent to the flow threshold employed by USEPA when determining the need for a pretreatment program. A high priority is also being assigned to other discharges (industrial, PCI, and, POTWs less than 5 MGD) if they are significant mercury sources, as defined by any one of the following criteria:

- ▶ One or more effluent measurements which exceed the GLCA;
- ▶ Internal or tributary waste stream measurements exceed the GLCA and the final effluent measurements are less than the GLCA due solely to dilution by uncontaminated waste streams;
- ▶ A permit application or other information indicates that mercury is handled on site and could be discharged through outfalls;
- ▶ Outfalls which contain mercury due to past waste disposal practices; or,
- ▶ Sizable POTW collection systems which are permitted (SPDES) and transmit wastewaters to large regional treatment plants that are separately permitted.

These high priority permits should be drafted by Bureau of Water Permits staff in the Central Office unless otherwise determined by the Regional Water Engineer and Bureau of Water Permits Director.

Low priority is assigned to discharges that do not meet the high priority criteria. Low priority discharges are believed to contain relatively low levels of mercury solely due to its presence in precipitation, intake water, or other background sources beyond the control of the individual permittees.

These discharge priority categories are reflected in *Table 3*.

The question may arise concerning how to handle permittees which are designated as high priority but then achieve effluent levels below the GLCA, i.e., should they be reassigned to a low priority? Permittees which are assigned a high priority should remain in that category for the duration of this MDV.

4.2.1.4 Mercury in Intake Water:

40 CFR Part 132, Appendix F, Procedure 5(D) addresses consideration of intake pollutants in determining reasonable potential. These requirements are interpreted in USEPA guidance.²¹ For some discharges, the only source of mercury may be the intake water taken directly from the same body of water to which the discharge occurs. In these situations where there are no known sources or additional contributions of mercury which would qualify the facility as high priority (see section 4.2.1.3), the permit writer may reasonably conclude that there is no need for a mercury limit or mercury minimization program.

40 CFR Part 132, Appendix F, Procedure 5(E) prohibits the use of “no net addition limitations” after March 23, 2007. For permits within the Great Lakes Basin “net” limits may not be authorized. For permits outside of the Great Lakes Basin, the GLCA limit may be applied by the permit writer as a “net” limit where a facility’s intake is from the same body of water as the wastewater is discharged to. Generally, the *Intake Pollutants (Technology Limits)* section of *TOGS 1.2.1* should be followed for permits outside the Great Lakes Basin.

4.2.1.5 Mercury Minimization Programs (MMPs):

Requirements for a MMP will be included in permits consistent with the recommendations summarized in *Table 3*. The goal of each MMP shall be to reduce mercury effluent levels in pursuit of the WQBEL. MMP requirements will include an on-going program consisting of: periodic monitoring designed to quantify and, over time, track the reduction of mercury; an acceptable control strategy for reducing mercury discharges via cost-effective measures, which may include more stringent control of tributary waste streams, remediation, and/or installation of new or improved treatment facilities; and, submission of annual status reports. In cases where a permit includes an ILCA then the permit writer should modify the MMP boilerplate permit requirement to specify submission of semi-annual instead of annual status reports.

MMP permit requirements for high priority facilities will be developed consistent with these recommendations which satisfy the requirements of 40 CFR Part 132. MMP permit requirements for low priority POTWs will simply amount to checking to see that dentists are properly operating and maintaining amalgam separators and a restriction on the acceptance of mercury contaminated waste streams. Example MMP permit requirements are included in *Appendix B*.

Note that it is not required or intended that NYSDEC staff approve the status reports. Rather, staff should review these reports and if there are concerns that the MMP may be inadequate then a comprehensive review of the complete MMP should be performed. If this comprehensive review indicates deficiencies then the permittee should be directed, in writing, to make necessary improvements within a reasonable time period. No permit modification is necessary to implement these MMP improvements.

²¹ Section 7.5.1.3 of *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, EPA-823-R-10-001, April 2010 (www.epa.gov/waterscience/criteria/methylmercury/mercury2010.pdf).

New York State has implemented several mercury minimization initiatives in the last several years. These are briefly summarized in *Appendix C*. The scale and success of these initiatives is reflected in *Table 3* such that most dischargers need not address mercury individually since the State has, in essence, performed a MMP on their behalf.

Guidance is available to assist permittees with development of MMPs. Some examples include:

- *Mercury Pollutant Minimization Program Guidance USEPA Region 5, NPDES Programs Branch, November 2004.*²² This guidance is focused on POTWs.
- *Mercury Pollutant Minimization Program Guidance Manual For Municipalities DNR PUB-WT-831 2006.*²³ This guidance is also focused on POTWs and was published by Wisconsin.
- *A Guide to Mercury Reduction in Industrial and Commercial Settings, A Joint Effort By: Inland Ispat Indiana Harbor Works, Bethlehem Steel Burns Harbor Division, United States Steel Gary Works, The Delta Institute, Lake Michigan Forum, July, 2001.*²⁴ This is MMP guidance for industrial/commercial facilities.
- *Pollutant Minimization Program Plans Guidance Manual for Wastewater Treatment Facilities in New York State, September 2004.*²⁵ This more generic pollutant minimization guidance document is not specific to either mercury or discharge category.
- *Optimizing Contaminant Trackdown, Focusing on Wastewater Treatment Plants and Related Systems, A Compendium, For Practitioners of Contaminant Trackdown Efforts, December 2007.* This document is available from the New York Academy of Sciences.
- Additional information is available from a number of sources including the USEPA Region 5 website²⁶ and the websites of the various Great Lakes States.

NYSDEC staff can find these documents on the NYSDEC computer server.²⁷ Additional information may be added to this location when it becomes available.

²² www.epa.gov/R5water/npdestek/mercury_pmp_nov_04_guidance.pdf

²³ www.epa.state.oh.us/portals/35/permits/Wisconsin%20Mercury%20PMP%20Guidance%20Manual.pdf

²⁴ www.delta-institute.org/publications/Steel-Hg-Report-0627011.pdf

²⁵ www.dec.ny.gov/chemical/61994.html

²⁶ www.epa.gov/reg5oair/mercury/reducing.html

²⁷ L:\DOW\PERMITS\!MERCURY MINIMIZATION PROGRAM GUIDANCE\

4.2.1.6 Analytical Methods:

All permittees must use USEPA Method 1631 when monitoring permitted compliance points (outfalls). Use of Method 245.7 at locations tributary to compliance points is acceptable. These are explicit conditions included in the MMP permit boilerplate. There should be no need to otherwise identify acceptable analytical methods elsewhere in the permit via footnotes or other conditions.

4.2.1.7 Permit Application Review:

When sampling for mercury is necessary or appropriate as part of a permit application, EBPS *Request For Information*, or in response to other NYSDEC request, the analytical methods and sampling techniques used should be consistent with *Table 2* recommendations. Otherwise, the information provided should be considered incomplete and the permittee (applicant) required to repeat the sampling using correct methods. At these times it is often appropriate for staff to require sampling of water supply intake, wastewater influent, and wastewater effluent to ensure complete characterization.

If permit application data for effluent mercury consists of a single sample result which is greater than 80% of the GLCA value, i.e., > 40 ng/L, and there is no other low level effluent mercury data available then the applicant should be required to further characterize the discharge by collecting a minimum of three additional rounds of samples. This additional information should be generated prior to the application being considered complete.

4.2.1.8 Anti-backsliding:

For high priority facilities, implementation of the MDV/permitting strategy will generally result in more stringent requirements as compared to the previous permit. However, there may be some facilities where conformance to the MDV/permitting strategy could result in less stringent requirements and the appearance of backsliding. On a case-by-case basis, the NYSDEC will review existing requirements and in some cases allow such less stringent requirements where justified in accordance with 40 CFR 122.44(l)(2)(i)(B)(1) and 122.44(l)(2)(i)(C) and the recommendations of this guidance.

Example #1 - A permit which currently contains a mercury limit and routine monitoring requirements may be modified to delete these requirements if low priority status is achieved prior to the date of this guidance.

Example #2 - A permit which contains a mercury limit which is more stringent than the GLCA may receive a modified permit which includes the GLCA limit (or no limit at all as per example #1).

4.2.1.9 Anti-degradation:

NYSDEC's existing anti-degradation policy is contained in *Organization and Delegation Memorandum No. 85-40, TOGS 1.3.9, and TOGS 1.2.1*. Department review should conform to the policy. Additional guidance is available from USEPA.²⁸

See section 4.2.3 below for guidance on new and recommencing discharges.

4.2.1.10 General Permit Issues:

As noted in Section 4.2.1.3 above, there are a large number of sites authorized by general stormwater permits.

The *SPDES Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity, GP-0-06-002 (MSGP)*²⁹ requires some sectors covered by the permit to test for certain pollutants. When mercury testing is required these results are compared against benchmarks and if a benchmark is exceeded then typically this is addressed via stormwater pollution prevention program modification (see page 29 of MSGP).

In the case of mercury, the MSGP procedures will require updating to improve water quality protection. When the MSGP is renewed in 2012 the mercury requirements contained therein should be harmonized with the intent of this guidance. Notably this should require replacement of mercury benchmarks, requirements to use USEPA Method 1631 for analysis, and more explicit MMP provisions for dischargers which achieve high priority status due to mercury detections.

In the interim period prior to renewal of the MSGP, NYSDEC staff may review mercury data for specific sites and require additional monitoring and/or mercury reduction actions in accordance with the current MSGP requirements if mercury levels exceed the GLCA of 50 ng/l or if there is otherwise concern for mercury at a specific site. Alternately, sites may be required to obtain an individual permit if it is believed by NYSDEC staff to be appropriate for controlling a mercury discharge.

It is predicted that the vast majority of sites authorized by the MSGP will fall into the low priority category (see *Table 3*) and require no further action by NYSDEC.

All sites solely authorized by the *SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-08-001*³⁰ should fall into the low priority category and require no further action by NYSDEC. Likewise, all sites authorized by the *SPDES General Permit for*

²⁸ Sections 7.2.3 and 7.5.1.2.2 of *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, EPA-823-R-10-001, April 2010* (www.epa.gov/waterscience/criteria/methylmercury/mercury2010.pdf).

²⁹ www.dec.ny.gov/docs/water_pdf/gp0601.pdf

³⁰ www.dec.ny.gov/docs/water_pdf/gpsconspmt10.pdf

*Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s), GP-0-10-002*³¹ should fall into the low priority category and require no further action by NYSDEC.

4.2.1.11 MDV Term:

This variance is in effect for five years from the effective date specified on page 1 of this document. After that date, high priority permits may not be renewed or modified unless they incorporate requirements of either a new MDV or an IDV, or include a limit of 0.70 ng/L. It is likely that the water quality goal will not be achieved for many years and that it will be necessary to pursue one or more subsequent MDVs in the future.

4.2.1.12 Implementation Schedule:

The permitting strategy should be implemented in accordance with the Environmental Benefit Permit Strategy (EBPS). EBPS is described in *TOGS 1.2.2*.

For each permit meeting the high priority criteria, the EBPS score could be increased by 100 points. The 100 points is determined as follows: factor 4, primary factor value of 10 multiplied by water quality enhancement multiplier of 5 = 50 points; plus, factor 5a, primary factor value of 10 multiplied by water quality enhancement multiplier of 5 = 50 points; sum of both factors = 100 points). For each POTW permit meeting the low priority criteria, the EBPS score could be increased by 25 points. The 25 points is determined as follows: factor 4, secondary factor value of 5 multiplied by water quality enhancement multiplier of 5 = 25 points. No limits should be proposed for low priority POTWs so factor 5a is not applicable. No mercury-related EBPS scoring is necessary for other low priority discharges.

According to *Table 3*, there are: 80 easily identified high priority POTWs; an estimated 20 additional, as yet mostly unidentified high priority POTWs; an estimated 120 as yet mostly unidentified high priority industrials; and, 500 easily identified low priority POTWs. If the EBPS points for just the easily identified permits are summed, a value in excess of 20,000 points is achieved.

Due to the very large priority point value for this group of permits and the importance of controlling mercury, it is the Department's goal to implement the MDV via a series of mass permit modifications in accordance with *TOGS 1.2.2*, section IV(D). The recommended schedule for these modifications is as follows:

Within one year of the effective date of this guidance:

All discharges currently designated as high priority.

Within five years of the effective date of this guidance:

All POTWs currently designated as low priority.

At the time of next technical review of permit:

³¹ www.dec.ny.gov/docs/water_pdf/ms4gp2010.pdf

All other discharges which achieve high priority subsequent to the date of this guidance.

The format for mass modification permit requirements is included in *Appendix B*. The mass modifications should be administered by Bureau of Water Permits (BWP) and Division of Environmental Permits (DEP) staff in the central office. Permits which are mass modified may be later converted from the mass modification format into the normal permit format during any subsequent permit modification or renewal.

4.2.2 Individual Discharge Variances

It is expected to be more economical for all involved if dischargers obtain necessary permit authorization under the MDV. Considering this economy, and the flexibility contained in the MDV, it should generally be unnecessary for the NYSDEC to solicit IDVs from permittees. Therefore, in most cases, IDVs should only be necessary upon a permittee's refusal to be authorized by the MDV. Such permittees have two regulatory options to obtain necessary permit authorization, i.e., accept an effluent limit of 0.70 ng/L (typically not a realistic option as described earlier in this document), or apply for and receive approval of a site-specific IDV in accordance with 6 NYCRR Part 702.17.

4.2.2.1 Application for an IDV:

Consistent with both 6 NYCRR Part 621.3(a)(5) and Part 750-1.7(f), an applicant/permittee wishing to vary from the MDV, or one directed to do so by NYSDEC, must submit an IDV request at application time if either a permit renewal or a permittee initiated modification are involved. If the IDV request is incomplete then the entire permit application is incomplete. If the IDV request is absent from an application then NYSDEC staff should incorporate MDV requirements into the permit, if appropriate. Likewise, for Department-initiated modifications, NYSDEC will incorporate MDV requirements into the permit, if appropriate.

If the permittee requests any deviation from the MDV during the public notice period then this must be supported by an IDV application. Many permittees are likely to be unaware of this requirement. Such permittees should be advised of the need for an IDV application and directed by NYSDEC staff to submit one within 60 days of such notification.

IDV application requirements are summarized in *Appendix D*.

4.2.2.2 IDV Review and Approval Procedures:

Received IDVs should first be reviewed for completeness by the permit writer. Consistent with 6 NYCRR Part 750-1.2(a)(8), IDV requests which are not complete should be revised and resubmitted to the NYSDEC within 60 days of notification. Requests which remain incomplete or are otherwise not approvable should be denied by the NYSDEC in accordance with 6 NYCRR Part 702.17(f).

Considering the flexibility contained in the MDV, it is not clear how a permittee can successfully demonstrate that an IDV which is less stringent than the MDV is acceptable. However, assuming this demonstration can be made to the satisfaction of NYSDEC, such IDV requests for Great Lakes

Basin dischargers must be sent to USEPA Region 2 for their review. The procedure is spelled out in the 1998 MOA in section III, paragraphs (2) - (8) and the 2000 MOA in section XII.³²

If a permittee's IDV application is not accepted by either NYSDEC or USEPA then either authorization via the MDV, a limit of 0.70 ng/L, or denial of the permit must be pursued.

4.2.2.3 IDV-Based Permit Requirements:

Permit requirements based on an approved IDV must conform to both 6 NYCRR Part 702.17(e) and the TMDL and these should be identical to the MDV requirements except where differences have been justified by the permittee. It is possible for an IDV to result in more or less stringent requirements as compared to the MDV. All IDV authorized permits should be placed on the Department's EBPS *No Administrative Renewal List*. IDVs last for five years, or the term of the permit, whichever period is less. For such permits the following requirement must also be added to the bottom of the MMP permit page:

"Individual Discharge Variance (IDV) requirements - The mercury-related requirements in this permit are based on a site-specific IDV issued in accordance with 6 NYCRR Part 702.17 (see also NYSDEC policy *DOW 1.3.10*). This IDV is valid for five years, or the term of the permit, whichever period is less. This permit may not be administratively renewed without full technical review. The permittee must submit a complete permit renewal application in accordance with regulatory deadlines. If renewal of the IDV is desired then a new IDV application must also be submitted at renewal application time."

4.2.3 Effluent Limits of 0.70 ng/L

There may be some existing cases which warrant a mercury limit and no variance. Such permits should be issued to contain a monthly average limit of 0.70 ng/L and routine monitoring using EPA Method 1631. No MMP is necessary.

4.2.4 New Discharges

New and recommencing dischargers are not eligible for a variance within the Great Lakes Basin unless the requirements of 6 NYCRR Part 702.17(a)(2) are met. For such permittees which would otherwise qualify as high priority facilities as per the MDV, permits should be issued to contain a monthly average limit of 0.70 ng/L and routine monitoring using EPA Method 1631.

New and recommencing dischargers located outside the Great Lakes Basin are eligible for a variance. For these permits the guidance in section 4.2.1 should be followed except that no limit which is less stringent than the GLCA should be authorized.

³² *Amendment To The National Pollutant Discharge Elimination System Memorandum Of Agreement Between The New York State Department Of Environmental Conservation And The United States Environmental Protection Agency, Region 2 Relating To Implementation Of The Requirements Of The Great Lakes Water Quality Guidance In The Great Lakes Basin, March 16, 1998 and September 27, 2000.*

5. SPDES PERMIT EQUIVALENTS

SPDES permit equivalents are developed for remedial discharges from contaminated sites using the same technical procedures as those used for SPDES permits. New permit equivalents should conform to this guidance. Existing permit equivalents for long-term discharges should be updated in accordance with this guidance at renewal or modification time. If there is a proposed remedial discharge or renewal/modification of an existing one the permit writer should request EPA Method 1631 data be provided if there is any possibility that mercury contamination could be an issue. A MMP is not necessary for most short-term remedial discharges of less than two years since there will be insufficient time for one to achieve meaningful results.

6. WASTEWATER TREATMENT

Under contract with USEPA, Science Applications International Corporation studied the mercury wastewater treatment issue and published a report in 2005.³³ That report indicated that it was possible to reduce mercury to about 12 ng/L using selective sorbents. However, no treatment technology was demonstrated to consistently achieve levels of 12 ng/L or less.

Data collected in New York State appears to confirm the Science Applications International Corporation study. Two ion exchange systems in New York reported average influent/effluent levels of 91000/11 ng/L and 190/8.2 ng/L respectively. Ion exchange appears to be the most effective full-scale treatment system type which has been demonstrated in the state. Mercury precipitation theoretically can achieve very low levels due to the insolubility of mercurous sulfide but there are no known systems in the state to review. Granular Activated Carbon (GAC) and Sulfur-impregnated Granular Activated Carbon (SGAC) systems have been successfully used to reduce mercury. One GAC system reported average influent/effluent levels of 100/2.2 ng/L. However, limited data suggests that these GAC/SGAC systems may not be able to achieve the GLCA when treating very high levels of both dissolved solids and mercury.

While review of the above information suggests that the GLCA is achievable, none of these systems have demonstrated compliance with the 0.70 ng/L WQBEL. Therefore, NYSDEC concludes that achieving the 0.70 ng/L WQBEL is not possible at this time.

Wastewater treatment system upgrades may be necessary at a few industrial facilities which are unable to achieve the GLCA using other methods. No POTW should require a treatment system upgrade to achieve the GLCA listed in *Table 3*. When necessary, more stringent control of industrial users and hauled wastes is expected to sufficiently reduce POTW effluent concentrations in all cases.

³³ *Technological Feasibility Of Proposed Water Quality Criteria For New Jersey, March 2005*, prepared for USEPA Region 2 by Science Applications International Corporation.

As the MDV is implemented an effort should be made to gather data on the effectiveness of actual full-scale treatment systems. This will allow for a better understanding of the capabilities of different mercury treatment technologies.

7. PROGRAMS IN OTHER STATES

It is important to acknowledge that there are several other states with progressive programs to reduce mercury levels in wastewater discharges. Two examples are noted below.

As of 1999, the Maine Department of Environmental Protection had established mercury limits in 157 permits with 82% of these limits < 50 ng/L daily max and 98% of limits <200 ng/L daily max.³⁴

Starting February 2000, the Michigan Department of Environmental Quality implemented a mercury MDV which included mercury limits of 30 ng/L (12 month rolling average), use of EPA Method 1631 for sample analysis, and a MMP requirement. Implementation appears to have been successful as Michigan has more recently implemented an updated MDV which includes a further reduction in effluent limits to 10 ng/L (12 month rolling average).³⁵

V. RESPONSIBILITY

BWP will maintain and interpret this policy and provide updates as needed.

VI. RELATED REFERENCES

To fully understand the mercury SPDES permitting and monitoring recommendations contained herein, one must also be familiar with the following primary documents and regulations. It is important to note that some of these documents are more up to date than others. In instances where guidance documents provide conflicting recommendations, the most recent guidance should be relied upon. These and some secondary documents and regulations are cited and/or footnoted above as appropriate.

6 NYCRR Parts 700-706 - Water Quality Regulations.

6 NYCRR Part 750 - SPDES Permit Regulations.

40 CFR Part 132 - Water Quality Guidance for the Great Lakes System.

³⁴ *Status of Mercury Discharged from Wastewater Treatment Facilities In Maine, A Report by the Department of Environmental Protection Submitted to the Joint Standing Committee on Natural Resources, January 15, 2001, DEPLW2001-5.*

³⁵ www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-11384--,00.html

40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants.

Amendments to the NPDES Memorandum of Agreement Between the NYSDEC and the USEPA, Region II Relating to Implementation of the Requirements of the Great Lakes Water Quality Guidance in the Great Lakes Basin, March 16, 1998 and September 27, 2000.

Northeast Regional Mercury Total Maximum Daily Load, October 24, 2007.

NYSDEC Mercury Work Group Recommendations to Meet the Mercury Challenge, December 2006.

NYSDEC Organization and Delegation Memorandum No. 85-40, Water Quality Antidegradation Policy, September 9, 1985.

NYSDEC TOGS 1.1.1 - Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

NYSDEC TOGS 1.2.1 - Industrial Permit Writing.

NYSDEC TOGS 1.2.2 - Administrative Procedures and the Environmental Benefit Permit Strategy for Individual SPDES Permits.

NYSDEC TOGS 1.3.1 - Total Maximum Daily Loads and Water Quality-Based Effluent Limits.

NYSDEC TOGS 1.3.3 - SPDES Permit Development for POTWs.

NYSDEC TOGS 1.3.9 - Implementation of the NYSDEC Antidegradation Policy - Great Lakes Basin (Supplement to Antidegradation Policy dated September 9, 1985).

Table 1 - Ambient Water Quality Standards for Mercury

Standard (ng/L)	Form	Basis	Regulation
1400	Dissolved	Aquatic Life - Acute	6 NYCRR Part 703.5
770	Dissolved	Aquatic Life - Chronic	6 NYCRR Part 703.5
700	Total	Human Health - Water Supply	6 NYCRR Part 703.5
2.6	Dissolved	Wildlife	6 NYCRR Part 703.5
1.3	Total	Wildlife (Great Lakes Basin only)	40 CFR Part 132.6(e)
0.7	Dissolved	Human Health - Fish Consumption	6 NYCRR Part 703.5

Table 2 - USEPA-Approved Methods for Mercury Water/Wastewater Analysis & Sampling

USEPA Method	MDL/ML (ng/L)	Estimated Cost (2009)	Method Suitability				
			Ambient Surface Water	Discharges to Surface Water - Permits & Permit Applications	MMP Internal Monitoring	Ambient Groundwater	Discharges to Groundwater - Permits & Permit Applications
245.1	200 / 500	\$25	NO	NO	NO	YES*	YES*
245.2	200 / 500	\$25	NO	NO	NO	YES*	YES*
245.7	2.0 / 5.0	\$35	NO	NO	YES	YES	YES
1631	0.20 / 0.50	\$75	YES	YES	YES	YES	YES
1669	grab sample collection		YES	YES	YES	UNNECESSARY	UNNECESSARY

* - USEPA Methods 245.1 and 245.2 are acceptable for use in assessing ambient groundwaters and discharges to groundwater. However, use of USEPA Methods 245.7 and 1631 is preferred.

Table 3 - MDV: Permit Limits, Monitoring Frequencies, and Mercury Minimization Programs

To be authorized by the MDV, the permit must include the limits and MMP version as specified in this table. The only MDV requirements subject to permit writer discretion are the sampling frequency and the initial period permit limits. If less frequent sampling is proposed the permit writer must ensure that it meets the minimum requirements of 40 CFR Part 132. Otherwise the discharge will not qualify for the MDV and must either be authorized by an approved IDV or include a limit of 0.70 ng/L. More frequent monitoring may be justified for dischargers with significant effluent variability.

Discharge Category	Permit Limits			Monitoring Frequency		MMP Version Required	Estimated # of Permits
	Initial*	Interim	Final	Initial *	Interim		
POTWs 5 MGD or >	200 ng/L Daily Max or site-specific ILCA**	GLCA of 50 ng/L Daily Maximum**	Non-Binding Goal of 0.70 ng/L	Monthly	Quarterly	High Priority POTW	80
High Priority POTWs < 5 MGD	200 ng/L Daily Max or site-specific ILCA**	GLCA of 50 ng/L Daily Maximum**	Non-Binding Goal of 0.70 ng/L	Once/2 months	Quarterly	High Priority POTW	20
All other POTWs	None	None	None	None	None	Low Priority POTW	500
High Priority Industries & High Priority PCIs	200 ng/L Daily Max or site-specific ILCA	GLCA of 50 ng/L Daily Maximum	Non-Binding Goal of 0.70 ng/L	Weekly to Once/2 Months	Quarterly	Industrial	120 0
All other individually permitted industries/PCIs	None	None	None	None	None	None	1030 1700
General stormwater permittees: MSGP, Construction, MS4	None	None	None	None	None	None	1460 7040 500

* - If permittee cannot achieve 50 ng/L Daily Maximum limit then “initial” requirements may be applied. Otherwise, “interim” requirements must be applied.

** - Sizeable POTW collection systems which are permitted (SPDES) and transmit wastewaters to large regional treatment plants that are separately permitted do not require permit limits but must get the *High Priority POTW* version of MMP unless the regional treatment plant accepts responsibility for performing the MMP system-wide.

APPENDIX A - Selected Mercury Monitoring Data

Table 4 summarizes the data for ambient water quality samples analyzed using EPA Method 1631. Table 5 summarizes the data for wastewater samples analyzed using EPA Method 1631.

Table 4 - Mercury Ambient Surface Water Monitoring Data

Drainage Basin (basin number)	Sample Results (ng/L) Average/Maximum (number of samples)	
	Total	Dissolved
Lake Erie - Niagara River Basin (01)	3.1/12 (55)	-
Allegheny River Basin (02)	-	-
Lake Ontario & Minor Tributaries (03)	5.7/30 (13)	1.9/4.3 (11)
Genesee River Basin (04)	2.5/4.3 (7)	0.70/1.1 (6)
Chemung River Basin (05)	-	-
Susquehanna River Basin (06)	-	-
Seneca-Oneida-Oswego River Basin (07)	2.0/2.7 (7)	0.82/1.6 (7)
Black River Basin (08)	4.1/10 (6)	1.9/2.6 (5)
St. Lawrence River Basin (09)	-	-
Lake Champlain Basin (10)	-	-
Upper Hudson River Basin (11)	30/170 (16)*	1.8/3.2 (9)*
Mohawk River Basin (12)	19/80 (20)*, 2.6/3.4 (4)	1.8/3.3 (14)*
Lower Hudson River Basin (13)	12/130 (64)*	1.9/18 (67)*
Delaware River Basin (14)	1.4/1.8 (5)	1.1/1.3 (5)
Passaic - Newark (Basin 15)	-	-
Housatonic River Basin (16)	-	-
Atlantic Ocean - Long Island Sound (Basin 17)	12/92 (42)*	1.5/6.7 (36)*

Sources of data: Various NYSDEC water quality surveys and SPDES permittee reported intake data.

* – Includes data collected 1999-2001 and may not be representative of current levels.

Table 5 - Mercury Wastewater Monitoring Data

Permit Number	Facility Name	Monitoring Location	Sample Results (ng/L) Avg/Max (# of samples)
POTWs			
NY0034771	Adams Village	001	12 (1)
NY0026867	Albany County - South	001	10/21 (4)
NY0021431	Bath	Influent 001	66 (1) 11/13 (2)
NY0025739	Bethlehem	Influent 001	40/87 (6) 6.5/24 (7)
NY0028410	Buffalo Sewer Authority	002	5.4 (1)
NY0021377	Camden	001	6.6/30 (6)
NY0029807	Canastota	001	1.2/1.7 (2)
NY0023248	Canisteo	001	2.0 (1)
NY0020389	Catskill Village	001	22 (1)
NY0020958	Cayuga Heights	001	7.8 (1)
NY0024830	Chateaugay	001	3.8 (1)
NY0036986	Chemung County SD#1	001	0.32 (1)
NY0027758	Colonie	001	2.0 (1)
NY0023591	Cooperstown	001	11 (1)
NY0025721	Corning Village	001	16 (1)
NY0022144	Cornwall	001	26/80 (6)
NY0027669	Endicott	001	15 (1)
NY0020681	Erie County - Blasdell	001	16 (1)
NY0022136	Erie County SD#6	001 003 (ORF)	11 (1) 17 (1)
NY0095401	Erie County - Southtowns	Influent 001 002 (ORF)	16 (1) 2.5/2.5 (2) 10 (1)
NY0029050	Glens Falls	001 002 (CSO)	20/60 (25) 840 (1)
NY0021547	Granville	001	2.7 (1)
NY0023523	Greater Atlantic Beach Water Reclamation District	001 Municipal Water Supply	20 (1) 0.80 (1)

NY0094854	Greenville	001	6.2 (1)
NY0036528	Herkimer County	Influent 001	37/60 (4) 1.6/2.3 (4)
NY0020486	Herkimer Village	001	6.2 (1)
NY0025259	Honeoye Falls	001	4.4 (1)
NY0021342	Huntington	Influent 001	360/600 (5) 40/89 (18)
NY0029351	Kingston	001	4.0/6.9 (3)
NY0094366	Lake George	001	9.2 (1)
NY0030546	LeRoy	001	2.3 (1)
NY0022403	Little Falls	001	5.8/7.8 (6)
NY0025437	Livingston Manor	001	6.3 (1)
NY0020125	Lowville	Influent 001	21 (1) <0.5 (1)
NY0022551	Lyons	001	2.3 (1)
NY0030376	Malone	Influent 001	30/50 (3) 6.0/8.0 (3)
NY0031194	Massena	Stormwater 1 Stormwater 2	12 (1) 14 (1)
NY0021873	Medina	001	3.3 (1)
NY0026859	Nassau County – Cedar Creek	001	11 (1)
NY0027774	Newfane	001	2.9 (1)
NY0030082	New Paltz	001	11 (1)
NY0026336	Niagara Falls	Influent 001	170/3100 (40) 55/190 (40)
NY0027979	Niagara County SD #1	001	3.9 (1)
NY0023973	Niskayuna	001	3.5 (1)
NY0021423	Norwich	001	3.0 (1)
NY0026212	NYC - 26 th Ward	Influent (1999-2001) 001 (1999-2001)	350/520 ^A 27/44 (4) ^A
NY0026158	NYC - Bowery Bay	001 (1999-2001)	11/18 (2) ^A
NY0026182	NYC - Coney Island	Influent (1999-2001) 001 (1999-2001)	340/420 (3) ^A 18/24 (2) ^A
NY0026191	NYC - Hunts Point	Influent (1999-2001) 001 (1999-2001)	320/720 (3) ^A 20/43 (10) ^A

NY0026115	NYC - Jamaica Bay	Influent (1999-2001) 001 (1999-2001)	210/410 (3) ^A 23/24 (2) ^A
NY0026204	NYC - Newtown Creek	Influent (1999-2001) 001 (1999-2001) 001 (2004-2005)	410/620 (4) ^A 29/48 (14) ^A 9.7/17 (12)
NY0026247	NYC - North River	Influent (1999-2001) 001 (1999-2001) 001 (2004-2005)	690/1500 (3) ^A 17/40 (15) ^A 8.1/13 (12)
NY0026174	NYC - Oakwood Beach	Influent (1999-2001) 001 (1999-2001)	170/250 (2) ^A 2.7/3.3 (3) ^A
NY0026166	NYC - Owls Head	Influent (1999-2001) 001 (1999-2001) 001 (2004-2005)	430/930 (3) ^A 9.2/22 (13) ^A 8.0/12 (12)
NY0026107	NYC - Port Richmond	Influent (1999-2001) 001 (1999-2001)	120/150 (3) ^A 35/130 (9) ^A
NY0027073	NYC - Red Hook	Influent (1999-2001) 001 (1999-2001)	430/750 (3) ^A 8.6/9.4 (3) ^A
NY0026221	NYC - Rockaway	Influent (1999-2001) 001 (1999-2001)	72/88 (2) ^A 14/32 (3) ^A
NY0026239	NYC - Tallman Island	Influent (1999-2001) 001 (1999-2001)	360/510 (2) ^A 22 (1) ^A
NY0026131	NYC - Wards Island	Influent (1999-2001) 001 (1999-2001) 001 (2004-2005)	180/280 (3) ^A 15/77 (17) ^A 7.2/23 (12)
NY0029831	Ogdensburg	Influent 001	61/150 (4) 7.2/28 (5)
NY0026956	Oneida City	001	3.2/4.0 (3)
NY0025780	Oneida County	001	<1 (1)
NY0031151	Oneonta	Influent 001	210/280 (4) 74/100 (6)
NY0027171	Ontario	001	1.0 (1)
NY0027901	Orange County	001	3.7 (1)
NY0022730	Owego SD#1	001	13/34 (6)
NY0025798	Owego SD#2	001	8.6/15 (6)
NY0029262	Owego Village	001	13 (1)
NY0030996	Philmont	001	0.82 (1)
NY0026557	Pine Hill	001	<0.5 (1)
NY0020818	Potsdam	001	9.1 (1)

NY0026255	Poughkeepsie City	001	9.1 (1) ^A
NY0026271	Poughkeepsie Town - Arlington	001	2.2 (1)
NY0087971	Rensselaer County	001	14/20 (3) ^A
NY0031411	Richfield Springs	001	7.6 (1)
NY0020061	Riverhead	001	4.2(1)
NY0031895	Rockland County #1	Influent 001	310 ^A 32 (1) ^A
NY0030864	Rome	Influent 001	38 (1) 3.4 (1)
NY0021831	Rouses Point	Influent 001	42/110 (5) 16/25 (5)
NY0028240	Saratoga County	Influent 001	36/72 (2) 4.4/6.1 (2)
NY0031208	Saugerties	001	28 (1)
NY0033308	Seneca Falls	001	2.7/7.3 (7)
NY0021466	Sherburne	001	25 (1)
NY0029271	Sidney	001	11/24 (14)
NY0024520	South Fallsburg	001	7.6 (1)
NY0028851	Stony Point	001	8.3 (1)
NY0022748	Suffern	001	9.8 (1)
NY0021750	Suffolk County #1	001	9.4/16 (12)
NY0104809	Suffolk County #3	001	7.8/13 (4)
NY0023311	Suffolk County #6	001	41/87 (12)
NY0206644	Suffolk County #21	002	11/18 (12)
NY0036790	Sylvan Beach	001	1.7 (1)
NY0027081	Syracuse Metro	001	21/60 (40)
NY0207004	Theresa	001 Nelson St. STP 002 Morgan St. STP 003 Bridge St. STP	7.6 (1) 2.0 (1) 1.8 (1)
NY0036706	Ticonderoga	001	9.1 (1)
NY0149209	Tri-municipal	001	3.3/5.9 (4)
NY0026395	Tonawanda	001	1.8 (1)
NY0021571	Ulster – Whitier SD	001	1.6 (1)
NY0024422	Wallkill	001	3.6 (1)

NY0025704	Walworth	001	2.0 (1)
NY0025984	Watertown City	Influent A Influent B Effluent A Effluent B	90/94 (3) 15/21 (3) 36/85 (10) 4.8/9.4 (10)
NY0031089	Waverly	001	0.50 (1)
NY0021610	Webster	001	2.2 (1)
NY0108324	Westchester County - Ossining	001	6.9/13 (14)
NY0100803	Westchester County - Peekskill	001	5.5/20 (26)
NY0024929	Whitehall	001	12 (1)
ME-	72 Maine POTWs ^B	Effluent	1.3 - 60 / not available
MI-	36 Michigan POTWs ^C	Effluent	0.5 - 23 / 0.9 - 53
WI-	11 Wisconsin POTWs ^D	Influent Effluent	130 - 820 / 250 - 3000 2 - 45 / 3 - 100
Industrial Facilities			
NY0001333	AES Cayuga	001 01C coal pile 01C other 013	1.0 (1) 61 (1) 92 (1) 1.6 (1)
NY0001325	AES Grenidge	002	8.1 (1)
NY0001325	AES Lockwood Ash Disposal Site	001	0.54 (1)
NY0104213	AES Somerset	Basin #1 01E 001 011 influent 011 012 influent 012 012A	3.0/5.2 (4) 8.8/21 (6) 0.8 (1) 2.6/5.7 (8) 11/45 (6) 3.7/8.0 (4) 5.4/9.9 (4) 3.3 (1)
NY0003875	AES Westover	001 01A 01B 01D 01E 002 003 004 005	2.6 (1) 2.5 (1) <0.5 (1) 16 (1) 0.53 (1) 29/32 (2) 3.2/3.6 (2) 2.5/2.8 (2) 8.5/11 (2)
NY0001732	Alcoa	001 01A 01D 01E 01I	0.78 (1) 0.52 (1) 0.58 (1) <0.50 (1) 0.83 (1)

		003 004 007 008	0.78 (1) 0.95 (1) 0.55 (1) 0.71 (1)
NY0260843	American Rock Salt	001	5.5 (1)
NY0003824	Amphenol	001	46 (1)
NY0003042	APC Paper	001	16 (1)
NY0068225	Arkema	001 influent 001	3900/8700 (13) 33/75 (13)
NY0275387	Ashland Advanced Materials	005 006 009	7.7/15 (6) 14/45 (6) 3.4/6.7 (6)
NY0005959	Bethlehem Energy Center	001 002 03A 03C 004	0.6 (1) 9.7 (1) 2.3 (1) 5.5 (1) 8.6 (1)
NY0206938	Black River Generation	Intake 001 003	2.8 (1) 24 (1) 6.0 (1)
NY0005835	Brookhaven National Laboratory	001	84/85 (3)
NY0000191	Cellu Tissue Corportation	001	3.5 (1)
NY0200484	Clean Water of New York	001	0.54/ 0.76 (2)
NY0072061	Chemical Waste Management	Fac Pond 1 influent 001 002 003	130 (1) 110/160 (6) 4.7 (1) 3.8 (1)
NY0005151	Consolidated Edison – Hudson Ave	001 002	13/22 (4) 440/1000 (4)
NY0261114	Delaware & Hudson - Albany	001	33 (1)
NY0002321	Dunkirk Generating Station	Intake 001 003 005	1.3/2.5 (2) 1.9/2.8 (2) <0.5/1.0 (2) 0.7/1.4 (2)
NY0003328	DuPont	Intake 116 Intake 117 01E 01W 004 101 103 104	1.9/2.1 (3) 0.97/1.6 (3) 9.7/35 (5) 4.9/9.4 (5) 370/1000 (3) 57/83 (3) 120/240 (3) 56/77 (3)

		106	133/150 (2)
NY0001406	Evans Chemetics	001 004 005 008 013	4.1/15 (14) 5.8/22 (14) 11/94 (14) 6.6/42 (14) 7.6/7.6 (1)
NY0000515	Felix Shoeller Technical Papers	001	1.2 (1)
NY0000337	FMC Peroxygens	Influent 001	5.3/12 (13) 40/150 (13)
NY0232491	Frazer and Jones	001 01A 002 003	1.6 (1) 1.0 (1) 65 (1) 26 (1)
NY0007030	General Electric - R&D	001 influent 001	76/640 (30) 46/190 (36)
NY0000540	General Motors - Powertrain	001 003 005	0.45 (1) 2.0 (1) 0.51 (1)
NY0005894	Glenwood Landing Energy Center	001	4.4 (1)
NY0006874	Holcim US	001 002 006 008	3.1 (1) 540 (1) 7400 (1) 2000 (1)
NY0006807	Hollingsworth & Vose - Easton	001	1.6 (1)
NY0006785	Hollingsworth & Vose - Greenwich	001	2.4 (1)
D -7-0004-01-09	Honeywell International	015A influent 015A	100 (3) 2.2/10 (25)
NY0006491	Interface Solutions	001 influent 001	48 (1) 1.1 (1)
NY0004405	International Paper - Corinth	001 influent 001	1.5 (1) <1 (1)
NY0257869	International Paper – Deferiet Closed Landfill	003 004	1.2 (1) <1 (1)
NY0008109	JFK International Airport	002 004 010 016 022 Rainfall	5.9/15 (7) 6.9/18 (7) 4.4/12 (7) 4.7/10 (7) 5.9/16 (7) <10/39 (30) ^E
NY0000957	Knowlton Technologies	001	6.5 (1)
NY0001643	Kodak	001	3.6 (1)

		003	2.3 (1)
		006	85 (1)
NY0004308	Kraft	001	2.1 (1)
NY0005037	Lafarge	003	28 (1)
NY0000400	Life Technologies	001	1.7 (1)
		002	9.4 (1)
		003	5.4 (1)
NY0075078	Metro North - Brewster	001	1.8 (1)
		005	1.3/1.5 (2)
NY0006912	Mohawk Fine Papers	Intake	2.9 (1)
		001	0.76 (1)
NY0257150	Mohawk Valley Landfill	untreated leachate	1.1 (1)
NY0000418	Morton Salt	001	1.8 (1)
NY0006670	Nepera	Thermal ww	180/300 (4)
		Stormwater	940/1300 (6)
		002	74/280 (52)
		02B influent	9.3/14 (3)
		02B	1.6/16 (40)
		02C influent	190/220 (3)
		02C	8.2/42 (42)
NY0001856	Newton Falls Fine Paper	Clarifier effluent	100 (1)
		001	17 (1)
NY0001015	Nine Mile Point Nuclear Station	001	0.60 (1)
		001A	1.5 (1)
		002	0.60 (1)
		010	<0.50 (1)
		020	0.82 (1)
		023	3.2 (1)
		040	27/48 (4)
NY0004880	Norlite	003	1.7/1.8 (2)
		004	0.81 (1)
		06A influent	16000/44000 (15)
		06A post-sand filter	6700/40000 (26)
		06A	2900/29000 (27)
		006	24/38 (2)
		007	43 (1)
		South drainage channel	270 (1)
NY0200867	NYC - Staten Island Landfill	001	30/59 (5)
NY0002186	Oswego Steam Station	Intake	1.2/1.2 (2)
		005	1.2 (1)
		006	1.1 (1)
		05A/06A	1.7 (1)
NY0260738	Port Albany Ventures	001	39/63 (4)
		002	380/1100 (4)

		003 004	30/53 (2) 30/68 (4)
NY0007579	Praxair Electronics	001	0.57 (1)
NY0004146	Procter & Gamble - Woods Corners	002 pre-UF upgrade 002 post-upgrade 02A pre-UF upgrade 02A post-upgrade	83/300 (23) 3.8/7.0 (5) 110/200 (7) 4.8/8.8 (5)
NY0110043	PVS Chemical Solutions	Intake 001 002	3.2/6.9 (31) 4.3/20 (31) 17/280 (31)
NY0005665	Revere Copper Products	Intake - River Intake - Municipal 005	3.4 (1) 1.9 (1) 0.60 (1)
NY0000132	Reynolds Metals	East Sump 001 002 003	0.9 (1) 1.5 (1) 9.2 (1) 0.9 (1)
NY0006157	Schweitzer-Mauduit International	003	1.2 (1)
NY0005801	SI Group - Rotterdam Junction	01A 01N 001	0.72 (1) 0.63 (1) 0.87/1.9 (3)
NY0260525	SI Group – Congress Street	01A influent	0.63 (1)
NY0205401	Troy Water Plant	001	2.4 (1)
NY0002330	US Salt	002	1.5/3.2 (6)
NY0000973	West Valley Demonstration Project	01B influent 01B 001	91000/126000 (3) 11/29 (11) 4.4/9.0 (17)
NY0004600	Wyeth Pharmaceutical	01A	6.9/8.0 (3)
NY0007170	Wyeth Research	Influent 001	41/72 (2) 0.60/1.0 (4)
ME-	13 Maine Industrials ^A	Effluent	0.3 - 250 / not available
MI-	9 Michigan Industrials ^B	Effluent	0.7 - 80 / 1.3 - 270
POTW and Industrial Facilities			
Northeast States	249 Sites in CT, ME, MA, NH, NY, RI, and VT ^F	Effluent	12/-
PCIs			
NY0035041	Great Meadow Correctional Facility	001	2.7 (1)
NY0023761	US Military Academy – West Point	001	1.2/2.0 (4)

NY0202070	Washington Correctional Facility	001	3.6 (1)
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Source of data - For New York State facilities based on permittee or NYSDEC sampling results unless otherwise noted below. Data from other States has been condensed and is represented as a range of both average and maximum values.

Footnotes for Table 5:

(A) – Data collected 1999-2001. The age of this data renders it unlikely to be representative of recent performance and it is therefore not included in the statistical summary provided in section 2.3 above.

(B) - Maine Department of Environmental Protection. “Mercury in Wastewater: Discharges to Waters of the State 1999” February 1, 1999.

(C) - May 18, 2004 letter, Richard A. Powers, State of Michigan Department of Environmental Quality to Jo Lynn Traub, USEPA Region 5.

(D) - Muga, T.J. “Quantification of Total Mercury Discharges from Publicly Owned Treatment Works to Wisconsin Surface Waters” Water Environment Research 1996, Vol. 68 [2] pp. 229-234.

(E) – Individual sample data not available. Rainfall data reported as six ranges of five samples each: 1.4 – 1.7; 4.2 – 6.2; 2.1 – 3.9; 1.7 – 3.3; 3.7 – 6.4; and 5.5 – 6.3 ng/L.

(F) - Connecticut Department of Environmental Protection, Maine Department of Environmental Protection, Massachusetts Department of Environmental Protection, New Hampshire Department of Environmental Services, New York State Department of Environmental Conservation, Rhode Island Department of Environmental Management, Vermont Department of Environmental Conservation, and New England Interstate Water Pollution Control Commission, “Northeast Regional Mercury Total Maximum Daily Load, October 24, 2007”, Table 6-3.

APPENDIX B – Example SPDES Permit Requirements

Mass modification for High Priority Dischargers:

<Where necessary include ILCA limits and monitoring frequency. Add appropriate sample frequency in accordance with Table 3 above. If composite sample is desired, change sample type to “Composite” and include a footnote similar to the following example: “Composite sample shall consist of three separate grab samples, with each sample collected at eight hour intervals, combined by the laboratory prior to analysis.” >

SPDES Permit Number NY XXXXXXXX

Mercury Multiple Discharge Variance Implementation Addendum – High Priority Dischargers

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL NUMBER	EFFECTIVE	EXPIRING
001	Effective Date of Permit Modification	Expiration Date of Permit

PARAMETER	EFFLUENT LIMIT		UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Monthly Avg.	Daily Max			
Mercury, Total	Monitor Monitor	50 Monitor	ng/L grams/day	<insert from Table 3>	Grab

Special Conditions:

(M1) – The requirements of this SPDES permit addendum supercede all mercury-related SPDES permit requirements in effect prior to the date of this addendum. Any such prior requirements shall be ignored.

(M2) – The fact sheet applicable to this permit addendum can be found in NYSDEC policy *DOW 1.3.10*.

(M3) – The permittee must also comply with the following Mercury Minimization Program requirements:

<Insert appropriate version of MMP here>

Mass modification for Low Priority POTWs:

SPDES Permit Number NY XXXXXXXX

Mercury Multiple Discharge Variance Implementation Addendum – Low Priority POTWs

EFFECTIVE	EXPIRING
Effective Date of Permit Modification	Expiration Date of Permit

Special Conditions:

(M1) – The requirements of this SPDES permit addendum supercede all mercury-related SPDES permit requirements in effect prior to the date of this addendum. Any such prior requirements shall be ignored.

(M2) – The fact sheet applicable to this permit addendum can be found in NYSDEC policy *DOW 1.3.10*.

(M3) – The permittee must also comply with the following Mercury Minimization Program requirements:

The permittee shall inspect each tributary dental facility at least once every five years to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. Inspection and/or outreach to other industrial/commercial sectors which may contribute mercury is also recommended. All new or increased tributary discharges, including hauled wastes, which are from sources that are industrial in nature shall be evaluated for mercury content and if levels exceed 500 ng/L then authorization shall be obtained from the Department prior to acceptance. A file shall be maintained containing the notices submitted by dental offices and all other pertinent information. This file shall be available for review by NYSDEC representatives and copies shall be provided upon request. Note that a permit modification may be necessary to include more stringent requirements for POTWs which do not maintain low mercury effluent levels. Note - The mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

Example non-mass modification SPDES permit fact sheet entry for mercury:

Effluent Parameter (Units) <small>(concentration units - mg/l, ug/l or ng/l; mass units - lbs/d or g/d)</small>	Existing Effluent Quality				Technology Based Effluent Limit					Water Quality Based Effluent Limit			Permit Basis (T or WQ)	
	concentration		mass		conc.	mass	Type	PQL conc.	Basis	AWQC conc.	Effluent			
	Avg/Max	95%/99%	Avg/Max	95%/99%							conc.	mass		Type
Mercury, Total (ng/l, grams/d)	<add info>	<add info>	<add info>	<add info>	50	Monitor	Max		Mercury Multiple Discharge Variance, see NYSDEC policy DOW 1.3.10.	0.70	0.70		Max	MDV

Example non-mass modification SPDES permit entry for mercury:

<Add appropriate sample frequency in accordance with Table 3 above. If composite sample is desired, change sample type to “Composite” and include a footnote similar to the following example: “Composite sample shall consist of three separate grab samples, with each sample collected at eight hour intervals, combined by the laboratory prior to analysis.” >

PARAMETER	EFFLUENT LIMIT		PQL	MONITORING ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg.	Daily Max.	Daily Max.					
Mercury, Total	Monitor Monitor	50 Monitor			ng/L grams/ d	<insert from Table 3>	Grab	

MERCURY MINIMIZATION PROGRAM – High Priority POTWs

1. General - The permittee shall develop, implement, and maintain a Mercury Minimization Program (MMP). The MMP is required because the 50 ng/L permit limit exceeds the statewide water quality based effluent limit (WQBEL) of 0.70 nanograms/liter (ng/L) for Total Mercury. The goal of the MMP will be to reduce mercury effluent levels in pursuit of the WQBEL. Note - The mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

2. MMP Elements - The MMP shall be documented in narrative form and shall include any necessary drawings or maps. Other related documents already prepared for the facility may be used as part of the MMP and may be incorporated by reference. As a minimum, the MMP shall include an on-going program consisting of: periodic monitoring designed to quantify and, over time, track the reduction of mercury; an acceptable control strategy for reducing mercury discharges via cost-effective measures, which may include more stringent control of tributary waste streams; and submission of periodic status reports.

A. Monitoring - The permittee shall conduct periodic monitoring designed to quantify and, over time, track the reduction of mercury. All permit-related wastewater and stormwater mercury compliance point (outfall) monitoring shall be performed using EPA Method 1631. Use of EPA Method 1669 during sample collection is recommended. Unless otherwise specified, all samples shall be grabs. Monitoring at influent and other locations tributary to compliance points may be performed using either EPA Methods 1631 or 245.7. Monitoring of raw materials, equipment, treatment residuals, and other non-wastewater/non-stormwater substances may be performed using other methods as appropriate. Monitoring shall be coordinated so that the results can be effectively compared between internal locations and final outfalls. Minimum required monitoring is as follows:

i. Sewage Treatment Plant Influent & Effluent, and Type II SSO Outfalls - Samples at each of these locations shall be collected in accordance with the minimum frequency specified on the mercury permit limits page.

ii. Key Locations in the Collection System and Potential Significant Mercury Sources - The minimum monitoring frequency at these locations shall be semi-annual. Monitoring of properly treated dental facility discharges is not required.

iii. Hauled Wastes - Hauled wastes which may contain significant mercury levels shall be periodically tested prior to acceptance to ensure compliance with pretreatment/local limits requirements and/or determine mercury load.

iv. Additional monitoring shall be completed as may be required elsewhere in this permit or upon Department request.

B. Control Strategy - An acceptable control strategy is required for reducing mercury discharges via cost-effective measures, including but not limited to more stringent control of industrial users and hauled wastes. The control strategy will become enforceable under this permit and shall contain the following minimum elements:

i. Pretreatment/Local Limits - The permittee shall evaluate and revise current requirements in pursuit of the goal.

ii. Periodic Inspection - The permittee shall inspect users as necessary to support the MMP. Each dental facility shall be inspected at least once every five years to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. Other mercury sources shall also be inspected once every five years. Alternatively, the

permittee may develop an outreach program which informs these users of their responsibilities once every five years and is supported by a subset of site inspections. Monitoring shall be performed as above.

iii. Systems with CSO & Type II SSO Outfalls - Priority shall be given to controlling mercury sources upstream of CSOs and Type II SSOs through mercury reduction activities and/or controlled-release discharge. Effective control is necessary to avoid the need for the Department to establish mercury permit limits at these outfalls.

iv. Equipment and Materials – Equipment and materials which may contain mercury shall be evaluated by the permittee and replaced with mercury-free alternatives where environmentally preferable.

for permits with all mercury limits less than or equal to 50 ng/L:

C. Annual Status Report & Documentation - An annual status report shall be submitted to the Regional Water Engineer and to the Bureau of Water Permits summarizing: (a) all MMP monitoring results for the previous year; (b) a list of known and potential mercury sources; (c) all action undertaken pursuant to the strategy during the previous year; (d) actions planned for the upcoming year, and (e) progress toward the goal. The first annual status report is due one year after the permit is modified to include the MMP requirement and follow-up status reports are due annually thereafter. A file shall be maintained containing all MMP documentation, including the dental forms required by 6NYCRR Part 374.4, which shall be available for review by NYSDEC representatives. Copies shall be provided upon request.

for permits with one or more mercury limits > 50 ng/L:

C. Semiannual Status Report & Documentation – A semiannual status report shall be submitted to the Regional Water Engineer and to the Bureau of Water Permits summarizing: (a) all MMP monitoring results for the previous six months; (b) a list of known and potential mercury sources; (c) all action undertaken pursuant to the strategy during the previous six months; (d) actions planned for the upcoming six months; and (e) progress toward the goal. The first semiannual status report is due six months after the permit is modified to include the MMP requirement and follow-up status reports are due every six months thereafter. A file shall be maintained containing all MMP documentation, including the dental forms required by 6NYCRR Part 374.4, which shall be available for review by NYSDEC representatives. Copies shall be provided upon request.

3. MMP Modification - The MMP shall be modified whenever: (a) changes at the facility or within the collection system increase the potential for mercury discharges; (b) actual discharges exceed 50 ng/L; (c) a letter from the Department identifies inadequacies in the MMP; or, (d) pursuant to a permit modification.

MERCURY MINIMIZATION PROGRAM – Low Priority POTWs

The permittee shall inspect each tributary dental facility at least once every five years to verify compliance with the wastewater treatment operation, maintenance, and notification elements of 6NYCRR Part 374.4. Inspection and/or outreach to other industrial/commercial sectors which may contribute mercury is also recommended. All new or increased tributary discharges, including hauled wastes, which are from sources that are industrial in nature shall be evaluated for mercury content and if levels exceed 500 ng/L then authorization shall be obtained from the Department prior to acceptance. Equipment and materials which may contain mercury shall be also evaluated by the permittee and replaced with mercury-free alternatives where environmentally preferable. A file shall be maintained containing the notices submitted by dental offices and all other pertinent information. This file shall be available for review by NYSDEC representatives and copies shall be provided upon request. A permit modification may be necessary to include more stringent requirements for POTWs which do not maintain low mercury effluent levels. Note - the mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

MERCURY MINIMIZATION PROGRAM – Industrial Facilities

1. General - The permittee shall develop, implement, and maintain a Mercury Minimization Program (MMP) for those outfalls which have mercury effluent limits. The MMP is required because the 50 ng/L permit limit exceeds the statewide water quality based effluent limit (WQBEL) of 0.70 nanograms/liter (ng/L) for Total Mercury. The goal of the MMP is to reduce mercury effluent levels in pursuit of the WQBEL. Note - The mercury-related requirements in this permit conform to the mercury Multiple Discharge Variance specified in NYSDEC policy *DOW 1.3.10*.

2. MMP Elements - The MMP shall be documented in narrative form and shall include any necessary drawings or maps. Other related documents already prepared for the facility may be used as part of the MMP and may be incorporated by reference. As a minimum, the MMP shall include an on-going program consisting of: periodic monitoring; an acceptable control strategy which will become enforceable under this permit; and, submission of periodic status reports.

A. Monitoring - The permittee shall conduct periodic monitoring designed to quantify and, over time, track the reduction of mercury. Wastewater treatment plant influents and effluents, and other outfalls shall be monitored in accordance with the minimum frequency specified on the mercury permit limits page. Additionally, key locations in the wastewater and/or stormwater collection systems, and known or potential mercury sources, including raw materials, shall be monitored at the above frequency during the first year of the MMP. Monitoring of key locations and known/potential sources may be reduced during subsequent years if downstream outfalls have maintained mercury levels less than 50 ng/l during the previous year. Additional monitoring shall be completed as may be required elsewhere in this permit or upon Department request. Monitoring shall be coordinated so that the results can be effectively compared between internal locations and final outfalls.

All permit-related wastewater and stormwater mercury compliance point (outfall) monitoring

shall be performed using EPA Method 1631. Use of EPA Method 1669 during sample collection is recommended. Unless otherwise specified, all samples shall be grabs. Monitoring at influent and other locations tributary to compliance points may be performed using either EPA Methods 1631 or 245.7. Monitoring of raw materials, equipment, treatment residuals, and other non-wastewater/non-stormwater substances may be performed using other methods as appropriate.

B. Control Strategy - An acceptable control strategy is required for reducing mercury discharges via cost-effective measures, which may include, but is not limited to: source identification; replacement of mercury-containing equipment, materials, and products with mercury-free alternatives where environmentally preferable; more stringent control of tributary waste streams; remediation; and/or installation of new or improved treatment facilities. Required monitoring shall also be used, and supplemented as appropriate, to determine the most effective way to operate the wastewater treatment system(s) to ensure effective removal of mercury while maintaining compliance with other permit requirements.

for permits with all mercury limits less than or equal to 50 ng/L:

C. Annual Status Report & Documentation - An annual status report shall be submitted to the Regional Water Engineer and to the Bureau of Water Permits summarizing: (a) all MMP monitoring results for the previous year; (b) a list of known and potential mercury sources; (c) all action undertaken pursuant to the strategy during the previous year; (d) actions planned for the upcoming year, and (e) progress toward the goal. The first annual status report is due one year after the permit is modified to include the MMP requirement and follow-up status reports are due annually thereafter. A file shall be maintained containing all MMP documentation, including the dental forms required by 6NYCRR Part 374.4, which shall be available for review by NYSDEC representatives. Copies shall be provided upon request.

for permits with one or more mercury limits > 50 ng/L:

C. Semiannual Status Report - A semiannual status report shall be submitted to the Regional Water Engineer and to the Bureau of Water Permits summarizing: (a) all MMP monitoring results for the previous six months; (b) a list of known and potential mercury sources; (c) all action undertaken pursuant to the strategy during the previous six months; (d) actions planned for the upcoming six months; and (e) progress toward the goal. The first semiannual status report is due six months after the permit is modified to include the MMP requirement and follow-up status reports are due every six months thereafter. A file shall be maintained containing all MMP documentation, including the dental forms required by 6NYCRR Part 374.4, which shall be available for review by NYSDEC representatives. Copies shall be provided upon request.

3. MMP Modification - The MMP shall be modified whenever: (a) changes at the facility or within the collection system increase the potential for mercury discharges; (b) actual discharges exceed 50 ng/L; (c) a letter from the Department identifies inadequacies in the MMP; or (d) pursuant to a permit modification.

APPENDIX C - Summary of New York State Mercury Minimization Milestones

1998 New ambient water quality standards promulgated;

2002 Lowered waste incineration limits;

2004 School (K-12) use/purchase banned;

2005 Elemental mercury sales restricted to medical, dental, manufacturing, research;

Sale/distribution of mercury-containing novelties, and fever thermometers (without prescription) prohibited;

Labeling of most mercury-added consumer products required;

Disposal of mercury-added consumer products restricted;

Law restricting mercury use in vaccines;

On record in opposition to inadequate federal Clean Air Mercury Rule (CAMR);

2006 Sale/distribution of mercury-containing barometers, flow meters, hydrometers, pyrometers, psychrometers, esophageal dilators, bougie tubes, and gastrointestinal tubes prohibited;

Proper management of dental mercury required, new dentists must install amalgam separators;

Mercury management restrictions at vehicle dismantlers;

Mercury-free schools outreach project begins;

2007 Coal-Fired Power Plant mercury regs issued, phase 2 implementation harmonized with CAIR & RGGI;

Sale/distribution of Hg-containing hydrometers and manometers prohibited;

Northeast Regional TMDL is approved by USEPA;

2008 Dental amalgam separator installation deadline for existing dentists;

Sale/distribution of mercury-containing switches and relays prohibited;

Sale/distribution of sphygomanometers prohibited;

2010 Coal-Fired Power Plant Regs Phase I - 50% mercury reduction required, mercury cap, no trading allowed;

Phase-out of mercury-added motor vehicle components;

Mercury SPDES permitting strategy and Multiple Discharge Variance finalized;

2015 Coal-Fired Power Plant Regs Phase II - 90% mercury reduction required (CAMR 70% by 2025);

Additional information on mercury management in New York State can be found on the NYSDEC website at www.dec.ny.gov/chemical/285.html .

APPENDIX D - SPDES Permit Application Requirements for an IDV

SPDES Permit Application Requirements for an Individual Discharge Variance from the Mercury Water Quality Based Effluent Limitations of 0.70, 1.3, and 2.6 ng/L

In accordance with 6 NYCRR Parts 702.17 and 750-2.1(i), an approvable application for an Individual Discharge Variance (IDV) shall contain all of the following information:

- ▶ A demonstration that it is not feasible to achieve one or more of the above-noted Water Quality Based Effluent Limitations;
- ▶ A demonstration that it is not feasible to achieve the Statewide Multiple Discharge Variance (MDV) requirements published in NYSDEC policy *DOW 1.3.10*. This shall address the specific MDV provisions that the applicant wishes to vary from;
- ▶ A characterization of any increased risk to human health and the environment and a demonstration that granting the IDV will not adversely affect the public health, safety and welfare, or, jeopardize the continued existence of any endangered or threatened species. The characterization and demonstration should be made relative to both the water quality standard and the MDV requirements, i.e., what is the risk of the overall IDV and what is the incremental increase in risk of the IDV versus the MDV;
- ▶ A demonstration that the requested IDV will conform to the applicable TMDL;
- ▶ A demonstration that the requested IDV will conform to the State's anti-degradation policy;
- ▶ A tabulation of all available mercury data for the site in question. This tabulation shall include a minimum of ten EPA Method 1631 sample results for each water supply intake, treatment system influent (if applicable), and effluent location. Sample results should also be provided for atmospheric precipitation, groundwater, site soils and sediments, and materials used or stored at the site, as appropriate.

The applicant shall submit the IDV request at application time if either a renewal or a permittee initiated modification is involved. For NYSDEC initiated modifications, an IDV request should only be submitted by the permittee if so directed by NYSDEC staff.