STATEMENTS OF POLICY

Title 25—ENVIRONMENTAL PROTECTION

DEPARTMENT OF ENVIRONMENTAL PROTECTION

[25 PA. CODE CH. 16]

Water Quality Toxics Management Strategy

The Department of Environmental Protection (Department) is amending Chapter 16 (relating to Water Quality Toxics Management Strategy—Statement of Policy). These proposed amendments were developed by the Department as part of the Regulatory Basics Initiative (RBI) and compliment the comprehensive review and revision of water quality management regulations Chapters 92, 93 and 95 (relating to National Pollutant Discharge Elimination System; water quality standards; and wastewater treatment requirements) and the addition of new Chapter 96 (relating to water quality standards implementation).

Effective Date

These amendments will be effective upon publication in the *Pennsylvania Bulletin*.

Contact Person

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Statutory Authority

These amendments are made under the authority of the following acts: sections 5(b)(1) and 402 of The Clean Streams Law (35 P. S. §§ 691.5(b)(1) and 691.402); and section 1920-A of The Administrative Code of 1929 (71 P. S. § 510-20), which grant to the Environmental Quality Board (Board) the authority to develop and adopt rules and regulations to implement the provisions of The Clean Streams Law. The Commonwealth's Water Quality Standards at Chapter 93 implement the provisions of these acts. Chapter 16 is a water quality policy for regulating toxic pollutants. It sets the guidelines for development of criteria for toxic substances, and lists the water quality criteria and the analytical methods and detection limits for toxic substances. Chapter 16 is directly referenced as a support policy document in the Department's toxic substances regulation in § 93.8a (relating to toxic substances).

Background and Summary

These final amendments revise the water quality management statement of policy as part of Governor Ridge's Regulatory Basics Initiative (RBI). The RBI is a multistep process to evaluate regulations and guidances considering several factors including whether requirements: are more stringent than Federal regulations without good reason; impose economic costs disproportionate to the environmental benefit; are prescriptive rather than performance-based; inhibit green technology and pollution prevention strategies; are obsolete or redundant; lack clarity; or are written in a way that causes significant noncompliance.

These revisions streamline and clarify requirements, update the policy to be consistent with Federal requirements, and preserve Pennsylvania-specific requirements to serve our citizens. These amendments may affect persons who discharge wastewater into surface waters of the Commonwealth, or otherwise conduct activities which may impact the waters.

The Air and Water Quality Technical Advisory Committee (AWQTAC) and its successor committee, the Water Resources Advisory Committee (WRAC) provided input on the proposed amendments. The proposal was published at 28 Pa.B. 4289 (August 29, 1998) with provisions for a 60-day public comment period and three public hearings. The public comment period concluded on October 28, 1998. In response to the public comments received on the proposal, the Department revised the proposal in the form of an Advance Notice of Final Rulemaking (ANFR) proposal. Notice of the availability of the ANFR appeared at 29 Pa.B. 4872 (September 18, 1999) with provisions for a public comment period open until November 17, 1999, and three public meetings/hearings. The Department received approximately 1,500 public comments on the ANFR, which addressed both the regulations and this statement of policy.

The comments received on the proposal and on the draft final amendments are summarized in Section E of this Preamble.

The Department considered all of the public comments received on both its proposal and the ANFR in preparing this final statement of policy. The draft final amendments were discussed with and approved by WRAC on March 8, 2000. WRAC also submitted minutes of their meeting to document their comments. The valuable input from the public and the collective knowledge and experience drawn from advisory committees and others on these proposals has been utilized to develop a regulation which carefully balances the needs of citizens and the regulated community in assuring the protection of the Commonwealth's waters.

Summary of Comments and Responses on the Proposed Amendments and the ANFR

The statement of policy contain changes from the proposal in the following major areas:

General—Many comments objected that the proposal weakened water quality protection in the Commonwealth and that the comment period was insufficient to address the wide scope of changes. In response, the Department prepared an ANFR and offered an additional comment period and a series of three public informational meetings and public hearings. The ANFR reinstated 75 aquatic life criteria in Chapter 16, in response to the specific concern about weakening protection by proposing to eliminate the criteria.

§ 16.11. Toxic substances.

In response to a comment that proposed deletions to this section provided valuable background information, the language has been reinstated.

§ 16.21. Acute and chronic protection.

Comments suggested updating language of this section and in response, language relating to aquatic life protection in the title and text is revised to clarify that "acute and chronic protection" is used in place of "long and short term concepts." Additional minor language changes reflect amendments to Chapter 96.

§ 16.22. Criteria development.

In response to extensive public comments, the Department has deleted the discussion of, and the methodology for development of guidance values in the final changes. There is a revised description that the Department will develop criteria in the cases where EPA has not developed water quality criteria and when there are adequate data to comply with the National guidance requirements for developing water quality criteria.

§ 16.24. Metals Criteria.

A comment that asked for more detail on development of water effect ratios did not result in any changes to the section.

§ 16.32. Threshold level toxic effects.

A comment requested, and the language of this section is amended, to allow for the use of teratology and other sources of data in criteria development that may become available in the future. The language also states that the Department *will* develop criteria when data become available for substances identified or *expected* in a discharge, as noted by commentators.

§ 16.33. Nonthreshold effects (cancer).

In the final amendments to Chapter 16, no changes are made to the proposed changes to this section. The proposed changes are carried over as final amendments.

§ 16.51. Human health and aquatic life criteria.

In response to a comment that water quality criteria are used for other purposes than included, the uses of criteria are amended to be for NPDES effluent limitations and other purposes. Subsection (b) is amended to limit the use of natural quality in place of criteria for aquatic life criteria, because a comment pointed out that natural quality cannot be used for human health protection.

§ 16.52. Whole effluent toxicity testing (WETT).

Subsection (b) is not needed because of the elimination of guidance values. Therefore, the proposed subsection (b) is not adopted as a change to existing § 16.52.

§ 16.61. Special Provisions for the Great Lakes System (Table).

Although inadvertently missed in the proposal and ANFR, amendments were made to the table in § 16.61 (relating to Great Lakes System) containing the Great Lakes Aquatic Life and Human Health Criteria. In response to EPA comments on the GLI adopted by the Department and published in the *Pennsylvania Bulletin* of December 28, 1998, the Department had committed to the Environmental Protection Agency (EPA) to change those criteria less stringent than the GLI. The final amendments to Chapter 16 include adding criteria for the parameter Chromium III and modifying the human health criteria for several of the listed parameters. The human health criteria revisions include changing to two significant figures for criteria expression and deletion of taste and odor criteria. These changes directly parallel the changes made in Table 1 for the Statewide criteria. A typographical error in the criterion for PCBs had listed it as 3 E-6 ug/L. The one in one million cancer risk criterion is 3.9 E-7 ug/L, as reflected in the amended table.

§ 16.102. Approved EPA Analytical Methods and Detection Limits.

The reference to Standard Methods is updated and, in response to a comment that suggested clarifying the language of paragraph, (ii), the commentator's language is used to replace the previous wording.

Appendix A. Table 1

To respond to many public comments, the aquatic life criteria for 75 substances that had been proposed for use as "guidance values" have been reinstated as criteria. In addition, in response to the EPA's comments, several criteria for human health and aquatic life protection are amended to reflect the most recent scientific data and the EPA's recommended criteria. Criteria changes are made for the following substances: arsenic, chromium III, copper, mercury, nickel, selenium, zinc, pentachlorophenol, isophorone, gamma-BHC (Lindane), dieldrin, endosulfan sulfate, endrin, endrin adehyde, and heptachlor epoxide.

The EPA's human health criteria for copper, selenium and zinc are not adopted. Pennsylvania deleted these criteria on the EPA's recommendation in the National Toxics Rule (1992). Although requested, the EPA has given no new data or cogent explanation of why they reversed that decision in the publication of recommended criteria in 63 *Fed. Reg.* 68354 (December 10, 1998). We again requested that the EPA explain the reasons for this change so that we may evaluate the validity of the criteria.

There is no data in the EPA's Integrated Risk Information System (IRIS) that supports the criterion the EPA suggests for 1,2-dichloropropane, and it is, therefore, not adopted.

The EPA adopted a new health criterion for 1,2-dichlorobenzene based on new data in IRIS, but continued to recommend health criteria for 1,3 and 1,4-dichlorobenzene based on the previous (1980) criterion for 1,2-dichlorobenzene. We requested that the EPA explain the rationale behind these seemingly contradictory criteria. Pennsylvania's health criteria for these compounds are based on the new data in IRIS.

Several other human health criteria are made equal to the EPA's recommendations by rounding to 2 significant figures.

Table 2. Approved EPA analytical methods and detection limits.

Table 2 had been proposed to be renumbered as Table 3 because a new Table 2 was proposed for "Guidance Values." The proposed Guidance Values are reinserted in Table 1 as criteria. Accordingly, in the final amendments, the "Approved EPA Analytical Methods and Detection Limits" revert to Table 2.

A comment correctly noted that the proposal replaced the units of measurement as mg/L; this has been corrected to ug/L. In addition, the detection level for chrysene using method 625 is corrected from 5.3 ug/L to 2.5 ug/L, as also noted in a comment.

The Department has prepared Comment and Response documents for the proposed amendments and the ANFR changes. Copies are available from the Division of Water Quality Assessment and Standards at the address in the "Contact Persons" section of this preamble.

JAMES M. SEIF,
Secretary

(*Effective Date:* The amendments to this chapter take effect upon publication as final in the *Pennsylvania Bulletin.)*

(*Editor's Note*: The regulations of the Department, 25 Pa. Code Chapter 16, are amended by amending §§ 16.1, 16.11, 16.21—16.24, 16.32, 16.33, 16.41, 16.51, 16.52, 16.61, 16.102 and Appendix A and be deleting § 16.42 to read as set forth in Annex A, with ellipses referring to the existing text.)

Fiscal Note: 7-509. No fiscal impact; (8) recommends adoption. This Statement of Policy (SOP) is being revised as part of the Governor's Regulatory Basics Initiative (RBI) in order to streamline, clarify and consolidate the Department of Environmental Protection's policies and regulations to more closely mirror Federal requirements. The SOP is scheduled to be published concurrently with Final Regulation 7-388.

Annex A

TITLE 25. ENVIRONMENTAL PROTECTION

PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION

Subpart A. PRELIMINARY PROVISIONS

ARTICLE II. STATEMENTS OF POLICY

CHAPTER 16. WATER QUALITY TOXICS MANAGEMENT STRATEGY—STATEMENT OF POLICY

Subchapter A. GUIDELINES FOR DEVELOPMENT OF CRITERIA FOR TOXIC SUBSTANCES AND WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

INTRODUCTION

§ 16.1. General.

Water quality criteria are the numeric concentrations, levels or surface water conditions that need to be maintained or attained to protect existing and designated uses. They are designed to protect the water uses listed in Chapter 93 (relating to water quality standards). The most sensitive of these protected uses are generally water supply, recreation and fish consumption, and aquatic life related. Therefore, criteria designed to protect these uses will normally protect the other uses listed in Chapter 93. This chapter specifies guidelines and procedures for development of criteria for toxic substances and also lists those criteria which have been developed.

DISCUSSION

§ 16.11. Toxic substances.

(a) These guidelines cover the Federal Clean Water Act section 307(a) priority pollutants and other toxic substances which the Department determines to be of concern due to their verified presence in wastewater discharges. Priority pollutants are the primary focus of concern because the EPA has determined them to be the most commonly used, persistent and toxic substances in wastewater discharges. They include many heavy metals and solvents.

(b) In November 1980, the EPA published criteria for protection of human health and aquatic life for 104 of the 129 priority pollutants. (There are currently 126 priority pollutants since three have subsequently been deleted.) These criteria were developed in accordance with National guidelines summarized in 45 FR 79318 (1980). In several instances, the EPA has updated the criteria or issued new criteria based upon new data. The Department's procedures for establishing criteria for aquatic life and human health protection for priority pollutants, and other toxics of concern are discussed in this subchapter.

GUIDELINES FOR DEVELOPMENT OF AQUATIC LIFE CRITERIA

§ 16.21. Acute and chronic protection.

To provide for protection of aquatic life, it is necessary to consider both chronic, that is, long-term (reproduction, growth, survival) and acute or short-term (survival) concepts. Aquatic life can generally survive excursions of elevated concentrations of a pollutant as long as the excursion is of relatively short duration and does not frequently recur. However, to provide protection over a lifetime, a lower concentration shall be maintained. Thus, each aquatic life criterion consists of two components. The EPA defines these as a criterion maximum concentration (CMC) for acute protection and a criterion continuous concentration (CCC) for chronic protection. Each component is further defined in terms of magnitude (a scientifically derived number), duration (the period of time over which the number must be achieved), and the maximum desired frequency (the number of repetitions per unit time) of occurrence. Consistent with this approach, the Department whenever possible develops acute and chronic criteria and specifies the applicable magnitude and duration. The frequency of occurrence is accounted for through the specification of factors appropriate to the criteria in Chapter 96 (relating to water quality standards implementation).

§ 16.22. Criteria development.

The Department will establish criteria for toxic substances to provide for protection of aquatic life in accordance with the following guidelines:

(1) For those toxics for which the EPA has developed criteria in accordance with the National guidelines as set forth in "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" (1985), the Department will review and evaluate the criteria. If the Department determines that the criteria are adequate to protect indigenous aquatic communities in the State's waters, these criteria will serve as the basis for establishing total maximum daily loads (TMDLs) under Chapter 96 or NPDES effluent limitations under Chapter 92 (relating to National Pollutant Discharge Elimination System). If the Department determines that the EPA National criteria are inappropriate, the Department will adjust these criteria in accordance with National guidelines to reflect the levels required for protection of aquatic life in this Commonwealth's waters.

(2) For those toxics identified or expected in a discharge for which the EPA has not developed criteria, the Department will develop criteria using the EPA's National Guidelines.

§ 16.23. Sources of information.

The Department will use the following sources of information in establishing criteria for aquatic life protection:

(1) United States EPA 1986 Quality Criteria for Water (Goldbook).

(2) United States EPA Ambient Water Quality Criteria Development Documents and updates.

(3) Aquatic life toxicity data available in the published scientific literature.

(4) Aquatic life toxicity data available on EPA computerized databases (for example, aquire, Great Lakes Initiative (GLI) Clearinghouse).

§ 16.24. Metals criteria.

(a) The criteria are established to control the toxic portion of a substance in the water column. Depending upon available data, aquatic life criteria for metals are expressed as either dissolved or total recoverable. As information develops, the chemical identifiers for the toxic portion may be added, changed or refined. The criteria form one of the bases for water quality-based effluent limitations, which are expressed as total recoverable metal.

(b) Dissolved criteria are indicated in Appendix A, Table 1 with "*", and have been developed by applying the most current EPA conversion factors to the total recoverable criteria. The EPA factors are listed in the following Conversion Factors Table.

Conversion Factors Table

	Chronic	*Acute*	*Source*
Arsenic	1.000 (As3+)	1.000 (As3+)	1,2
Cadmium	1.101672-(ln[H]x0.041838)	1.136672-(ln[H]x0.041838)	2
Chromium VI	0.962	0.982	1,2
Copper	0.960	0.960	1,2
Lead*	1.46203-(ln[H])x0.145712)		2
Mercury	NA**	0.85	1,2
Nickel	0.997	0.998	1,2
Selenium	0.922	0.922	1
Silver	NA	0.85	2
Zinc	0.986	0.978	1,2

*Conversion factor is for both acute and chronic criteria

**The Great Lakes Guidance includes a conversion factor for the Great Lakes-specific chronic mercury criterion which is based on chronic effects to fish and aquatic life. The factor is not applicable to the PA (and NTR) criterion, which was developed by the EPA as a Nationally applicable criterion, because it is residue based.

Source 1—Final Water Quality Guidance for the Great Lakes System (60 FR 15366, March 23, 1995)

2—Establishment of Numeric Criteria for Priority Pollutants; Revision of Metals Criteria—Interim Final Rule (60 FR 22229, May 4, 1995)

(c) Chemical translators are used to convert dissolved criteria into effluent limitations which are required by Federal regulations to be expressed as total recoverable metal. The default chemical translator used by the Department is the reciprocal of the conversion factor (listed in the Conversion Factors Table) that was used to determine the dissolved criterion.

(d) NPDES dischargers may request alternate effluent limitations by using site-specific water quality characteristics. This is accomplished by performing a site-specific chemical translator study for a dissolved criterion. A water effect ratio (WER) study may also be conducted, based on either total recoverable or dissolved criteria, depending on the form of the criterion.

(e) A WER is a factor that expresses the difference between the measures of the toxicity of a substance in laboratory water and the toxicity in site water. The WER provides a mechanism to account for that portion of a metal which is toxic under certain physical, chemical or biological conditions. At this time, WERs are applicable only to certain metals, which are listed by the EPA in "Guidance on the Determination and Use of Water-Effect Ratios for Metals" (February 1994), as amended and updated. Subject to Departmental approval of the testing and its results, the Department will use the WER to establish an alternate site-specific criterion.

(f) Chemical translator studies must be conducted in accordance with the EPA's interim final document, "The Metals Translator: A Guidance for calculating a total recoverable permit limit from a dissolved criterion" (June 1996), as amended and updated.

(g) Final reports on the studies shall be submitted to the Department within 60 days of completion. Upon approval of the study results, the Department will use the chemical translator or WER, or both, to determine revised effluent limitations.

GUIDELINES FOR DEVELOPMENT OF HUMAN HEALTH-BASED CRITERIA

§ 16.32. Threshold level toxic effects.

(a) A threshold effect is defined as an adverse impact that occurs in the exposed individual only after a physiological reserve is depleted. For these effects there exists a dose below which no adverse response will occur. Threshold toxic effects include most systemic effects and developmental toxicity, including teratogenicity. Developmental toxicity includes all adverse effects in developing offspring resulting from prenatal exposure to a causative agent.

(b) Control of threshold toxics is based upon animal testing or epidemiological studies that report no- or lowest-observed adverse effect levels of the substance (NOAEL or LOAEL). In evaluating a particular toxic, toxicologists weigh the merits of all the tests, and choose, in their best professional judgment, the safe level. By applying standard margins of safety to the NOAEL, extrapolations from the laboratory animals to humans (factor of 10), for sensitive subpopulations (10), and from short-term to chronic studies (10) can be taken into account. An additional factor of 10 is used if only a LOAEL is available. Modifying factors (1-10), which account for deficiencies in the toxicity studies, are also considered in determining an acceptable exposure level. The current term for this acceptable level is reference dose (RfD); it was previously called the acceptable daily intake (ADI). The RfD is adjusted for protection of an average (70 Kg) person. It is then divided by expected exposure condition to result in an applicable criterion. Except as provided in § 16.61(b)(2) (relating to special provisions for the Great Lakes System), exposure conditions via water include 2 liters per day of drinking water and consumption of 6.5 grams of fish per day. Bioaccumulation of toxics in edible portions of fish is accounted for by use of bioaccumulation factors (BAF). BAF is the ratio in liters per kilogram of a substance's concentration in tissues of an aquatic organism to its concentration in the ambient water, in situations where both the organism and its food are exposed and the ratio does not change substantially over time.

(c) The Department will establish criteria for threshold toxics in accordance with the following guidelines:

(1) If the EPA has developed criteria, the Department will evaluate and accept the criteria when it is determined that they are adequate to protect the designated water uses.

(2) If the EPA criteria have been evaluated, and have been determined to be inadequate to protect designated uses, or when no criteria have been developed for a substance identified or expected in a discharge, the Department will develop criteria following EPA's standard toxicological procedures outlined in Exhibit 3-1 of the Water Quality Standards Handbook, Second Edition, EPA 823-0-94-005A, August, 1994, as amended and updated.

(3) If no data are available to characterize the human health hazard of a chemical, no criterion will be developed. A criterion to protect the next most sensitive use will be used. A threshold criterion will be developed at a future date if information becomes available.

(d) The sources the Department uses to obtain relevant risk assessment values for protection for threshold level toxic effects to human health are as follows:

(1) Verified reference doses, listed in the EPA agency-wide supported data system known as IRIS (Integrated Risk Information System).

(2) Maximum Contaminant Level Goals (MCLGs).

(3) The EPA's CWA § 304(a) health criteria listed under the National Toxics Rule at 40 CFR 131.36 (57 FR 80848, December 22, 1992) (relating to toxics criteria for those States not complying with Clean Water Act section 303(c)(2)(B)), as amended and updated and other final criteria published by the EPA and the Great Lakes Initiative Clearinghouse.

(4) Teratology and other data that have been peer-reviewed may provide information for criteria development.

§ 16.33. Nonthreshold effects (cancer).

(a) A nonthreshold effect is defined as an adverse impact, including cancer, for which no exposure greater than zero assures protection to the exposed individual. Thus, in contrast to the threshold concept discussed in § 16.32 (relating to threshold level toxic effects), the nonthreshold approach to toxics control is based upon the premise that there is no safe concentration of the toxic.

(b) The Department has determined that the regulation of carcinogens from a water quality perspective in accordance with the procedure specified in the following subsections will adequately and reasonably protect human health.

(c) The Department accepts the evaluation and extrapolation modeling used by the EPA to quantitate the carcinogenic risk of particular chemicals. Cancer risk level criteria are, therefore, adaptations of the EPA's cancer potency (slope) factors. Criteria based on cancer risk levels are average lifetime exposure values.

(d) The Department's water quality toxics management program controls carcinogens to an overall risk management level of one excess case of cancer in a population of one million (1×10^{-6}). Expressing this another way, the probability of an individual getting cancer from an ambient water exposure to a carcinogen is increased by a factor of one in one million. This level appears to be protective of human health to a significant degree when compared to other risks encountered in life.

(e) The Department uses a 1×10^{-6} cancer risk level as specified in § 93.8a(d) (relating to development of site specific quality criterion for the protection of aquatic life). Attainment of this risk level is predicated on exposure that includes drinking 2 liters of water and ingesting 6.5 grams of fish per day over a 70-year lifetime, except as provided in § 16.61(b)(2) (relating to special provisions for the Great Lakes Systems). Bioaccumulation of carcinogenic toxics in edible portions of fish are accounted for by use of bioaccumulation factors (BAFs).

(f) The Department will use the following guidelines in establishing criteria for nonthreshold toxics:

(1) The determination as to whether a substance is a carcinogen will be its identification by the EPA.

(2) For toxics for which (cancer potency) slope factors have been developed as evidenced by listing on IRIS the Department will either use the EPA developed criteria or will develop criteria based upon these potency factors using the EPA's Standard Toxicological Procedures outlined in Exhibit 3-2 of the *Water Quality Standards Handbook*, Second Edition, EPA 823-0-94-005A, August, 1994, as amended and updated.

(3) For carcinogens for which cancer potency (slope) factors have not been developed, the Department will use an additional margin of safety (factor of 10) with threshold toxicity data to develop a protective health criterion.

CRITERIA MODIFICATION

§ 16.41. Changes and additions.

The criteria in Appendix A, Table 1 for toxic substances are based on the best scientific information currently available. These criteria may, however, be modified if the Department determines upon evaluation of new scientific findings and information that a change is warranted. Submittal of data and information will be considered by the Department for this purpose. Changes and additions to the table will be published annually in the *Pennsylvania Bulletin*.

§ 16.42. (Reserved).

WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

§ 16.51. Human health and aquatic life criteria.

(a) Appendix A, Table 1 lists the human health and aquatic life criteria for toxic substances which the Department uses in development of effluent limitations in NPDES Permits and for other purposes. The human health criteria, which include exposures from drinking water and fish consumption, are further defined as to the specific effect (that is, cancer or threshold health effects). For those aquatic life criteria which are hardness related and specified as a formula, such as several of the heavy metals, the Department will use the specific hardness of the receiving stream after mixing with the waste discharge in calculating criteria on a case-by-case basis. The priority pollutant numbers (PP NO) used by the EPA to identify priority pollutants are included in Table 1 for reference purposes. Some of these criteria may be superseded for the Delaware Estuary, Ohio River Basin, Lake Erie Basin), and Genesee River Basin under interstate and international compact agreements with the Delaware River Basin Commission, Ohio River Valley Sanitation Commission and International Joint Commission respectively. The criteria in Table 1 do not apply to the Great Lakes System. Water quality criteria for the Great Lakes System are contained in § 16.61 (relating to special provisions for the Great Lakes System). Criteria may be

developed for the Great Lakes System for substances other than those listed in § 16.61 under the methodologies in § 16.61(b).

(b) If the Department determines that the natural quality of a surface water segment is of lower quality than the applicable criteria listed in Table 1, the natural quality shall constitute the aquatic life criterion for that segment. All draft natural quality determinations shall be published in the *Pennsylvania Bulletin* and be subject to a minimum 30 day comment period. The Department will maintain a publicly available list of surface waters and parameters where this subsection applies, and will, from time to time, submit appropriate amendments to this chapter.

§ 16.52. Whole Effluent Toxicity Testing (WETT).

The Department may impose WETT requirements on wastewater discharges where it is determined that the testing is necessary to assure the protection of aquatic life. Where WETT is required, the Department will use the criteria of 0.3 TUA (Toxic Units Acute) and 1 TUC (Toxic Units Chronic) as a basis for evaluating test results. WETT shall be conducted in accordance with 40 CFR Part 136 (relating to the establishment of test procedures for the analysis of pollutants), Quality Assurance Quality Control (QA/QC) guidance issued by the Department, or other protocols approved by the Department.

§ 16.61 Special provisions for the Great Lakes System.

(a) *Definitions*. The following words and terms, when used in this section, have the following meanings, unless the context clearly indicates otherwise:

BAF—Bioaccumulation Factor—The ratio in liters per kilogram of a substance's concentration in tissues of an aquatic organism to its concentration in the ambient water, when both the organism and its food are exposed and the ratio does not change substantially over time.

BCC—Bioaccumulative Chemical of Concern—A chemical that has the potential to cause adverse effects which, upon entering the surface waters, by itself or its toxic transformation product, accumulates in aquatic organisms by a human health BAF greater than 1000, after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation, under the methodology in 40 CFR Part 132 Appendix B (relating to Great Lakes Water Quality Initiative). Current BCCs are listed in 40 CFR 132.6, Table 6 Subpart A (relating to pollutants of initial focus in the Great Lakes Water Quality Initiative).

Great Lakes System—The streams, rivers, lakes and other bodies of surface water within the drainage basin of the Great Lakes in this Commonwealth.

(b) *Water quality criteria for the Great Lakes System*.

(1) *Aquatic life criteria*. Aquatic life criteria for toxic substances in the Great Lakes System will be developed under the methodologies in § 16.22 (relating to criteria development) to the extent they are consistent with 40 CFR Part 132, Appendix A (relating to Great Lakes Water Quality Initiative methodologies for developments of aquatic life values). If there are insufficient data to develop aquatic life criteria for a toxic substance identified in a discharge into these waters, the Department will develop or require a discharger to develop, subject to Department approval, protective aquatic life values using the methodologies in 40 CFR Part 132, Appendix A and guidance issued by the Department. For non-BCCs, WETT may be used in lieu of Tier II values to determine aquatic toxicity.

(2) *Human health criteria*. Human health criteria for the Great Lakes System will be developed using the methods in §§ 16.32 and 16.33 (relating to threshold level toxic effects; and nonthreshold effects (cancer)), except that fish consumption is 15 grams per day. If there are insufficient data to develop human health threshold criteria for a toxic substance identified in a discharge into these waters, the Department will develop, or require the discharger to develop, subject to Department approval, protective human health values using the methodologies in 40 CFR Part 132, Appendix C, Part III, as it relates to Tier II values, and guidance issued by the Department.

(3) *BAFs*. Human health criteria for BCCs will be developed under the methodologies in 40 CFR Part 132, Appendix B relating to bioaccumulation factors, and will be listed by the EPA in the GLI Clearinghouse. Because substances other than BCCs (Non-BCCs) bioaccumulate to a much lesser degree, BAFs for Non-BCCs are similar to bioconcentration factors (BCFs). Field measured BAFs, or BAFs equal to BCFs will be used for the development of non-BCC criteria in the Great Lakes.

(4) *Criteria for Great Lakes System*. Human health and aquatic life criteria for the Great Lakes System are contained in the following table. For any pollutant not listed in the table, criteria to protect existing and designated uses will be developed by the Department as needed in accordance with this section.

GREAT LAKES AQUATIC LIFE AND HUMAN HEALTH CRITERIA

			Fish and Aquatic Life Criteria		*Human*
PP NO	*Chemical Name*	*CAS Number*	*Criteria Continuous Concentrations (ug/L)*	*Criteria Maximum Concentration (ug/L)*	*Health Criteria (ug/L)*
2M	Arsenic	07440382	*148 (As3+)	*340_(As3+)	N/A
4M	Camdium	07440439	*{1.101672-(In[H]x0.041838)}x Exp(0.7852xIn[H]-2.715) (ex: @H=100, CCC=2.24)	*{1.136672-(In[H]x0.041838)}x Exp(1.128xIn[H]-3.6867) (ex: @H=100, CMC=4.26)	N/A
5M	Chromium, III	16065831	*0.860xExp(0.819xIn[H]+0.6848)	*0.316xExp(0.819xIn[H]+3.7256)	N/A

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
			(ex: @H=100, CCC=74)	*(ex: @H=100, CMC=570)*		
5M	Chromium, VI	18540299	*10.56	*15.73	N/A	-
6M	Copper	07440508	*0.960xExp(0.8545xIn[H]-1.702) (ex: @H=100, CCC=8.96)	*(0.960xExp(0.9422xIn[H]-1.700) (ex: @H=100, CMC=13.44)	N/A	
8M	Mercury	07439976	*0.77	*1.44	0.0031	H
9M	Nickel	07440020	*0.997xExp(0.846xIn[H]+0.0584 (ex: @H=100, CCC=52.01)	*[0.998xExp(0.846xIn[H]+2.255) (ex: @H=100, CMC=468.24)	N/A	H
10M	Selenium	07782492	*4.61	N/A	N/A	-
13M	Zinc	07440666	*0.986xExp(0.8473xIn[H]+0.884) (ex: @H=100, CCC=118.14)	*0.978xExp(0.8473xIn[H]+0.884) (ex: @H=100, CMC=117.18)	N/A	
14M	Cyanide, Free	00057125	5.2	22	600	H
3A	2,4-Dimethyl-phenol	00105679	N/A	N/A	450	H
5A	2,4-Dinitro-phenol	00051285	N/A	N/A	55	H
9A	Pentachloro-phenol	00087865	Exp(1.05[pH]-5.134) @pH= 6.5 7.8 9.0 Crit= 4.05 14.95 49.95	Exp(1.005[pH]-4.869) @pH= 6.5 7.8 9.0 Crit= 5.28 19.49 65.10	N/A	
3V	Benzene	00071432	N/A	N/A	1.2	CRL
7V	Chloro-benzene	00108907	N/A	N/A	470	H
22V	Methylene Chloride	00075092	N/A	N/A	4.7	CRL
25V	Toluene	00108883	N/A	N/A	5600	H
29V	Trichloro-ethylene	00079016	N/A	N/A	2.9	CRL
33B	Hexachloro-benzene	00118741	N/A	N/A	0.000045	CRL
36B	Hexachloro-ethane	00067721	N/A	N/A	0.53	CRL
4P	gamma-BHC (Lindane)	00058899	N/A	0.95	0.47	CRL
6P	Chlordane	00057749	N/A	N/A	0.000025	CRL
7P	4,4′-DDT	00050293	N/A	N/A	0.000015	CRL
10P	Dieldrin	00060571	0.056	0.24	0.00000065	CRL
14P	Endrin	00072208	0.036	0.086	N/A	
18P	PCBs	53469219	N/A	N/A	0.00000039	CRL

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
25P	Toxaphene	08001352	N/A	N/A	0.0000068	CRL
PP	2,3,7,8-TCDD	01746016	N/A	N/A	8.6 E-10	CRL
—	Parathion	00056382	0.013	0.065	N/A	

(5) *Wildlife criteria*. Wildlife criteria will be developed for the BCCs in the Great Lakes System using methodologies contained in the Great Lakes guidance in 40 CFR Part 132, Appendix D (relating to Great Lakes Water Quality Initiative methodology for the development of wildlife criteria). The wildlife criteria are contained in the following table:

GREAT LAKES WILDLIFE CRITERIA TABLE

PP NO.	CHEMICAL NAME	CRITERION (ug/L)
7-9P	DDT & METABOLITES	0.000011
8M	MERCURY	0.0013
18-24P	PCBs (TOTAL)	0.00012
PP	2,3,7,8-TCDD	3.1 E-9

(6) *Additional requirements*. Additivity of toxic effects for cholorinated dibenzo-p-dioxins and chlorinated dibenzofurans will be accounted for under 40 CFR Part 132, Appendix F, Procedure 4 (relating to Great Lakes Water Quality Initiative implementation procedures).

(c) *Minimum protections*. The Department will follow guidance that is as protective as the final water quality guidance for the Great Lakes System in 40 FR 15366 (March 23, 1995), as updated and amended.

§ 16.102. Approved EPA Analytical Methods and Detection Limits.

(a) Appendix A, Table 2 contains the following data elements and is to be used as follows:

(1) Parameter + (CAS) is the chemical name preceded by an alphanumeric code for the priority pollutants. Other inorganics (metals) listed on the application form have also been included. The Chemical Abstracts Service (CAS) number, a unique chemical identifier, is also listed for completeness of identification. The CAS number should always be verified to ensure proper identification, particularly with chemicals with ambiguous or unfamiliar names, or both.

(2) Method number + (description) includes the approved EPA procedures by identifying number and an abbreviated description of each. The methods are detailed in one or more of the following sources:

(i) *Methods for Chemical Analysis of Water and Wastes*, EPA 600/4-79-020, Revised March 1984.

(ii) 40 CFR Part 136 (relating to guidelines establishing test procedures). The EPA provides a list of still other sources for these methods in 40 CFR Part 136. Methods that were not developed by the EPA, that is, have no EPA identifying method number, but are approved by the EPA for use in NPDES related analyses are marked with an asterisk (*) in Appendix A, Table 2.

(iii) *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, APHA-AWWA-JWPCF, 1998.

(iv) *Hach Handbook of Wastewater Analysis*, Hach Chemical Company, 1979.

(v) *Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029*. Applied Research Laboratories, Inc., 1986—Revised 1991, Fison Instruments, Inc.

(vi) *ASTM Annual Book of Standards, Section 11, Water*. American Society for Testing and Materials, 1991.

(3) MDL is the method detection limit for each chemical for each method. The MDL is defined as the minimum concentration that can be measured and reported with 99% confidence that the value is above zero—that is, something is really there. The MDL concentrations listed were obtained using reagent water. Similar results were achieved using representative wastewaters. The MDL achieved in a given analysis will vary depending on instrument sensitivity and matrix effects.

(i) When MDLs are not available, detection limits based on other criteria, such as instrument signal to noise ratios, are included in Appendix A, Table 3 Detection limits for metals are generally instrument detection limits.

(ii) For any pollutant with an effluent limitation below the method detection limit, the permittee is expected to generally achieve the detection limit of the most sensitive method that is below detection available.

(iii) If two approved analytical methods for the same parameter have detection limits that differ by less than 1 ug/l or a factor of 2 (whichever is greater), the permit may be written designating either method as acceptable. The permittee also has the option of using an alternate method approved by the Department and the EPA that the permittee selects as long as he achieves the level of detection of the cited method or the numerical water quality-based limit.

(iv) The primary source for detection limits in Appendix A, Table 2 is EPA MDL studies. However, when the EPA has not performed an MDL study or reported the detection limit, other sources—particularly, Standard Methods—are consulted. When there is no literature on detection limit, the Department's Bureau of Laboratories may be asked to determine the detection limit based on an MDL study.

(4) Permittees will be required to meet the detection limits listed in Appendix A, Table 2. If the detection limit is not listed, a permittee shall develop a detection limit using an MDL study.

(5) When permittees cannot meet a listed detection limit, they may be granted case-specific MDLs if they submit complete documentation demonstrating a matrix effect in their particular effluent. The permittees shall follow the procedure for determining MDLs published as

Appendix B of 40 CFR Part 136 (relating to guidelines establishing test procedures). The Bureau of Laboratories will evaluate the data and advise the regional office of their decision.

(b) Appendix A, Table 3 gives a more detailed description of the EPA 600-series of analytical procedures for organic pollutants. Further detail is contained in 40 CFR Part 136.

APPENDIX A

TABLE 1

WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

			Fish and Aquatic Life Criteria		*Human Health Criteria*	
PP NO	*Chemical Name*	*CAS Number*	*Criteria Continuous Concentrations (ug/L)*	*Criteria Maximum Concentration (ug/L)*	*(ug/L)*	
1M	Antimony	07440360	220	1100	14	H
2M	Arsenic	07440382	150 (As3+)	340 (As3+)	50	H
3M	Beryllium	07440417	N/A	N/A	N/A	-
4M	Cadmium	07440439	*{1.101672-(In[H]x0.041838)}x Exp(0.7852xIn[H]-2.715) (ex: @H=100, CCC=2.2)	*{1.136672-(In[H]x0.041838)}x Exp(1.128xIn[H]-3.6867) (ex: @H=100, CMC=4.3)	N/A	-
5M	Chromium, III	16065831)	*0.860xExp(0.819xIn[H]+0.6848) (ex: @H=100, CCC=74)	*0.316Exp(0.819xIn[H]+3.7256) (ex: @H=100, CMC=570)	N/A	-
5M	Chromium VI	18540299	*10	*16	N/A	-
6M	Copper	07440508	0.960xExp(0.8545xIn[H]-1.702) (ex: @H=100, CCC=9.0)	0.960xExp(0.9422xIn[H]-1.700) (ex: @H=100, CMC=13)	N/A	-
7M	Lead	07439921	*{1.46203-(In[H]x0.145712)}x Exp(1.273xIn[H]-4.705) (ex: @H=100, CCC=2.5)	*{1.46203-(In[H]x0.145712)}x Exp(1.273xIn[H]-1.460) (ex: @H=100, CMC=65)	N/A	-
8M	Mercury	07439976	*0.77 (Hg2+)	*1.4 (Hg2+)	0.05	H
9m	Nickel	07440020	0.997xExp(0.846xIn[H]+0.0584) (ex: @H=100, CCC=52)	0.998xExp(0.846xIn[H]+2.255) (ex: @H=100, CMC=470)	610	H
10M	Selenium	07782492	*4.6	N/A	N/A	-
11M	Silver	07440224	N/A	*0.850xExp(1.72xIn[H]-6.520) (ex: @H=100, CMC=3.5)	N/A	-
12M	Thallium	07440280	13	65	1.7	H
13M	Zinc	07440666	0.986xExp(0.8473xIn[H]+0.884) (ex: @H=100, CCC=120)	0.978xExp(0.8473xIn[H]+0.884) (ex: @H=100, CMC=120)		
14M	Cyanide, Free	00057125	5.2	22	700	H
1A	2-Chlorophenol	00095578	110	560	120	H
2A	2,4-Dichloro-phenol	00120832	340	1700	93	H
3A	2,4-Dimethyl-phenol	00105679	130	660	540	H
4A	4,6-Dinitro-o-Cresol	00534521	16	80	13.4	H

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
5A	2,4-Dinitro-phenol	00051285	130	660	70	H
6A	2-Nitrophenol	00088755	1600	8000	N/A	-
7A	4-Nitrophenol	00100027	470	2300	N/A	-
8A	p-Chloro-m-Cresol	00059507	30	160	N/A	-
9A	Pentachloro-phenol	00087865	Exp(1.005x[pH]-5.134) @pH= 6.5 7.8 9.0 Crit= 4.1 15 50	Exp(1.005x[pH]-4.869) @pH= 6.5 7.8 9.0 Crit= 5.3 19 65	0.28	CRL
10A	Phenol	00108952	N/A	N/A	21000	H
11A	2,4,6-Trichloro-phenol	00088062	91	460	2.1	CRL
1V	Acrolein	00107028	1	5	320	H
2V	Acrylonitrile	00107131	130	650	0.059	CRL
3V	Benzene	00071432	130	640	1.2	CRL
5V	Bromoform	00075252	370	1800	4.3	CRL
6V	Carbon Tetrachloride	00056235	560	2800	0.25	CRL
7V	Chloro-benzene	00108907	240	1200	680	H
8V	Chlorodibromo-methane	00124481	N/A	N/A	0.41	CRL
9V	Chloroethane	00075003	N/A	N/A	N/A	-
10V	2-Chloroethyl Vinyl Ether	00110758	3500	18,000	N/A	-
11V	Chloroform	00067663	390	1900	5.7	CRL
12V	Dichlorobromo-methane	00075274	N/A	N/A	0.56	CRL
14V	1,1-Dichloro-ethane	00075343	N/A	N/A	N/A	-
15V	1,2-Dichloro-ethane	00107062	3100	15,000	0.38	CRL
16V	1,1-Dichloro-ethylene	00075354	1500	7500	0.057	CRL
17V	1,2-Dichloro-propane	00078875	2200	11,000	N/A	-
18V	1,3-Dichloro-propylene	00542756	61	310	10	H
19V	Ethylbenzene	00100414	580	2900	3100	H

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
20V	Methyl Bromide	00074839	110	550	48	H
21V	Methyl Chloride	0074873	5500	28,000	N/A	-
22V	Methylene Chloride	00075092	2400	12,000	4.7	CRL
23V	1,1,2,2-Tetra-chloroethane	00079345	210	1000	0.17	CRL
24V	Tetrachloro-Ethylene	00127184	140	700	0.8	CRL
25V	Toluene	00108883	330	1700	6800	H
26V	1,2-trans-Dichloro-Ethylene	00156605	1400	6800	700	H
27V	1,1,1-Trichloro-ethane	00071556	610	3000	N/A	
28V	1,1,2-Trichloro-ethane	00079005	680	3400	0.60	CRL
29V	Trichloro-ethylene	00079016	450	2300	2.7	CRL
31V	Vinyl Chloride	00075014	N/A	N/A	2	CRL
1B	Acenaphthene	00083329	17	83	1200	H
2B	Acenaphthylene	00208968	N/A	N/A	N/A	-
3B	Anthracene	00120127	N/A	N/A	9600	H
4B	Benzidine	00092875	59	300	0.00012	CRL
5B	Benzo(a)-Anthracene	00056553	0.1	0.5	0.0044	CRL
6B	Benzo(a)Pyrene	00050328	N/A	N/A	0.0044	CRL
7B	3,4-Benzo-Fluoranthene	00205992	N/A	N/A	0.0044	CRL
8B	Benzo(ghi)-Perylene	00191242	N/A	N/A	N/A	-
9B	Benzo(k)-Fluoranthene	00207089	N/A	N/A	0.0044	CRL
10B	Bis(2-Chloro-ethoxy)Methane	00111911	N/A	N/A	N/A	-
11B	Bis(2-Chloro-ethyl)Ether	00111444	6000	30,000	0.031	CRL
12B	Bis(2-Chloro-Isopropyl)Ether	39638329	N/A	N/A	1400	H

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
13B	Bis(2-Ethyl-hexyl)phthalate	00117817	910	4500	1.8	CRL
14B	4-Bromophenyl Phenyl Ether	00101553	54	270	N/A	-
15B	Butylbenzyl Phthalate	00085687	35	140	300	H
16B	2-Chloro-Naphthalene	00091587	N/A	N/A	1700	H
17B	4-Chlorophenyl Phyenyl Ether	07005723	N/A	N/A	N/A	-
18B	Chrysene	00218019	N/A	N/A	0.0044	CRL
19B	Dibenzo(a,h)-Anthracene	00053703	N/A	N/A	0.0044	CRL
20B	1,2-Dichloro-Benzene	00095501	160	820	2700 for dichloro-benzene	H
21B	1,3-Dichloro-Benzene	00541731	69	350	See 20B	H
22B	1,4-Dichloro-Benzene	00106467	150	730	See 20B	H
23B	3,3′-Dichloro-Benzidine	00091941	N/A	N/A	0.04	CRL
24B	Diethyl Phthalate	00084662	800	4000	23,000	H
25B	Dimethyl Phthalate	00131113	500	2500	313,000	H
26B	Di-N-Butyl Phthalate	00084742	21	110	2700	H
27B	2,4-Dinitro-toluene	00121142	320	1600	0.05 for dinitro-toluene	CRL
28B	2,6-Dinitro-toluene	00606202	200	990	See 27B	CRL
29B	Di-N-Octyl Phthalate	00117840	N/A	N/A	N/A	-
30B	1,2-Diphenyl-Hydrazine	00122667	3	15	0.04	CRL
31B	Fluoranthene	00206440	40	200	300	H
32B	Fluorene	00086737	N/A	N/A	1300	H
33B	Hexachloro-benzene	00118741	N/A	N/A	0.00075	CRL
34B	Hexachloro-butadiene	00087683	2	10	0.44	CRL

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
35B	Hexachloro-cyclopentadiene	00077474	1	5	240	H
36B	Hexachloro-Ethane	00067721	12	60	1.9	CRL
37B	Indeno(1,2,3-cd)Pyrene	00193395	N/A	N/A	0.0044	CRL
38B	Isophorone	00078591	2100	10,000	36	H
39B	Naphthalene	00091203	43	140	N/A	-
40B	Nitrobenzene	00098953	810	4000	17	H
41B	N-Nitroso-Dimethylamine	00062759	3400	17,000	0.00069	CRL
42B	N-Nitrosodi-N-Propylamine	00621647	N/A	N/A	0.005	CRL
43B	N-Nitroso-Diphenylamine	00086306	59	300	5	CRL
44B	Phenanthrene	00085018	1	5	N/A	-
45B	Pyrene	00129000	N/A	N/A	960	H
46B	1,2,4-Trichloro-benzene	00120821	26	130	330	H
1P	Aldrin	00309002	0.1	3	0.00013	CRL
2P	alpha-BHC	00319846	N/A	N/A	0.0039	CRL
3P	beta-BHC	00319857	N/A	N/A	0.014	CRL
4P	gamma-BHC (Lindane)	00058899	N/A	0.95	0.019	CRL
5P	delta-BHC	00319868	N/A	N/A	N/A	-
6P	Chlordane	00057749	0.0043	2.4	0.0021	CRL
7P	4,4′-DDT	00050293	0.0001	1.1	0.00059	CRL
8P	4,4′-DDE	00072559	0.001	1.1	0.00059	CRL
9P	4,4′-DDD	00072548	0.001	1.1	0.00083	CRL
10P	Dieldrin	00060571	0.056	0.24	0.00014	CRL
11P	alpha-Endosul-fan	00959988	0.056	0.22	110 for endosulfan	H
12P	beta-Endosulfan	33213659	0.056	0.22	See 11P	H
13P	Endosulfan Sulfate	01031078	N/A	N/A	N/A	-
14P	Endrin	00072208	0.036	0.086	0.76	H
15P	Endrin Aldehyde	07421934	N/A	N/A	0.76	-

PP NO	Chemical Name	CAS Number	Fish and Aquatic Life Criteria: Criteria Continuous Concentrations (ug/L)	Fish and Aquatic Life Criteria: Criteria Maximum Concentration (ug/L)	Human Health Criteria (ug/L)	
16P	Heptachlor	00076448	0.0038	0.52	0.00021	CRL
17P	Heptachlor Epoxide	01024573	0.0038	0.5	0.0001	CRL
18P	PCB-1242	53469219	0.014	N/A	0.000044 for PCBs	CRL
19P	PCB-1254	11097691	0.014	N/A	See 18P	CRL
20P	PCB-1221	11104282	0.014	N/A	See 18P	CRL
21P	PCB-1232	11141165	0.014	N/A	See 18P	CRL
22P	PCB-1248	12672296	0.014	N/A	See 18P	CRL
23P	PCB-1260	11096825	0.014	N/A	See 18P	CRL
24P	PCB-1016	12674112	0.014	N/A	See 18P	CRL
25P	Toxaphene	08001352	0.0002	0.73	0.00073	CRL
PP	2,3,7,8-TCDD	01746016	N/A	N/A	1.3 E-8	CRL
—	Aluminum	07429905	N/A	750	N/A	-
—	Barium	07440393	4100	21,000	2400	H
—	Boron	07440428	1600	8100	3100	H
—	Cobalt	07440484	19	95	N/A	-
—	Lithium	07439932	N/A	N/A	N/A	-
—	Vanadium	07440622	100	510	N/A	-
—	Acetone	00067641	86,000	450,000	3500	H
—	p-Cresol	00106445	160	800	N/A	-
—	2-Hexanone	00591786	4300	21,000	N/A	-
—	Methylethyl Ketone	00078933	32,000	230,000	21,000	H
—	Methylisobutyl Ketone	00108101	5000	26,000	N/A	-
—	I-Propanol	00071238	46,000	230,000	N/A	-
—	2-Propanol	00067630	89,000	440,000	N/A	-
—	1,2,3-Trichloro-Propane	00096184	N/A	N/A	210	H
—	Xylene	01330207	210	1100	70,000	H
—	Formaldehyde	00050000	440	2200	700	H

APPENDIX A

TABLE 1

WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

Acronyms and Footnotes to Table 1

* Indicates dissolved metal criterion; others are total recoverable metals. Each listed dissolved criterion in Table 1 is equal to the corresponding total recoverable criterion before rounding (from the EPA National Ambient Water Quality Criteria Documents) multiplied by the conversion factor (from the Conversions Factors Table); a criterion that is expressed as a hardness (H)-based equation is shown in Table 1 as the conversion factor (listed) multiplied by the hardness criterion equation; an example criterion at hardness=100 mg/l is included.

H- Threshold effect human health criterion; incorporates additional uncertainly factor for some Group C carcinogens.
CRL- Cancer risk level at 1×10^{-6}
InH- National Logarithm of the Hardness of stream at mg/l $CaCO_3$
N/A- Insufficient data to develop criterion.

* * * * *

TABLE 2

APPROVED EPA ANALYTICAL METHODS AND DETECTION LIMITS: INORGANICS

Parameter (CAS)	*Method Number (Description) *Source*	*Detection Limit (ug/L)*
- Aluminum	202.1 (AA, flame)	100

* * * * *

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