ANNEX A

TITLE 25. ENVIRONMENTAL PROTECTION
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CHAPTER 16. WATER QUALITY TOXICS MANAGEMENT STRATEGY STATEMENT OF POLICY

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GREAT LAKES SYSTEM

Source

The provisions of this Chapter 16 adopted March 10, 1989, effective March 11, 1989, 19 Pa.B. 1059, unless otherwise noted.

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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 **site-specific** 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 **or suspected** 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,] [t]T**he EPA has updated the criteria or issued new criteria **since 1980** based upon new data**, and more recently, new methodologies for developing human health criteria as summarized in the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (EPA-822-B-00-004, October 2000) and the National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047, November 2002)**. 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

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§ 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)**, as amended and updated**, 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 (relating to water quality standards implementation) or NPDES effluent limitations under Chapter 92 (relating to National Pollutant Discharge Elimination System permitting, monitoring and compliance). 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]** **approved** **[N]n**ational **[G]g**uidelines.

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§ 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) [Reserved]. [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]x0.041838**	

Mercury	**0.85**	**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.**

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 **located in §93.8b**) 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

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§ 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]** **17.5** grams of fish per day. **[Bioaccumulation]** **Bioconcentration** of toxics in edible portions of fish is accounted for by use of **[bioaccumulation]** **bioconcentration** factors **[(BAF). BAF]** **(BCF). BCF** 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 **the Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (EPA-822-B-00-004, October 2000) and the National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047, November 2002) or** 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) **and other EPA approved data sources referred through IRIS.**

(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 **water quality criteria for** toxic substances). Attainment of this risk level is predicated on exposure that includes drinking 2 liters of water and ingesting **[6.5] 17.5** 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 **Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (EPA-822-B-00-004, October 2000) and the National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047, November 2002) or** 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 **or suspected 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 **Chapter 93, Table 5 and** Appendix A, Table 1 for toxic substances are based on the best scientific information currently available. These criteria may, however, be **added to or** 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. **Site-specific criteria development will be performed in accordance with section 93.8d.** Changes and additions to the table**s** 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 **and Chapter 93, Table 5** list**[s]** 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. **Appendix A, Table 1 lists site-specific human health and aquatic life criteria that have been developed or reviewed and approved by the Department.** 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 toxics substances in Chapter 93, Table 5 without a PP NO are state-derived criteria.** The criteria in **Appendix A,** Table 1 **and Chapter 93, Table 5** do not apply to the Great Lakes System. Water quality criteria for the Great Lakes System are contained in § **[16.61] 93.8e, Tables 6 and 7** (relating to special **[provisions] criteria** for the Great Lakes System). Criteria may be developed for the Great Lakes System for

substances other than those listed in **§ [16.61]** **Table 6** under the methodologies in §16.61.

(b) If the Department determines that the natural quality of a surface water segment is of lower quality than the applicable criteria listed in **Appendix A** Table 1 **or Chapter 93, Table 5** , 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]** **these** chapter**s**.

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GREAT LAKES SYSTEM

§ 16.61. Special provisions for the Great Lakes System.

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

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(4) **[Reserved]. [***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*
			Criteria Continuous	*Criteria Maximum*	*Health*
PP	***Chemical***	***CAS***	***Concentrations***	***Concentration***	***Criteria***
NO	***Name***	***Number***	***(ug/L)***	***(ug/L)***	***(ug/L)***
2M	**Arsenic**	**07440382**	***148 (As3+)**	***340[lowbar](As3+)**	**N/A**

4M	**Cadmium**	**07440439**	***{1.101672-(ln[H]x0.041838)}x Exp(0.7852xln[H]-2.715) (ex: @H=100, CCC=2.24)**	***{1.136672-(ln[H]x0.041838)}x Exp(1.128xln[H]-3.6867) (ex: @H=100, CMC=4.26)**	**N/A**	
5M	**Chromium, III**	**16065831**	***0.860xExp(0.819xln[H]+0.6848)** ***(ex: @H=100, CCC=74)***	***0.316xExp(0.819xln[H]+3.7256)** ***(ex: @H=100, CMC=570)***	**N/A**	
5M	**Chromium, VI**	**18540299**	***10.56**	***15.73**	**N/A**	**-**
6M	**Copper**	**07440508**	***0.960xExp(0.8545xln[H]-1.702) (ex: @H=100, CCC=8.96)**	***(0.960xExp(0.9422xln[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(0.846xln[H]+0.0584 (ex: @H=100, CCC=52.01)**	***[0.998xExp(0.846xln[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(0.8473xln[H]+0.884) (ex: @H=100, CCC=118.14)**	***0.978xExp(0.8473xln[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	**Pentachlorophenol**	**00087865**	**Exp(1.005[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**	**H**
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**		**N/A**	**N/A**	**0.00000039**	**CRL**
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) **[Reserved]. [*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 chlorinated 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.

Subchapter B. ANALYTICAL METHODS AND DETECTION LIMITS FOR TOXIC SUBSTANCES

GENERAL PROVISIONS

Sec.

16.101. Introduction.

16.102. Approved EPA Analytical Methods and Detection Limits.

GENERAL PROVISIONS

§ 16.101. Introduction.

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(c) The Department recommends that clean techniques be employed as appropriate in collecting, handling, storing, preparing and analyzing samples. Clean techniques refer to methods that reduce contamination and enable the accurate and precise measurement of substances, and to related issues concerning detection limits, quality control and quality assurance. Clean techniques are those requirements or practices for sample collection and handling necessary to produce reliable analytical data **[in]** **to at least** the microgram per liter (µ/l) or part per billion range**, or lower as required by the analytical method**. The use of clean techniques reduces the incidence of overstatement of environmental concentrations of trace substances.

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APPENDIX A

TABLE 1

SITE-SPECIFIC WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

The following table contains recently adopted water quality criteria that were developed based on a need for a site-specific water quality criterion, and according to the guidelines for criteria development, as contained in this chapter. The sources the Department uses to obtain relevant risk assessment values for these criteria include, but is not limited to, US EPA agency-wide supported data systems such as IRIS (Integrated Risk Information System) and ECOTOX; the Great Lakes' Tier II aquatic life criteria guidelines; and other nationally developed criteria as reviewed and approved by the Department for statewide use.

	Fish and Aquatic Life Criteria		*Human*	*Source*
	Criteria Continuous	*Criteria Maximum*	*Health*	

PP NO	*Chemical Name*	*CAS Number*	*Concentrations (ug/L)*	*Concentration (ug/L)*	*Criteria (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-(ln[H]x0.041838)}x Exp(0.7409xln[H]-4.719) (ex: @H=100, CCC=0.25)**	***{1.136672-(ln[H]x0.041838)}x Exp(1.0166xln[H]-3.924) (ex: @H=100, CMC=2.01)**	**N/A**	**-**
5M	**CHROMIUM III**	**16065831)**	***0.860xExp(0.819xln[H]+0.6848) (ex: @H=100, CCC=74)**	***0.316Exp(0.819xln[H]+3.7256) (ex: @H=100, CMC=570)**	**N/A**	**-**
5M	**CHROMIUM VI**	**18540299**	***10**	***16**	**N/A**	**-**
6M	**COPPER**	**07440508**	***0.960xExp(0.8545xln[H]-1.702) (ex: @H=100, CCC=9.0)**	***0.960xExp(0.9422xln[H]-1.700) (ex: @H=100, CMC=13)**	**N/A**	**-**
7M	**LEAD**	**07439921**	***{1.46203-(ln[H]x0.145712)}x Exp(1.273xln[H]-4.705) (ex: @H=100, CCC=2.5)**	***{1.46203-(ln[H]x0.145712)}x Exp(1.273xln[H]-1.460) (ex: @H=100, CMC=65)**	**N/A**	**-**
8M	**MERCURY**	**07439976**	***0.77 (Hg2+)**	***1.4 (Hg2+)**	**0.05**	**H**
9[m]M	**NICKEL**	**07440020**	***0.997xExp(0.846xln[H]+0.0584) (ex: @H=100, CCC=52)**	***0.998xExp(0.846xln[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(1.72xln[H]-6.520) (ex: @H=100, CMC=3.5)**	**N/A**	**-**
12M	**THALLIUM**	**07440280**	**13**	**65**	**1.7**	**H**
13M	**ZINC**	**07440666**	***0.986xExp(0.8473xln[H]+0.884) (ex: @H=100, CCC=120)**	***0.978xExp(0.8473xln[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**
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)**	**Exp(1.005x[pH]-4.869)**	**0.28**	**CRL**

			@pH= 6.5 7.8 9.0 Crit= 4.1 15 50	@pH= 6.5 7.8 9.0 Crit= 5.3 19 65		
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	**CHLORODIBRO-MO-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	**DICHLOROBRO-MO- 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**
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	**ACENAPHTHY-LENE**	**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	**BI[X]S(2-CHLORO-ETHYL)ETHER**	**00111444**	**6000**	**30,000**	**0.031**	**CRL**
12B	**BIS(2-CHLORO-ISOPROPYL)ETHER**	**[39638329] 108-60-1**	**N/A**	**N/A**	**1400**	**H**
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-CHLORO-PHENYL 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**
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**	**0.001**	**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-**	**00959988**	**0.056**	**0.22**	**110 for**	**H**

	FAN				**endosulfan**	
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**	**-**
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**
—	**METHYLISO-BUTYL 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—Threshold effect human health criterion; incorporates additional uncertainty factor for some Group C carcinogens.

CRL—Cancer risk level at 1 x 10^{-6}

lnH—Natural Logarithm of the Hardness of stream as mg/l $CaCO_3$]

N/A—Insufficient data to criterion develop

CAS Number – Chemical Abstract Service Number

PPNO – Priority Pollutant Number

ug/L – micrograms per liter

* * * * *

TABLE 2A

APPROVED EPA ANALYTICAL METHODS AND DETECTION LIMITS: INORGANICS

Parameter (CAS)		Method Number (Description) *Source	Detection Limit (µg/l)
—	ALUMINUM	**[202.1] 3111 D (**AA, flame)	**[100] NA**
	(07429905)	**[202.2] 3113 B** (AA, furnace)	3
		200.7 (ICP/**AES**)	**[45] 20**
		200.8 (ICP/MS)	**1**
		200.9 (STGFAA)	**7.8**
		3500 Al B*[1] (Colorimetric)	6
		D4190-94*[4] (DCP)	NA
1M	ANTIMONY	**[204.1] 3111 B**(AA, flame)	**[200] 70**
	(07440360)	[204.2] **3113 B** (AA, furnace)	3
		200.7 (ICP)	32
		200.8 (ICP/MS)	**0.4**
		200.9 (STGFAA)	**0.8**

2M	ARSENIC	**[206.2] 3113 B** (AA, furnace)	1
	(07440382)	**[206.3] 3114 B. d** (AA, hydride)	**[2] NA**
		[206.4] **3500 B** (SDDC)	**[10] 2**
		200.7 (ICP/**AES**)	**[53] 8**
		200.8 (ICP/MS	**1.4**
		200.9 (STGFAA)	**0.5**
—	BARIUM	**[208.1] 3111 D** (AA, flame)	**[100] NA**
	(14798084)	**[208.2] 3113 B** (AA, furnace)	2
		200.7 (ICP/**AES**)	**[2] 1**
		200.8 ICP/MS	**1.4**
		—*[3] (DCP)	NA
3M	BERYLLIUM	**[210.1] 3111 D** (AA, flame)	**[5] NA**
	(07440417)	**[210.2] 3113 B** (AA, furnace)	0.2
		200.7 (ICP/**AES**)	0.3
		200.8 (ICP/MS)	**0.3**
		200.9 (STGFAA)	**.02**
		3500-Be D*[1] (Colorimetric)	5
		D4190-94**, 99***[4] (DCP)	NA
—	BORON	[212.3] **4500 B B** (Colorimetric)	0.2
	(07440428)	200.7 (ICP/**AES**)	**[5] 3**
		D4190-94**, 99***[4] (DCP)	NA
4M	CADMIUM	**[213.1] 3111 B OR C** (AA, flame)	**[5] 3**
	(07440439)	**[213.2] 3113 B** (AA, furnace)	0.1
		200.7 (ICP/**AES**)	**[4] 1**
		200.8 (ICP/MS)	**0.5**
		200.9 (STGFAA)	**.05**
		3500-Cd D*[1] (Colorimetric)	0.5
		D3557-95**, 02**(C)*[4] (Voltametry)	NA
		D4190-94**, 99***[4] (DCP)	NA
5M	CHROMIUM	**[218.1] 3111 B** (AA, flame)	**[50]20**
	TOTAL	**[218.2] 3113 B** (AA, furnace)	**[1] 2**
	(07440473)	**[218.3] 3111 C** (AA, extraction)	**[1] N/A**

		200.7 (ICP/**AES**)	**[7] 4**
		200.8 (ICP/MS)	**0.9**
		200.9 (STGFAA)	**0.1**
		D4190-94**, 99***[4] (DCP)	NA
		3500-Cr B*[1] (Colorimetric)	NA
5M	CHROMIUM VI (07440473)	**[218.4] 3111 C** (AA extraction)	**[10] NA**
		[3500-Cr B] **3120***[1] [(Colorimetric)] **(ICP)**	**[NA] 7**
		218.6 (Ion Chromatography)	**NA**
—	COBALT (07440484)	**[219.1] 3111 B** (AA, flame)	**[50] 30**
		[219.2] **3113 B** (AA, furnace)	1
		200.7 (ICP/**AES**)	**[7] 2**
		200.8 (ICP/MS)	**.09**
		200.9 (STGFAA)	**0.7**
		D4190-94**, 99***[4] (DCP)	NA
6M	COPPER (07440508)	**[220.1] 3111 B** (AA, flame)	**[20] 10**
		[220.2] 3113 B (AA, furnace)	1
		200.7 (ICP/**AES**)	**[6] 3**
		200.8 (ICP/MS)	**0.5**
		200.9 (STGFAA)	**0.7**
		3500-Cu B*[1] (Colorimetric)	3
		3500-Cu C*[1] (Colorimetric)	20
		D4190-94**, 99***[4] (DCP)	NA
—	IRON (07439921)	**[236.1] 3111 B or C** (AA, flame)	**[30] 20**
		[236.2] 3113 B (AA, furnace)	1
		200.7 (ICP/**AES**)	**[7] 30**
		200.9 (STGFAA)	NA
		3500-Fe B*[1] (Colorimetric)	10
		D4190-94**, 99***[4] (DCP)	NA
7M	LEAD (07439921)	**[239.1] 3111 B or C** (AA, flame)	**[100] 50**
		[239.2] 3113 B (AA, furnace)	1
		200.7 (ICP/**AES**)	**[42] 10**
		200.8 (ICP/MS)	**0.6**

		200.9 (STFGAA)	**0.7**
		3500-Pb B*[1] (Colorimetric)	NA
		D3559-96**, 03**(C)*[4] (Voltametry)	NA
		D4190-94**, 99***[4] (DCP)	NA
—	MAGNESIUM	**[242.1] 3111 B** (AA, flame)	**[1] 0.5**
	(07439954)	200.7 (ICP/**AES**)	**[30] 20**
		3500-Mg D*[1] (Gravimetric)	NA
		—*[3] (DCP)	NA
—	MANGANESE	**[243.1] 3111 B** (AA, flame)	10
	(07439965)	**[243.2] 3113 B** (AA, furnace)	0.2
		200.7 (ICP/**AES**)	[2] **1**
		200.8 (ICP/MS)	**0.1**
		200.9 (STGFAA)	**0.3**
		3500-Mn B*[1] (Colorimetric)	6
		8034-*[2] (Colorimetric)	NA
		D4190-94**, 99***[4] (DCP**36**)	NA
8M	MERCURY	245.1 (Cold vapor, Man)	0.2
	(07439976)	245.2 (Cold vapor, Auto)	0.2
		245.7 (CVAFS)	**NA**
		1631 **E [(Cold vapor, Atomic Fluor.] (Purge and Trap CVAFS**)	[0.0005] **0.0002**
—	MOLYBDENUM	**[246.1] 3111 D** (AA, flame)	**[100]NA**
	(07439987)	[246.2] **3113 B** (AA, furnace)	1
		200.7 (ICP/**AES**)	**[8] 4**
		200.8 (ICP/MS)	**0.3**
		[—*[3] (DCP)]	**[NA]**
9M	NICKEL	**[249.1] 3111 B or C** (AA, flame)	**[40] 20**
	(07440020)	**[249.2] 3113 B** (AA, furnace)	1
		200.7 (ICP/**AES**)	[15] **5**
		200.8 (ICP/MS)	**0.5**
		200.9 (STGFAA)	**0.6**
		3500-Ni D*[1] (Colorimetric)	NA
		D4190-94**, 99***[4] (DCP)	NA

10M	SELENIUM	**[270.2] 3113 B**(AA, furnace)	2
	(07782492)	**[270.7] 200.7** (ICP/**AES**)	**[75] 20**
		200.8 (ICP/MS)	**7.9**
		200.9 (STGFAA)	**0.6**
		3114B*[1] (AA, gaseous hydride)	2
11M	SILVER	**[272.1] 3111 B or C** (AA, flame)	10
	(07440224)	**[272.2] 3113 B**(AA, furnace)	0.2
		200.7 (ICP/**AES**)	**[7] 2**
		200.8 (ICP/MS)	**0.1**
		200.9 (STGFAA)	**0.6**
		—*[3] (DCP)	NA
12M	THALLIUM	**[279.1] 3111 B** (AA, flame)	[100] **NA**
	(07440280)	279.2 (AA, furnace)	1
		200.7 (ICP/**AES**)	[40] **1**
		200.8 (ICP/MS)	**0.3**
		200.9 (STGFAA)	**0.7**
—	TIN	**[282.1] 3111 B** (AA, flame)	800
	(07440315)	**[282.2] 3113 B** (AA, furnace)	5
		200.7 (ICP/**AES**)	[NA] **7**
		200.9 (STGFAA)	**1.7**
—	TITANIUM	**[283.1] 3111 D**(AA, flame)	400
	(07440326)	283.2 (AA, furnace)	10
		—*[3] (DCP)	NA
		[289.1 (AA, flame)	**5]**
		[289.2 (AA, furnace)	**0.05]**
13M	ZINC	200.7 (ICP/**AES**)	2
	(07440666)	3500-Zn E*[1] (Colorimetric)	1
		3500-Zn B*[1] (Colorimetric)	20
		289.2 (AA furnace)	**.05**
		200.8 (ICP/MS)	**1.8**
		D4190-94**, 99***[4] (DCP)	NA

14M	CYANIDE, TOTAL	4500-CN D*[1] (Titrimetric)	1000
	(00057125)	**[335.2] <u>4500-CN E</u>** (Spectrophometric)	20
		335.**[3]<u>4</u>** (Color., Auto)	5
**14M	CYANIDE, FREE	—(DEP Free CN method, Auto)	1
	(00057125)	Not EPA approved	
		4500-CN I*[1] Not EPA approved	NA
		335.1 (Amenable to Chlor.)	NA
	PHENOLS TOTAL	420.1 (4AAP, Manual)	5
		420.**[2]<u>4</u>** (4AAP, Auto)	2

TABLE 2B

APPROVED EPA ANALYTICAL METHODS AND DETECTION LIMITS: ORGANICS

Parameter (CAS)		Method Number (Description) *Source	Detection Limit (MDL) (µg/l)
	* * * * *		
11V	CHLOROFORM (00067663)	601—GC/Hal.	0.05
		624—GC/MS	1.6
		1624B—GC/MS(isotope)	10
12V	**[DICHLOROBROMOETHANE] <u>DICHLOROBROMOMETHANE</u>** (00075274)	601—GC/Hal.	0.10
		624—GC/MS	2.2
		1624B—GC/MS(isotope)	10
14V	1,1-DICHLOROETHANE (00075343)	601—GC/Hal.	0.07
		624—GC/MS	4.7
		1624B—GC/MS(isotope)	10
	* * * * *		
18V	1,3-DICHLOROPROPYLENE (00542756) **<u>(cis – 10061-01-5)</u>** **<u>(trans – 10061-02-6)</u>**	601—GC/Hal.	0.34-cis
		624—GC/MS	0.20-trans
		1624B—GC/MS(isotope)	5.0-cis
			10-trans
	* * * * *		

4B	BENZIDINE[2] (00092875)	**[605—HPLC]**	**[0.08]**
		625—GC/MS	44
		1625B—GC/MS(isotope)	50
		* * * * *	
18B	CHRYSENE (00218019)	610—GC/FID	NA
		610—HPLC	0.15
		625—GC/MS	**[5.3]** **2.5**
		1625B—GC/MS(isotope)	10
19B	DIBENZO(a,h) ANTHRACENE (00053703)	610—GC/FID	NA
		610—HPLC	0.030
		625—GC/MS	2.5
		1625B—GC/MS(isotope)	20
20B	1,2-DICHLOROBENZENE (00095501)	601—GC/Hal.	0.15
		602—GC/PID	0.40
		[612—GC/ECD]	**[1.14]**
		624—GC/MS	NA
		[625—GC/MS]	**[1.9]**
		1625B—GC/MS(isotope)	10
21B	1,3-DICHLOROBENZENE (00541731)	601—GC/Hal.	0.32
		602—GC/PID	0.40
		[612—GC/ECD]	**[1.19]**
		624—GC/MS	NA
		[625—GC/MS]	**[1.9]**
		1625B—GC/MS(isotope)	10
22B	1,4-DICHLOROBENZENE (00106467)	601—GC/Hal.	0.24
		602—GC/PID	0.30
		[612—GC/ECD]	**[1.34]**
		624—GC/MS	NA
		[625—GC/MS]	**[4.4]**
		1625B—GC/MS(isotope)	10
		* * * * *	

TABLE 3
DESCRIPTION OF EPA METHODS FOR THE ANALYSIS OF PRIORITY POLLUTANT ORGANICS

* * * * *

1625**B**	Semivolatile organic compounds by isotope dilution GC/MS.	Acid and base/neutral fractions

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