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 site-specific criteria which have been developed]**.

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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]** **endpoints**. 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]** **magnitudes**. 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]** **criterion is** 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 and in Chapter 96 (relating to water quality standards implementation). **Basis for the magnitude, duration and frequency is described in criteria development rationale or other appropriate supporting documentation.**

§ 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]** **92a** (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 EPA approved 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]** **ECOTOX**, Great Lakes Initiative (GLI) Clearinghouse).

§ 16.24. Metals criteria.

(a) **[The]** **Metals** 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. **When calculating equation-based metals criteria for determining effluent limitations, the criteria must be developed in accordance with §93.8c (relating to human health and aquatic life criteria for toxic substances).**

(b) 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 (relating to metals criteria)) that was used to determine the dissolved criterion. **If a NPDES discharger performs a chemical translator study for a dissolved criterion, the study of this site-specific translator should be conducted in accordance with the EPA's "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion" (June 1996), as amended and updated.**

(c) NPDES dischargers may request alternate effluent limitations by using site-specific water quality characteristics **in a request to modify an existing water quality criterion, in accordance with § 93.8d (relating to development of site-specific water quality criteria). [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.] This may be accomplished through one or more of the following methods:**

(1) Recalculating a water quality criterion in accordance with the EPA's ''Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals, Appendix B: The Recalculation Procedure'' (February 1994), as amended and updated. The Recalculation Procedure accounts for corrections, updates, and additions to the original criterion dataset to create an appropriate dataset to calculate the site-specific criterion. If the optional deletion process is used to evaluate the taxonomic composition, this process should follow the EPA's "Revised Deletion Process for the Site-Specific Recalculation Procedure for Aquatic Life Criteria" (April 2013).

(2) Developing a water quality criterion by performing a Water Effect Ratio (WER) study, which 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. WERs are applicable only to certain metals, which are listed by the EPA in ''Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals'' (February 1994), as amended and updated.

(3) Developing a water quality criterion by performing a Biotic Ligand Model (BLM) study for copper in freshwater systems. The BLM is a metal bioavailability model that uses receiving water body characteristics and monitoring data to develop site-specific water quality criteria. The BLM is used in evaluating the differences in the BIOavailability and toxicity of metals. These differences occur as a result of variation in local water chemistry. The BLM may be used to derive site-specific criteria for copper in freshwater systems. The BLM incorporates the best available science for determining site-specific water quality criteria for copper and is therefore preferred by the Department. THE DEPARTMENT WILL REQUIRE USE OF BLM FOR COPPER IN FRESHWATER SYSTEMS. Subject to Departmental approval of the testing and its results, the Department will evaluate the

use of the BLM to establish alternate site-specific criteria. In the absence of available site data to run the BLM, estimates for missing water quality parameters may be developed using EPA's guidance, "Draft Technical Support Document: Recommended Estimates for Missing Water Quality Parameters for Application in EPA's Biotic Ligand Model," (March 2016), as amended and updated.

(4) Developing a water quality criterion using other guidance approved by the Department, which is based on other EPA-approved or scientifically defensible methodologies.

(d) **[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.]** ~~**The discharger may choose to conduct either the WER or BLM.**~~ **Either the WER or BLM may be combined with a chemical translator study.** ~~**or**~~ **THE WER MAY ALSO BE USED IN COMBINATION WITH the Recalculation Procedures. If the Recalculation Procedure is selected, the procedure requires the recalculation of the existing criterion before the WER is applied. THE BLM CANNOT BE USED IN COMBINATION WITH THE RECALCULATION PROCEDURES OR THE WER.**

[(e) 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.

(f) Final reports on the studies must 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.

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(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). **Adverse effect levels may be calculated using Benchmark Dose (BMD) Modeling ~~(BMD)~~. The purpose of the ~~BDM~~ BMD is to derive a point of departure for calculating a risk value, such as a reference dose or a reference concentration. In the customary approach, the point of departure is the NOAEL or the LOAEL. The BMD values are calculated by dividing a point of departure by the uncertainty factors. This most sensitive effect is also called the critical effect, and it is used as the point of departure in establishing a toxicity benchmark.** The RfD, **can be calculated using a LOAEL, a NOAEL or BMD. It** is adjusted for protection of an average **([70] 80** Kg) person. It is then divided by expected exposure **[condition] conditions** to result in an applicable criterion. **[Except as provided in § 16.61(b)(2) (relating to special provisions for the Great Lakes System), exposure] Exposure** conditions by means of water include **[2] 2.4** liters per day of drinking water and consumption of **[17.5] 22.0** grams of fish per day. **[Bioconcentration] The bioaccumulation** of toxics in edible portions of fish is accounted for by use of **[bioconcentration factors (BCF)] bioaccumulation factors (BAF)**. **[BCF] The 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.] that accounts for the chemical accumulation in aquatic organisms from all potential exposure routes, including water, food and sediment.**

(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* (EPA-822-H-04-001, 2004), as amended and updated or Exhibit 3-1 of the Water Quality Standards Handbook, Second Edition, EPA 823-0-94-005A, August, 1994],** as amended and updated.

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§ 16.33. Nonthreshold effects (cancer).

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(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] 2.4** liters of water and ingesting **[17.5] 22.0** grams of fish per day over a 70-year lifetime**[, except as provided in § 16.61(b)(2) (relating to special criteria for the**

Great Lakes Systems)]. Bioaccumulation of carcinogenic toxics in edible portions of fish are accounted for by use of bioaccumulation factors (BAFs).

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WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

§ 16.51. Human health and aquatic life criteria.

(a) **[Appendix A, Table 1A and]** Chapter 93, Table 5 **[list]** **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. **[Appendix A, Table 1A lists]** **The Department will maintain a table of** site-specific human health and aquatic life criteria that have been developed or reviewed and approved by the Department. **The approved analytical procedures and detection limits for these substances will be listed, as appropriate, in Table 2A.** 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]** **a function of local water quality conditions and are** 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]** **hardness and pH values used to derive the appropriate water quality criteria will be determined by instream measurements or best estimates, representative of the median concentrations or conditions of the receiving stream for the applicable time period and design conditions** on a case-by-case basis. **[The priority pollutant numbers (PP NO) used by the EPA to identify priority pollutants are included in Table 1A 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]** **State-derived** criteria. **[The criteria in Appendix A, Table 1A and Chapter 93, Table 5 do not apply to the Great Lakes System.]** Water quality criteria for the Great Lakes System are **[contained]** in § 93.8e, Tables 6 and 7 **[(relating to special criteria for the Great Lakes System)]**. **Criteria in § 93.8c, Table 5 may apply to the Great Lakes System for those substances not listed in Table 6.** Criteria may be developed for the Great Lakes System for substances other than those listed in Table **5 or** 6 under the methodologies in § 16.61 (relating to special provisions for the Great Lake System).

(b) If the Department determines that the natural quality of a surface water segment is of lower quality than the applicable criteria listed in Chapter 93, Table 5, the natural quality shall constitute the aquatic life criterion for that segment**. [All]** **Notice of all** draft natural quality determinations shall be published in the *Pennsylvania Bulletin* and be subject to a minimum **[30 day]** **45-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 these chapters. **Natural quality determinations are ~~housed~~ DOCUMENTED in stream investigation reports or water quality criteria rationale documents.**

§ 16.52. Whole Effluent Toxicity Testing (WETT).

The Department may **[impose WETT requirements on wastewater discharges]** **require WETT, under § 92a.21(d)(4) (relating to application for a permit), for any discharges covered by an NPDES permit or other activities** 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)**, design conditions and other applicable factors** as a basis for evaluating test results. WETT shall be conducted in accordance with 40 CFR Part 136 (relating to **[the establishment of]** **guidelines establishing** test procedures for the analysis of pollutants)**, Chapter 252 (relating to environmental laboratory accreditation), the NPDES permit,** Quality Assurance Quality Control **[(QA/QC)]** guidance issued by the Department**[,]** or other protocols approved by the Department.

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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(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 **criteria for a substance is not available in § 93.8 Tables 5 or 6, and** 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, Section III, as it relates to Tier II values, **in accordance with exposure inputs at §§ 16.32 and 16.33,** and guidance issued by the Department.

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Subchapter B. ANALYTICAL METHODS AND DETECTION LIMITS FOR TOXIC SUBSTANCES

GENERAL PROVISIONS

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§ 16.102. Approved EPA **[Analytical Methods and Detection Limits]** **and DEP analytical methods and detection limits**.

[(a) Appendix A, Tables 2A and 2B contain the following data elements and is to be used as follows:] **Appendix A, Table 2A contains approved Department analytical methods and detection limits. The following data elements are 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]** **to be used** 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) **If the EPA has an approved test method for analysis of a specific pollutant, the NPDES permittee shall use the approved test method (or an approved alternate test method) for the specific pollutant under 40 CFR Part 136 (relating to guidelines establishing test procedures for the analysis of pollutants).** Methods **[number + (description) includes the approved EPA method 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.]** **EPA-approved analytical methods and guidelines in 40 CFR Parts 122, 136, 141, 143, 430, 455 and 465. EPA-approved analytical methods must be sufficiently sensitive and capable of detecting and measuring the pollutants at, or below, the applicable water quality criteria or permit limits consistent with the EPA's regulations in 40 CFR Part 122 (relating to EPA administered permit programs: the National Pollutant Discharge Elimination System) and 40 CFR Part 136.**

(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, Tables 2A and 2B.]** **If an EPA-approved analytical method is not available for a pollutant, an analytical method may be used that is capable of detecting and measuring the pollutant at or below the applicable water quality criterion or permit limit. The analytical method should be consistent with guidelines for developing analytical methods, as described in this Chapter.**

(iii) *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, APHA-AWWA-WEF, 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, 1999.

(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] approved by the Department, may be used. [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 **µ[u]**g/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, Tables 2A and 2B is EPA MDL studies. However, when] 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] develop a detection limit or review and approve a Department-accredited lab's development of a detection limit using an MDL study**.

(4) Permittees will be required to meet the detection limits listed in Appendix A, **[Tables 2A and 2B] Table 2A**. **[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]in** Appendix B of 40 CFR Part 136 **[(relating to guidelines establishing text 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

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TABLE 1A
(RESERVED)

[SITE-SPECIFIC WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES

The following table contains 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 of Environmental Protection (Department) uses to obtain relevant risk assessment values for these criteria include, but are not limited to, United States Environmental Protection Agency agency-wide supported data systems such as Integrated Risk Information System (IRIS) 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. A criterion placed in this table will remain a site-specific criterion as originally developed and be incorporated into the appropriate portion of § § 93.9a—93.9z that relates to ''exceptions to specific criteria'' unless, during rulemaking, it is determined that the same criteria has general Statewide applicability.

			Fish and Aquatic Life Criteria					
PP NO	Chemical Name	CAS Number	Criteria Continuous Concentrations (µg/L)	Criteria Maximum Concentration (µg/L)	Human Health Criteria (µg/L)	Health Effect	Drainage List	Water Body/ County
-	1,4 Dioxane	123911	103000	515000	3.0	CRL	F	West Branch Perkiomen Creek, Berks County

Acronyms and Footnotes to Table 1A

CAS—Chemical Abstract Service number
CRL—Cancer risk level at 1 x 10^{-6}
H—Threshold effect human health criterion; incorporates additional uncertainty factor for some Group C carcinogens.
1n [H]—Natural Logarithm of the Hardness of stream as mg/l $CaCO_3$

µ/L—Micrograms per liter
N/A—Criterion not developed
PP NO—Priority Pollutant Number]

TABLE 2A

APPROVED **[EPA]DEP** ANALYTICAL METHODS AND DETECTION LIMITS**[: INORGANICS]**

	Parameter (CAS)	Method Number (Description) **[*]**Source	Detection Limit (µG/l)
[—	**ALUMINUM**	**3111 D (AA, flame)**	**N/A**
	(07429905)	**3113 B (AA, furnace)**	**3**
		200.7 (ICP/AES)	**20**
		200.8 (ICP/MS)	**1**
		200.9 (STGFAA)	**7.8**
		3500 Al B*[1] (Colorimetric)	**6**
		D4190-94*[4] (DCP)	**N/A**
1M	**ANTIMONY**	**3111 B (AA, flame)**	**70**
	(07440360)	**3113 B (AA, furnace)**	**3**
		200.7 (ICP)	**32**
		200.8 (ICP/MS)	**0.4**
		200.9 (STGFAA)	**0.8**
2M	**ARSENIC**	**3113 B (AA, furnace)**	**1**
	(07440382)	**3114 B. d (AA, hydride)**	**N/A**
		3500 B (SDDC)	**2**
		200.7 (ICP/AES)	**8**
		200.8 (ICP/MS	**1.4**
		200.9 (STGFAA)	**0.5**
—	**BARIUM**	**3111 D (AA, flame)**	**N/A**
	(14798084)	**3113 B (AA, furnace)**	**2**
		200.7 (ICP/AES)	**1**
		200.8 ICP/MS	**1.4**
		—*[3] (DCP)	**N/A**
3M	**BERYLLIUM**	**3111 D (AA, flame)**	**N/A**
		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)	**N/A**

—	BORON	4500 B B (Colorimetric)	0.2
	(07440428)	200.7 (ICP/AES)	3
		D4190-94, 99*[4] (DCP)	N/A
4M	CADMIUM (07440439)	3111 B OR C (AA, flame)	3
		3113 B (AA, furnace)	0.1
		200.7 (ICP/AES)	1
		200.8 (ICP/MS)	0.5
		200.9 (STGFAA)	.05
		3500-Cd D*[1] (Colorimetric)	0.5
		D3557-95, 02(C)*[4] (Voltametry)	N/A
		D4190-94, 99*[4] (DCP)	N/A
5M	CHROMIUM	3111 B (AA, flame)	20
	TOTAL	3113 B (AA, furnace)	2
	(07440473)	3111 C (AA, extraction)	N/A
		200.7 (ICP/AES)	4
		200.8 (ICP/MS)	0.9
		200.9 (STGFAA)	0.1
		D4190-94, 99*[4] (DCP)	N/A
		3500-Cr B*[1] (Colorimetric)	N/A
5M	CHROMIUM	3111 C (AA extraction)	N/A
	VI	3120*[1] (ICP)	7
	(07440473)	218.6 (Ion Chromatography)	N/A
—	COBALT	3111 B (AA, flame)	30
	(07440484)	3113 B (AA, furnace)	1
		200.7 (ICP/AES)	2
		200.8 (ICP/MS)	.09
		200.9 (STGFAA)	0.7
		D4190-94, 99*[4] (DCP)	N/A
6M	COPPER	3111 B (AA, flame)	10
	(07440508)	3113 B (AA, furnace)	1
		200.7 (ICP/AES)	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)	N/A
—	IRON	3111 B or C (AA, flame)	20

	(07439921)	3113 B (AA, furnace)	1
		200.7 (ICP/AES)	30
		200.9 (STGFAA)	N/A
		3500-Fe B*[1] (Colorimetric)	10
		D4190-94, 99*[4] (DCP)	N/A
7M	LEAD	3111 B or C (AA, flame)	50
	(07439921)	3113 B (AA, furnace)	1
		200.7 (ICP/AES)	10
		200.8 (ICP/MS)	0.6
		200.9 (STFGAA)	0.7
		3500-Pb B*[1] (Colorimetric)	N/A
		D3559-96, 03(C)*[4] (Voltametry)	N/A
		D4190-94, 99*[4] (DCP)	N/A
—	MAGNESIUM	3111 B (AA, flame)	0.5
	(07439954)	200.7 (ICP/AES)	20
		3500-Mg D*[1] (Gravimetric)	N/A
		—*[3] (DCP)	N/A
—	MANGANESE	3111 B (AA, flame)	10
	(07439965)	3113 B (AA, furnace)	0.2
		200.7 (ICP/AES)	1
		200.8 (ICP/MS)	0.1
		200.9 (STGFAA)	0.3
		3500-Mn B*[1] (Colorimetric)	6
		8034-*[2] (Colorimetric)	N/A
		D4190-94, 99*[4] (DCP36)	N/A
8M	MERCURY	245.1 (Cold vapor, Man)	0.2
	(07439976)	245.2 (Cold vapor, Auto)	0.2
		245.7 (CVAFS)	N/A
		1631 E (Purge and Trap CVAFS)	0.0002
—	MOLYBDENUM	3111 D (AA, flame)	N/A
	(07439987)	3113 B (AA, furnace)	1
		200.7 (ICP/AES)	4
		200.8 (ICP/MS)	0.3
9M	NICKEL (07440020)	3111 B or C (AA, flame)	20
		3113 B (AA, furnace)	1
		200.7 (ICP/AES)	5

		200.8 (ICP/MS)	**0.5**
		200.9 (STGFAA)	**0.6**
		3500-Ni D*[1] (Colorimetric)	**N/A**
		D4190-94, 99*[4] (DCP)	**N/A**
10M	**SELENIUM**	**3113 B (AA, furnace)**	**2**
	(07782492)	**200.7 (ICP/AES)**	**20**
		200.8 (ICP/MS)	**7.9**
		200.9 (STGFAA)	**0.6**
		3114B*[1] (AA, gaseous hydride)	**2**
11M	**SILVER**	**3111 B or C (AA, flame)**	**10**
	(07440224)	**3113 B (AA, furnace)**	**0.2**
		200.7 (ICP/AES)	**2**
		200.8 (ICP/MS)	**0.1**
		200.9 (STGFAA)	**0.6**
		—*[3] (DCP)	**N/A**
		200.7 (ICP/AES)	**0.01**
—	**STRONTIUM**	**200.8 (ICP/MS)**	**2.0**
	(07440246)	**6010B (ICP/AES)**	**0.01**
		6020 (ICP/MS)	**1.0**
12M	**THALLIUM**	**3111 B (AA, flame)**	**N/A**
	(07440280)	**279.2 (AA, furnace)**	**1**
		200.7 (ICP/AES)	**1**
		200.8 (ICP/MS)	**0.3**
		200.9 (STGFAA)	**0.7**
—	**TIN**	**3111 B (AA, flame)**	**800**
	(07440315)	**3113 B (AA, furnace)**	**5**
		200.7 (ICP/AES)	**7**
		200.9 (STGFAA)	**1.7**
—	**TITANIUM**	**3111 D (AA, flame)**	**400**
	(07440326)	**283.2 (AA, furnace)**	**10**
		—*[3] (DCP)	**N/A**
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)	**N/A**

14M	**CYANIDE, TOTAL (00057125)**	**4500-CN D*[1] (Titrimetric)**	**1000**
		4500-CN E (Spectrophometric)	**20**
		335.4 (Color., Auto)	**5]**
***[*]** 14M	CYANIDE, FREE (00057125)	—(DEP Free CN method, Auto) Not EPA approved	1
		[4500-CN I*[1] Not EPA approved	**N/A**
		335.1 (Amenable to Chlor.)	**N/A**
	PHENOLS	**420.1 (4AAP, Manual)**	**5**
	TOTAL	**420.4 (4AAP, Auto)**	**2]**
—	**BENZENE METADISULFONIC ACID (00098486)**	**OR 357A Test America, HPLC/UV or LC/MS/MS**	**50**
—	**BENZENE MONOSULFONIC ACID (00098113)**	**OR 357A Test America, HPLC/UV or LC/MS/MS**	**50**
—	**P-PHENOL SULFONIC ACID (00098679)**	**OR 357A Test America, HPLC/UV or LC/MS/MS**	**50**

[* Not an EPA developed method, but approved by EPA
Source is:
[1] —Standard Methods for the Examination of Water and Wastewater, 20th Edition. APHA-AWWA-WEF, 1998. The approved methods may also be found in Standard Methods for the Examination of Water and Wastewater, 18th or 19th Editions, but with different identifying numbers. For Selenium, the method number quoted is from the 19th Edition.
[2] —Hach Handbook of Wastewater Analysis. 1979.
[3] —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.
[4] —ASTM Annual Book of Standards, Section 11, Water. American Society for Testing and Materials, 1999.]
[**] * EPA currently measures ‘‘total cyanide’’ to satisfy cyanide limits and has not yet approved analytical methods for ‘‘free cyanide.’’ Free cyanide is a DEP required analysis, and either of the three listed methods are acceptable for its determination.
[NOTE: Metal samples are to be unfiltered and predigested for measurement of the total recoverable (not dissolved) fraction. Samples for dissolved measurement are to be field filtered.]

TABLE 2B

(RESERVED)

[APPROVED EPA AND DEP ACCREDITED ANALYTICAL METHODS AND DETECTION LIMITS: ORGANICS

	Parameter (CAS)	Method Number (Description) *Source	Detection Limit (MDL) (µg/L)
—	BENZENE METADISULFONIC ACID (00098486)	OR 357A Test America, HPLC/UV or LC/MS/MS	50
—	BENZENE MONOSULFONIC ACID (00098113)	OR 357A Test America, HPLC/UV or LC/MS/MS	50
1A	2-CHLOROPHENOL (00095578)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.31 0.58 3.3 10
2A	2,4-DICHLOROPHENOL (00120832)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.39 0.68 2.7 10
3A	2,4-DIMETHYLPHENOL (00105679)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.32 0.63 2.7 10
4A	4,6-DINITRO-o-CRESOL (00534521)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	16.0 N/A 24 20
5A	2,4-DINITROPHENOL (00051285)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	13.0 N/A 42 50
6A	2-NITROPHENOL (00088755)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.45 0.77 3.6 20
7A	4-NITROPHENOL (00100027)	604—GC/FID 604—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	2.8 0.70 2.4 50

—	**NONYLPHENOL (00104405)**	**D7065-06M—GC/MS** **D7485-09—LC/LC/TANDEM MS**	**2.0** **.033**
8A	**p-CHLORO-m-CRESOL (00059507)**	**604—GC/FID** **604—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.36** **1.8** **3.0** **10**
9A	**PENTACHLOROPHENOL (00087865)**	**604—GC/FID** **604—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**7.4** **0.59** **3.6** **50**
10A	**PHENOL (00108952)**	**604—GC/FID** **604—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.14** **2.2** **1.5** **10**
—	**P-PHENOL SULFONIC ACID (00098679)**	**OR 357A Test America, HPLC/UV or LC/MS/MS**	**50**
—	**RESORCINOL (01084603)**	**8270D—GC/MS**	**100**
11A	**2,4,6-TRICHLOROPHENOL (00088062)**	**604—GC/FID** **604—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.64** **0.58** **2.7** **10**
1V	**ACROLEIN[(1)] (00107028)**	**603—GC/FID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.7** **N/A** **50**
2V	**ACRYLONITRILE[(1)] (00107131)**	**603—GC/FID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.5** **N/A** **50**
3V	**BENZENE (00071432)**	**602—GC/PID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.20** **4.4** **10**
—	**BENZYL CHLORIDE (00100447)**	**8021B—GC** **8260B—GC/MS**	**1.0** **.005—5.0**
5V	**BROMOFORM (00075252)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.20** **4.7** **10**
—	**2-BUTOXYETHANOL (00111762)**	**EPA R5/6LC—LC/MS/MS (DIRECT INJECT)**	**125**
6V	**CARBON TETRACHLORIDE (00056235)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.12** **2.8** **10**

7V	**CHLOROBENZENE (00108907)**	**601—GC/Hal.** **602—GC/PID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.25** **0.20** **6.0** **10**
8V	**CHLORODIBROMOMETHANE (00124481)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.09** **3.1** **10**
9V	**CHLOROETHANE (00075003)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.52** **N/A** **50**
10V	**2-CHLOROETHYL VINYL ETHER (00110758)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.13** **N/A** **10**
11V	**CHLOROFORM (00067663)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.05** **1.6** **10**
12V	**DICHLOROBROMOMETHANE (00075274)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.10** **2.2** **10**
14V	**1,1-DICHLOROETHANE (00075343)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.07** **4.7** **10**
15V	**1,2-DICHLOROETHANE (00107062)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.03** **2.8** **10**
16V	**1,1-DICHLOROETHYLENE (00075354)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.13** **2.8** **10**
17V	**1,2-DICHLOROPROPANE (00078875)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.04** **6.0** **10**
18V	**1,3-DICHLOROPROPYLENE (00542756)** **(cis—10061-01-5)** **(trans—10061-02-6)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.34-cis** **0.20-trans** **5.0-cis** **10-trans**
19V	**ETHYLBENZENE (00100414)**	**602—GC/PID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.20** **7.2** **10**
20V	**METHYL BROMIDE (00074839)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**1.18** **N/A** **50**

21V	**METHYL CHLORIDE (00074873)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.08** **N/A** **50**
22V	**METHYLENE CHLORIDE (00075092)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.25** **2.8** **10**
23V	**1,1,2,2-TETRACHLOROETHANE (00079345)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.03** **6.9** **10**
24V	**TETRACHLOROETHYLENE (00127184)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.03** **4.1** **10**
25V	**TOLUENE (00108883)**	**602—GC/PID** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.20** **6.0** **10**
26V	**1,2-trans-DICHLOROETHYLENE (00156605)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.10** **1.6** **10**
—	**1,2-cis-DICHLOROETHYLENE (00156592)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.10** **1.6** **10**
27V	**1,1,1-TRICHLOROETHANE (00071556)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.03** **3.8** **10**
28V	**1,1,2-TRICHLOROETHANE (00079005)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.02** **5.0** **10**
29V	**TRICHLOROETHYLENE (00079016)**	**601—GC/Hal.** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.12** **1.9** **10**
—	**1,2,4-TRIMETHYLBENZENE (00095636)**	**524.2—GC/MS** **624—GC/MS** **8021B—GC** **8260B—GC/MS**	**0.5** **1.0** **1.0** **2.0**
—	**1,3,5-TRIMETHYLBENZENE (00108678)**	**524.2—GC/MS** **624—GC/MS** **8021B—GC** **8260B—GC/MS**	**0.5** **1.0** **1.0** **2.0**
31V	**VINYL CHLORIDE (00075014)**	**601—GC/Hal** **624—GC/MS** **1624B—GC/MS(isotope)**	**0.18** **N/A** **10**
1B	**ACENAPHTHENE (00083329)**	**610—GC/FID** **610—HPLC**	**N/A** **1.8**

		625—GC/MS	1.9
		1625B—GC/MS(isotope)	10
2B	ACENAPHTHYLENE (00208968)	610—GC/FID	N/A
		610—HPLC	2.3
		625—GC/MS	3.5
		1625B—GC/MS(isotope)	10
—	ACRYLAMIDE (00079061)	8032A (GC)	.032
		8316 (HPLC)	10
3B	ANTHRACENE (00120127)	610—GC/FID	N/A
		610—HPLC	0.66
		625—GC/MS	1.9
		1625B—GC/MS(isotope)	10
4B	BENZIDINE[2] (00092875)	625—GC/MS	44
		1625B—GC/MS(isotope)	50
5B	BENZO(a)ANTHRACENE (00056553)	610—GC/FID	N/A
		610—HPLC	0.013
		625—GC/MS	7.8
		1625B—GC/MS(isotope)	10
6B	BENZO(a)PYRENE (00050328)	610—GC/FID	N/A
		610—HPLC	0.023
		625—GC/MS	2.5
		1625B—GC/MS(isotope)	10
7B	3,4-BENZOFLUORANTHENE (00205992)	610—GC/FID	N/A
		610—HPLC	0.018
		625—GC/MS	4.8
		1625B—GC/MS(isotope)	10
8B	BENZO(ghi)PERYLENE (00191242)	610—GC/FID	N/A
		610—HPLC	0.076
		625—GC/MS	4.1
		1625B—GC/MS(isotope)	20
9B	BENZO(k)FLUORANTHENE (00207089)	610—GC/FID	N/A
		625—GC/MS	0.017
		1625B—GC/MS(isotope)	2.5 10
10B	BIS(2-CHLOROETHOXY) METHANE (00111911)	611—GC/Hal.	0.5
		625—GC/MS	5.3
		1625B—GC/MS(isotope)	10
11B	BIS(2-CHLOROETHYL) ETHER (00111444)	611—GC/Hal.	0.3
		625—GC/MS	5.7
		1625B—GC/MS(isotope)	10
12B	BIS(2-CHLOROISOPROPYL) ETHER (39638329)	611—GC/Hal.	0.8
		625—GC/MS	5.7
		1625B—GC/MS(isotope)	10

13B	**BIS(2-ETHYLHEXYL) PHTHALATE (00117817)**	**606—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**2.0** **2.5** **10**
14B	**4-BROMOPHENYL PHENYL ETHER (00101553)**	**611—GC/Hal.** **625—GC/MS** **1625B—GC/MS(isotope)**	**2.3** **1.9** **10**
15B	**BUTYLBENZYL PHTHALATE (00085687)**	**606—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.34** **2.5** **10**
16B	**2-CHLORONAPHTHALENE (00091587)**	**612—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.94** **1.9** **10**
17B	**4-CHLOROPHENYL PHENYL ETHER (07005723)**	**611—GC/Hal.** **625—GC/MS** **1625B—GC/MS(isotope)**	**3.9** **4.2** **10**
18B	**CHRYSENE (00218019)**	**610—GC/FID** **610—HPLC** **625—GC/MS** **1625B—GC/MS(isotope)**	**N/A** **0.15** **2.5** **10**
—	**CYCLOHEXYLAMINE (00108918)**	**8270B—GC/MS**	**.01**
19B	**DIBENZO(a,h) ANTHRACENE (00053703)**	**610—GC/FID** **610—HPLC** **625—GC/MS** **1625B—GC/MS(isotope)**	**N/A** **0.030** **2.5** **20**
20B	**1,2-DICHLOROBENZENE (00095501)**	**601—GC/Hal.** **602—GC/PID** **624—GC/MS** **1625B—GC/MS(isotope)**	**0.15** **0.40** **N/A** **10**
21B	**1,3-DICHLOROBENZENE (00541731)**	**601—GC/Hal.** **602—GC/PID** **624—GC/MS** **1625B—GC/MS(isotope)**	**0.32** **0.40** **N/A** **10**
22B	**1,4-DICHLOROBENZENE (00106467)**	**601—GC/Hal.** **602—GC/PID** **624—GC/MS** **1625B—GC/MS(isotope)**	**0.24** **0.30** **N/A** **10**
23B	**3,3'-DICHLOROBENZIDINE[(2)] (00091941)**	**605—HPLC** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.13** **16.5** **50**
24B	**DIETHYL PHTHALATE (00084662)**	**606—GC/ECD** **625—GC/MS** **1625B—GC/MS(isotope)**	**0.49** **1.9** **10**

25B	DIMETHYL PHTHALATE (00131113)	606—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.29 1.6 10
26B	DI-N-BUTYL PHTHALATE (00084742)	606—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.36 2.5 10
27B	2,4-DINITROTOLUENE (00121142)	609—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.02 5.7 10
28B	2,6-DINITROTOLUENE (00606202)	609—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.01 1.9 10
29B	DI-N-OCTYL PHTHALATE (00117840)	606—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	3.0 2.5 10
—	1,4-DIOXANE (00123911)	624—GC/MS 625—GC/MS 8260B—GC/MS 8270L—GC/MS	1.0 5.0 0.1 0.2
30B	1,2-DIPHENYLHYDRAZINE (00122667)	625—GC/MS 1625B—GC/MS(isotope)	10 20
31B	FLUORANTHENE (00206440)	610—GC/FID 610—HPLC 625—GC/MS 1625B—GC/MS(isotope)	N/A 0.21 2.2 10
32B	FLUORENE (00086737)	610—GC/FID 610—HPLC 625—GC/MS 1625B—GC/MS(isotope)	N/A 0.21 1.9 10
33B	HEXACHLOROBENZENE (00118741)	612—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.05 1.9 10
34B	HEXACHLOROBUTADIENE (00087683)	612—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.34 0.9 10
35B	HEXACHLOROCYCLOPENTA-DIENE[3] (00077474)	612—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.40 N/A 10
36B	HEXACHLOROETHANE (00067721)	612—GC/ECD 625—GC/MS 1625B—GC/MS(isotope)	0.03 1.6 10
37B	INDEN0(1,2,3-cd)PYRENE (00193395)	610—GC/FID 610—HPLC	N/A 0.043

		625—GC/MS	3.7
		1625B—GC/MS(isotope)	20
38B	ISOPHORONE (00078591)	609—GC/FID	5.7
		609—GC/ECD	15.7
		625—GC/MS	2.2
		1625B—GC/MS(isotope)	10
39B	NAPHTHALENE (00091203)	610—GC/FID	N/A
		610—HPLC	1.8
		625—GC/MS	1.6
		1625B—GC/MS(isotope)	10
40B	NITROBENZENE (00098953)	609—GC/FID	3.6
		609—GC/ECD	13.7
		625—GC/MS	1.9
		1625B—GC/MS(isotope)	10
41B	N-NITROSODIMETHYLAMINE[4] (00062759)	607—GC/N-PD	0.15
		625—GC/MS	N/A
		1625B—GC/MS(isotope)	50
42B	N-NITROSODI-N-PROPYLAMINE (00621647)	607—GC/ECD	0.46
		625—GC/MS	N/A
		1625B—GC/MS(isotope)	20
43B	N-NITROSODI-PHENYLAMINE[4] (00086306)	607—GC/N-PD	0.81
		625—GC/MS	1.9
		1625B—GC/MS(isotope)	20
44B	PHENANTHRENE (00085018)	610—GC/FID	N/A
		610—HPLC	0.64
		625—GC/MS	5.4
		1625B—GC/MS(isotope)	10
45B	PYRENE (00129000)	610—GC/FID	N/A
		610—HPLC	0.27
		625—GC/MS	1.9
		1625B—GC/MS(isotope)	10
46B	1,2,4-TRICHLORO-BENZENE (00120821)	612—GC/ECD	0.05
		625—GC/MS	1.9
		1625B—GC/MS(isotope)	10
1P	ALDRIN (00309002)	608 - GC/ECD	0.004
		625 - GC/MS	1.9
2P	alpha-BHC[5] (00319846)	608 - GC/ECD	0.003
		625 - GC/MS	N/A
3P	beta-BHC (00319857)	608 - GC/ECD	0.006
		625 - GC/MS	4.2
4P	gamma-BHC[5] (LINDANE) (00058899)	608 - GC/ECD	0.004
		625 - GC/MS	N/A

5P	**delta-BHC (00319868)**	**608 - GC/ECD** **625 - GC/MS**	**0.009** **3.1**
6P	**CHLORDANE (00057749)**	**608 - GC/ECD** **625 - GC/MS**	**0.014** **N/A**
7P	**4,4’-DDT (00050293)**	**608 - GC/ECD** **625 - GC/MS**	**0.012** **4.7**
8P	**4,4’-DDE (00072559)**	**608 - GC/ECD** **625 - GC/MS**	**0.004** **5.6**
9P	**4,4’-DDD (00072548)**	**608 - GC/ECD** **625 - GC/MS**	**0.011** **2.8**
10P	**DIELDRIN (00060571)**	**608 - GC/ECD** **625 - GC/MS**	**0.002** **2.5**
11P	**alpha-ENDOSULFAN[(5)] (00095988)**	**608 - GC/ECD** **625 - GC/MS**	**0.014** **N/A**
12P	**beta-ENDOSULFAN[(5)] (33212659)**	**608 - GC/ECD** **625 - GC/MS**	**0.004** **N/A**
13P	**ENDOSULFAN SULFATE (01031078)**	**608 - GC/ECD** **625 - GC/MS**	**0.066** **5.6**
14P	**ENDRIN[(5)] (00072208)**	**608 - GC/ECD** **625 - GC/MS**	**0.006** **N/A**
15P	**ENDRIN ALDEHYDE (07421934)**	**608 - GC/ECD** **625 - GC/MS**	**0.023** **N/A**
16P	**HEPTACHLOR (00076448)**	**608 - GC/ECD** **625 - GC/MS**	**0.003** **1.9**
17P	**HEPTACHLOR EPOXIDE (01024573)**	**608 - GC/ECD** **625 - GC/MS**	**0.083** **2.2**
18P	**PCB-1242 (53469219)**	**608 - GC/ECD** **625 - GC/MS**	**0.065** **N/A**
19P	**PCB-1254 (11097691)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **36**
20P	**PCB-1221 (11104282)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **30**
21P	**PCB-1232 (11141165)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **N/A**
22P	**PCB-1248 (12672296)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **N/A**

23P	**PCB-1260 (11096825)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **N/A**
24P	**PCB-1016 (12674112)**	**608 - GC/ECD** **625 - GC/MS**	**N/A** **N/A**
25P	**TOXAPHENE (08001352)**	**608 - GC/ECD** **625 - GC/MS**	**0.24** **N/A**
PP	**2,3,7,8-TCDD (01746016)**	**613 - GC/MS**	**0.002**

N/A = Not available.
(1)—If acrolein and/or acrylonitrile is expected, use method 603 as screening method.
(2)—EPA says ''When Benzidine is known to be present, screen with EPA 605.'' However, because HPLC is a generally unavailable procedure at this time, GC-MS enhanced to achieve a detection level more sensitive than the EPA's MDL can be used. Permit monitoring requirements for these two chemicals can also be set using EPA 625 as an acceptable analytical procedure.
(3)—When Hexachlorocyclopentadiene is known to be present, screen with EPA 612.
(4)—When N-Nitrosodimethylamine and/or N-Nitrosodiphenylamine are known to be present, screen with EPA 607.
(5)—When alpha-BHC, gamma-BHC (Lindane) alpha-Endosulfan (I), beta-Endosulfan (II) and/or Endrin are known to be present, screen with EPA 608.]

TABLE 3
(RESERVED)

[DESCRIPTION OF EPA METHODS FOR THE ANALYSIS OF PRIORITY POLLUTANT ORGANICS

EPA Method Number	Description of Method	Types of Compounds Analyzed
601	**Gas chromatography (GC) using purge and trap system with halide specific detector (HAL).**	**29 Purgeable Halocarbons (Volatile fraction)**
602	**Gas chromatography using purge and trap system photoronization detector (PED).**	**Purgeable aromatics (4 Volatiles 3 base/neutrals)**
603	**Gas chromatography using purge and trap system with flame ionization detector (FID).**	**Acrolein Acrylonitrile**
604	**Gas chromatography preceded by extraction, using a flame ionization detector.**	**Acid extractable fraction (10 phenols)**

605	**High performance liquid chomatography (HPLC) preceded by acid-back extraction with electrochemical detector.**	**Benzidine 3,3'-Dichlorobenzidine**
606	**Gas chromatography preceded by extraction using a flame ionizator or electron capture detector (ECD).**	**6 Phthalate esters**
607	**Gas chromatography preceded by extraction using a nitrogenphosphorous detector.**	**N-Nitrosodimethylamine N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine**
608	**Gas chromatography preceded by extraction and measured with a electron capture detector.**	**Pesticide fraction, including PCBs (25 cmpds)**
609	**Gas chromatography preceded by extraction using a flame ionization or electron capture detector.**	**2,4-Dinitrotoluene 2,6-Dinitrotoluene Isophorone Nitrobenzene**
610	**Extraction followed by separation by a) gas chromatography with flame ionization detector, or b) high performance liquid chromatography with ultraviolet (UV) or fluorescence detector.**	**16 Polynuclear aromatic hydrocarbons**
611	**Gas chromatography preceded by extraction using a halide specific detector.**	**5 Haloethers**
612	**Gas chromatography preceded by extraction using an electron capture detector.**	**9 chlorinated hydrocarbons**
613	**Gas chromatography preceded by extraction and measured with a mass spectometer (MS)**	**2,3,7,8-TCDD**
624	**Gas chromatography, using purge and trap system, detected with a mass spectrometer.**	**Purgeable (volatile) fraction**
625	**Gas chromatography, preceded by separation via acid and basic extraction, detected with a mass spectrometer.**	**Acid and base/neutral fractions**
1624	**Volatile organic compounds by isotope dilution GC/MS.**	**Purgeable (volatile) fraction**
1625B	**Semivolatile organic compounds by isotope dilution GC/MS.**	**Acid and base/neutral fractions]**