

Appendix A: Selected Chemical Methods

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SAM 2017 — Appendix A: Selected Chemical Methods

The fitness of a method for an intended use is related to site-specific data quality objectives (DQOs) for a particular environmental remediation activity. These selected chemical methods have been assigned tiers (below) to indicate a level of method usability for the specific analyte and sample type. The assigned tiers reflect the conservative view for DQOs involving timely implementation of methods for analysis of a high number of samples (such that multiple laboratories are necessary), low limits of identification and quantification, and appropriate quality control. Assigned usability tiers are indicated next to each method or method combination throughout this appendix.

Tier I: Analyte/sample type is a target of the method(s). Data are available for all aspects of method performance and quality control measures supporting its use for analysis of environmental samples following a contamination event. Evaluation and/or use of the method(s) in multiple laboratories indicate that the method can be implemented with no additional modifications for the analyte/sample type

Tier II: (1) The analyte/sample type is a target of the method(s) and the method(s) has been evaluated for the analyte/sample type by one or more laboratories, or (2) the analyte/sample type is not a target of the method(s), but the method has been used by laboratories to address the analyte/sample type. In either case, available data and/or information indicate that modifications will likely be needed for use of the method(s) to address the analyte/sample type (e.g., due to potential interferences, alternate matrices, the need to address different DQOs).

Tier III: The analyte/sample type is not a target of the method(s), and/or no reliable data supporting the method's fitness for its intended use are available. Data from other analytes or sample types, however, suggest that the method(s), with significant modification, may be applicable.

Note: Column headings are defined in Section 5.0.

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Acephate	30560-19-1	LC-MS-MS	Sample Prep	Adapted from J. Chromatogr. A, (2007) 1154(1): 3-25	II	Adapted from Chromatographia, 63(5/6): 233-237	II	538 (EPA OW)	I	Adapted from J. Chromatogr. A, (2007) 1154(1): 3-25	III	Adapted from J. Chromatogr. A, (2007) 1154(1): 3-25	III
			Determinative										
Acrylamide	79-06-1	HPLC-UV	Sample Prep	Water extraction	III	8316 (EPA SW-846)	II	8316 (EPA SW-846)	II	PV2004 (OSHA)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8316 (EPA SW-846)								8316 (EPA SW-846)	
Acrylonitrile	107-13-1	HPLC-UV / GC-MS	Sample Prep	5035A (EPA SW-846)	II	524.2 ¹ (EPA OW)	II	524.2 ¹ (EPA OW)	II	PV2004 (OSHA)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8260D (EPA SW-846)								8260D (EPA SW-846)	
Aldicarb (Temik)	116-06-3	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	II	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	
Aldicarb sulfone	1646-88-4	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	II	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	
Aldicarb sulfoxide	1646-87-3	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	III	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Allyl alcohol	107-18-6	GC-MS	Sample Prep	5035A (EPA SW-846)	II	5030C (EPA SW-846)	II	5030C (EPA SW-846)	II	TO-15 ² (EPA ORD)	III	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)		8260D (EPA SW-846)					
4-Aminopyridine	504-24-5	HPLC-UV	Sample Prep	8330B (EPA SW-846)	III	3535A/8330B (EPA SW-846)	III	3535A/8330B (EPA SW-846)	III	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative			8330B (EPA SW-846)		8330B (EPA SW-846)				8330B (EPA SW-846)	
Ammonia	7664-41-7	Visible spectrophotometry	Sample Prep	Not of concern	NA	4500-NH ₃ B (SM)	I	350.1 (EPA OW)	I	6015 (NIOSH)	I	Not of concern	NA
			Determinative			4500-NH ₃ G (SM)							
Ammonium metavanadate (analyze as total vanadium)	7803-55-6	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Arsenic, Total	7440-38-2	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Arsenic trioxide (analyze as total arsenic)	1327-53-3	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Arsine (analyze as total arsenic in non-air samples)	7784-42-1	GFAA / ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	6001 (NIOSH)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)						6010D/6020B (EPA SW-846)	
Asbestos	1332-21-4	TEM	Sample Prep	D5755-03 (soft surfaces-microvac) (ASTM)	III	Not of concern	NA	Not of concern	NA	10312:1995 (ISO)	I	D6480-05 (hard surfaces-wipes) (ASTM)	I
			Determinative										
Boron trifluoride	7637-07-2	ISE	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	ID216SG (OSHA)	I	Not of concern	NA
			Determinative										
Brodifacoum	56073-10-0	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	D7644-16 (ASTM)	II	D7644-16 (ASTM)	II	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	D7644-16 (ASTM)								D7644-16 (ASTM)	

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Bromadiolone	28772-56-7	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	D7644-16 (ASTM)	II	D7644-16 (ASTM)	II	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	D7644-16 (ASTM)								D7644-16 (ASTM)	
BZ [Quinuclidinyl benzilate]	6581-06-2	HPLC-UV / LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	Adapted from J. Chromatogr. B (2008) 874: 42-50	III	Adapted from J. Chromatogr. B (2008) 874: 42-50	III	TO-10A (EPA ORD)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	Adapted from J. Chromatogr. B (2008) 874: 42-50								Adapted from J. Chromatogr. B (2008) 874: 42-50	
Calcium arsenate (analyze as total arsenic)	7778-44-1	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Carbofuran (Furadan)	1563-66-2	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	II	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	
Carbon disulfide	75-15-0	GC-MS	Sample Prep	5035A (EPA SW-846)	I	5030C (EPA SW-846)	I	524.2 ¹ (EPA OW)	I	TO-15 (EPA ORD)	I	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)							
Carfentanil	59708-52-0	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	Adapted from J. Chromatogr. B (2014) 962: 52-58		Adapted from J. Chromatogr. B (2014) 962: 52-58		Adapted from J. Chromatogr. B (2014) 962: 52-58				Adapted from J. Chromatogr. B (2014) 962: 52-58	
Chlorfenvinphos	470-90-6	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHRSC)	II	3520C/3535A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHRSC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Chlorine	7782-50-5	Visible spectrophotometry	Sample Prep	Not of concern	NA	4500-Cl G (SM)	I	4500-Cl G (SM)	I	Adapted from Analyst (1999) 124(12):1853- 1857	II	Not of concern	NA
			Determinative							4500-Cl G (SM)			

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
2-Chloroethanol	107-07-3	GC-MS / GC-FID	Sample Prep	5035A (EPA SW-846)	II	5030C (EPA SW-846)	II	5030C (EPA SW-846)	II	2513 (NIOSH)	I	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)		8260D (EPA SW-846)					
3-Chloro-1,2-propanediol	96-24-2	GC-MS	Sample Prep	Adapted from Eur. J. Lipid Sci. Technol. (2011) 113: 345-355	II	Adapted from J. Chromatogr. A (2000) 866: 65-77	II	Adapted from J. Chromatogr. A (2000) 866: 65-77	II	TO-10A ³ (EPA ORD)	III	Adapted from Eur. J. Lipid Sci. Technol. (2011) 113: 345-355	III
			Determinative										
Chloropicrin	76-06-2	GC-MS / GC-ECD	Sample Prep	EPA/600/R-16/114 ¹⁵ (EPA NHSRC)	II	551.1 (EPA OW)	I	551.1 (EPA OW)	I	PV2103 (OSHA)	I	EPA/600/R-16/114 ¹⁵ (EPA NHSRC)	II
			Determinative										
Chlorosarin	1445-76-7	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	TO-17 ³ (EPA ORD)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III
			Determinative										
Chlorosoman	7040-57-5	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	TO-17 ³ (EPA ORD)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III
			Determinative										
2-Chlorovinylarsonic acid (CVAOA) (degradation product of Lewisite)	64038-44-4	LC-MS-MS / ICP-AES / ICP-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II
			Determinative							IO-3.4/IO-3.5 ⁵ (EPA ORD)			
2-Chlorovinylarsonous acid (CVAA) (degradation product of Lewisite)	85090-33-1	LC-MS-MS / ICP-AES / ICP-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*II
			Determinative							IO-3.4/IO-3.5 ⁵ (EPA ORD)			
Chlorpyrifos	2921-88-2	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	525.2 ⁶ (EPA OW)	I	TO-10A (EPA ORD)	I	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										
Chlorpyrifos oxon	5598-15-2	GC-MS / LC-MS-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	540 (EPA OW)	I	540 (EPA OW)	I	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Crimidine	535-89-7	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	Not of concern	NA	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										
Cyanide, Amenable to chlorination	NA	Visible spectrophotometry	Sample Prep	3135.2I (EPA RLAB)	I	3135.2I ⁷ (EPA RLAB)	I	3135.2I ⁷ (EPA RLAB)	I	Not of concern	NA	3135.2I (EPA RLAB)	III
			Determinative										
Cyanide, Total	57-12-5	Visible spectrophotometry	Sample Prep	ISM02.3 CN (EPA CLP)	I	ISM02.3 CN ⁸ (EPA CLP)	I	335.4 (EPA OW)	I	6010 (NIOSH)	I	ISM02.3 CN (EPA CLP)	III
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Cyanogen chloride	506-77-4	GC-MS / GC-ECD	Sample Prep	Adapted from Encyclopedia of Anal. Chem. (2006) DOI: 10.1002/9780470027318.a0809	II	Adapted from Encyclopedia of Anal. Chem. (2006) DOI: 10.1002/9780470027318.a0809	II	Adapted from Encyclopedia of Anal. Chem. (2006) DOI: 10.1002/9780470027318.a0809	II	TO-15 (EPA ORD)	III	Not of concern	NA
			Determinative										
Cyclohexyl sarin (GF)	329-99-7	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	TO-17 (EPA ORD)	III	EPA/600/R-16/115 (EPA NHSRC)	*I
			Determinative										
1,2-Dichloroethane (degradation product of HD)	107-06-2	GC-MS	Sample Prep	5035A (EPA SW-846)	I	5030C (EPA SW-846)	I	524.2 ¹ (EPA OW)	I	TO-15 (EPA ORD)	I	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)							
Dichlorvos	62-73-7	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	525.2 ⁶ (EPA OW)	I	TO-10A (EPA ORD)	I	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)							
Dicrotophos	141-66-2	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	3535A (EPA SW-846)	I	TO-10A (EPA ORD)	I	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Diesel range organics	NA	GC-FID	Sample Prep	3541/3545A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative	8015D (EPA SW-846)		8015D (EPA SW-846)		8015D (EPA SW-846)					
Diisopropyl methylphosphonate (DIMP) (degradation product of GB)	1445-75-6	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	II	D7597-16 (ASTM)	II	538 (EPA OW)	I	TO-10A ³ (EPA ORD)	III	EPA/600/R-13/224 (EPA NHSRC)	II
			Determinative										
Dimethylphosphite	868-85-9	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	Not of concern	NA	Not of concern	NA	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										
Dimethylphosphoramidic acid (degradation product of GA)	33876-51-6	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	III	D7597-16 (ASTM)	III	D7597-16 (ASTM)	III	TO-10A (EPA ORD)	III	EPA/600/R-13/224 (EPA NHSRC)	III
			Determinative										
Diphacinone	82-66-6	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	D7644-16 (ASTM)	II	D7644-16 (ASTM)	II	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	D7644-16 (ASTM)								D7644-16 (ASTM)	
Disulfoton	298-04-4	GC-MS / GC-FPD	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	525.2 ^{6,9} (EPA OW)	II	525.2 ^{6,9} (EPA OW)	II	5600 (NIOSH)	I	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Disulfoton sulfone oxon	2496-91-5	GC-MS / GC-FPD	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	525.2 ^{6,9} (EPA OW)	III	525.2 ^{6,9} (EPA OW)	III	5600 (NIOSH)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Disulfoton sulfoxide	2497-07-6	GC-MS / GC-FPD	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	525.2 ^{6,9} (EPA OW)	II	525.2 ^{6,9} (EPA OW)	II	5600 (NIOSH)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Disulfoton sulfoxide oxon	2496-92-6	GC-MS / GC-FPD	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	525.2 ^{6,9} (EPA OW)	III	525.2 ^{6,9} (EPA OW)	III	5600 (NIOSH)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
1,4-Dithiane (degradation product of HD)	505-29-3	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	Not of concern	NA	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										
EA 2192 [S-2-(diisopropylamino)ethyl methylphosphonothioic acid] (hydrolysis product of VX)	73207-98-4	HPLC-UV / LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	EPA/600/R-15/097 (EPA NHSRC)	II	EPA/600/R-15/097 (EPA NHSRC)	II	TO-10A (EPA ORD)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	EPA/600/R-15/097 (EPA NHSRC)								EPA/600/R-15/097 (EPA NHSRC)	
Ethyl methylphosphonic acid (EMPA) (degradation product of VX)	1832-53-7	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	II	D7597-16 (ASTM)	II	D7597-16 (ASTM)	III	TO-10A (EPA ORD)	III	EPA/600/R-13/224 (EPA NHSRC)	II
			Determinative										
Ethylchloroarsine (ED)	598-14-1	GC-MS	Sample Prep	3541/3545A (EPA SW-846)	III	3535A (EPA SW-846)	III	3535A (EPA SW-846)	III	TO-15 (EPA ORD)	III	9102 (NIOSH)	III
			Determinative	8270E (EPA SW-846)		8270E (EPA SW-846)		8270E (EPA SW-846)				8270E (EPA SW-846)	
N-Ethyldiethanolamine (EDEA) (degradation product of HN-1)	139-87-7	LC-MS-MS / IC- conductivity detection	Sample Prep	3541/3545A (EPA SW-846)	III	D7599-16 (ASTM)	II	D7599-16 (ASTM)	III	3509 (NIOSH)	III	EPA/600/R-11/143 (EPA NHSRC)	II
			Determinative	EPA/600/R-11/143 (EPA NHSRC)									
Ethylene oxide	75-21-8	GC-MS	Sample Prep	5035A (EPA SW-846)	II	5030C (EPA SW-846)	II	5030C (EPA SW-846)	II	TO-15 (EPA ORD)	I	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)		8260D (EPA SW-846)					
Fenamiphos	22224-92-6	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	525.2 ⁶ (EPA OW)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Fentanyl	437-38-7	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	Adapted from J. Chromatogr. A (2011) 1218: 1620 - 1649		Adapted from J. Chromatogr. A (2011) 1218: 1620 - 1649		Adapted from J. Chromatogr. A (2011) 1218: 1620 - 1649				Adapted from J. Chromatogr. A (2011) 1218: 1620 - 1649	
Fluoride	16984-48-8	IC-conductivity detection	Sample Prep	Not of concern	NA	300.1, Rev 1.0 (EPA OW)	I	300.1, Rev 1.0 (EPA OW)	I	Not of concern	NA	Not of concern	NA
			Determinative										
Fluoroacetamide	640-19-7	GC-MS	Sample Prep	Adapted from J. Chromatogr. B (2008) 876(1): 103-108	II	Adapted from J. Chromatogr. B (2008) 876(1): 103-108	II	Adapted from J. Chromatogr. B (2008) 876(1): 103-108	II	Adapted from J. Chromatogr. B (2008) 876(1): 103-108	III	Adapted from J. Chromatogr. B (2008) 876(1): 103-108	III
			Determinative										
Fluoroacetic acid and fluoroacetate salts (analyze as fluoroacetate ion)	NA	LC-MS / LC-MS-MS	Sample Prep	Adapted from J. Chromatogr. A (2007) 1139: 271-278	III	Adapted from J. Chromatogr. B (2010) 878: 1045-1050	III	Adapted from J. Chromatogr. B (2010) 878: 1045-1050	III	S301-1 (NIOSH)	III	Adapted from J. Chromatogr. A (2007) 1139: 271-278	III
			Determinative	Adapted from J. Chromatogr. A (2007) 1139: 271-278		Adapted from J. Chromatogr. A (2007) 1139: 271-278							
2-Fluoroethanol	371-62-0	GC-MS / GC-FID	Sample Prep	5035A (EPA SW-846)	III	5030C (EPA SW-846)	III	5030C (EPA SW-846)	III	2513 (NIOSH)	III	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)		8260D (EPA SW-846)					
Fluorosilicic acid (analyze as fluoride)	16961-83-4	IC-conductivity detection	Sample Prep	Not of concern	NA	300.1, Rev 1.0 (EPA OW)	I	300.1, Rev 1.0 (EPA OW)	I	Not of concern	NA	Not of concern	NA
			Determinative										
Formaldehyde	50-00-0	FGC-ECD / HPLC-UV	Sample Prep	8315A (EPA SW-846)	I	8315A (EPA SW-846)	I	556.1 (EPA OW)	I	2016 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8315A (EPA SW-846)		8315A (EPA SW-846)							
Gasoline range organics	NA	GC-FID	Sample Prep	5035A (EPA SW-846)	I	5030C (EPA SW-846)	I	5030C (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative	8015D (EPA SW-846)		8015D (EPA SW-846)		8015D (EPA SW-846)					
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	HPLC-UV	Sample Prep	8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative	8330B (EPA SW-846)		8330B (EPA SW-846)		8330B (EPA SW-846)					

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Hexamethylenetriperoxidediamine (HMTD)	283-66-9	LC-MS	Sample Prep	8330B (EPA SW-846)	II	3535A/8330B (EPA SW-846)	II	3535A/8330B (EPA SW-846)	II	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	Adapted from Analyst (2001) 126:1689- 1693		Adapted from Analyst (2001) 126:1689- 1693		Adapted from Analyst (2001) 126:1689- 1693				Adapted from Analyst (2001) 126:1689-1693	
Hydrogen bromide	10035-10-6	IC-conductivity detection	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	7907 (NIOSH)	I	Not of concern	NA
			Determinative										
Hydrogen chloride	7647-01-0	IC-conductivity detection	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	7907 (NIOSH)	I	Not of concern	NA
			Determinative										
Hydrogen cyanide	74-90-8	Visible spectrophotometry	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	6010 (NIOSH)	I	Not of concern	NA
			Determinative										
Hydrogen fluoride	7664-39-3	IC-conductivity detection	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	7906 (NIOSH)	I	Not of concern	NA
			Determinative										
Hydrogen sulfide	7783-06-4	IC-conductivity detection	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	6013 (NIOSH)	I	Not of concern	NA
			Determinative										
Isopropyl methylphosphonic acid (IMPA) (degradation product of GB)	1832-54-8	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	II	D7597-16 (ASTM)	II	D7597-16 (ASTM)	III	TO-10A (EPA ORD)	III	EPA/600/R-13/224 (EPA NHRSC)	II
			Determinative										
Kerosene	64742-81-0	GC-FID	Sample Prep	3541/3545A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative	8015D (EPA SW-846)		8015D (EPA SW-846)		8015D (EPA SW-846)				8015D (EPA SW-846)	
Lead arsenate (analyze as total arsenic)	7645-25-2	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Lewisite 1 (L-1) [2-chlorovinylchloroarsine]	541-25-3	ICP-AES / ICP-MS / LC-MS-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*II	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*II	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*II	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*II
			Determinative				IO-3.4/IO-3.5 ⁵ (EPA ORD)						
Lewisite 2 (L-2) [bis(2-chlorovinyl)chloroarsine]	40334-69-8	ICP-AES / ICP-MS / LC-MS-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*III	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*III	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*III	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHRSC)	*III
			Determinative				IO-3.4/IO-3.5 ⁵ (EPA ORD)						

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Lewisite 3 (L-3) [tris(2-chlorovinyl)arsine]	40334-70-1	ICP-AES / ICP-MS / LC-MS-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III
			Determinative							IO-3.4/IO-3.5 ⁵ (EPA ORD)			
Lewisite oxide (degradation product of Lewisite)	1306-02-1	ICP-AES / ICP-MS / LC-MS-MS	Sample Prep	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III	IO-3.1 ⁵ (EPA ORD)	*I	EPA/600/R-15/258 ⁴ (EPA NHSRC)	*III
			Determinative							IO-3.4/IO-3.5 ⁵ (EPA ORD)			
Mercuric chloride (analyze as total mercury)	7487-94-7	Visible spectrophotometry / CVAA / CVAFS	Sample Prep	7473 ¹⁰ (EPA SW-846)	I	245.1 ¹¹ (EPA OW)	I	245.1 (EPA OW)	I	Not of concern	NA	9102 (NIOSH)	I
			Determinative									7473 ¹⁰ (EPA SW-846)	
Mercury, Total	7439-97-6	Visible spectrophotometry / CVAA / CVAFS	Sample Prep	7473 ¹⁰ (EPA SW-846)	I	245.1 ¹¹ (EPA OW)	I	245.1 (EPA OW)	I	IO-5 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative									7473 ¹⁰ (EPA SW-846)	
Methamidophos	10265-92-6	LC-MS-MS	Sample Prep	Adapted from J. Chromatogr. A (2007) 1154(1): 3-25	II	Adapted from Chromatographia (2006) 63(5/6): 233-237	II	538 (EPA OW)	I	Adapted from J. Chromatogr. A (2007) 1154(1): 3-25	III	Adapted from J. Chromatogr. A (2007) 1154(1): 3-25	III
			Determinative										
Methomyl	16752-77-5	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	II	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	
Methoxyethylmercuric acetate (analyze as total mercury)	151-38-2	Visible spectrophotometry / CVAA / CVAFS	Sample Prep	7473 ¹⁰ (EPA SW-846)	I	245.1 ¹¹ (EPA OW)	I	245.1 (EPA OW)	I	IO-5 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative									7473 ¹⁰ (EPA SW-846)	
Methyl acrylonitrile	126-98-7	HPLC-UV / GC-MS	Sample Prep	5035A (EPA SW-846)	II	524.2 ¹ (EPA OW)	II	524.2 ¹ (EPA OW)	II	PV2004 (OSHA)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8260D (EPA SW-846)									
Methylamine	74-89-5	HPLC-FL / HPLC-vis	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	OSHA 40	I	Not of concern	NA
			Determinative										
N-Methyldiethanolamine (MDEA) (degradation product of HN-2)	105-59-9	LC-MS-MS / IC-conductivity detection	Sample Prep	3541/3545A (EPA SW-846)	III	D7599-16 (ASTM)	II	D7599-16 (ASTM)	III	3509 (NIOSH)	III	EPA/600/R-11/143 (EPA NHSRC)	II
			Determinative	EPA/600/R-11/143 (EPA NHSRC)									
1-Methylethyl ester ethylphosphonofluoridic acid (GE)	1189-87-3	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III	TO-17 ³ (EPA ORD)	*III	EPA/600/R-16/115 (EPA NHSRC)	*III
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
3-Methyl fentanyl	42045-87-4	LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	Adapted from J. Chromatogr. B (2014) 962: 52-58		Adapted from J. Chromatogr. B (2014) 962: 52-58		Adapted from J. Chromatogr. B (2014) 962: 52-58				Adapted from J. Chromatogr. B (2014) 962: 52-58	
Methyl fluoroacetate (analyze as fluoroacetate ion)	453-18-9	LC-MS	Sample Prep	J. Chromatogr. A (2007) 1139: 271-278	III	J. Chromatogr. B (2010) 878: 1045-1050	III	J. Chromatogr. B (2010) 878: 1045-1050	III	S301-1 (NIOSH)	III	J. Chromatogr. A (2007) 1139: 271-278	III
			Determinative					J. Chromatogr. A (2007) 1139: 271-278					
Methyl hydrazine	60-34-4	Visible spectrophotometry / HPLC-UV	Sample Prep	3541/3545A (EPA SW-846)	III	J. Chromatogr. (1993) 617: 157-162	III	J. Chromatogr. (1993) 617: 157-162	III	3510 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	J. Chromatogr. (1993) 617: 157-162				J. Chromatogr. (1993) 617: 157-162					
Methyl isocyanate	624-83-9	HPLC-UV	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	OSHA 54	I	Not of concern	NA
			Determinative										
Methyl paraoxon	950-35-6	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	3535A (EPA SW-846)	III	3535A (EPA SW-846)	III	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative			8270E ⁹ (EPA SW-846)		8270E ⁹ (EPA SW-846)					
Methyl parathion	298-00-0	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	3535A (EPA SW-846)	I	TO-10A (EPA ORD)	I	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Methylphosphonic acid (MPA) (degradation product of VX, GB, & GD)	993-13-5	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	II	D7597-16 (ASTM)	II	D7597-16 (ASTM)	III	TO-10A (EPA ORD)	III	EPA/600/R-13/224 (EPA NHSRC)	II
			Determinative										
Mevinphos	7786-34-7	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	525.2 ⁶ (EPA OW)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)							
Monocrotophos	6923-22-4	GC-MS	Sample Prep	3541/3545A (EPA SW-846)	I	3535A (EPA SW-846)	I	3535A (EPA SW-846)	I	TO-10A (EPA ORD)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8270E (EPA SW-846)		8270E (EPA SW-846)		8270E (EPA SW-846)					
Mustard, nitrogen (HN-1) [bis(2-chloroethyl)ethylamine]	538-07-8	GC-MS	Sample Prep	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	TO-17 (EPA ORD)	*III	EPA/600/R-12/653 (EPA NHSRC)	*II
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Mustard, nitrogen (HN-2) [2,2'-dichloro-N-methyldiethylamine N,N-bis(2-chloroethyl)methylamine]	51-75-2	GC-MS	Sample Prep	EPA/600/R-12/653 (EPA NHSRC)	*III	EPA/600/R-12/653 (EPA NHSRC)	*III	EPA/600/R-12/653 (EPA NHSRC)	*III	TO-17 (EPA ORD)	*III	EPA/600/R-12/653 (EPA NHSRC)	*III
			Determinative										
Mustard, nitrogen (HN-3) [tris(2-chloroethyl)amine]	555-77-1	GC-MS	Sample Prep	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	TO-17 (EPA ORD)	*III	EPA/600/R-12/653 (EPA NHSRC)	*II
			Determinative										
Mustard, sulfur / Mustard gas (HD)	505-60-2	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	TO-17 (EPA ORD)	III	EPA/600/R-16/115 (EPA NHSRC)	*I
			Determinative										
Nicotine compounds (analyze as nicotine)	54-11-5	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	II	3535A (EPA SW-846)	II	Not of concern	NA	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0	HPLC-UV	Sample Prep	8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative			8330B (EPA SW-846)		8330B (EPA SW-846)					
Osmium tetroxide (analyze as total osmium)	20816-12-0	ICP-AES / ICP-MS	Sample Prep	3051A (EPA SW-846)	II	3015A (EPA SW-846)	II	3015A (EPA SW-846)	II	IO-3.1 (EPA ORD)	II	3051A (EPA SW-846)	III
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)		6010D/6020B (SW-846)		IO-3.4 (EPA ORD)		6010D/6020B (EPA SW-846)	
Oxamyl	23135-22-0	HPLC-UV / HPLC-FL / LC-MS-MS	Sample Prep	8318A (EPA SW-846)	II	D7645-16 (ASTM)	II	531.2 (EPA OW)	I	5601 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative									8318A (EPA SW-846)	
Paraoxon	311-45-5	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	3520C/3535A (EPA SW-846)	III	3520C/3535A (EPA SW-846)	III	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Paraquat	4685-14-7	HPLC-UV / LC-MS-MS	Sample Prep	Adapted from J. Chromatogr. A (2008) 1196-1197: 110-116	II	549.2 (EPA OW)	I	549.2 (EPA OW)	I	Not of concern	NA	Adapted from J. Chromatogr. A (2008) 1196-1197: 110-116	III
			Determinative										
Parathion	56-38-2	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3520C/3535A (EPA SW-846)	I	3520C/3535A (EPA SW-846)	I	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Pentaerythritol tetranitrate (PETN)	78-11-5	HPLC-UV	Sample Prep	8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative			8330B (EPA SW-846)		8330B (EPA SW-846)				8330B (EPA SW-846)	
Phencyclidine	77-10-1	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	II	TO-10A (EPA ORD)	II	9106/9109 (NIOSH)	II
			Determinative										
Phorate	298-02-2	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	3535A (EPA SW-846)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E ⁹ (EPA SW-846)		8270E ⁹ (EPA SW-846)					
Phorate sulfone	2588-04-7	GC-MS / LC-MS-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	540 (EPA OW)	I	540 (EPA OW)	I	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Phorate sulfone oxon	2588-06-9	GC-MS / LC-MS-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	540 (EPA OW)	III	540 (EPA OW)	III	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Phorate sulfoxide	2588-03-6	GC-MS / LC-MS-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	540 (EPA OW)	I	540 (EPA OW)	I	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Phorate sulfoxide oxon	2588-05-8	GC-MS / LC-MS-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	III	540 (EPA OW)	III	540 (EPA OW)	III	TO-10A (EPA ORD)	III	EPA/600/R-16/114 (EPA NHSRC)	III
			Determinative										
Phosgene	75-44-5	GC-NPD	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	OSHA 61	I	Not of concern	NA
			Determinative										
Phosphamidon	13171-21-6	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3520C/3535A (EPA SW-846)	I	525.3 (EPA OW)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)							
Phosphine	7803-51-2	Visible spectrophotometry	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	6002 (NIOSH)	I	Not of concern	NA
			Determinative										
Phosphorus trichloride	7719-12-2	Visible spectrophotometry	Sample Prep	Not of concern	NA	Not of concern	NA	Not of concern	NA	6402 (NIOSH)	I	Not of concern	NA
			Determinative										
Pinacolyl methyl phosphonic acid (PMPA) (degradation product of GD)	616-52-4	HPLC-UV / LC-MS-MS	Sample Prep	E2866-12 (ASTM)	II	D7597-16 (ASTM)	II	D7597-16 (ASTM)	III	TO-10A (EPA ORD)	III	EPA/600/R-13/224 (EPA NHSRC)	II
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Propylene oxide	75-56-9	GC-MS / GC-FID	Sample Prep	5035A (EPA SW-846)	II	5030C (EPA SW-846)	II	5030C (EPA SW-846)	II	1612 (NIOSH)	I	Not of concern	NA
			Determinative	8260D (EPA SW-846)		8260D (EPA SW-846)		8260D (EPA SW-846)					
R 33 (VR) [methylphosphonoethioic acid, S-[2-(diethylamino)ethyl] O-2-methylpropyl ester]	159939-87-4	GC-MS	Sample Prep	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	TO-17 (EPA ORD)	*III	EPA/600/R-12/653 (EPA NHSRC)	*II
			Determinative										
Sarin (GB)	107-44-8	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	TO-17 ³ (EPA ORD)	*III	EPA/600/R-16/115 (EPA NHSRC)	*I
			Determinative										
Sodium arsenite (analyze as total arsenic)	7784-46-5	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Sodium azide (analyze as azide ion)	26628-22-8	IC-conductivity detection	Sample Prep	Adapted from J. Forensic Sci. (1998) 43(1): 200-202 ¹²	II	Adapted from J. Forensic Sci. (1998) 43(1): 200-202 ¹²	II	Adapted from J. Forensic Sci. (1998) 43(1): 200-202 ¹²	II	ID-211 (OSHA)	I	ID-211 (OSHA)	I
			Determinative	300.1, Rev 1.0 ¹³ (EPA OW)		300.1, Rev 1.0 ¹³ (EPA OW)		300.1, Rev 1.0 ¹³ (EPA OW)					
Soman (GD)	96-64-0	GC-MS	Sample Prep	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	EPA/600/R-16/115 (EPA NHSRC)	*I	TO-17 ³ (EPA ORD)	*III	EPA/600/R-16/115 (EPA NHSRC)	*I
			Determinative										
Strychnine	57-24-9	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3535A (EPA SW-846)	I	3535A (EPA SW-846)	I	Not of concern	NA	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Tabun (GA)	77-81-6	GC-MS	Sample Prep	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	EPA/600/R-12/653 (EPA NHSRC)	*II	TO-17 (EPA ORD)	*III	EPA/600/R-12/653 (EPA NHSRC)	*II
			Determinative										
Tetraethyl pyrophosphate (TEPP)	107-49-3	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	3511 (EPA SW-846)	II	3511 (EPA SW-846)	II	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative			8270E (EPA SW-846)		8270E (EPA SW-846)					
Tetramethylenedisulfotetramine (TETS)	80-12-6	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHSRC)	II	EPA/600/R-16/114 (EPA NHSRC)	I	EPA/600/R-16/114 (EPA NHSRC)	I	TO-10A (EPA ORD)	II	EPA/600/R-16/114 (EPA NHSRC)	II
			Determinative										

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
Thallium sulfate (analyze as total thallium)	10031-59-1	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	
Thiodiglycol (TDG) (degradation product of HD)	111-48-8	HPLC / LC-MS-MS	Sample Prep	E2787-11 (ASTM)	II	D7598-16 (ASTM)	II	D7598-16 (ASTM)	III	TO-10A (EPA ORD)	III	E2838-11 (ASTM)	II
			Determinative										
Thiofanox	39196-18-4	HPLC-UV / LC-MS-MS	Sample Prep	3541/3545A (EPA SW-846)	III	D7645-16 (ASTM)	II	538 (EPA OW)	I	5601 (NIOSH)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	D7645-16 (ASTM)		D7645-16 (ASTM)							
1,4-Thioxane (degradation product of HD)	15980-15-1	GC-MS	Sample Prep	EPA/600/R-16/114 (EPA NHRSC) ¹⁴	II	EPA/600/R-16/114 (EPA NHRSC) ¹⁴	II	EPA/600/R-16/114 (EPA NHRSC) ¹⁴	II	Not of concern	NA	EPA/600/R-16/114 (EPA NHRSC) ¹⁴	II
			Determinative										
Titanium tetrachloride (analyze as total titanium)	7550-45-0	ICP-AES / ICP-MS	Sample Prep	3051A (EPA SW-846)	I	Not of concern	NA	Not of concern	NA	Not of concern	NA	3051A (EPA SW-846)	III
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)							
Triethanolamine (TEA) (degradation product of HN-3)	102-71-6	LC-MS-MS / IC-conductivity detection	Sample Prep	3541/3545A (EPA SW-846)	III	D7599-16 (ASTM)	II	D7599-16 (ASTM)	III	3509 (NIOSH)	II	EPA/600/R-11/143 (EPA NHRSC)	II
			Determinative	EPA/600/R-11/143 (EPA NHRSC)									
Trimethyl phosphite	121-45-9	GC-MS	Sample Prep	3541/3545A (EPA SW-846)	III	Not of concern	NA	Not of concern	NA	TO-10A (EPA ORD)	III	3570/8290A Appendix A (EPA SW-846)	III
			Determinative	8270E ¹⁵ (EPA SW-846)		8270E ¹⁵ (EPA SW-846)							
1,3,5-Trinitrobenzene (1,3,5-TNB)	99-35-4	HPLC-UV	Sample Prep	8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative			8330B (EPA SW-846)		8330B (EPA SW-846)					
2,4,6-Trinitrotoluene (2,4,6-TNT)	118-96-7	HPLC-UV	Sample Prep	8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	3535A/8330B (EPA SW-846)	I	Not of concern	NA	3570/8290A Appendix A (EPA SW-846)	I
			Determinative			8330B (EPA SW-846)		8330B (EPA SW-846)					
Vanadium pentoxide (analyze as total vanadium)	1314-62-1	ICP-AES / ICP-MS	Sample Prep	3050B/3051A (EPA SW-846)	I	3015A (EPA SW-846)	I	200.7/200.8 (EPA OW)	I	IO-3.1 (EPA ORD)	I	9102 (NIOSH)	I
			Determinative	6010D/6020B (EPA SW-846)		6010D/6020B (EPA SW-846)				IO-3.4/IO-3.5 (EPA ORD)		6010D/6020B (EPA SW-846)	

Analyte(s)	CAS RN	Determinative Technique	Method Type	Solid Samples		Non-Drinking Water Samples		Drinking Water Samples		Air Samples		Wipes	
VE [phosphonothioic acid, ethyl-, S-(2-(diethylamino)ethyl) O-ethyl ester]	21738-25-0	GC-MS	Sample Prep	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	TO-17 (EPA ORD)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III
			Determinative										
VG [phosphonothioic acid, S-(2-(diethylamino)ethyl) O,O-diethyl ester]	78-53-5	GC-MS	Sample Prep	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	TO-17 (EPA ORD)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III
			Determinative										
VM [phosphonothioic acid, methyl-, S-(2-(diethylamino)ethyl) O-ethyl ester]	21770-86-5	GC-MS	Sample Prep	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III	TO-17 (EPA ORD)	*III	EPA/600/R-16/116 (EPA NHSRC)	*III
			Determinative										
VX [O-ethyl-S-(2-diisopropylaminoethyl)methyl-phosphonothiolate]	50782-69-9	GC-MS	Sample Prep	EPA/600/R-16/116 (EPA NHSRC)	*II	EPA/600/R-16/116 (EPA NHSRC)	*I	EPA/600/R-16/116 (EPA NHSRC)	*I	TO-17 (EPA ORD)	*III	EPA/600/R-16/116 (EPA NHSRC)	*II
			Determinative										
White phosphorus	12185-10-3	GC-NPD / GC-FPD	Sample Prep	7580 (EPA SW-846)	I	7580 (EPA SW-846)	I	7580 (EPA SW-846)	I	7905 (NIOSH)	I	3570/8290A Appendix A (EPA SW-846)	III
			Determinative										

* Only laboratories approved under the ERLN umbrella are designated for handling the CWA standards needed for this method. For access to the nearest ERLN laboratory specially trained and equipped for CWA analysis, contact the EPA Headquarters Emergency Operations Center (EPA/HQ-EOC) at 202-564-3850.

Footnotes

- ¹ Methods 524.3 or 524.4 may be used in place of Method 524.2 provided the laboratory has the necessary equipment and expertise.
- ² If problems occur when using this method, TO-10A should be used.
- ³ If problems occur when using this method, Method TO-15 should be used.
- ⁴ The following methods can be used to analyze these compounds as total arsenic in situations where high throughput analysis is needed or where standards are not available for the specific compounds: ICP AES/MS Methods 200.7/200.8 for drinking water; Methods 3015A/6010D/6020B for aqueous liquid samples; Methods 3050B/3051A/6010D/6020B for solid samples; and Methods 9102/6010D/6020B for wipes.
- ⁵ TO Methods IO-3.1, IO-3.4 and IO-3.5 address these compounds as total arsenic in air samples.
- ⁶ Method 525.3 may be used in place of Method 525.2 provided the laboratory has the necessary equipment and expertise.
- ⁷ Standard Method 4500-CN-G may be used in place of RLAB Method 3135.2I for the analysis of cyanide amenable to chlorination in aqueous liquid or drinking water samples.
- ⁸ The inline distillation method, EPA-821-B-01-009, may be used to prepare and analyze for total cyanide in aqueous liquid samples.
- ⁹ If problems occur during measurement of oxon compounds, analysts should consider use of procedures included in Kamal, A. et al., "Oxidation of selected organophosphate pesticides during chlorination of simulated drinking water." Water Research. 2009. 43(2): 522-534. <http://www.sciencedirect.com/science/journal/00431354>.
- ¹⁰ If equipment is not available or problems occur when analyzing solid and wipe samples, use CVAA Method 7471B (EPA SW-846).
- ¹¹ If problems occur when using EPA Method 245.1 for these analytes during preparation and analysis of aqueous liquid samples, refer to EPA Method 7470A (SW-846).
- ¹² Water extraction, filtration and acidification steps from the Journal of Forensic Science. 1998. 43(1): 200-202 should be used for the preparation of solid samples. Filtration and acidification steps from this journal should be used for preparation of aqueous liquid and drinking water samples.
- ¹³ If analyses are problematic, refer to column manufacturer for alternate conditions.
- ¹⁴ If problems occur when using this method, SW-846 Method 8260D and appropriate corresponding sample preparation procedures (i.e., 5035A for solid samples, and 5030C for aqueous liquid and drinking water samples) should be used.
- ¹⁵ If problems occur with analyses, lower the injection temperature.