

DOE Oversight Bureau, New Mexico Environment Department

**Groundwater Monitoring at
Sandia National Laboratories/New Mexico
Technical Area-V**

**Conducted by the
New Mexico Environment Department DOE Oversight Bureau
for FFY 2014 Q-1**

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Final Report

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The purpose of this communication is to transmit groundwater data collected by NMED DOE Oversight Bureau from Technical Area-V groundwater monitoring wells during first quarter FFY 2014.

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Introduction

The New Mexico Environment Department (NMED) DOE Oversight Bureau (Bureau) has compiled and assessed groundwater data collected during October and November 2013. The Bureau collected groundwater samples from Technical Area V (TAV) groundwater monitoring wells TAV-MW3, TAV-MW4, TAV-MW7, TAV-MW10, and TAV-MW12. A duplicate sample was collected at TAV-MW12. Split samples were collected using standard Sandia National Laboratories/New Mexico sampling procedures and equipment. Bureau samples were submitted to an independent analytical laboratory where they were analyzed for total target analyte list (TAL) metals plus uranium, nitrate-nitrite, and volatile organic compounds (VOCs). Nitrate-nitrite exceeded the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) at monitoring well TAV-MW10. Trichloroethylene (TCE) also exceeded the EPA MCL at monitoring wells TAV-MW10 and TAV-MW12.

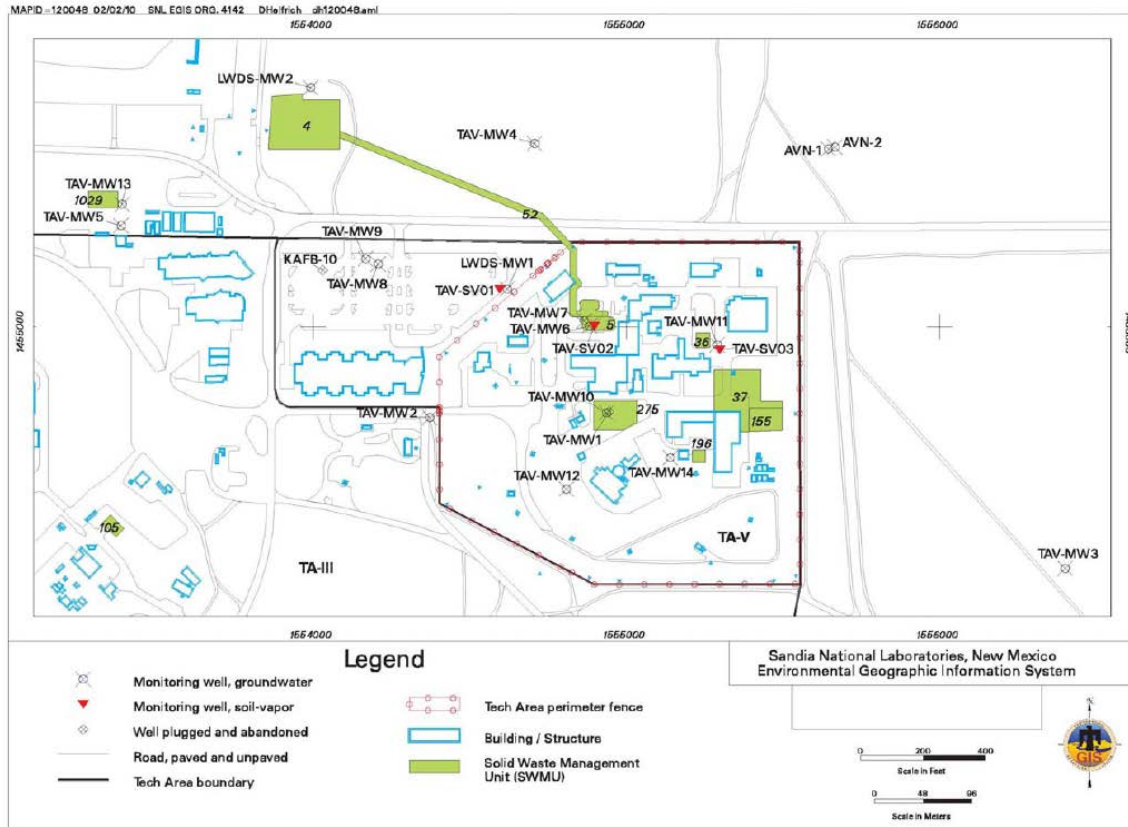


Figure 1. TA-V Monitoring Well Locations (16 Active Groundwater Monitoring Wells) (Sandia National Laboratories, New Mexico Environmental Geographic Information System, Annual Groundwater Monitoring Report, Calendar Year 2012)

Data Assessment

All groundwater samples were collected and analyzed in accordance with U.S. EPA protocols. Data results are compared to applicable MCLs established by the EPA National Primary Drinking Water Regulations (40 CFR 141), National Primary Drinking Water Standards, EPA, July 2002.

Results

Analytical results for total target analyte list (TAL) metals are listed in Table 1. All metal concentrations were below established MCLs.

Analytical results for nitrate-nitrite are listed in Table 2. Nitrate-nitrite concentration at TAV-MW10 exceeded the MCL of 10 mg/L at a concentration of 12 mg/L. All other values were below the nitrate MCL.

Analytical results for volatile organic compounds (VOCs) detected above the method detection limit (MDL) are listed in Table 3. Trichloroethylene (TCE) concentrations detected at monitoring wells TAV-MW10 and TAV-MW12 exceeded the EPA MCL of 5 µg/L. Concentrations were 15 µg/L and 8.2 µg/L, respectively. All other values were below established MCLs.

Table 4 lists the laboratory method detection limits for the remaining VOCs.

Conclusions

Nitrate concentration at TAV-MW10 (12 mg/L) was detected above the MCL of 10 mg/L. TCE results exceeded the MCL of 5 µg/L in samples collected from monitoring wells TAV-MW10 and TAV-MW12. The maximum concentration of TCE detected during this sampling event was 15 µg/L in the sample from monitoring well TAV-MW10.

Both TCE and nitrates have been contaminants of concern for the TA-V groundwater area of concern. The analytical results collected during this quarterly sampling event are consistent with historical detections

References

Sandia National Laboratories, New Mexico Environmental Geographic Information System, Annual Groundwater Monitoring Report, Calendar Year 2012

U.S. EPA National Primary Drinking Water Regulations (40 CFR 141), National Primary Drinking Water Standards, EPA, July 2002.

Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW3 17-Oct-13	Aluminum	0.12	NE	0.05	0.025		SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.0019	0.01	0.002	0.001	J	SW-846:6020
	Barium	0.049	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	55	NE	0.05	0.03		SW-846:6020
	Chromium	0.0025	0.1	0.002	0.001		SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.067	NE	0.05	0.025		SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	16	NE	0.05	0.025		SW-846:6020
	Manganese	0.0073	NE	0.001	0.0004		SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.00024	NE	0.002	0.0001	J	SW-846:6020
	Potassium	4.6	NE	0.05	0.025		SW-846:6020
	Selenium	0.0038	0.05	0.002	0.001		SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	58	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.0036	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0056	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.004	NE	0.005	0.004	U	SW-846:6020	

B = Compound was found in the blank and sample.

D = Dilution

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW4 30-Oct-13	Aluminum	0.025	NE	0.05	0.025	U	SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.0019	0.01	0.002	0.001	J	SW-846:6020
	Barium	0.086	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	46	NE	0.05	0.03		SW-846:6020
	Chromium	0.024	0.1	0.002	0.001		SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.025	NE	0.05	0.025	U	SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	13	NE	0.05	0.025		SW-846:6020
	Manganese	0.00045	NE	0.001	0.0004	J	SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.0001	NE	0.002	0.0001	U	SW-846:6020
	Potassium	3.1	NE	0.05	0.025		SW-846:6020
	Selenium	0.004	0.05	0.002	0.001		SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	44	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.0028	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0057	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.004	NE	0.005	0.004	U	SW-846:6020	

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NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW7 21-Oct-13	Aluminum	0.2	NE	0.05	0.025		SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.002	0.01	0.002	0.001		SW-846:6020
	Barium	0.058	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	59	NE	0.05	0.03		SW-846:6020
	Chromium	0.0012	0.1	0.002	0.001	J	SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.14	NE	0.05	0.025		SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	20	NE	0.05	0.025		SW-846:6020
	Manganese	0.0083	NE	0.001	0.0004		SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.00026	NE	0.002	0.0001	J	SW-846:6020
	Potassium	4.2	NE	0.05	0.025		SW-846:6020
	Selenium	0.0034	0.05	0.002	0.001		SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	62	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.005	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0069	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.0093	NE	0.005	0.004		SW-846:6020	

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Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW10 7-Nov-13	Aluminum	0.025	NE	0.05	0.025	U	SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.0013	0.01	0.002	0.001	J	SW-846:6020
	Barium	0.063	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	57	NE	0.05	0.03		SW-846:6020
	Chromium	0.0025	0.1	0.002	0.001		SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.13	NE	0.25	0.13	D,U	SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	17	NE	0.05	0.025		SW-846:6020
	Manganese	0.0004	NE	0.001	0.0004	U	SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.0001	NE	0.002	0.0001	U	SW-846:6020
	Potassium	4.2	NE	0.05	0.025		SW-846:6020
	Selenium	0.0023	0.05	0.002	0.001	B	SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	59	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.0034	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0052	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.004	NE	0.005	0.004	U	SW-846:6020	

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NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW12 5-Nov-13	Aluminum	0.24	NE	0.05	0.025		SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.001	0.01	0.002	0.001	U	SW-846:6020
	Barium	0.076	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	54	NE	0.05	0.03		SW-846:6020
	Chromium	0.0027	0.1	0.002	0.001		SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.073	NE	0.05	0.025		SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	18	NE	0.05	0.025		SW-846:6020
	Manganese	0.013	NE	0.001	0.0004		SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.00034	NE	0.002	0.0001	J	SW-846:6020
	Potassium	3.7	NE	0.05	0.025		SW-846:6020
	Selenium	0.0019	0.05	0.002	0.001	J,B	SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	57	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.0046	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0042	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.004	NE	0.005	0.004	U	SW-846:6020	

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NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-1 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Total TAL Metals plus Uranium

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW12 5-Nov-13 DUP	Aluminum	0.68	NE	0.05	0.025		SW-846:6020
	Antimony	0.0002	0.006	0.002	0.0002	U	SW-846:6020
	Arsenic	0.0012	0.01	0.002	0.001	J	SW-846:6020
	Barium	0.077	2	0.001	0.0005		SW-846:6020
	Beryllium	0.0001	0.004	0.001	0.0001	U	SW-846:6020
	Cadmium	0.0005	0.005	0.001	0.0005	U	SW-846:6020
	Calcium	53	NE	0.05	0.03		SW-846:6020
	Chromium	0.0033	0.1	0.002	0.001		SW-846:6020
	Cobalt	0.0006	NE	0.001	0.0006	U	SW-846:6020
	Copper	0.001	1.3	0.002	0.001	U	SW-846:6020
	Iron	0.47	NE	0.05	0.025		SW-846:6020
	Lead	0.0006	0.015	0.001	0.0006	U	SW-846:6020
	Magnesium	18	NE	0.05	0.025		SW-846:6020
	Manganese	0.016	NE	0.001	0.0004		SW-846:6020
	Mercury	0.0001	0.002	0.0002	0.0001	U	SW-846:7470A
	Nickel	0.00072	NE	0.002	0.0001	J	SW-846:6020
	Potassium	3.7	NE	0.05	0.025		SW-846:6020
	Selenium	0.0022	0.05	0.002	0.001	B	SW-846:6020
	Silver	0.0003	NE	0.001	0.0003	U	SW-846:6020
	Sodium	57	NE	0.05	0.025		SW-846:6020
	Thallium	0.0005	0.002	0.001	0.0005	U	SW-846:6020
Tin	0.005	NE	0.02	0.005	U	SW-846:6010B	
Uranium	0.0047	0.03	0.001	0.0002		SW-846:6020	
Vanadium	0.0048	NE	0.01	0.003	J	SW-846:6020	
Zinc	0.0041	NE	0.005	0.004	J	SW-846:6020	

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J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

NE = Not Established

U = Analyte not detected at or above the reporting limit or MDL

Table-2 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Nitrate-Nitrite
(EPA MCL 10 mg/L)

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TAV-MW3 17-Oct-13	Nitrate Nitrite as N	4.9	0.5	0.053	D,H	EPA:353.2
TAV-MW4 30-Oct-13	Nitrate Nitrite as N	5	0.5	0.053	D	EPA:353.2
TAV-MW7 21-Oct-13	Nitrate Nitrite as N	3.7	0.5	0.053	D	EPA:353.2
TAV-MW10 7-Nov-13	Nitrate Nitrite as N	12	1	0.11	D,B	EPA:353.2
TAV-MW12 5-Nov-13	Nitrate Nitrite as N	6.7	1	0.11	D,B	EPA:353.2
TAV-MW12 5-Nov-13 DUP	Nitrate Nitrite as N	6.7	1	0.11	D,B	EPA:353.2

B = Compound was found in the blank and sample.

D = Dilution

H = Sample was prepped or analyzed beyond the specified holding time

Table-3 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Detected Volatile Organic Compounds

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA (µg/L)	Quantitation Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
TAV-MW4 30-Oct-13	Chloroform	0.77	NE	1	0.12	J	SW-846:8260B
	Dichloroethane[1,1-]	0.11	NE	1	0.1	J	SW-846:8260B
	Dichloroethene[cis-1,2-]	0.27	70	1	0.1	J	SW-846:8260B
	Trichloroethene	2.6	5	1	0.13		SW-846:8260B
TAV-MW10 7-Nov-13	Chloroform	0.16	NE	1	0.12	J	SW-846:8260B
	Dichloroethene[cis-1,2-]	3	70	1	0.1		SW-846:8260B
	Trichloroethene	15	5	1	0.13		SW-846:8260B
TAV-MW12 5-Nov-13	Chloroform	0.13	NE	1	0.12	J	SW-846:8260B
	Dichloroethene[cis-1,2-]	0.53	70	1	0.1	J	SW-846:8260B
	Trichloroethene	8.2	5	1	0.13		SW-846:8260B
TAV-MW12 5-Nov-13 DUP	Chloroform	0.13	NE	1	0.12	J	SW-846:8260B
	Dichloroethene[cis-1,2-]	0.59	70	1	0.1	J	SW-846:8260B
	Trichloroethene	7.9	5	1	0.13		SW-846:8260B

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Table-4 NMED DOE OB FFY 2014 Q-1 Technical Area-V Groundwater Quality Results: Method Detection Limits for Volatile Organic Compounds

Analyte	MDL (µg/L)	Analytical Method
4-Methyl-2-pentanone (MIBK)	0.18	SW-846:8260B
Acetone	2.1	SW-846:8260B
Benzene	0.13	SW-846:8260B
Bromodichloromethane	0.14	SW-846:8260B
Bromoform	0.1	SW-846:8260B
Bromomethane	0.29	SW-846:8260B
Butanone[2-]	0.35	SW-846:8260B
Carbon Disulfide	0.16	SW-846:8260B
Carbon Tetrachloride	0.15	SW-846:8260B
Chlorobenzene	0.12	SW-846:8260B
Chloroethane	0.34	SW-846:8260B
Chloroform	0.12	SW-846:8260B
Chloromethane	0.25	SW-846:8260B
Dibromochloromethane	0.13	SW-846:8260B
Dichloroethane[1,1-]	0.1	SW-846:8260B
Dichloroethane[1,2-]	0.22	SW-846:8260B
Dichloroethene[1,1-]	0.14	SW-846:8260B
Dichloroethene[cis-1,2-]	0.1	SW-846:8260B
Dichloroethene[trans-1,2-]	0.11	SW-846:8260B
Dichloropropane[1,2-]	0.15	SW-846:8260B
Dichloropropene[cis-1,3-]	0.22	SW-846:8260B
Dichloropropene[trans-1,3-]	0.08	SW-846:8260B
Ethylbenzene	0.1	SW-846:8260B
Hexanone[2-]	0.17	SW-846:8260B
Methylene Chloride	0.35	SW-846:8260B
Styrene	0.15	SW-846:8260B
Tetrachloroethane[1,1,2,2-]	0.09	SW-846:8260B
Tetrachloroethene	0.1	SW-846:8260B
Toluene	0.25	SW-846:8260B
Trichloroethane[1,1,1-]	0.19	SW-846:8260B
Trichloroethane[1,1,2-]	0.31	SW-846:8260B
Trichloroethene	0.13	SW-846:8260B
Vinyl acetate	0.21	SW-846:8260B
Vinyl Chloride	0.22	SW-846:8260B
Xylenes, Total	0.18	SW-846:8260B