Enclosure 1

Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit, Revision 1.0

Volume 3

EPA ID# NM0890010515

Includes:
LA-UR-25-21395
Appendix 4, Supplements 4-6 through 4-16

Prepared by:

Los Alamos National Laboratory
Environmental Protection and Compliance Division
Los Alamos, New Mexico 87545

Supplement 4-6

Soil Sampling Results Summary Report for the Open Detonation Unit at Technical Area (TA) 39-6

TA-39-6 Open Detonation Unit

This summary report includes discussion of the analytical results associated with soil sampling conducted at the Technical Area 39, Building 6 (TA-39-6) open detonation unit on September 27, 2018. Twelve soil samples were collected from pre-selected locations (Figure 1) based on a defined area where deposition of particulates from air to soil, including predominant downwind locations, and areas of potential storm water runoff are most likely to occur. Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), total metals, dioxins/furans, perchlorates and high explosives, gross alpha and beta and isotopic plutonium. Surface soil samples were collected as grab samples from a depth of 0 to 2 inches below ground surface.

In 2010 and early 2011, soil data were collected to determine the baseline soil constituent of concern concentrations at the unit after more than 50 years of use. A summary of the soil analytical results for the sample collection events is included in Attachment D of the *Los Alamos National Laboratory Permit Modification Request for Open Detonation Units at Technical Areas 36 and 39 (TA-36-8 & TA-39-6), Revision 0* (LANL, 2011). Soil samples were analyzed for high explosives, metals, dioxins/furans, SVOCs, VOCs, PCBs, perchlorates, and radiological constituents (gross alpha, gross beta, and isotopic uranium). Analytical results indicate that the average soil constituent concentrations in and around the TA-39-6 open detonation unit are less than the New Mexico Environment Department (NMED) Residential Soil Screening Levels (RSSLs) (NMED, 2019).

PCB soil data was collected in 2010 and 2011, because the soil monitoring conducted at that time was designed to be a baseline data set to begin an assumed soil monitoring program at the detonation unit. Constituents chosen for the 2018 sampling effort were based on the likelihood that current operational activities may contribute to deposition of the constituents.

PCB waste is not treated or used in association with the current operational activities at either of the units; therefore, PCBs should not be added to the soil surface since initial detection. At the time of closure of the units, PCBs should be evaluated based on the sites historic use.

The results of the 2018 soil sampling event, discussed in detail below, indicate that active operations at the unit does not pose an unnecessary risk to human health based on the soil sample analytical results. Any potential contamination at the site is believed to be primarily limited to the surface (i.e., the first few inches in depth) of the site.

Laboratory Analysis and Reporting

The soil samples collected in 2018 were analyzed at a qualified offsite laboratory. The LANL Sample Management Office qualifies contract laboratories and ensures these laboratories adhere to U.S. Environmental Protection Agency (EPA) quality assurance and quality control (QA/QC) requirements. All sampling and analyses were conducted in accordance with QA/QC procedures defined by the latest revision of SW-846 (EPA, 1986) or other NMED-approved procedures. Field sampling procedures and laboratory analyses are evaluated through the use of QA/QC samples to assess the overall quality of the data produced. The field QC samples included trip blanks, field blanks, field duplicates, and equipment rinsate blanks. Field QC samples were given a unique sample identification number and submitted to the analytical laboratory as blind samples. Laboratory QC samples include calibrations, blanks, duplicates,

and spike samples. QC sample results are included in the analytical results received from the laboratory so the results can be applied to the associated samples.

Samples were analyzed for the following constituents using the methods indicated in the parentheses:

- High explosives (SW-846-8330B)
- Metals (SW-846-6010C, SW-846-6020, and SW-846-7471A)
- Dioxins/Furans (SW-846-8290A)
- SVOCs (SW-846-8270D)
- VOCs (SW-846-8260B)
- Percphlorates (SW-846-6850)
- Gross alpha beta (SW-846 EPA Method 900)
- Isotopic plutonium (HASL-300:ISOP)

Complete analytical results are included in Table 1, *TA-39-6 Analytical Data Summary*. Data are reported with qualifiers that denote the following analytical situations:

- For Dioxins/Furans
    - U – Compound analyzed for, but not detected, reported quantity equals the contract required quantitation limit (CRQL)
    - J - Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - K – Estimated Maximum Possible Concentration
    - NQ – No qualification
- For Metals and Isotopic Plutonium
    - U – reading was less than the method detection limit (MDL); reported value equals the CRQL
    - J – The reported value was obtained from a reading less than the CRQL but greater than or equal to the MDL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - NQ – No qualification
- For VOCs and SVOCs
    - U – Compound analyzed for, but not detected; reported value equals the CRQL
    - J – Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank

- For Explosives
    - U – Compound analyzed for, but not detected; reported value equals the CRQL
    - J – Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - Blank qualifier field – No qualification

Soil samples collected in 2018 were intended to be analyzed for isotopic uranium, but were analyzed for isotopic plutonium instead, which is not a constituent that should be present at the site. A miscommunication on the chain of custody forms for the sample suites led to analysis for isotopic plutonium and as expected, there was no plutonium detected at the site. However, previously collected data regarding isotopic uranium (the applicable constituent) concentration information is included within Attachment D of the *Los Alamos National Laboratory Permit Modification Request for Open Detonation Units at Technical Areas 36 and 39 (TA-36-8 & TA-39-6), Revision 0* (LANL, 2011). The data were also analyzed within the 2013 revised risk assessment included as Permit Application Supplement 4-9, *Revised 2011 Open Detonation Risk Assessment*.

Summary of Results

Compiled data were compared to NMED RSSLs. It is important to note that very few constituents, when compared to the constituents that the soil was tested for, were detected. The paragraphs below provide a discussion of the compounds detected within the soil, as well as other information about the analytical data that provide a more in depth discussion regarding some of the results.

Organic constituents detected within the soils at the TA-39-6 open detonation unit include:

- 0 of the 62 VOCs analyzed;
- 6 of the 69 SVOCs analyzed;
- 2 of the 20 explosives compounds analyzed; and
- 10 of the 25 dioxin or furan compounds analyzed.

For the TA-39-6 open detonation unit, none of the detected concentrations of SVOCs within the samples exceed the NMED RSSLs. However, when a constituent is reported as a CRQL which is greater than the screening level, it appears that the constituent is detected at a concentration that is greater than the NMED RSSL. This is the case for n-nitrosodimethylamine within this dataset. It is not detected in any of the samples analyzed and is included within the 'U' qualifier, as referenced above. However, because the reported results are the same as the CRQL, and the CRQL is above the NMED RSSL, n-nitrosodimethylamine appears to be detected at a concentration greater than the NMED RSSLs. The method utilized by the analytical laboratory for the SVOC analysis can detect the presence of nitrosamines; however, it is not the most sensitive method and therefore, the detection limit is higher than the soil screening level. Since the presence of n-nitrosodimethylamine due to operations at the TA-36-8 open detonation is not likely, a more focused analytical validation was deemed not necessary. Further discussion regarding the likelihood of the presence of n-nitrosodimethylamine at the site is below.

N-nitrosodimethylamine is produced by industry only in small amounts for research. It was used to make rocket fuel, but this use was stopped after unusually high levels of the chemical were found in air, water, and soil samples collected near a rocket fuel manufacturing plant. It is currently used in some cosmetic

and toiletry products and in cleansers. N-nitrosodimethylamine is unintentionally formed during various manufacturing processes and in air, water, and soil from reactions involving other chemicals called alkylamines. It is also found in some foods and may be formed in the body. When released to the air, it is broken down by sunlight in a matter of minutes. When released to soil, it may evaporate into air or could sink down into deeper soil. It is unlikely that n-nitrosodimethylamine was deposited by past or current activities at the TA-39-6 open detonation unit, given that rocket fuel was never manufactured at LANL.

The two explosives compounds (HMX and RDX) detected within the soil at TA-39-6 open detonation unit were detected at concentrations below the NMED RSSLs.

For dioxins and furans, EPA has established 50 parts per trillion (ppt) Toxic Equivalency Quantity (TEQ) as being an acceptable limit for residential contamination. The TEQ system was developed for the purpose of comparing the relative risk of exposure in areas of contamination that vary widely in the composition and level of most toxic dioxins and furans. Each of the 17 highly toxic dioxins/furans are assigned a Toxic Equivalency Factor (TEF) based on a particular chemical's toxicity relative to 2,3,7,8-tetrachlorodibenzodioxin (TCDD), with the toxicity of TCDD being equal to 1.0. The concentration of each dioxin/furan is multiplied by its respective TEF and the results are summed. The summed results are known as the TEQ of the sample and it is this value that is compared to the 50 ppt screening level. This analysis is conducted as part of the health and ecological risk assessment included with this application and is included within Permit Application Supplement 4-8, *Technical Area 39 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 39-6 Open Detonation Unit Human Health and Ecological Risk- Screening Assessments*.

There were no detections of perchlorate within the 12 locations sampled at the TA-39-6 open detonation unit.

Eighteen (18) of the 23 metals analyzed for were detected in the soil at the TA-39-6 open detonation unit. There were no detected metals above NMED RSSLs. Most of the detected metal concentrations are below the established background levels at the Los Alamos National Laboratory. Seven of the metals detected are present at concentrations above background values. Human health and ecological risks associated with these detections are included in Supplement 4-7, *Technical Area 36 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 36-8 Open Detonation Unit Human Health and Ecological Risk- Screening Assessments*.

- Calcium (2 locations)
- Chromium (3 locations)
- Cobalt (1 location)
- Copper (11 locations)
- Mercury (2 locations)
- Vanadium (4 locations)
- Zinc (2 locations)

Antimony, while not detected at in any soil samples collected at the site, is reported in 7 of the locations as a CRQL that is greater than the establish background value at LANL. The CRQL is less than the NMED RSSL.

Conclusion

Sampling and analysis results indicate that none of the soil samples have constituent concentrations greater than the screening levels (see Table 1) when compared directly to the screening levels. Detected metals at 11 of 12 soil sample locations were measured above established background values.

References

EPA, 1986 (and all approved updates). *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* SW-846, U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response, U.S Government Printing Office, Washington D.C.

LANL, 2011. *Los Alamos National Laboratory Permit Modification Request for Open Detonation Units at Technical Areas 36 and 39 (TA-36-8 & TA-39-6), Revision 0*. Los Alamos National Laboratory. July 2011. (http://permalink.lanl.gov/object/tr?what=info:lanl-repo/lareport/LA-UR-11-04739)

NMED, 2010. *Los Alamos National Laboratory Hazardous Waste Facility Permit,* EPA ID# NM0890010515, New Mexico Environment Department, Santa Fe, New Mexico.

NMED, 2019. *New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation*, February 2019 (Revision 2, 6/19/19).



Figure 1. TA-39-6 Soil Sample Locations

Table 1. TA-39-6 2018 Analytical Data Summary

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**8.52E-06**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Heptachlorodibenzodioxins (Total)**	**1.53E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**9.01E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Heptachlorodibenzofurans (Total)**	**2.91E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Hexachlorodibenzodioxins (Total)**	**5.90E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Hexachlorodibenzofurans (Total)**	**5.32E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**7.21E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**2.49E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
1	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Tetrachlorodibenzofuran[2,3,7,8-]**	**3.65E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
1	**Tetrachlorodibenzofurans (Totals)**	**6.28E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Aluminum**	**3.91E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
1	Antimony	3.16E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
1	**Arsenic**	**7.58E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
1	**Barium**	**5.67E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
1	**Beryllium**	**2.32E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
1	Cadmium	9.57E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
1	**Calcium**	**4.70E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
1	**Chromium**	**1.05E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
1	**Cobalt**	**4.49E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
1	**Copper**	**2.78E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
1	**Iron**	**1.33E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
1	**Lead**	**9.00E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
1	**Magnesium**	**2.13E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
1	**Manganese**	**1.92E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	**Mercury**	**1.05E-01**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	TRUE
1	**Nickel**	**8.05E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
1	**Potassium**	**7.38E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
1	Selenium	3.57E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
1	Silver	3.31E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
1	**Sodium**	**3.17E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
1	Thallium	1.39E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
1	**Vanadium**	**2.77E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
1	**Zinc**	**3.36E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
1	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Amino-2,6-dinitrotoluene[4-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**HMX**	**2.82E-01**	mg/kg	**Y**	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
1	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
1	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
1	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
1	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
1	**TATB**	**6.76E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetryl	1.50E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Trinitrotoluene[2,4,6-]	1.50E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
1	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Perchlorate	4.92E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
1	**Gross alpha**	**8.86E+00**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	**Gross beta**	**2.49E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Plutonium-238	0.00E+00	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
1	Plutonium-239/240	1.87E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
1	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
1	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
1	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
1	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Benzyl Alcohol	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
1	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
1	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
1	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
1	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
1	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
1	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
1	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1	**Di-n-butylphthalate**	**2.38E-02**	mg/kg	**Y**	J	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
1	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
1	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
1	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
1	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
1	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
1	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
1	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
1	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
1	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
1	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
1	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
1	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
1	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
1	Acetone	1.65E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
1	Benzene	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
1	Bromobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bromochloromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bromodichloromethane	3.29E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
1	Bromoform	3.29E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Bromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
1	Butanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
1	Butylbenzene[n-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butylbenzene[sec-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butylbenzene[tert-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Carbon Disulfide	1.65E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
1	Carbon Tetrachloride	3.29E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
1	Chlorobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Chlorodibromomethane	3.29E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Chloroethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
1	Chloroform	3.29E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
1	Chloromethane	3.29E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
1	Chlorotoluene[2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chlorotoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dibromo-3-Chloropropane[1,2-]	4.94E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
1	Dibromoethane[1,2-]	3.29E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
1	Dibromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
1	Dichlorobenzene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1	Dichlorobenzene[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorobenzene[1,4-]	3.29E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1	Dichlorodifluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
1	Dichloroethane[1,1-]	3.29E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
1	Dichloroethane[1,2-]	3.29E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
1	Dichloroethene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
1	Dichloroethene[cis-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1	Dichloroethene[trans-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
1	Dichloropropane[1,2-]	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
1	Dichloropropane[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropane[2,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[cis-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[trans-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Ethylbenzene	3.29E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
1	Hexanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Iodomethane	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Isopropylbenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
1	Isopropyltoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Methyl-2-pentanone[4-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
1	Methylene Chloride	1.65E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
1	Propylbenzene[1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Styrene	3.29E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
1	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachloroethane[1,1,1,2-]	3.29E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
1	Tetrachloroethane[1,1,2,2-]	3.29E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
1	Tetrachloroethene	3.29E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
1	Toluene	3.29E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
1	Trichloroethane[1,1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
1	Trichloroethane[1,1,2-]	3.29E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
1	Trichloroethene	3.29E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
1	Trichlorofluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Trichloropropane[1,2,3-]	3.29E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
1	Trimethylbenzene[1,2,4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Trimethylbenzene[1,3,5-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Vinyl Chloride	3.29E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
1	Xylene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
1	Xylene[1,3-]+Xylene[1,4-]	6.59E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
2	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**4.57E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Heptachlorodibenzodioxins (Total)**	**7.80E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Heptachlorodibenzofurans (Total)**	**1.02E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**3.58E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**1.38E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
2	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Tetrachlorodibenzofuran[2,3,7,8-]**	**2.01E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
2	**Tetrachlorodibenzofurans (Totals)**	**2.01E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Aluminum**	**3.91E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
2	Antimony	3.13E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
2	**Arsenic**	**1.28E+00**	mg/kg	**Y**	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	**Barium**	**3.92E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
2	**Beryllium**	**2.23E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
2	Cadmium	9.47E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
2	**Calcium**	**4.81E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
2	**Chromium**	**1.21E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
2	**Cobalt**	**6.40E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
2	**Copper**	**5.56E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
2	**Iron**	**1.81E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
2	**Lead**	**1.56E+01**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
2	**Magnesium**	**2.34E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
2	**Manganese**	**2.17E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
2	**Mercury**	**1.92E-02**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
2	**Nickel**	**6.85E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
2	**Potassium**	**5.99E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
2	Selenium	3.53E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
2	Silver	5.94E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
2	**Sodium**	**2.49E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
2	Thallium	1.37E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
2	**Vanadium**	**4.38E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	TRUE
2	**Zinc**	**4.56E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
2	2,4-Diamino-6-nitrotoluene	4.95E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	2,6-Diamino-4-nitrotoluene	6.53E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	3,5-Dinitroaniline	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	HMX	1.49E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
2	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
2	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
2	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
2	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
2	PETN	2.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
2	**TATB**	**9.65E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetryl	1.49E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
2	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Tris (o-cresyl) phosphate	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Perchlorate	4.86E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
2	**Gross alpha**	**1.34E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Gross beta**	**2.44E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Plutonium-238	-3.82E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
2	Plutonium-239/240	1.02E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
2	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
2	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
2	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
2	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	**Benzyl Alcohol**	**1.04E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
2	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
2	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
2	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
2	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
2	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
2	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
2	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
2	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
2	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	**Di-n-butylphthalate**	**1.54E-02**	mg/kg	**Y**	J	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
2	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
2	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
2	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
2	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
2	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
2	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
2	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
2	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
2	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
2	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
2	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
2	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
2	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
2	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
2	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
2	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
2	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
2	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
2	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
2	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
2	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
2	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
2	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
2	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
2	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
2	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
2	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
2	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
2	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
2	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
2	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dibromo-3-Chloropropane[1,2-]	5.03E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
2	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
2	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
2	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
2	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
2	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
2	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
2	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
2	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
2	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
2	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
2	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
2	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
2	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
2	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
2	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
2	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
2	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
2	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
2	Toluene	3.35E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
2	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
2	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
2	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
2	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
2	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
2	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
2	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
2	Xylene[1,3-]+Xylene[1,4-]	6.71E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
3	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**3.49E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Heptachlorodibenzodioxins (Total)**	**6.56E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Heptachlorodibenzofurans (Total)**	**7.60E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**2.99E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
3	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Tetrachlorodibenzofuran[2,3,7,8-]**	**2.57E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
3	**Tetrachlorodibenzofurans (Totals)**	**2.07E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Aluminum**	**4.01E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
3	Antimony	3.17E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
3	**Arsenic**	**8.68E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
3	**Barium**	**3.00E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
3	**Beryllium**	**1.88E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
3	Cadmium	9.60E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
3	**Calcium**	**3.49E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
3	**Chromium**	**9.47E+00**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
3	**Cobalt**	**3.89E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
3	**Copper**	**7.38E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
3	**Iron**	**1.12E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
3	**Lead**	**6.00E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
3	**Magnesium**	**2.17E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
3	**Manganese**	**1.47E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
3	**Mercury**	**1.51E-02**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
3	**Nickel**	**9.05E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
3	**Potassium**	**8.12E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
3	Selenium	3.48E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
3	Silver	2.33E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
3	**Sodium**	**3.36E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
3	Thallium	1.35E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
3	**Vanadium**	**2.22E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
3	**Zinc**	**2.47E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
3	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	HMX	1.49E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
3	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
3	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
3	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
3	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
3	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
3	**TATB**	**1.86E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetryl	1.49E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
3	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
3	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Perchlorate	5.01E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
3	**Gross alpha**	**1.10E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Gross beta**	**2.48E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Plutonium-238	-3.74E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
3	Plutonium-239/240	1.49E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
3	Acenaphthene	1.00E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
3	Acenaphthylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Aniline	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Anthracene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
3	Azobenzene	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(a)anthracene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(a)pyrene	1.00E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
3	Benzo(b)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(g,h,i)perylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(k)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
3	Benzoic Acid	1.67E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	**Benzyl Alcohol**	**3.33E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bis(2-chloroethoxy)methane	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bis(2-chloroethyl)ether	1.00E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Bis(2-ethylhexyl)phthalate	1.00E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Bromophenyl-phenylether[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chloroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chloronaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
3	Chlorophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
3	Chlorophenyl-phenyl[4-] Ether	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Chrysene	1.00E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
3	Dibenz(a,h)anthracene	1.00E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
3	Dibenzofuran	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorobenzene[1,2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3	Dichlorobenzene[1,3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorobenzene[1,4-]	1.00E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3	Dichlorobenzidine[3,3'-]	1.00E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
3	Diethylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
3	Dimethyl Phthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
3	Dimethylphenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Di-n-butylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3	Dinitro-2-methylphenol[4,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
3	Dinitrophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,4-]	1.00E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Di-n-octylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Diphenylamine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Fluoranthene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3	Fluorene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3	Hexachlorobenzene	1.00E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
3	Hexachlorobutadiene	1.00E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
3	Hexachlorocyclopentadiene	1.00E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
3	Hexachloroethane	1.00E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
3	Indeno(1,2,3-cd)pyrene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Isophorone	1.00E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
3	Methylnaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
3	Methylphenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Methylphenol[3-,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Naphthalene	1.00E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
3	Nitroaniline[2-]	1.10E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitroaniline[3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrobenzene	1.00E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
3	Nitrophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrophenol[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrosodimethylamine[N-]	1.00E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
3	Nitroso-di-n-propylamine[N-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Oxybis(1-chloropropane)[2,2'-]	1.00E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Pentachlorophenol	1.00E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
3	Phenanthrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3	Phenol	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
3	Pyrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3	Pyridine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trichlorobenzene[1,2,4-]	1.00E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
3	Trichlorophenol[2,4,5-]	1.00E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3	Trichlorophenol[2,4,6-]	1.00E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
3	Acetone	1.64E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
3	Benzene	3.28E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
3	Bromobenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bromochloromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bromodichloromethane	3.28E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
3	Bromoform	3.28E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Bromomethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
3	Butanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
3	Butylbenzene[n-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzene[sec-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzene[tert-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Carbon Disulfide	1.64E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
3	Carbon Tetrachloride	3.28E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
3	Chlorobenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
3	Chlorodibromomethane	3.28E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Chloroethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
3	Chloroform	3.28E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
3	Chloromethane	3.28E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
3	Chlorotoluene[2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chlorotoluene[4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dibromo-3-Chloropropane[1,2-]	4.93E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
3	Dibromoethane[1,2-]	3.28E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
3	Dibromomethane	3.28E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
3	Dichlorobenzene[1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3	Dichlorobenzene[1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorobenzene[1,4-]	3.28E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3	Dichlorodifluoromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
3	Dichloroethane[1,1-]	3.28E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
3	Dichloroethane[1,2-]	3.28E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
3	Dichloroethene[1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
3	Dichloroethene[cis-1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Dichloroethene[trans-1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
3	Dichloropropane[1,2-]	3.28E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
3	Dichloropropane[1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropane[2,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[cis-1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[trans-1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Ethylbenzene	3.28E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
3	Hexanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Iodomethane	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Isopropylbenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
3	Isopropyltoluene[4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Methyl-2-pentanone[4-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
3	Methylene Chloride	1.64E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
3	Propylbenzene[1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Styrene	3.28E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
3	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachloroethane[1,1,1,2-]	3.28E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
3	Tetrachloroethane[1,1,2,2-]	3.28E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
3	Tetrachloroethene	3.28E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
3	Toluene	3.28E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
3	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
3	Trichloroethane[1,1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
3	Trichloroethane[1,1,2-]	3.28E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
3	Trichloroethene	3.28E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
3	Trichlorofluoromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Trichloropropane[1,2,3-]	3.28E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
3	Trimethylbenzene[1,2,4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trimethylbenzene[1,3,5-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Vinyl Chloride	3.28E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
3	Xylene[1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
3	Xylene[1,3-]+Xylene[1,4-]	6.58E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
4	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**1.96E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.00E-06	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofuran[1,2,3,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofuran[2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
4	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzofuran[2,3,7,8-]	1.05E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	**Aluminum**	**3.48E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
4	Antimony	3.03E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
4	**Arsenic**	**1.01E+00**	mg/kg	**Y**	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
4	**Barium**	**4.19E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
4	**Beryllium**	**2.03E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
4	Cadmium	9.17E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
4	**Calcium**	**6.78E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	TRUE
4	**Chromium**	**1.24E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
4	**Cobalt**	**4.84E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
4	**Copper**	**1.58E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
4	**Iron**	**1.26E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
4	**Lead**	**8.89E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
4	**Magnesium**	**2.32E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
4	**Manganese**	**2.81E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
4	Mercury	3.73E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
4	**Nickel**	**9.96E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
4	**Potassium**	**4.64E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
4	Selenium	3.45E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
4	Silver	2.44E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
4	**Sodium**	**2.04E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Thallium	1.34E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
4	**Vanadium**	**2.83E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
4	**Zinc**	**2.44E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
4	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Amino-2,6-dinitrotoluene[4-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	HMX	1.50E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
4	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
4	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
4	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
4	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
4	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
4	TATB	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetryl	1.50E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
4	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trinitrotoluene[2,4,6-]	1.50E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
4	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Perchlorate	4.91E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
4	**Gross alpha**	**1.10E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	**Gross beta**	**2.42E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Plutonium-238	-9.85E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
4	Plutonium-239/240	5.63E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
4	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
4	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
4	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
4	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Benzyl Alcohol	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
4	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
4	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
4	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
4	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
4	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
4	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
4	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
4	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Di-n-butylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
4	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
4	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
4	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
4	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
4	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
4	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
4	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
4	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
4	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
4	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
4	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
4	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
4	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
4	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
4	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
4	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
4	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
4	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
4	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
4	Acetone	1.65E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
4	Benzene	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
4	Bromobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bromochloromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bromodichloromethane	3.29E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
4	Bromoform	3.29E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Bromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
4	Butanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
4	Butylbenzene[n-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzene[sec-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzene[tert-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Carbon Disulfide	1.65E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
4	Carbon Tetrachloride	3.29E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
4	Chlorobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
4	Chlorodibromomethane	3.29E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Chloroethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
4	Chloroform	3.29E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
4	Chloromethane	3.29E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
4	Chlorotoluene[2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chlorotoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Dibromo-3-Chloropropane[1,2-]	4.94E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
4	Dibromoethane[1,2-]	3.29E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
4	Dibromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
4	Dichlorobenzene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,4-]	3.29E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
4	Dichlorodifluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
4	Dichloroethane[1,1-]	3.29E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
4	Dichloroethane[1,2-]	3.29E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
4	Dichloroethene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
4	Dichloroethene[cis-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
4	Dichloroethene[trans-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
4	Dichloropropane[1,2-]	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
4	Dichloropropane[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropane[2,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[cis-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[trans-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Ethylbenzene	3.29E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
4	Hexanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Iodomethane	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Isopropylbenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
4	Isopropyltoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Methyl-2-pentanone[4-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
4	Methylene Chloride	1.65E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
4	Propylbenzene[1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Styrene	3.29E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
4	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachloroethane[1,1,1,2-]	3.29E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
4	Tetrachloroethane[1,1,2,2-]	3.29E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
4	Tetrachloroethene	3.29E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
4	Toluene	3.29E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
4	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
4	Trichloroethane[1,1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
4	Trichloroethane[1,1,2-]	3.29E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
4	Trichloroethene	3.29E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
4	Trichlorofluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Trichloropropane[1,2,3-]	3.29E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Trimethylbenzene[1,2,4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trimethylbenzene[1,3,5-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Vinyl Chloride	3.29E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
4	Xylene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
4	Xylene[1,3-]+Xylene[1,4-]	6.58E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
5	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**8.28E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**5.50E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.00E-06	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofuran[1,2,3,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofuran[2,3,4,7,8-]	5.01E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
5	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**Tetrachlorodibenzofuran[2,3,7,8-]**	**1.36E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
5	**Tetrachlorodibenzofurans (Totals)**	**1.36E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**Aluminum**	**4.24E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
5	Antimony	3.31E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
5	**Arsenic**	**6.61E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
5	**Barium**	**2.80E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
5	**Beryllium**	**1.67E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
5	Cadmium	1.00E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
5	**Calcium**	**5.64E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
5	**Chromium**	**1.17E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
5	**Cobalt**	**5.31E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	**Copper**	**5.27E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
5	**Iron**	**1.42E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
5	**Lead**	**5.83E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
5	**Magnesium**	**2.45E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
5	**Manganese**	**1.95E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
5	Mercury	3.70E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
5	**Nickel**	**5.57E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
5	**Potassium**	**6.18E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
5	Selenium	3.35E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
5	Silver	2.47E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
5	**Sodium**	**2.76E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
5	Thallium	1.30E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
5	**Vanadium**	**3.18E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
5	**Zinc**	**2.98E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
5	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**HMX**	**6.66E+00**	mg/kg	**Y**	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
5	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
5	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
5	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
5	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
5	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
5	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetryl	1.48E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
5	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
5	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Perchlorate	4.91E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
5	**Gross alpha**	**8.53E+00**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**Gross beta**	**2.32E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Plutonium-238	-1.62E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
5	Plutonium-239/240	-1.24E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
5	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
5	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
5	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	**Benzyl Alcohol**	**7.66E-01**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
5	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
5	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
5	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
5	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
5	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
5	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
5	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
5	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
5	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Di-n-butylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
5	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
5	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
5	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
5	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
5	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
5	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
5	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
5	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
5	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
5	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
5	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
5	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
5	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
5	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
5	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
5	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
5	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
5	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
5	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
5	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
5	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
5	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
5	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
5	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
5	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
5	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
5	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
5	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
5	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
5	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
5	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dibromo-3-Chloropropane[1,2-]	5.03E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
5	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
5	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
5	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
5	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
5	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
5	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
5	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
5	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
5	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
5	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
5	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
5	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
5	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
5	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
5	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
5	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
5	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
5	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
5	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
5	Toluene	3.35E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
5	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
5	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
5	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
5	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
5	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
5	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
5	Xylene[1,3-]+Xylene[1,4-]	6.72E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
6	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**8.60E-06**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Heptachlorodibenzodioxins (Total)**	**1.45E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**7.97E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Heptachlorodibenzofurans (Total)**	**7.97E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**5.49E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**2.51E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
6	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	**Tetrachlorodibenzofuran[2,3,7,8-]**	**1.87E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
6	**Tetrachlorodibenzofurans (Totals)**	**1.87E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Aluminum**	**2.93E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
6	Antimony	3.07E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
6	**Arsenic**	**6.99E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
6	**Barium**	**3.00E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
6	**Beryllium**	**1.90E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
6	Cadmium	9.32E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
6	**Calcium**	**2.93E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
6	**Chromium**	**8.96E+00**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
6	**Cobalt**	**3.89E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
6	**Copper**	**2.02E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
6	**Iron**	**1.03E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
6	**Lead**	**7.72E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
6	**Magnesium**	**1.75E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
6	**Manganese**	**1.50E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
6	**Mercury**	**5.07E-03**	mg/kg	**Y**	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
6	**Nickel**	**6.68E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
6	**Potassium**	**5.44E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
6	Selenium	3.54E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
6	Silver	3.84E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
6	**Sodium**	**2.38E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
6	Thallium	1.38E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
6	**Vanadium**	**2.32E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
6	**Zinc**	**3.04E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
6	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Amino-2,6-dinitrotoluene[4-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	HMX	1.50E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
6	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
6	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
6	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
6	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
6	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
6	TATB	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetryl	1.50E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
6	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trinitrotoluene[2,4,6-]	1.50E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
6	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Perchlorate	4.98E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
6	**Gross alpha**	**1.01E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	**Gross beta**	**2.81E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Plutonium-238	-5.42E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
6	Plutonium-239/240	-8.67E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
6	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
6	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
6	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
6	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
6	**Benzoic Acid**	**4.83E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Benzyl Alcohol	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
6	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
6	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
6	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
6	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
6	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
6	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
6	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
6	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Di-n-butylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
6	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
6	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
6	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
6	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
6	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
6	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
6	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
6	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
6	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
6	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
6	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
6	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
6	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
6	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
6	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
6	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
6	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
6	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
6	Acetone	1.64E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
6	Benzene	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
6	Bromobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bromochloromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bromodichloromethane	3.29E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
6	Bromoform	3.29E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Bromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
6	Butanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
6	Butylbenzene[n-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzene[sec-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzene[tert-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Carbon Disulfide	1.64E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
6	Carbon Tetrachloride	3.29E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
6	Chlorobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
6	Chlorodibromomethane	3.29E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Chloroethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
6	Chloroform	3.29E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
6	Chloromethane	3.29E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
6	Chlorotoluene[2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chlorotoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dibromo-3-Chloropropane[1,2-]	4.93E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
6	Dibromoethane[1,2-]	3.29E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
6	Dibromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
6	Dichlorobenzene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
6	Dichlorobenzene[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorobenzene[1,4-]	3.29E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
6	Dichlorodifluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
6	Dichloroethane[1,1-]	3.29E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
6	Dichloroethane[1,2-]	3.29E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
6	Dichloroethene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
6	Dichloroethene[cis-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
6	Dichloroethene[trans-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
6	Dichloropropane[1,2-]	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
6	Dichloropropane[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropane[2,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropene[cis-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Dichloropropene[trans-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Ethylbenzene	3.29E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
6	Hexanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Iodomethane	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Isopropylbenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
6	Isopropyltoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Methyl-2-pentanone[4-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
6	Methylene Chloride	1.64E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
6	Propylbenzene[1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Styrene	3.29E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
6	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachloroethane[1,1,1,2-]	3.29E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
6	Tetrachloroethane[1,1,2,2-]	3.29E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
6	Tetrachloroethene	3.29E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
6	Toluene	3.29E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
6	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
6	Trichloroethane[1,1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
6	Trichloroethane[1,1,2-]	3.29E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
6	Trichloroethene	3.29E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
6	Trichlorofluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Trichloropropane[1,2,3-]	3.29E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
6	Trimethylbenzene[1,2,4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trimethylbenzene[1,3,5-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Vinyl Chloride	3.29E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
6	Xylene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
6	Xylene[1,3-]+Xylene[1,4-]	6.58E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
7	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**5.86E-06**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Heptachlorodibenzodioxins (Total)**	**1.01E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**2.21E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Heptachlorodibenzofurans (Total)**	**1.22E-05**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Hexachlorodibenzofurans (Total)**	**1.36E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**6.84E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**1.92E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
7	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzofuran[2,3,7,8-]	1.16E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Aluminum**	**5.28E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
7	Antimony	3.19E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
7	**Arsenic**	**8.22E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
7	**Barium**	**4.12E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
7	**Beryllium**	**1.67E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
7	Cadmium	9.68E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
7	**Calcium**	**5.81E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
7	**Chromium**	**1.86E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
7	**Cobalt**	**8.42E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
7	**Copper**	**1.74E+02**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
7	**Iron**	**2.14E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
7	**Lead**	**9.68E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
7	**Magnesium**	**3.74E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
7	**Manganese**	**2.58E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
7	Mercury	3.77E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
7	**Nickel**	**7.61E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
7	**Potassium**	**6.13E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
7	Selenium	3.44E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
7	Silver	6.85E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
7	**Sodium**	**2.61E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
7	Thallium	1.34E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
7	**Vanadium**	**4.83E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	TRUE
7	**Zinc**	**5.73E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	TRUE
7	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**HMX**	**1.72E-01**	mg/kg	**Y**	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
7	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
7	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
7	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
7	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
7	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
7	TATB	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetryl	1.49E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
7	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
7	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Perchlorate	4.93E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
7	**Gross alpha**	**8.70E+00**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	**Gross beta**	**2.40E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Plutonium-238	-1.31E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
7	Plutonium-239/240	1.31E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
7	Acenaphthene	1.00E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
7	Acenaphthylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Aniline	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Anthracene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
7	Azobenzene	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(a)anthracene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(a)pyrene	1.00E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
7	Benzo(b)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(g,h,i)perylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(k)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Benzoic Acid	1.67E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Benzyl Alcohol	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bis(2-chloroethoxy)methane	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bis(2-chloroethyl)ether	1.00E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Bis(2-ethylhexyl)phthalate	1.00E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Bromophenyl-phenylether[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chloroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chloronaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
7	Chlorophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
7	Chlorophenyl-phenyl[4-] Ether	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chrysene	1.00E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
7	Dibenz(a,h)anthracene	1.00E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
7	Dibenzofuran	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorobenzene[1,2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
7	Dichlorobenzene[1,3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorobenzene[1,4-]	1.00E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
7	Dichlorobenzidine[3,3'-]	1.00E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
7	Diethylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
7	Dimethyl Phthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
7	Dimethylphenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Di-n-butylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
7	Dinitro-2-methylphenol[4,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
7	Dinitrophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,4-]	1.00E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Di-n-octylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Diphenylamine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Fluoranthene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
7	Fluorene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
7	Hexachlorobenzene	1.00E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
7	Hexachlorobutadiene	1.00E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
7	Hexachlorocyclopentadiene	1.00E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
7	Hexachloroethane	1.00E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
7	Indeno(1,2,3-cd)pyrene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Isophorone	1.00E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
7	Methylnaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
7	Methylphenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Methylphenol[3-,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Naphthalene	1.00E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
7	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitroaniline[3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrobenzene	1.00E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Nitrophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrophenol[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrosodimethylamine[N-]	1.00E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
7	Nitroso-di-n-propylamine[N-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Oxybis(1-chloropropane)[2,2'-]	1.00E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorophenol	1.00E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
7	Phenanthrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
7	Phenol	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
7	Pyrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
7	Pyridine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trichlorobenzene[1,2,4-]	1.00E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
7	Trichlorophenol[2,4,5-]	1.00E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
7	Trichlorophenol[2,4,6-]	1.00E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
7	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
7	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
7	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
7	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
7	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
7	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
7	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
7	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
7	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
7	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
7	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
7	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dibromo-3-Chloropropane[1,2-]	5.03E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
7	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
7	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
7	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
7	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
7	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
7	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
7	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
7	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
7	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
7	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
7	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
7	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
7	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
7	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
7	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
7	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
7	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
7	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
7	Toluene	3.35E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
7	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
7	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
7	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
7	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
7	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
7	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
7	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
7	Xylene[1,3-]+Xylene[1,4-]	6.71E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
8	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**1.13E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	**Heptachlorodibenzodioxins (Total)**	**1.13E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**9.66E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
8	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**Tetrachlorodibenzofuran[2,3,7,8-]**	**1.44E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
8	**Tetrachlorodibenzofurans (Totals)**	**1.44E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**Aluminum**	**3.96E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
8	Antimony	3.07E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
8	**Arsenic**	**8.66E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
8	**Barium**	**4.71E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
8	**Beryllium**	**1.79E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
8	Cadmium	9.31E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
8	**Calcium**	**4.19E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
8	**Chromium**	**3.20E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	TRUE
8	**Cobalt**	**8.95E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	TRUE
8	**Copper**	**2.54E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
8	**Iron**	**2.01E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
8	**Lead**	**7.31E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
8	**Magnesium**	**2.31E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
8	**Manganese**	**2.44E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
8	Mercury	3.55E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	**Nickel**	**1.01E+01**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
8	**Potassium**	**6.34E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
8	Selenium	3.57E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
8	Silver	5.76E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
8	**Sodium**	**2.86E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
8	Thallium	1.39E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
8	**Vanadium**	**4.65E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	TRUE
8	**Zinc**	**3.95E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
8	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**HMX**	**1.37E+00**	mg/kg	**Y**	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
8	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
8	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
8	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
8	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
8	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
8	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetryl	1.48E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
8	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
8	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Perchlorate	4.96E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
8	**Gross alpha**	**1.01E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**Gross beta**	**2.36E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Plutonium-238	-3.76E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
8	Plutonium-239/240	1.13E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
8	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
8	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
8	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
8	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	**Benzyl Alcohol**	**1.27E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Bis(2-ethylhexyl)phthalate	1.01E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
8	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
8	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
8	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
8	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
8	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
8	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
8	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
8	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
8	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Di-n-butylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
8	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
8	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
8	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
8	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
8	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
8	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
8	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
8	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
8	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
8	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
8	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
8	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
8	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
8	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
8	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
8	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
8	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
8	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
8	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
8	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
8	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
8	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
8	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
8	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
8	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
8	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
8	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
8	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
8	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
8	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dibromo-3-Chloropropane[1,2-]	5.04E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
8	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
8	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
8	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
8	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
8	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
8	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
8	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
8	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
8	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
8	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
8	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
8	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
8	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
8	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
8	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
8	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
8	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
8	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
8	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
8	Toluene	3.35E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
8	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
8	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
8	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
8	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
8	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
8	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
8	Xylene[1,3-]+Xylene[1,4-]	6.72E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
9	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**6.07E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Heptachlorodibenzodioxins (Total)**	**6.07E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**3.91E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachlorodibenzodioxin[2,3,7,8-]	9.96E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
9	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Tetrachlorodibenzofuran[2,3,7,8-]**	**1.06E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Aluminum**	**4.10E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
9	Antimony	3.12E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
9	**Arsenic**	**7.81E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
9	**Barium**	**4.55E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	**Beryllium**	**1.43E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
9	Cadmium	9.46E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
9	**Calcium**	**6.00E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
9	**Chromium**	**4.79E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	TRUE
9	**Cobalt**	**6.65E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
9	**Copper**	**2.71E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
9	**Iron**	**1.71E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
9	**Lead**	**9.07E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
9	**Magnesium**	**2.62E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
9	**Manganese**	**2.22E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
9	Mercury	3.90E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
9	**Nickel**	**1.04E+01**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
9	**Potassium**	**7.58E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
9	Selenium	3.30E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
9	Silver	2.59E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
9	**Sodium**	**3.22E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
9	Thallium	1.28E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
9	**Vanadium**	**3.39E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
9	**Zinc**	**3.65E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
9	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
9	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**HMX**	**2.95E-01**	mg/kg	**Y**	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
9	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
9	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
9	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
9	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
9	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
9	TATB	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetryl	1.49E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
9	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
9	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Perchlorate	4.97E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
9	**Gross alpha**	**7.22E+00**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Gross beta**	**2.19E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Plutonium-238	-4.05E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
9	Plutonium-239/240	-2.70E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
9	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
9	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
9	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
9	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	**Benzyl Alcohol**	**1.60E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Bis(2-ethylhexyl)phthalate	1.38E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
9	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
9	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
9	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
9	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
9	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
9	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
9	Diethylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
9	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
9	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Di-n-butylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
9	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
9	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
9	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
9	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
9	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
9	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
9	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
9	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
9	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
9	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
9	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
9	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
9	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
9	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
9	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
9	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
9	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
9	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
9	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
9	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
9	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
9	Benzene	3.36E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
9	Bromobenzene	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bromochloromethane	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Bromodichloromethane	3.36E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
9	Bromoform	3.36E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Bromomethane	3.36E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
9	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
9	Butylbenzene[n-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzene[sec-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzene[tert-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
9	Carbon Tetrachloride	3.36E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
9	Chlorobenzene	3.36E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
9	Chlorodibromomethane	3.36E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Chloroethane	3.36E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
9	Chloroform	3.36E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
9	Chloromethane	3.36E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
9	Chlorotoluene[2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chlorotoluene[4-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dibromo-3-Chloropropane[1,2-]	5.04E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
9	Dibromoethane[1,2-]	3.36E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
9	Dibromomethane	3.36E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
9	Dichlorobenzene[1,2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
9	Dichlorobenzene[1,3-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorobenzene[1,4-]	3.36E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
9	Dichlorodifluoromethane	3.36E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
9	Dichloroethane[1,1-]	3.36E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
9	Dichloroethane[1,2-]	3.36E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
9	Dichloroethene[1,1-]	3.36E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
9	Dichloroethene[cis-1,2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
9	Dichloroethene[trans-1,2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
9	Dichloropropane[1,2-]	3.36E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
9	Dichloropropane[1,3-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropane[2,2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[1,1-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[cis-1,3-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[trans-1,3-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Ethylbenzene	3.36E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
9	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Isopropylbenzene	3.36E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
9	Isopropyltoluene[4-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
9	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
9	Propylbenzene[1-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Styrene	3.36E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
9	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachloroethane[1,1,1,2-]	3.36E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
9	Tetrachloroethane[1,1,2,2-]	3.36E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
9	Tetrachloroethene	3.36E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
9	Toluene	3.36E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
9	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
9	Trichloroethane[1,1,1-]	3.36E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
9	Trichloroethane[1,1,2-]	3.36E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
9	Trichloroethene	3.36E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
9	Trichlorofluoromethane	3.36E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Trichloropropane[1,2,3-]	3.36E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
9	Trimethylbenzene[1,2,4-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trimethylbenzene[1,3,5-]	3.36E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Vinyl Chloride	3.36E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
9	Xylene[1,2-]	3.36E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
9	Xylene[1,3-]+Xylene[1,4-]	6.73E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
10	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**5.21E-06**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Heptachlorodibenzodioxins (Total)**	**1.04E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**6.88E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**4.10E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**1.18E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
10	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Tetrachlorodibenzofuran[2,3,7,8-]**	**5.50E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
10	**Tetrachlorodibenzofurans (Totals)**	**2.41E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Aluminum**	**4.13E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
10	Antimony	3.15E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
10	**Arsenic**	**7.59E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
10	**Barium**	**8.86E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
10	**Beryllium**	**1.62E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
10	Cadmium	9.55E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
10	**Calcium**	**5.04E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
10	**Chromium**	**2.16E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	TRUE
10	**Cobalt**	**6.60E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
10	**Copper**	**1.58E+02**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
10	**Iron**	**1.76E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
10	**Lead**	**1.39E+01**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
10	**Magnesium**	**2.45E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
10	**Manganese**	**2.35E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
10	**Mercury**	**5.68E-02**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
10	**Nickel**	**8.75E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
10	**Potassium**	**6.88E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
10	Selenium	3.33E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
10	Silver	5.31E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
10	**Sodium**	**3.04E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
10	Thallium	1.29E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
10	**Vanadium**	**4.29E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	TRUE
10	**Zinc**	**4.55E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
10	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Amino-2,6-dinitrotoluene[4-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**HMX**	**1.14E+00**	mg/kg	**Y**	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
10	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
10	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
10	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
10	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
10	**TATB**	**1.06E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetryl	1.50E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
10	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trinitrotoluene[2,4,6-]	1.50E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
10	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Perchlorate	4.98E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
10	**Gross alpha**	**1.22E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Gross beta**	**3.21E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Plutonium-238	1.01E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
10	Plutonium-239/240	1.15E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
10	Acenaphthene	1.00E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
10	Acenaphthylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Aniline	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Anthracene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
10	Azobenzene	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(a)anthracene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(a)pyrene	1.00E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
10	Benzo(b)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(g,h,i)perylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(k)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Benzoic Acid	1.67E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Benzyl Alcohol**	**1.65E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bis(2-chloroethoxy)methane	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bis(2-chloroethyl)ether	1.00E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Bis(2-ethylhexyl)phthalate	3.05E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Bromophenyl-phenylether[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Butylbenzylphthalate**	**3.21E-02**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chloroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chloronaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
10	Chlorophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
10	Chlorophenyl-phenyl[4-] Ether	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chrysene	1.00E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Dibenz(a,h)anthracene	1.00E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
10	Dibenzofuran	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorobenzene[1,2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
10	Dichlorobenzene[1,3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorobenzene[1,4-]	1.00E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
10	Dichlorobenzidine[3,3'-]	1.00E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
10	Diethylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
10	Dimethyl Phthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
10	Dimethylphenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
10	**Di-n-butylphthalate**	**2.48E-02**	mg/kg	**Y**	J	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
10	Dinitro-2-methylphenol[4,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
10	Dinitrophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,4-]	1.00E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Di-n-octylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Diphenylamine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	**Fluoranthene**	**1.87E-02**	mg/kg	**Y**	J	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
10	Fluorene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
10	Hexachlorobenzene	1.00E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
10	Hexachlorobutadiene	1.00E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
10	Hexachlorocyclopentadiene	1.00E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
10	Hexachloroethane	1.00E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
10	Indeno(1,2,3-cd)pyrene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Isophorone	1.00E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
10	Methylnaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
10	Methylphenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Methylphenol[3-,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Naphthalene	1.00E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
10	Nitroaniline[2-]	1.10E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitroaniline[3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrobenzene	1.00E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
10	Nitrophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrophenol[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrosodimethylamine[N-]	1.00E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
10	Nitroso-di-n-propylamine[N-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Oxybis(1-chloropropane)[2,2'-]	1.00E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorophenol	1.00E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Phenanthrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
10	Phenol	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
10	**Pyrene**	**1.61E-02**	mg/kg	**Y**	J	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
10	Pyridine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trichlorobenzene[1,2,4-]	1.00E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
10	Trichlorophenol[2,4,5-]	1.00E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
10	Trichlorophenol[2,4,6-]	1.00E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
10	Acetone	1.64E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
10	Benzene	3.28E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
10	Bromobenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bromochloromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bromodichloromethane	3.28E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
10	Bromoform	3.28E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Bromomethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
10	Butanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
10	Butylbenzene[n-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butylbenzene[sec-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butylbenzene[tert-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Carbon Disulfide	1.64E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
10	Carbon Tetrachloride	3.28E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
10	Chlorobenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
10	Chlorodibromomethane	3.28E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Chloroethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
10	Chloroform	3.28E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
10	Chloromethane	3.28E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
10	Chlorotoluene[2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chlorotoluene[4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dibromo-3-Chloropropane[1,2-]	4.93E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
10	Dibromoethane[1,2-]	3.28E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
10	Dibromomethane	3.28E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
10	Dichlorobenzene[1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
10	Dichlorobenzene[1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorobenzene[1,4-]	3.28E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
10	Dichlorodifluoromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
10	Dichloroethane[1,1-]	3.28E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
10	Dichloroethane[1,2-]	3.28E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
10	Dichloroethene[1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
10	Dichloroethene[cis-1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
10	Dichloroethene[trans-1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Dichloropropane[1,2-]	3.28E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
10	Dichloropropane[1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropane[2,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[cis-1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[trans-1,3-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Ethylbenzene	3.28E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
10	Hexanone[2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Iodomethane	1.64E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Isopropylbenzene	3.28E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
10	Isopropyltoluene[4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Methyl-2-pentanone[4-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
10	Methylene Chloride	1.64E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
10	Propylbenzene[1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Styrene	3.28E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
10	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachloroethane[1,1,1,2-]	3.28E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
10	Tetrachloroethane[1,1,2,2-]	3.28E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
10	Tetrachloroethene	3.28E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
10	Toluene	3.28E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
10	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.64E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
10	Trichloroethane[1,1,1-]	3.28E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
10	Trichloroethane[1,1,2-]	3.28E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
10	Trichloroethene	3.28E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
10	Trichlorofluoromethane	3.28E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Trichloropropane[1,2,3-]	3.28E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
10	Trimethylbenzene[1,2,4-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trimethylbenzene[1,3,5-]	3.28E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Vinyl Chloride	3.28E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
10	Xylene[1,2-]	3.28E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
10	Xylene[1,3-]+Xylene[1,4-]	6.57E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
11	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**1.17E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Heptachlorodibenzodioxins (Total)**	**2.07E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**1.10E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Heptachlorodibenzofurans (Total)**	**2.70E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Hexachlorodibenzodioxins (Total)**	**9.86E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Hexachlorodibenzofurans (Total)**	**7.05E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**9.57E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**3.40E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachlorodibenzodioxin[2,3,7,8-]	9.96E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
11	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Tetrachlorodibenzofuran[2,3,7,8-]**	**5.60E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Aluminum**	**4.37E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
11	Antimony	3.24E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
11	**Arsenic**	**8.85E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
11	**Barium**	**3.93E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
11	**Beryllium**	**2.25E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
11	Cadmium	9.81E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
11	**Calcium**	**3.59E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
11	**Chromium**	**1.49E+01**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
11	**Cobalt**	**5.81E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
11	**Copper**	**6.42E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
11	**Iron**	**1.39E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
11	**Lead**	**9.56E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
11	**Magnesium**	**3.16E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
11	**Manganese**	**2.05E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
11	**Mercury**	**1.31E-01**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	TRUE
11	**Nickel**	**8.35E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
11	**Potassium**	**6.09E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
11	Selenium	3.42E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
11	Silver	3.49E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
11	**Sodium**	**2.66E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
11	Thallium	1.33E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	**Vanadium**	**2.80E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
11	**Zinc**	**6.25E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	TRUE
11	2,4-Diamino-6-nitrotoluene	4.95E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	2,6-Diamino-4-nitrotoluene	6.53E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	3,5-Dinitroaniline	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**HMX**	**1.93E+00**	mg/kg	**Y**	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
11	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
11	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
11	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
11	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
11	PETN	2.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
11	**TATB**	**7.91E-01**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetryl	1.49E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
11	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
11	Tris (o-cresyl) phosphate	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Perchlorate	5.04E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
11	**Gross alpha**	**1.29E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Gross beta**	**2.77E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Plutonium-238	6.80E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
11	**Plutonium-239/240**	**4.62E-02**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
11	Acenaphthene	1.01E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
11	Acenaphthylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Aniline	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Anthracene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
11	Azobenzene	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(a)anthracene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(a)pyrene	1.01E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
11	Benzo(b)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(g,h,i)perylene	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(k)fluoranthene	1.01E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Benzoic Acid	1.68E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Benzyl Alcohol**	**4.34E-01**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Bis(2-chloroethoxy)methane	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bis(2-chloroethyl)ether	1.01E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Bis(2-ethylhexyl)phthalate	1.48E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Bromophenyl-phenylether[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	**Butylbenzylphthalate**	**6.35E-02**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chloroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chloronaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
11	Chlorophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
11	Chlorophenyl-phenyl[4-] Ether	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chrysene	1.01E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
11	Dibenz(a,h)anthracene	1.01E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
11	Dibenzofuran	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorobenzene[1,2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
11	Dichlorobenzene[1,3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorobenzene[1,4-]	1.01E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
11	Dichlorobenzidine[3,3'-]	1.01E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
11	Diethylphthalate	1.28E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
11	Dimethyl Phthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
11	Dimethylphenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
11	**Di-n-butylphthalate**	**1.00E-01**	mg/kg	**Y**	NQ	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
11	Dinitro-2-methylphenol[4,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
11	Dinitrophenol[2,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,4-]	1.01E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,6-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Di-n-octylphthalate	1.01E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Diphenylamine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Fluoranthene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
11	Fluorene	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
11	Hexachlorobenzene	1.01E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
11	Hexachlorobutadiene	1.01E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
11	Hexachlorocyclopentadiene	1.01E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
11	Hexachloroethane	1.01E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
11	Indeno(1,2,3-cd)pyrene	1.01E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Isophorone	1.01E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
11	Methylnaphthalene[2-]	1.01E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
11	Methylphenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Methylphenol[3-,4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Naphthalene	1.01E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
11	Nitroaniline[2-]	1.11E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitroaniline[3-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitroaniline[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrobenzene	1.01E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
11	Nitrophenol[2-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrophenol[4-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrosodimethylamine[N-]	1.01E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
11	Nitroso-di-n-propylamine[N-]	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Oxybis(1-chloropropane)[2,2'-]	1.01E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorophenol	1.01E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
11	Phenanthrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
11	Phenol	1.01E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
11	Pyrene	1.01E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
11	Pyridine	1.01E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Trichlorobenzene[1,2,4-]	1.01E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
11	Trichlorophenol[2,4,5-]	1.01E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
11	Trichlorophenol[2,4,6-]	1.01E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
11	Acetone	1.65E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
11	Benzene	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
11	Bromobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bromochloromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bromodichloromethane	3.29E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
11	Bromoform	3.29E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Bromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
11	Butanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
11	Butylbenzene[n-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butylbenzene[sec-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butylbenzene[tert-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Carbon Disulfide	1.65E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
11	Carbon Tetrachloride	3.29E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
11	Chlorobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
11	Chlorodibromomethane	3.29E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Chloroethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
11	Chloroform	3.29E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
11	Chloromethane	3.29E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
11	Chlorotoluene[2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chlorotoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dibromo-3-Chloropropane[1,2-]	4.95E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Dibromoethane[1,2-]	3.29E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
11	Dibromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
11	Dichlorobenzene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
11	Dichlorobenzene[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorobenzene[1,4-]	3.29E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
11	Dichlorodifluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
11	Dichloroethane[1,1-]	3.29E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
11	Dichloroethane[1,2-]	3.29E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
11	Dichloroethene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
11	Dichloroethene[cis-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
11	Dichloroethene[trans-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
11	Dichloropropane[1,2-]	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
11	Dichloropropane[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropane[2,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[cis-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[trans-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Ethylbenzene	3.29E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
11	Hexanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Iodomethane	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Isopropylbenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
11	Isopropyltoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Methyl-2-pentanone[4-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
11	Methylene Chloride	1.65E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
11	Propylbenzene[1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Styrene	3.29E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
11	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachloroethane[1,1,1,2-]	3.29E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
11	Tetrachloroethane[1,1,2,2-]	3.29E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
11	Tetrachloroethene	3.29E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
11	Toluene	3.29E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
11	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
11	Trichloroethane[1,1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
11	Trichloroethane[1,1,2-]	3.29E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
11	Trichloroethene	3.29E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
11	Trichlorofluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Trichloropropane[1,2,3-]	3.29E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
11	Trimethylbenzene[1,2,4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Trimethylbenzene[1,3,5-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Vinyl Chloride	3.29E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
11	Xylene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
11	Xylene[1,3-]+Xylene[1,4-]	6.60E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
12	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**3.01E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	**Heptachlorodibenzodioxins (Total)**	**5.65E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**2.49E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.93E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofuran[1,2,3,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofuran[2,3,4,7,8-]	4.96E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Tetrachlorodibenzodioxin[2,3,7,8-]	9.93E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
12	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	**Tetrachlorodibenzofuran[2,3,7,8-]**	**3.75E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
12	**Tetrachlorodibenzofurans (Totals)**	**3.75E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	**Aluminum**	**1.76E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
12	Antimony	3.08E+00	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
12	**Arsenic**	**3.65E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
12	**Barium**	**1.68E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
12	**Beryllium**	**2.05E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
12	Cadmium	9.34E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
12	**Calcium**	**5.88E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
12	**Chromium**	**3.22E+00**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
12	**Cobalt**	**2.25E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
12	**Copper**	**4.92E+00**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	**Iron**	**9.03E+03**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
12	**Lead**	**7.11E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
12	**Magnesium**	**3.75E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
12	**Manganese**	**2.17E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
12	Mercury	3.77E-03	mg/kg	N	U	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
12	**Nickel**	**1.27E+00**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
12	**Potassium**	**3.74E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
12	Selenium	3.58E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
12	Silver	1.67E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
12	**Sodium**	**1.28E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
12	Thallium	1.39E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
12	**Vanadium**	**1.14E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
12	**Zinc**	**3.86E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
12	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Amino-2,6-dinitrotoluene[4-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	HMX	1.50E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
12	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
12	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
12	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
12	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
12	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
12	TATB	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Tetryl	1.50E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
12	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trinitrotoluene[2,4,6-]	1.50E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
12	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Perchlorate	4.92E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
12	**Gross alpha**	**1.42E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	**Gross beta**	**3.67E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Plutonium-238	-5.36E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
12	Plutonium-239/240	2.01E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
12	Acenaphthene	1.00E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Acenaphthylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Aniline	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Anthracene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
12	Azobenzene	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(a)anthracene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(a)pyrene	1.00E-02	mg/kg	N	U	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
12	Benzo(b)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(g,h,i)perylene	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(k)fluoranthene	1.00E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
12	Benzoic Acid	1.67E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Benzyl Alcohol	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bis(2-chloroethoxy)methane	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bis(2-chloroethyl)ether	1.00E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Bis(2-ethylhexyl)phthalate	1.00E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Bromophenyl-phenylether[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butylbenzylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chloroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chloronaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
12	Chlorophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
12	Chlorophenyl-phenyl[4-] Ether	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chrysene	1.00E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
12	Dibenz(a,h)anthracene	1.00E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
12	Dibenzofuran	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorobenzene[1,2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
12	Dichlorobenzene[1,3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorobenzene[1,4-]	1.00E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
12	Dichlorobenzidine[3,3'-]	1.00E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
12	Diethylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
12	Dimethyl Phthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
12	Dimethylphenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Di-n-butylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
12	Dinitro-2-methylphenol[4,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
12	Dinitrophenol[2,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,4-]	1.00E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,6-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Di-n-octylphthalate	1.00E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Diphenylamine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Fluoranthene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
12	Fluorene	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
12	Hexachlorobenzene	1.00E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
12	Hexachlorobutadiene	1.00E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
12	Hexachlorocyclopentadiene	1.00E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
12	Hexachloroethane	1.00E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
12	Indeno(1,2,3-cd)pyrene	1.00E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Isophorone	1.00E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
12	Methylnaphthalene[2-]	1.00E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
12	Methylphenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Methylphenol[3-,4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Naphthalene	1.00E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
12	Nitroaniline[2-]	1.10E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitroaniline[3-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitroaniline[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrobenzene	1.00E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
12	Nitrophenol[2-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrophenol[4-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrosodimethylamine[N-]	1.00E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
12	Nitroso-di-n-propylamine[N-]	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Oxybis(1-chloropropane)[2,2'-]	1.00E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorophenol	1.00E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
12	Phenanthrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
12	Phenol	1.00E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
12	Pyrene	1.00E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
12	Pyridine	1.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trichlorobenzene[1,2,4-]	1.00E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
12	Trichlorophenol[2,4,5-]	1.00E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
12	Trichlorophenol[2,4,6-]	1.00E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
12	Acetone	1.67E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
12	Benzene	3.34E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
12	Bromobenzene	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bromochloromethane	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bromodichloromethane	3.34E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
12	Bromoform	3.34E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Bromomethane	3.34E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
12	Butanone[2-]	1.67E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
12	Butylbenzene[n-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butylbenzene[sec-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Butylbenzene[tert-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Carbon Disulfide	1.67E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
12	Carbon Tetrachloride	3.34E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
12	Chlorobenzene	3.34E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
12	Chlorodibromomethane	3.34E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Chloroethane	3.34E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
12	Chloroform	3.34E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
12	Chloromethane	3.34E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
12	Chlorotoluene[2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chlorotoluene[4-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dibromo-3-Chloropropane[1,2-]	5.02E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
12	Dibromoethane[1,2-]	3.34E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
12	Dibromomethane	3.34E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
12	Dichlorobenzene[1,2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
12	Dichlorobenzene[1,3-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorobenzene[1,4-]	3.34E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
12	Dichlorodifluoromethane	3.34E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
12	Dichloroethane[1,1-]	3.34E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
12	Dichloroethane[1,2-]	3.34E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
12	Dichloroethene[1,1-]	3.34E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
12	Dichloroethene[cis-1,2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
12	Dichloroethene[trans-1,2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
12	Dichloropropane[1,2-]	3.34E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
12	Dichloropropane[1,3-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropane[2,2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[1,1-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[cis-1,3-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[trans-1,3-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Ethylbenzene	3.34E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
12	Hexanone[2-]	1.67E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Iodomethane	1.67E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Isopropylbenzene	3.34E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
12	Isopropyltoluene[4-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Methyl-2-pentanone[4-]	1.67E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
12	Methylene Chloride	1.67E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
12	Propylbenzene[1-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Styrene	3.34E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
12	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Tetrachloroethane[1,1,1,2-]	3.34E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
12	Tetrachloroethane[1,1,2,2-]	3.34E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
12	Tetrachloroethene	3.34E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
12	Toluene	3.34E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
12	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.67E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
12	Trichloroethane[1,1,1-]	3.34E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
12	Trichloroethane[1,1,2-]	3.34E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
12	Trichloroethene	3.34E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
12	Trichlorofluoromethane	3.34E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Trichloropropane[1,2,3-]	3.34E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
12	Trimethylbenzene[1,2,4-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trimethylbenzene[1,3,5-]	3.34E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Vinyl Chloride	3.34E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
12	Xylene[1,2-]	3.34E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
12	Xylene[1,3-]+Xylene[1,4-]	6.70E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
1 dup	**Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]**	**9.83E-06**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Heptachlorodibenzodioxins (Total)**	**1.76E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Heptachlorodibenzofuran[1,2,3,4,6,7,8-]**	**1.00E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Heptachlorodibenzofurans (Total)**	**3.22E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Hexachlorodibenzodioxins (Total)**	**1.10E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Hexachlorodibenzofurans (Total)**	**6.26E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]**	**8.89E-05**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]**	**2.73E-06**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
1 dup	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Tetrachlorodibenzofuran[2,3,7,8-]**	**3.63E-07**	mg/kg	**Y**	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1 dup	**Tetrachlorodibenzofurans (Totals)**	**3.63E-07**	mg/kg	**Y**	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Aluminum**	**4.67E+03**	mg/kg	**Y**	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
1 dup	Antimony	3.13E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
1 dup	**Arsenic**	**8.18E-01**	mg/kg	**Y**	J	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
1 dup	**Barium**	**5.37E+01**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
1 dup	**Beryllium**	**1.91E-01**	mg/kg	**Y**	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
1 dup	Cadmium	9.48E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
1 dup	**Calcium**	**7.16E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	TRUE
1 dup	**Chromium**	**9.63E+00**	mg/kg	**Y**	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
1 dup	**Cobalt**	**5.17E+00**	mg/kg	**Y**	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
1 dup	**Copper**	**5.15E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
1 dup	**Iron**	**1.50E+04**	mg/kg	**Y**	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
1 dup	**Lead**	**7.04E+00**	mg/kg	**Y**	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
1 dup	**Magnesium**	**3.40E+03**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
1 dup	**Manganese**	**2.16E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
1 dup	**Mercury**	**8.37E-02**	mg/kg	**Y**	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
1 dup	**Nickel**	**1.38E+01**	mg/kg	**Y**	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
1 dup	**Potassium**	**6.20E+02**	mg/kg	**Y**	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
1 dup	Selenium	3.43E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
1 dup	Silver	3.02E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
1 dup	**Sodium**	**3.99E+02**	mg/kg	**Y**	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
1 dup	Thallium	1.33E-01	mg/kg	N	U	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
1 dup	**Vanadium**	**2.36E+01**	mg/kg	**Y**	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
1 dup	**Zinc**	**3.73E+01**	mg/kg	**Y**	J+	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
1 dup	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
1 dup	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
1 dup	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1 dup	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
1 dup	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
1 dup	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
1 dup	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1 dup	**TATB**	**4.31E+00**	mg/kg	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Tetryl	1.48E-01	mg/kg	N	UJ	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1 dup	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
1 dup	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Perchlorate	4.86E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
1 dup	**Gross alpha**	**7.77E+00**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	**Gross beta**	**2.70E+01**	pCi/g	**Y**	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Plutonium-238	1.68E-02	pCi/g	N	U	N/A	FALSE	N/A	FALSE	2.30E-02	FALSE
1 dup	Plutonium-239/240	3.05E-03	pCi/g	N	U	N/A	FALSE	N/A	FALSE	5.40E-02	FALSE
1 dup	Acenaphthene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
1 dup	Acenaphthylene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Aniline	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Anthracene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
1 dup	Azobenzene	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzo(a)anthracene	1.00E-02	mg/kg	N	UJ	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzo(a)pyrene	1.00E-02	mg/kg	N	UJ	1.12E+00	FALSE	1.74E+01	FALSE	N/A	FALSE
1 dup	Benzo(b)fluoranthene	1.00E-02	mg/kg	N	UJ	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzo(g,h,i)perylene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzo(k)fluoranthene	1.00E-02	mg/kg	N	UJ	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzoic Acid	1.67E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Benzyl Alcohol	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Bis(2-chloroethoxy)methane	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Bis(2-chloroethyl)ether	1.00E-01	mg/kg	N	UJ	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Bis(2-ethylhexyl)phthalate	1.00E-02	mg/kg	N	UJ	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1 dup	Bromophenyl-phenylether[4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Butylbenzylphthalate	1.00E-02	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Chloro-3-methylphenol[4-]	1.34E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Chloroaniline[4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Chloronaphthalene[2-]	1.00E-02	mg/kg	N	UJ	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
1 dup	Chlorophenol[2-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
1 dup	Chlorophenyl-phenyl[4-] Ether	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Chrysene	1.00E-02	mg/kg	N	UJ	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dibenz(a,h)anthracene	1.00E-02	mg/kg	N	UJ	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dibenzofuran	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,2-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,3-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,4-]	1.00E-01	mg/kg	N	UJ	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1 dup	Dichlorobenzidine[3,3'-]	1.00E-01	mg/kg	N	UJ	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1 dup	Dichlorophenol[2,4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
1 dup	Diethylphthalate	1.00E-02	mg/kg	N	UJ	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
1 dup	Dimethyl Phthalate	1.00E-02	mg/kg	N	UJ	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
1 dup	Dimethylphenol[2,4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1 dup	**Di-n-butylphthalate**	**5.46E-02**	mg/kg	**Y**	J-	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
1 dup	Dinitro-2-methylphenol[4,6-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	7.33E+01	FALSE	N/A	FALSE
1 dup	Dinitrophenol[2,4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
1 dup	Dinitrotoluene[2,4-]	1.00E-01	mg/kg	N	UJ	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
1 dup	Dinitrotoluene[2,6-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Di-n-octylphthalate	1.00E-02	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Diphenylamine	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Fluoranthene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1 dup	Fluorene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1 dup	Hexachlorobenzene	1.00E-01	mg/kg	N	UJ	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
1 dup	Hexachlorobutadiene	1.00E-01	mg/kg	N	UJ	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
1 dup	Hexachlorocyclopentadiene	1.00E-01	mg/kg	N	UJ	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
1 dup	Hexachloroethane	1.00E-01	mg/kg	N	UJ	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
1 dup	Indeno(1,2,3-cd)pyrene	1.00E-02	mg/kg	N	UJ	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Isophorone	1.00E-01	mg/kg	N	UJ	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
1 dup	Methylnaphthalene[2-]	1.00E-02	mg/kg	N	UJ	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
1 dup	Methylphenol[2-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Methylphenol[3-,4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Naphthalene	1.00E-02	mg/kg	N	UJ	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
1 dup	Nitroaniline[2-]	1.11E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Nitroaniline[3-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Nitroaniline[4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Nitrobenzene	1.00E-01	mg/kg	N	UJ	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1 dup	Nitrophenol[2-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Nitrophenol[4-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Nitrosodimethylamine[N-]	1.00E-01	mg/kg	N	UJ	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
1 dup	Nitroso-di-n-propylamine[N-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Oxybis(1-chloropropane)[2,2'-]	1.00E-01	mg/kg	N	UJ	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Pentachlorophenol	1.00E-01	mg/kg	N	UJ	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
1 dup	Phenanthrene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1 dup	Phenol	1.00E-01	mg/kg	N	UJ	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
1 dup	Pyrene	1.00E-02	mg/kg	N	UJ	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1 dup	Pyridine	1.00E-01	mg/kg	N	UJ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Trichlorobenzene[1,2,4-]	1.00E-01	mg/kg	N	UJ	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
1 dup	Trichlorophenol[2,4,5-]	1.00E-01	mg/kg	N	UJ	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1 dup	Trichlorophenol[2,4,6-]	1.00E-01	mg/kg	N	UJ	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
1 dup	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
1 dup	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
1 dup	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
1 dup	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1 dup	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
1 dup	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
1 dup	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
1 dup	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
1 dup	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
1 dup	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
1 dup	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
1 dup	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
1 dup	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
1 dup	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dibromo-3-Chloropropane[1,2-]	5.03E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
1 dup	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
1 dup	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1 dup	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
1 dup	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
1 dup	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
1 dup	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
1 dup	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1 dup	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
1 dup	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
1 dup	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1 dup	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
1 dup	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
1 dup	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
1 dup	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
1 dup	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
1 dup	Temperature	5.20E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
1 dup	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
1 dup	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
1 dup	Toluene	3.35E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
1 dup	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
1 dup	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
1 dup	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
1 dup	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
1 dup	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1 dup	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
1 dup	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1 dup	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
1 dup	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
1 dup	Xylene[1,3-]+Xylene[1,4-]	6.71E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
Trip Blank	**Acetone**	**3.05E-02**	mg/kg	**Y**	J-	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
Trip Blank	Benzene	3.33E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
Trip Blank	Bromobenzene	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Bromochloromethane	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Bromodichloromethane	3.33E-04	mg/kg	N	U	6.19E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
Trip Blank	Bromoform	3.33E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Bromomethane	3.33E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
Trip Blank	**Butanone[2-]**	**2.89E-03**	mg/kg	**Y**	J-	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[n-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[sec-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[tert-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Carbon Disulfide	1.67E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
Trip Blank	Carbon Tetrachloride	3.33E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
Trip Blank	Chlorobenzene	3.33E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
Trip Blank	Chlorodibromomethane	3.33E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Chloroethane	3.33E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
Trip Blank	Chloroform	3.33E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
Trip Blank	Chloromethane	3.33E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
Trip Blank	Chlorotoluene[2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Chlorotoluene[4-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dibromo-3-Chloropropane[1,2-]	5.00E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
Trip Blank	Dibromoethane[1,2-]	3.33E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
Trip Blank	Dibromomethane	3.33E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
Trip Blank	Dichlorobenzene[1,2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
Trip Blank	Dichlorobenzene[1,3-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichlorobenzene[1,4-]	3.33E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
Trip Blank	Dichlorodifluoromethane	3.33E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethane[1,1-]	3.33E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
Trip Blank	Dichloroethane[1,2-]	3.33E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[1,1-]	3.33E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[cis-1,2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[trans-1,2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[1,2-]	3.33E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[1,3-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[2,2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[1,1-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[cis-1,3-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[trans-1,3-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Ethylbenzene	3.33E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
Trip Blank	Hexanone[2-]	1.67E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Iodomethane	1.67E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Isopropylbenzene	3.33E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
Trip Blank	Isopropyltoluene[4-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Methyl-2-pentanone[4-]	1.67E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
Trip Blank	Methylene Chloride	1.67E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
Trip Blank	Propylbenzene[1-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Styrene	3.33E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
Trip Blank	Temperature	5.00E+00	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethane[1,1,1,2-]	3.33E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethane[1,1,2,2-]	3.33E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethene	3.33E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
Trip Blank	Toluene	3.33E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE

Table 1. TA-39-6 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
Trip Blank	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.67E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
Trip Blank	Trichloroethane[1,1,1-]	3.33E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
Trip Blank	Trichloroethane[1,1,2-]	3.33E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
Trip Blank	Trichloroethene	3.33E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
Trip Blank	Trichlorofluoromethane	3.33E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Trichloropropane[1,2,3-]	3.33E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
Trip Blank	Trimethylbenzene[1,2,4-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Trimethylbenzene[1,3,5-]	3.33E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Vinyl Chloride	3.33E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
Trip Blank	Xylene[1,2-]	3.33E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
Trip Blank	Xylene[1,3-]+Xylene[1,4-]	6.67E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE

BOLD TEXT Constituent detected above the detection limit, but below the select soil screening limit

Highlighted “TRUE” value – constituent detected above either the selected soil screening level or above the background value

Supplement 4-7

Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk Screening Assessments

OPEN DETONATION UNIT AT TECHNICAL AREA 36
HUMAN HEALTH AND ECOLOGICAL RISK-SCREENING ASSESSMENTS

May 11, 2022

Prepared by:
TerranearPMC
222 Valley Creek Blvd Exton, PA 19341

For:
Waste Management Programs
Environmental Protection and Compliance Division
Los Alamos National Laboratory
P.O. Box 1663 MS M969, Los Alamos, NM 87545

EXECUTIVE SUMMARY

The area around the open detonation (OD) area Technical Area (TA) 36 (the TA-36 OD Unit) within the Los Alamos National Laboratory (LANL) was sampled as part of the application process for a Resource Conservation and Recovery Act (RCRA) permit to perform hazardous waste treatment operations. The TA-36 OD Unit is referred to as "the Unit" in the remainder of this risk assessment. Surface soil samples were collected in September 2018 and analyzed for inorganic and organic compounds. Data from these samples were used to conduct human health and ecological risk-screening assessments to determine whether hazardous contaminants from ongoing treatment operations are being released into the soil at levels that pose an unacceptable risk to human health or the environment.

Screening criteria for these assessments require that residential, industrial, and construction worker exposure scenarios be evaluated, despite that the TA-36 OD Unit is not located at a residential location. For the human health risk-screening assessment, a hypothetical future resident, industrial, and construction worker exposure scenarios were evaluated by comparing the maximum exposure point concentration for each analyte to the New Mexico Environment Department (NMED) soil screening levels (NMSSLs). The following conclusions are made:

- **Detected inorganics were compared to background values (BVs) and New Mexico risk-based soil screening levels (NMSSLs).** Eight detected inorganics exceeded BVs. Of these, only one (copper) exceeded background based on hypothesis testing. Perchlorate was retained for further evaluation because there was no BV, and cadmium was retained due to low detection frequency in both site and background data sets. Mercury was retained because there were only two detects in the background dataset, and silver was retained because there was only one detect in the background dataset.
- **Detected organics were compared to risk-based NMSSLs.** There are no individual organic constituents that exceed NMSSLs.
- **Cumulative Cancer Risk (CCR) was calculated.** Cumulative cancer risk is the sum of the individual cancer risks. The resident CCR was $3x10^{-6}$, the industrial worker CCR was $4x10^{-7}$, and the construction worker CCR was $6x10^{-8}$. Therefore, there is no excess cancer risk for any human receptor evaluated in this report.
- **Screening Level Hazard Indices (HI) were calculated.** The sum of the screening level noncancer hazard quotients (HQs) is called a HI. The noncancer HI for the hypothetical future resident is 0.3, the HI for industrial workers is 0.02, and the HI for construction workers is 0.09. As all HIs were less than 1, there is no excess noncancer hazard for human receptors evaluated in this report.
- **The screening evaluation indicates that residents or workers are not at risk due to exposure to soils at the Unit.**
- **RDX exceeds groundwater protection screening levels by a factor of 20 based on the refined EPC.**

Potential risk to ecological receptors was evaluated by analyzing different lines of evidence that were weighed to draw a conclusion regarding the potential for adverse ecological effects. This included:

- **Comparing maximum exposure point concentrations (EPC) to no effect (NE) ecological screening levels (ESLs).** There were 12 analytes for which the maximum value exceeded NE ESLs resulting in hazard quotients (HQ) greater than 0.1.
- **Comparing refined EPCs based on upper 95th percentile confidence limits (UCL95) to Low Effect (LE) ESLs.** There were six analytes for which the UCL95 EPC exceeded LE ESLs.

- **Calculating HIs.** The HIs for NE ESL exceeded 1 for all receptors, and LE ESL comparisons to the EPCs exceeded 1 for several ecological receptors.
- **Application of site-specific population area use factors and NE ESLs.** The American robin, plants, and earthworms had HQs above 1 under the area use factor analysis when compared to NE ESLs due to mercury and copper. HIs based on NE ESLs exceeded 1 for robin, deer mouse, earthworm, and plants. The HIs for robins feeding as omnivores or insectivores for comparison to NE ESLs were 2 and 3, respectively, and the HIs based on NE ESLs for earthworms and plants were 20 and 3. The HI for the deer mouse was 2, but no HQs exceeded 1.
- **Application of site-specific population area use factors and LE ESLs.** There were no analytes that exceeded LE ESLs once the areal extent of the Unit was taken into consideration in conjunction with typical home range for ecological receptors and all HQs were less than 1. HIs based on LE ESLs exceeded 1 for earthworms only. A vegetative or invertebrate soil fauna community (as represented in the risk assessment by plants and earthworms) is not expected to occur in the Unit due to intended use and bare ground, and robins are not expected to feed on a daily basis totally within the Unit due to lack of food and cover, as well as human disturbance due to intended use.
- **Avian and mammalian population information does not indicate that birds or mammals are adversely affected**.
- **The ecological risk assessment concludes that there is likely no risk to ecological receptors at the Unit.**

Table of Contents

1. Introduction 1
2. Human Health Risk Assessment 1
   2.1. Conceptual Site Model 1
      2.1.1. Receptors 1
      2.1.2. Exposure Pathways 1
      2.1.3. Approach for Identification of Chemicals of Potential Concern 2
   2.2. Screening Evaluation 6
      2.2.1. Data Analysis 6
      2.2.2. Comparison to Background 6
      2.2.3. Comparison of Maximum EPCs to NMSSLs 7
      2.2.1. Lead 8
      2.2.2. Migration to Groundwater 9
      2.2.3. Refined EPCs 9
   2.3. Uncertainty Analysis 9
      2.3.1. Data and Data Analysis 9
      2.3.2. Comparison of MDLs to NMSSLs 10
      2.3.3. Exposure Assessment 10
      2.3.4. Toxicity Values 10
      2.3.5. Additive Approach 11
   2.4. Conclusions 11
3. ECOLOGICAL Risk ASSESSMENT 12
   3.1. Introduction 12
   3.2. Problem Formulation and Conceptual Site Exposure Model 13
      3.2.1. Data Summary 13
      3.2.2. Site Visit Summary 13
      3.2.3. Receptors and Pathways 13
      3.2.4. Technical Decision Point and Recommendations 14
   3.3. Ecological Screening Evaluation 14
      3.3.1. Inorganics 15
      3.3.2. Dioxin and Furans 15
      3.3.3. Other Organics 16
      3.3.4. Hazard Indices 16
   3.4. Uncertainty Analysis 16
      3.4.1. Chemical Form 16
      3.4.2. Reporting Limits 17

3.4.3. Exposure and Risk Estimates 17
3.4.4. Mixture Toxicity 18
3.4.5. Toxicity Information 18
3.4.6. Small-Mammal Field Investigations 19
3.4.7. Avian Field Investigations 20
3.4.8. Area Use Factors 20
3.5. Conclusions 21
4. References 22
Attachment A. ProUCL Output for Upper Confidence Limits and Hypothesis Tests 61
Attachment b. Lanl ecorisk database for soil (mg/kg) 83
ATTACHMENT A. ProUCL Output
ATTACHMENT B. LANL ECORISK DATABASE 4.2

List of Tables

Table 2-1. Summary Statistics for Fall 2018 Data 26
Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations to Background 32
Table 2- 3. Human Health Screening Assessment for Organics and Inorganics Above Background 33
Table 2-4. Dioxin/Furan Data, Human Health TEFs, and TEQs 35
Table 2-5. Screening Level Risk Assessment Cumulative Cancer Risk and Hazard Index 39
Table 2-6. Migration to Groundwater Screening Evaluation for Maximum Soil Concentrations of Inorganics above Background and Detected Organics 40
Table 3-1. Ecological Screening Levels (ESLs) 41
Table 3-2. Ecological Screening Evaluation for Maximum Soil Concentrations and No Effect ESLs 44
Table 3-3. Refined Exposure Point Concentrations (EPCs) 46
Table 3-4. Ecological Screening Evaluation for Low Effect ESLs and Refined EPCs. 47
Table 3-5. Toxic Equivalency Factors (TEFs) Used for Calculating Ecological TCDD Equivalent Concentrations 48
Table 3-6. Dioxin-Furan Concentrations, Mammalian TEFs, and TEQs, ... 49
Table 3-7. Dioxin-Furan Concentrations, Avian TEFs, and TEQs 53
Table 3-8. Area Use Factor and Site-Specific Hazard Analysis for TA 36 Based on NE ESLs 57
Table 3-9. Area Use Factors and Site-Specific Hazard Analysis for TA 36 Based on LE ESLs. 58

List of Figures

Figure 1-1. Sample Location Map for the Unit OD Area 59
Figure 3-1. Conceptual Site Exposure Model (CSEM) for the Ecological Risk Assessment 60

Acronyms and Abbreviations

AUF	Area Use Factor
BMP	Best Management Practice
BV	Background Benchmark Value
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
CR	Cancer Risk
CSEM	Conceptual Site Exposure Model
DAF	Dilution Attenuation Factor
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESL	Ecological Screening Level
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMX	Cyclotetramethylene-tetranitramine
HQ	Hazard Quotient
HR	Home Range
LANL	Los Alamos National Laboratory
LD50	Lethal Dose for Half of the Population
LE	Low Effect
LOAEL	Lowest Observed Adverse Effect Level
MDL	Method Detection Limit
NE	No Effect
NMED	New Mexico Environment Department
NMSSL	New Mexico Soil Screening Levels
NOAEL	No Observed Adverse Effect Level
OD	Open Detonation
PAUF	Population Area Use Factor
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RSL	Regional Screening Level
RSRL	Regional Statistical Reference Levels
SD	Standard Deviation
SF	Cancer Slope Factor
SL	Screening Level
SL-SSL	Groundwater Protection Soil Screening Level
SVOC	Semi-volatile Organic Compound
TA	Technical Area
TATB	2,4,6-Triamino-1,3,5-trinitrobenzene
TECi	Toxicity Equivalent Concentration for congener ***i***

TEF	Toxicity Equivalency Factor
TEQ	Toxicity Equivalent Quotient
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
UCL95	95% Upper Confidence Limit of the Mean
VOC	Volatile Organic Compound
WHO	World Health Organization

1. INTRODUCTION

The area around the open detonation (OD) area at Technical Area (TA) 36 (the OD Unit) within the Los Alamos National Laboratory (LANL) was sampled as part of the application process for a Resource Conservation and Recovery Act (RCRA) permit to perform hazardous waste treatment operations. The OD Unit is referred to as "the Unit" in the remainder of this risk assessment.

The Unit is a hazardous waste management unit located in the southern portion of LANL (Figure 1-1), near Building 8. The unit was established in 1959 for the testing of explosives materials and has been used for open detonation of high explosives debris potentially contaminated with depleted uranium and other metals. The Unit consists of a relatively flat area that measures approximately 1.44 acres. All waste treatment detonations are conducted above ground with the use of a predetermined amount of explosive to initiate and increase the effectiveness of the treatment. Waste treatment shots are assembled in a manner to ensure complete detonation of the waste with minimized fragmentation dispersal. There are several firing sites and support buildings. The firing pit is bounded on the east, south, and west sides by storm water best management practices (BMPs) consisting of earth berms that have been hydroseeded and mulched.

One surface soil sampling event of the top 2 inches of soil at 15 discrete locations (Figure 1-1) was conducted in and around the Unit on September 19, 2018. Sample collection included soil both in and out of potential run-off areas; however, sample collection did not include rocks, debris, or vegetation. Data from these samples were used to conduct human health and ecological risk-screening assessments to determine whether hazardous contaminants from ongoing treatment operations are being released to soil at levels that pose an unacceptable risk to human health or the environment.

The results of the risk assessments are presented in the following sections.

2. HUMAN HEALTH RISK ASSESSMENT

2.1. CONCEPTUAL SITE MODEL

The primary land use for the human health risk assessment (HHRA) is industrial because only authorized Laboratory workers currently have access to the area around the Unit. Laboratory workers are the primary human receptors, and the industrial scenario is the defining scenario for the human health risk-screening assessment (i.e., the scenario on which decisions are based).

2.1.1. Receptors

Because the site is located within the boundaries of an operational facility (i.e., the Unit), the reasonably foreseeable future land use will continue to be industrial. Both a commercial worker and a construction worker are evaluated. A Hypothetical Future Residential exposure is also assessed and provided for comparison purposes.

2.1.2. Exposure Pathways

The release of contaminants from open detonation operations has potentially occurred for many years. Releases are transported primarily by wind, which rapidly disperses the material in ambient air. Most material is likely deposited close to the source(s), and concentrations are expected to decrease with

distance from the source. Exposure to a site worker may occur through various surface soil contact pathways. Potential exposure pathways are:

- Incidental ingestion of surface soil
- Inhalation of fugitive dust or volatiles emanating from surface soil
- Dermal contact with surface soil

Storm water discharges from the Unit are regulated under the Clean Water Act by the National Pollutant Discharge Elimination System permit program under the LANL Storm Water Individual Permit. The LANL Storm Water Individual Permit contains nonnumeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program and implementation of corrective actions where necessary, to minimize pollutants in LANL's storm water discharges. Grading for runoff and erosion control has been performed in the area of the Unit. In addition, berms and infiltration system have been installed. This, combined with the distance to the nearest surface water, makes it unlikely that impacts to surface water east of the Unit will occur.

2.1.3. Approach for Identification of Chemicals of Potential Concern

2.1.3.1. Sampling and Data Analysis

Fifteen surface soil samples and one duplicate were collected September 19, 2018. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 to 2 inches below ground surface. The duplicate pair was WST36-18-162834 and WST36-18-162985. Each sample set was analyzed for the following:

- Volatile Organic Compounds (VOCs)
- Semi-Volatile Organic Compounds (SVOCs)
- Total Metals
- Dioxins/Furans
- Perchlorates
- High Explosives

A staged approach was used for the risk assessment. Duplicates were evaluated consistent with the New Mexico Environment Department (NMED) guidance (NMED 2019) which states that in the initial screening assessment the maximum, and not the average, of the duplicate pair must be used. Figure 1-1 shows the current sampling locations from which data were obtained for use in the risk assessment.

2.1.3.2. Comparison to Background

The background data used in this evaluation is presented in the report "Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory," (LANL, 1998). The background data are used in the RCRA corrective action process to distinguish between contaminated and uncontaminated media and have been accepted by NMED. As stated in the background report, the background dataset was collected as follows:

> Twenty-one soil profiles distributed across the Pajarito Plateau were described in the field and were sampled for inorganic chemical analyses. These samples provide information about the varied soils and geomorphic settings that occur on the Pajarito Plateau, allowing for an evaluation of the variability in soil characteristics and chemistry within several of the soil series previously described by Nyhan et al. (1978, 05702). Most sampled soils were collected from mesa tops. Other geomorphic settings sampled include hillslopes and canyon bottoms. (LANL, 1998)

The locations sampled as part of the background study were not impacted by deposition from the historical operation of the OD units or other firing sites. Background values (BVs) were obtained from this document to use in comparison to site data.

Inorganic analytes are first compared to BVs established for the site (LANL, 1998). The inorganic data that exceeded BVs were then statistically compared to the background data with hypothesis tests. No further evaluation is necessary for analytes for which the maximum is less than the BV, and these data are not compared to NMED (2019) risk-based soil screening levels (NMSSLs). Organic analytes are not compared to background values as a matter of standard practice, although there are naturally occurring sources of organic constituents.

2.1.3.3. Comparison of Maximum EPCs to NMSSLs

The maximum concentration was used as the maximum exposure point concentration (EPC), which is the environmental concentration to which the receptors are potentially exposed. The screening approach used the maximum of all detected data, including the duplicate pair, for the initial screening evaluation. The maximum concentration of each analyte was divided by its NMSSL. For the HHRA, this meant using two screening levels (SLs) based on toxicity endpoints, (i.e., a cancer and noncancer SL were used to obtain a cancer risk and non-cancer hazard quotient (HQ).

All analytes that exceeded the initial NMSSLs were considered to have "failed" the initial screen. These are considered to be contaminants of potential concern (COPCs).

2.1.3.4. Surrogates

Where an NMSSL was not available, the U.S. Environmental Protection Agency (EPA) Regional Screening Level (RSL) for residential soils was applied as an SL for residential use, and the RSL for industrial commercial soil was used as the SL for industrial and construction workers. Consistent with NMED guidance, cancer-based RSLs were adjusted to a cancer risk (CR) level of $1x10^{-5}$ by multiplying the RSL by 10; noncancer RSLs were based on a HQ of 1. If an RSL was also not available, a suitable surrogate is proposed if physicochemical data suggest identifying a suitable surrogate. Most of the surrogates are proposed for nondetected analytes in order to verify that method detection limits (MDLs) are suitable for performing risk assessment.

The NMED migration to groundwater screening levels (SL-SSL) are used to assess potential migration to groundwater risks assuming human receptors then consume groundwater. Where SL-SSLs are unavailable, surrogates based on EPA RSLs are proposed. In these cases, the EPA RSL for protection of migration to groundwater was used. The EPA RSL for protection of migration to groundwater is based on a dilution attenuation factor (DAF) of 1, whereas the NMED SL-SSL is based on a DAF of 20. For consistency with NMED, the EPA RSL migration to groundwater values were multiplied by a factor of 20.

Surrogates were obtained for the following analytes because NMSSLs were not available (Table 2-1); note that most of these are not detected, and the SL is used to verify reporting limits are adequate:

- 2,4-Diamino-6-nitrotoluene – There is no NMSSL or RSL. Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 2,6-Diamino-4-nitrotoluene – Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 3,5-Dinitroaniline – There is no NMSSL. Use the amino-2,6-dinitrotoluene[4-] RSL as surrogate based on structural similarity.

- Acenaphthylene – There is no NMSSL or RSL. The NMSSLs for acenaphthene were used as a surrogate based on structural similarity.
- Aniline - There is no NMSSL. The RSLs were used as a surrogate.
- Azobenzene - There is no NMSSL. The RSLs were used as a surrogate.
- Benzo(g,h,i)perylene – There is no NMSSL or RSL. The NMSSLs for benzo(a)pyrene were used as a surrogate.
- Benzoic Acid - There is no NMSSL. RSLs were used as a surrogate.
- Benzyl Alcohol- There is no NMSSL. RSLs were used as a surrogate.
- Bis(2-chloroethoxy)methane- There is no NMSSL. RSLs were used as a surrogate.
- Bromobenzene - There is no NMSSL. RSLs were used as a surrogate.
- Bromochloromethane - There is no NMSSL. RSLs were used as a surrogate.
- Bromophenyl-phenylether[4-] – There is no NMSSL or RSL. The RSL for pentabromodiphenyl ether was used.
- Butylbenzene isomers – There are no NMSSLs. The RSLs are used as surrogates.
- Butylbenzylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Chloro-3-methylphenol[4-]– There are no NMSSLs. The RSLs are used as surrogates.
- Chloroaniline[4-] – There are no NMSSLs. The RSLs are used as surrogates.
- Chlorophenyl-phenyl[4-] Ether– There is no NMSSL or RSL. No recommendation for a surrogate is made.
- Chlorotoluene[4-] – Use the NMSSLs for the o-chlorotoluene isomer because the RSLs for the two isomers are the same.
- Dibenzofuran – There are no NMSSLs. The RSLs are used as surrogates.
- Dichlorobenzene[1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,4-dichlorobenzene were used as it may be the more toxic isomer considering it has cancer-based as well as noncancer-based endpoints.
- Dichloropropane[2,2-] – There is no NMSSL or RSL. The NMSSLs for 1,2-dichloropropane were used. The RSL is higher for 1,3 than 1,2 dichloropropane, and therefore this is considered conservative.
- Dichloropropane[1,3-] – There is no NMSSL. The NMSSLs for 1,2-dichloropropane were used.
- Dichloropropene[1,1-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[cis-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[trans-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dimethyl phthalate– There is no NMSSL or RSL. The NMSSLs for diethyl phthalate were used.
- Dinitrobenzene[1,3-] – There are no NMSSLs. The RSLs are used as surrogates.
- Di-n-octylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Diphenylamine – There are no NMSSLs. The RSLs are used as surrogates.
- Hexanone[2] – There are no NMSSLs. The RSLs are used as surrogates.
- Iodomethane – There is no NMSSL or RSL. No recommendation for a surrogate is made.

- 4-Isopropyltoluene – There is no NMSSL. The NMSSL values for toluene were used as a surrogate.
- Methylphenols – There are no NMSSLs for these compounds. The RSLs were applied for 2- and 4- methylphenol. The RSLs for 3-methylphenol were used for 3,4-methylphenol as most conservative option.
- Nitroanilines – There are no NMSSLs for these compounds. The RSLs were applied for 2- and 4-nitroaniline. The RSL for 4-nitroaniline was applied to 3-nitroaniline.
- Nitrophenols – There are no NMSSLs or RSLs for these compounds. The RSLs for phenol were applied for 2- and 4-nitrophenol.
- Nitroso-di-n-propylamine[N-] – There are no NMSSLs. The RSLs were applied.
- PETN - There is no NMSSL for PETN. RSLs were used as a surrogate.
- Propylbenzene[1-] – There are no NMSSLs. The RSLs are used as surrogates.
- Pyridine– There are no NMSSLs. The RSLs are used as surrogates.
- 1,3,5-Trinitrobenzene – There is no NMSSL. RSLs for 1,3,5-trinitrobenzene were used as a surrogate.
- TATB – There is no NMSSL or RSL for TATB. RSLs for 1,3,5-trinitrobenzene were used as a surrogate because of structural similarity.
- Trimethylbenzenes – There are no NMSSLs. The RSLs are used as surrogates.
- Tris (o-cresyl) phosphate – There is no NMSSL or RSL. The RSL for tris(2-ethylhexyl)phosphate was applied as a similar structure without halogen substitutions.

2.1.3.5. Evaluation of Refined EPCs

A refinement of the EPCs is performed if the HI or the cumulative cancer risk based on maxima exceeds target levels of 1 or $1x10^{-5}$, respectively. The maximum of each duplicate pair is used in the upper 95th percent confidence limit on the mean (UCL95). The UCL95 concentrations are compared to NMSSLs, and any analytes above the NMSSLs are considered further if necessary.

2.1.3.6. Calculation of Hazard Index or Cumulative Cancer Risk

Noncancer HQs are calculated as follows using the NMSSL based on noncancer endpoints:

$$HQ = EPC/NMSSL$$

A Hazard Index (HI) was calculated by summing all of the HQs as follows:

$$HI = \sum HQ1, HQ2, \ldots$$

A CR was calculated as follows using the cancer-based NMSSL for each receptor and adjusting from a ratio to a cancer risk:

$$CR = \frac{EPC}{NMSSL} * 1 \times 10^{-5}$$

A Cumulative Cancer Risk (CCR) was calculated by summing the cancer risks for each detected analytes as follows:

$$CCR = \sum CR1, CR2, \ldots.$$

If the HI exceeded 1, or the CCR exceeded $1x10^{-5}$, a UCL95 was calculated for all COPCs with the EPA ProUCL 5.1.002 software (EPA 2015). The refined EPCs based on UCL95 concentrations were then compared to the NMSSLs.

2.1.3.7. Dioxin/Furans

Guidance from NMED was used to evaluate the potential toxicity of the dioxin/furans. This guidance relies on the 2005 World Health Organization (WHO) toxicity equivalency factors (TEF) (Van den berg et al. 2006) approach (WHO 2009). The TEFs are multiplied by the measured concentration to obtain a congener-specific product called the toxicity equivalent concentration (TECi), and the product for each (TECi) is summed for each sample location. This sum is referred to as the toxicity equivalent quotient (TEQ). The TEQ is divided by the NMED screening level for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) to obtain a risk ratio.

2.2. SCREENING EVALUATION

The following sections present the human health risk-screening assessment for the Unit.

2.2.1. Data Analysis

Table 2-1 presents the summary statistics. Maximum concentrations in the soil samples analyzed for inorganics were compared to the established soil BVs (LANL 1998) (Table 2-2). The exposure interval for industrial workers is 0–1 ft bgs and for hypothetical future residents and construction workers the exposure interval is 0–10 ft bgs. Since all data fall within the 0–1 ft depth interval, the available data set was used for all receptors.

Antimony was the only inorganic that was never detected. Thallium and cadmium were only detected in 3 of 16 samples. Mercury was also infrequently detected in 6 of 16 samples.

Many of the organics are not detected. Organics that were detected in the surface soil samples are indicated in Table 2-1. These include energetics or explosives (e.g., HMX [cyclotetramethylene-tetranitramine], TATB, and RDX). SVOCs including fluoranthene and pyrene were detected. Phthalates (e.g., butylbenzyl- and di-n-butylphthalate) were also detected (Table 2-1), as were some dioxin/furan congeners. Methylene chloride and toluene were the only volatile organic chemicals (VOCs) detected.

2.2.2. Comparison to Background

The maximum detected result was used as the initial EPC (Table 2-2) and compared to background. Background values for the site are from the 1998 background report (LANL 1998), and soil screening levels are the NMSSLs (Table 2-2). There were no BVs for perchlorate. The maximum concentration for the following detected inorganics exceeded BVs:

- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Silver
- Thallium

- Zinc

All other inorganics were equal to or lower than BVs. A BV for perchlorate was not available and it was retained for further evaluation.

If the maximum concentration for the an inorganic exceeded its BV, the data were statistically evaluated, and if the Wilcoxon-Mann-Whitney (or Gehan test if ProUCL identified multiple detection limits) two sample hypothesis test indicated the site exceeded background, they were carried forward, in addition to retaining perchlorate for which BVs were not available. The results are as follows:

- Cadmium – BV was exceeded; statistical test showed Site≤BKG, test concluded reject from further evaluation. Only 3 detects in the Unit and background data set, therefore retain for further evaluation due to low detection frequency.
- Chromium – BV was exceeded, statistical test showed Site≤BKG, therefore reject from further evaluation.
- Copper – BV was exceeded; statistical test showed Site>BKG, therefore retain for further evaluation.
- Lead – BV was exceeded, statistical test showed Site≤BKG, therefore reject from further evaluation.
- Mercury – BV was exceeded. All BKG data had same value. No tests could be performed. Retain for further evaluation.
- Silver – BV was exceeded; no background data available for the All H horizon. Only 1 detect in Tuff horizon. Retain for further evaluation.
- Thallium - BV was exceeded, statistical test showed Site≤BKG. Only three detects in site data (two below the residential NMSSL and one above), but 105 detects in background. Since the dataset appears robust despite the low detection frequency for site data, reject from further evaluation.
- Zinc – BV was exceeded; statistical test showed Site ≤BKG, therefore reject from further evaluation.

The maximum concentration of all other inorganics was below BVs, and statistical hypothesis testing was not performed. Only inorganics that both exceeded BVs and were above background by hypothesis testing were carried forward. The ProUCL output is reported in Attachment A.

2.2.3. **Comparison of Maximum EPCs to NMSSLs**

Table 2-3 presents maximum soil concentrations for the September 2018 surface soil samples compared to the NMSSLs. There were 15 samples and one duplicate included in this data set collected in September 2018. The duplicate pair is grid point 1 (WST36-18-162985 and WST36-18-162834).

The maximum EPC for each detected analyte was divided by the industrial (i.e., composite worker and construction worker) and residential NMSSLs to obtain a HQ for each of the noncarcinogens, for which the hazard index (HI) was calculated by summing the HQs (NMED 2019). The NMSSLs used in the evaluations were obtained from current NMED guidance (NMED 2021) or the most recent EPA RSLs (EPA 2021) if an NMED value was not available (Section 2.2.4). The cancer-based EPA RSLs were multiplied by 10 to adjust them to a cancer risk level of $1x10^{-5}$, consistent with the NMSSLs. The NMSSLs for carcinogens are equivalent to a 1×10^{-5} cancer risk, and for noncarcinogens the NMSSLs correlate to a ratio or HQ of 1. Any detected organic analytes that exceeded the SLs were considered

COPCs. Any inorganic analytes that exceeded both background and the NMSSL were also considered COPCs.

2.2.3.1. Results Based on Maximum EPC for Inorganics

Maximum concentrations in the soil samples analyzed for inorganics were compared to the established soil BVs (LANL 1998) as described in Section 2.4.2. The results indicate that there were no noncancer HQs above 1 for inorganics (Table 2-3). Only cadmium is also assessed as a carcinogen, and the cancer risk was below the NMED target of $1x10^{-5}$ for all receptors (Table 2-3).

2.2.3.2. Results Based on Maximum EPC for Organics

No individual constituents exceeded NMSSLs (NMED 2021).

2.2.3.3. Dioxin/Furans

The dioxin/furans are organics but are evaluated in the analysis differently than other organics. Some dioxins/furan congeners were detected in the surface soil samples, although most were not (Table 2-1). The evaluation of the dioxin/furans is summarized in Table 2-4. The measured detected concentration or the MDL for nondetects is shown for each congener in each sample. The detection status is indicated by a zero for nondetect, and a 1 for a detected value. The TEFs are shown for each congener, and multiplying the TEF by the measured concentration (or MDL for nondetects) produces the TECi. Summing the TECi yields the TEQ. Dividing the maximum TEQ by the residential or worker NMSSLs for TCDD (Tables 2-3 and 2-4) produces a HI less than 1 and a cancer risk less than $1x10^{-5}$. Therefore, the dioxins and furans do not exceed risk-based SLs.

2.2.3.4. Hazard Indices and Cumulative Cancer Risk

The HI for the evaluation of maximum detected soil concentrations of inorganics for noncancer-based health effects was 0.2 for residents, and 0.01 for industrial workers, and 0.06 for construction workers (Table 2-5). The HI for the evaluation of maximum detected soil concentrations of organics for noncancer-based health effects was 0.04 for residents, 0.002 for industrial workers, and 0.008 for construction workers (Table 2-5). The HI for the evaluation of maximum detected soil concentrations of dioxins/furans as represented by the TCDD TEQ for noncancer-based health effects was 0.1 for residents, and 0.006 for industrial workers, and 0.02 for construction workers (Table 2-5). The total HI for noncancer-based health effects was 0.3 for residents, 0.02 for industrial workers, and 0.1 for construction workers (Table 2-5).

Cancer risk due to inorganics was $5x10^{-11}$ for residents, $1x10^{-11}$ for industrial workers, and $1x10^{-9}$ for construction workers (Table 2-5). The cancer risk for maximum detected soil concentrations of organics was $2x10^{-6}$ for residents, $2x10^{-7}$ for industrial workers, and $3x10^{-8}$ for construction workers (Table 2-5). For TCDD the cancer risk was $8x10^{-7}$ for residents, $2x10^{-7}$ for industrial workers, and $2x10^{-8}$ for construction workers (Table 2-5). Total cumulative cancer risk was $3x10^{-6}$ for residents, $4x10^{-7}$ for industrial workers, and $6x10^{-8}$ for construction workers (Table 2-5).

2.2.1. Lead

Risk evaluation of lead is separate from the other inorganics. Lead was not evaluated because the hypothesis testing indicated that site concentrations were equal to or below background (Table 2-2). Maximum lead concentrations are only 35.2 mg/kg, which is below the NMSSL of 400 mg/kg protective of residential use and the NMSSL of 800 mg/kg protective of industrial use.

2.2.2. Migration to Groundwater

Maximum concentrations were compared to NMED migration to groundwater SL-SSLs based on a DAF of 20. Where SL-SSLs were unavailable, the EPA RSL (DAF of 1) was multiplied by 20 and used as a proxy value (Section 2.2.4). All maxima with the exception of RDX were below the SL-SSL indicating there is little chance of potential migration to groundwater for nearly all constituents.

The RDX maximum is 80 times higher than the SL-SSL. For this reason, RDX was carried forward for further evaluation by use of refined EPCs based on the UCL95.

2.2.3. Refined EPCs

RDX is further evaluated because it exceeds the groundwater SL-SSL. The site data for RDX follow a normal distribution. The UCL95 statistic used as the refined EPC is a 95% Kaplan Meier (KM) (t) UCL of 1.48 mg/kg. The SL-SSL is 5.93E-02 mg/kg. Dividing the refined EPC by the SL-SSL results in a ratio of $2x10^{1}$, indicating the refined EPC is still 20 times higher than the SL-SSL.

Hydrologic information for the area north of the TA-36-8 open detonation unit is presented in the Pajarito Canyon Investigation Report, Revision 1 (LANL, 2009). Groundwater in the unit is not utilized for potable purposes. The closest water supply wells into the regional aquifer are over a mile northeast and upgradient with respect to groundwater flow direction. The depth to groundwater is approximately 1000 feet, suggesting percolation to groundwater is unlikely to occur. Furthermore, evapotranspiration exceeds precipitation, resulting in infiltration rates of less than 10 milliliters per year. The physical information combined with the low concentrations of RDX and the small spatial extent of the Unit suggests that it is unlikely that the Unit would impact groundwater significantly.

2.3. UNCERTAINTY ANALYSIS

The human health risk assessment has inherent uncertainties associated with data and data evaluation, exposure assessment, and the toxicity values on which the SLs are based. Each or all of these uncertainties may affect the assessment results, biasing the risk assessment results high or low.

2.3.1. Data and Data Analysis

Uncertainties in the data or its analysis may include errors in sampling, laboratory analysis, and data analysis. Data evaluation uncertainties are expected to have little effect on the assessment results because the data have undergone validation to minimize errors, and any errors are not expected to bias the results high or low. The J-flagged (estimated) qualification of detected concentrations of some organic COPCs does not affect the assessment. The data represent deposition from more than 60 years of operation into 2018. Therefore, the data and subsequently the screening assessment results represent current baseline conditions.

The use of a judgmental sampling design biases the risk results high since samples were targeted to locations where contamination was most likely to occur or known to occur from past sampling events.

The use of the maximum or a UCL95 as the COPC EPC for each COPC is also expected to bias risk estimates high, erring towards being conservative. Use of the maximum as the EPC overestimates exposure, as by definition all other concentrations are below this value. Use of the UCL95 may also result in an overestimation of risk since by definition true mean values are nearly always going to be less than this value.

2.3.2. Comparison of MDLs to NMSSLs

The MDLs were used for nondetects as the basis of comparing to NMSSLs to verify that detection limits were low enough to detect potential risk that might exist. Only one nondetected analyte had elevated MDLs. The maximum MDL for nitrosodimethylamine[N-] exceeds the cancer-based NMSSL for residential use resulting in a $4x10^{-5}$ cancer risk. NMSSLs for workers did not exceed $1x10^{-5}$, and there were no HQs above 1. All the MDLs are the same indicating that the laboratory cannot achieve lower results with typical laboratory practices. N-Nitrosodimethylamine is volatile and combustible and decomposes when exposed to light (PubChem 2022). It may be formed during cooking meat or fish containing sodium nitrite as a preservative, but is also found in other foods including vegetables, cheeses, alcoholic beverages, and fruits. It is a known contaminant associated with hydrazine manufacturing. Given that volatiles are not expected to remain in surface soils over time, that it is likely to break down under UV light, that residential use is not considered likely at the site, and that there are no statistical approaches that would alter the EPC, this analyte is not addressed further. The MDLs for nondetected analytes are not expected to bias the risk assessment results high or low.

2.3.3. Exposure Assessment

The exposure assessment assumptions bias the risk results high (i.e., overestimate risk). Assumptions for the industrial SLs are that the potentially exposed individual is a Laboratory worker who is outside at the site for 8 hours per day for 225 days per year (NMED 2019), and who spends the entire 8 hours on-site within the contaminated area. Assumptions for the residential SLs are that the potentially exposed individual is a resident who is present 24 hours per day for 350 days per year (NMED 2019) and spends the entire 24 hours on-site within the contaminated area. Because it is unlikely the worker or resident would be within the contaminated area for the entire time, the screening assessments overestimate the exposure. As a result, risks may be overestimated.

Assumptions underlying the exposure parameters, routes of exposure, and intake rates for routes of exposure are consistent with NMED parameters and default values (NMED 2019). In the absence of site-specific data, several upper-bound values for the assumptions may be combined to estimate exposure for any one pathway, and the resulting risk estimate can exceed the 99th percentile. Therefore, uncertainties in the assumptions underlying the exposure pathways may contribute to risk assessments that overestimate the reasonably expected risk levels.

2.3.4. Toxicity Values

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (slope factors [SFs] and reference doses [RfDs]) were used to derive the risk-based screening values used in the screening evaluation (NMED 2019). Uncertainties were identified in four areas with respect to the toxicity values: (1) extrapolation from animals to humans, (2) variability between individuals in the human population, (3) the derivation of RfDs and SFs, and (4) the chemical form of the COPC.

The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in each of these steps, potentially biasing the estimate high and resulting in the overestimation of potential risk.

For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no observed adverse effect level (NOAEL). The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment. This factor of 10 is generally considered to result in a conservative estimate of risk for noncarcinogenic COPCs.

The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision that could lead to an over- or underestimation of risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen.

COPCs may be bound to the environmental matrix and not be available for absorption into the human body following ingestion. However, the exposure scenarios typically default to the assumption that the COPCs are bioavailable. This assumption can lead to an overestimation of toxicity, total exposure, and overestimate risk.

2.3.5. Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown and possible interactions could be synergistic or antagonistic, resulting in either an underestimation or overestimation of the potential risk by assuming additivity. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated by the HI considering individual COPCs act by different mechanisms and on different target organs but are addressed additively. Cancer risks are typically assumed to be additive.

2.4. CONCLUSIONS

Inorganics were compared to BVs and risk-based SLs. Eight inorganics exceeded background to some extent. Hypothesis testing reduced the inorganics for risk screening to cadmium, copper, mercury, and silver. Perchlorate was also retained because there was no BV.

Organics were compared to risk-based NMSSLs. There were numerous organics detected, including some energetics, some SVOCs, and dioxin/furans. However, maximum concentrations of all of the detected analytes were below cancer- and noncancer-based NMSSLs for all constituents. None of the TEQs for dioxin/furans exceeded the TCDD SL. The Unit does not present an elevated cancer risk or noncancer hazard to human health due to exposure to surficial soils. The following interpretation can be made from the analysis, where the total HI or cancer risk is the sum of the inorganics, organics, and dioxin/furan values (excluding lead):

- For the residential scenario, inorganics above background, and maximum detected concentrations for each analyte, the total noncancer HI (0.3) and cancer risk ($3x10^{-6}$) are less than the NMED target levels of 1 and $1x10^{-5}$, respectively.
- Based on an industrial scenario, inorganics above background, and maximum detected concentrations for each analyte, the total noncancer HI (0.02) and cancer risk ($4x10^{-7}$) are less than the NMED target levels of 1 and $1x10^{-5}$, respectively.

- Based on a construction worker scenario, inorganics above background, and maximum detected concentrations for each analyte, the noncancer HI (0.09) and cancer risk ($6x10^{-8}$) are less than the NMED target levels of 1 and $1x10^{-5}$, respectively.
- The TEC concentration of each dioxin/furan congener was summed to obtain a TEQ which was compared to the NMED NMSSLs for each receptor for TCDD. The noncancer HI and cancer risk are less than the NMED target levels of 1 and $1x10^{-5}$, respectively.
- The maximum lead concentration of 35.2 mg/kg at the Unit is just slightly above the background value of 22.3 mg/kg, and is much less than the residential SSL (400 mg/kg). Lead is not significantly different from background based on hypothesis testing.
- RDX exceeded migration to groundwater SL-SSLs. The ratio was 80 based on the maximum RDX concentration, and 20 based on the refined EPC.
- There are no elevated human health risks for exposure to soils based on this evaluation. Risks to groundwater are considered minimal because depth to the regional aquifer is approximately 1000 ft bgs with little potential for infiltration. Runoff into surface water from the Unit is considered unlikely due to distance and existing erosion controls.

3. ECOLOGICAL RISK ASSESSMENT

3.1. INTRODUCTION

The ecological risk assessment (ERA) for the Unit is presented in the following sections. The ecological risk-screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs with Ecological Screening Levels (ESLs) in accordance with Laboratory guidance (LANL 2012a) and NMED (2017) guidance.

Site information including ESLs, biological studies, and historical information were reviewed and a site visit was conducted. A preliminary conceptual site exposure model (CSEM) was prepared.

The ESLs obtained from the ECORISK Database, Version 4.2 (LANL 2020), updated November 11, 2020), are presented in Table 3-1. The ESLs are based on toxicity data for laboratory species similar to those expected to occur at the site, and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined to be lethal to 50% of the test population (LD50). Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values, are presented in the ECORISK Database, Versions 2.0, 3.1, and 4.1 (LANL 2003; LANL 2012b; LANL 2017; LANL 2020).

The screening evaluation is conducted by dividing the EPCs by the ESLs to obtain a HQ calculated for each COPEC and screening receptor. As a generalization, the higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. The analysis begins with a comparison of the No Effect (NE) ESL for each receptor and COPEC to the maximum EPC. HQs greater than 0.1 are used to identify COPECs requiring additional evaluation.

Individual HQs for a receptor are summed to derive a HI. An HI greater than 1 indicates that further assessment may be needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

3.2. PROBLEM FORMULATION AND CONCEPTUAL SITE EXPOSURE MODEL

The Unit is a terrestrial ecosystem. The area is disturbed with little to no vegetation present. Vegetation increases with distance from the OD area and consists of grasses and shrubs. There are likely terrestrial birds and small mammals including deer mice or ground squirrels using the area, although intermittently due to the lack of food or cover. There is not enough vegetation within the 1.44-acre Unit to support large herbivores.

Due to the site history, there is the potential for energetic compounds or their breakdown products to be present in surface soils, where terrestrial animals and plants may contact surface soils and potentially be exposed. This possibility led to the collection of data and ecological risk assessment.

3.2.1. Data Summary

Soil samples used in this analysis were collected in September 2018. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 - 2 inches below ground surface. Each sample set was analyzed for the following:

- VOCs –15 samples and one duplicate
- SVOCs –15 samples and one duplicate
- Total Metals –15 samples and one duplicate
- Dioxins/Furans –15 samples and one duplicate
- High Explosives –15 samples and one duplicate

In addition, two samples were resampled for SVOCs, and some organics were analyzed by more than one method, resulting in an apparently higher sample count (i.e., 2,4 and 2,6 dinitrotoluene, nitrobenzene, dinitrobenzenes) (Table 2-1). Figure 1-1 shows a map of the site including the current sampling locations from which data were obtained for use in the risk assessment, and habitat in the immediate site vicinity is also shown in Figure 1-1.

3.2.2. Site Visit Summary

A site visit was conducted in March 2019. The area is disturbed by human activity with buildings, roads, and maintained cleared areas to minimize fire danger. The vicinity around the Unit is a terrestrial ecosystem, although within the Unit it is largely bare ground (Figure 1-1). There are likely terrestrial birds and small mammals including deer mice or ground squirrels using the area; however, there is not enough vegetation within the Unit to support birds or mammals or their prey items.

3.2.3. Receptors and Pathways

Exposure pathways are considered complete if all of the following components are present (EPA, 1989; NMED, 2017):

- A source and mechanism for hazardous waste/constituent release into the environment;
- An environmental transport medium or mechanism;
- A point of contact directly between the receptor and site-related contaminated media, or indirectly via dietary ingestion of prey or forage items contaminated by contact with site related contaminants; and

•An exposure route leading to interaction of the contaminant with target organs within the receptor.

If any of the above components are missing from the exposure pathway, it is not a complete pathway for the site.

A CSEM was developed for the site (Figure 3-1). The primary contaminant source is the testing of explosives and detonation of explosives debris at the site. Any uncombusted material, if present, could remain in soil or be released to air as fugitive dust. Materials in surface soil could be carried by overland flow or percolate into the subsurface with rain, whereas material in air could be transported by wind. Receptors could contact contaminants within the immediate site area, up to the site boundary, or slightly beyond. The use of stormwater BMPs and earthen berms reduces the potential for migration beyond the Unit.

Ingestion of soil, plants, or animals are all potential exposure routes to ecological receptors. Although inhalation is recognized to occur, it is typically considered insignificant relative to ingestion and only quantified for burrowing animals where volatile organics are present in the subsurface. Respirable dust particles are likely ingested rather than inhaled by ecological receptors, and this pathway is considered negligible (EPA 1997; EPA 2003), while non-respirable dust is ingested and accounted for in incidental soil ingestion values for wildlife species (EPA 1993; EPA 2003). Therefore, the exposure pathways considered in the development of the ESLs used in the risk-screening assessment capture the primary exposure for wildlife receptors.

Terrestrial flora (i.e., plants) and fauna (e.g., invertebrates, birds, and mammals) are the general categories of ecological receptors that could be exposed. The primary ecological exposure pathways are based on direct or indirect contact with surface soils. These include root uptake, incidental ingestion of soil, and biotic uptake leading to food-web transport. Exposure of plants and soil invertebrates is not evaluated as related to dietary pathways but as the result of direct contact with, and uptake from, the surrounding medium. For terrestrial wildlife, most exposure is considered to be through the oral pathway from the diet and incidental soil ingestion (Sample et al. 1998). The dermal contact and inhalation pathways are not typically assessed quantitatively in ecological risk assessments, based on guidance indicating the ingestion route is most important to terrestrial animals (EPA 1997; EPA 2003). Dermal exposure to wildlife is mitigated by the fur or feathers covering the bodies of most vertebrates and the incidental soil consumption during grooming is included in the direct soil ingestion estimates. Due to lack of its preferred riparian habitat and lack of dense cover, the montane shrew (*Sorex monticolus*) is not expected to occur and is not evaluated in this analysis.

3.2.4. Technical Decision Point and Recommendations

Because of the ecological habitat near the Unit boundaries, and because of the potential for exposure, the data were used to perform a quantitative screening level ecological evaluation.

3.3. Ecological Screening Evaluation

The summary statistics for the data were presented in Table 2-1. Maximum detected concentrations of each analyte are used as the initial EPC. The EPCs and the screening results for the ecological screening assessment are presented in Table 3-2. Any analytes for which the measured maximum detected value exceeded the NE ESLs were considered COPECs and were evaluated further by calculating UCL95s and comparing the UCL95s to the Low Effect (LE) ESLs. The approach used to evaluate the data for ecological risk was as follows:

- An attribution analysis (NMED 2019) was conducted by comparing the inorganic site data to BVs. Analytes less than BVs were eliminated from further evaluation. The remaining inorganics were tested with Wilcoxon-Mann Whitney or Gehan hypothesis tests to determine if site data exceeded or were similar to background. Analytes that exceeded background were carried forward. Cadmium, copper, mercury, perchlorate, and silver are carried forward (Section 2.1.3.4).
- The screening approach then used the maximum of all data, including the duplicate pair, for the initial screening evaluation. The maximum concentration of each analyte was divided by its NE ESL for each receptor.
- All analytes that exceeded the NE ESLs with a HQ greater than 0.1 were considered to have "failed" the initial screen. These are considered to be COPECs.
- A refinement of the EPCs was performed. The minimum of the duplicate pair was removed from the dataset prior to estimating UCL95 values to use as the refined EPC. The refined EPCs based on UCL95 concentrations were compared to LE ESLs, and any analytes above the LE ESLs with a HQ greater than 0.1 were evaluated further by comparison to population area use factors.

3.3.1. **Inorganics**

There are four inorganics that exceed site BVs, and perchlorate is retained because there is no BV (Section 2.2.2). The maximum concentration of each of these was compared to the NE ESL, if one was available, to determine if the resulting HQ >0.1. The inorganic analytes that exceed ecological NE SLs for one or more receptors are as follows (Table 3-2):

- Cadmium
- Copper
- Mercury
- Perchlorate
- Silver

If an inorganic analyte maximum exceeded the BV and the ratio of the maximum to the risk-based SL was greater than 0.1, a UCL95 was calculated with the EPA ProUCL 5.1.002 software (EPA 2015). This UCL95 was then compared to the LE ESLs found in Table 3-1 consistent with the NMED (2017) Tier II approach. Note that comparison to the UCL95s was made prior to incorporating population area use factors (PAUFs) into the analysis. Receptor-specific dietary composition is built into the receptor-specific ESLs. The minimum concentrations for each of the samples in the duplicate pair, site location point #1 in Figure 1-1, were removed and the UCL95 calculated with a sample size of 15. Table 3-3 presents the UCL95s used to represent refined EPCs. The ProUCL output is found in Attachment A.

UCL95 values for copper and mercury produced HQs greater than 0.1 when compared to the LE ESL with UCL95/ESL (Table 3-4). This suggests some limited potential for adverse ecological effects at the Unit, and therefore these COPECs are evaluated in more detail in the uncertainty analysis in Section 3.4.8.

3.3.2. **Dioxin and Furans**

Dioxin and furans were detected in multiple samples in the September 2018 data set. Dioxins and furans are evaluated in a multi-step process that takes the concentration of each congener and multiplies it by a TEF for mammals or birds (Table 3-5). The TEFs for mammals and birds were applied to calculate a TECi for each congener in a sample. The resulting TECi values are summed to obtain a TEQ specific to mammalian (Table 3-6) or avian (Table 3-7) receptors for each sample.

TEFs for plants and invertebrates are not available. Therefore, the TEFs for mammals were applied to represent these taxa in order to calculate TEQs. In general, mammalian TEFs are the same or higher than avian TEFs, and this results in a higher, more conservative, TEQ.

The maximum avian and mammalian TEQs were compared to the NE ESLs reported in Table 3-1. The results of the comparison to maximum EPCs is reported in Table 3-2. The UCL95 TEQ was used as the refined EPC and compared to the LE ESLs (Table 3-1) with the results reported in Table 3-4. There are no LE ESLs for birds for TCDD. The MDLs were used as the reported value for nondetected data.

The dioxin/furans produced HQs greater than 0.1 when compared to the NE ESL for birds. There is no LE ESL and further evaluation for avian species was not performed. The HQ based on the LE ESL for the deer mouse was 1; no other mammals or other ecological receptors are potentially negatively affected by dioxin/furans..

3.3.3. **Other Organics**

Maximum concentrations of six other organics produced HQs greater than 0.1 when compared to NE ESLs (Table 3-2). These were benzoic acid, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, HMX, RDX, and TATB. UCL95 values were calculated (Table 3-3) and compared to the LE ESLs (Table 3-4).

There were only two detections of benzoic acid, and four detections of di-n-butylphthalate. The low detection frequency for these two constituents means that a robust UCL95 cannot be calculated. Therefore, a median of the measured concentrations and the reported MDL values was calculated and used as the estimate of the EPC. This approach is consistent with ProUCL guidance (EPA 2015) that recommends use of alternative statistics when detection frequency is low.

Refined EPC values for bis(2-ethylhexyl)phthalate produced HQs greater than 0.1 when compared to the LE ESLs (Table 3-4) for the American kestrel and robin. RDX and TATB also produced HQs greater than 0.1 when compared to the LE ESLs (Table 3-4). These organics are further evaluated in the risk analysis in Section 3.4.8.

3.3.4. **Hazard Indices**

The HIs ranged from less than 1 for plants, mammalian herbivores, and top avian and mammalian carnivores to 10 for the robin modeled as an insectivore (Table 3-4). Section 3.4.8 addresses all COPECs with HQs greater than 0.1.

3.4. UNCERTAINTY ANALYSIS

3.4.1. **Chemical Form**

Inorganic analytes can speciate into different forms with varying degrees of toxicity. The assumptions used in the ESL derivations are conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. These factors tend to result in conservative ESL estimates, which may lead to an overestimation of the potential risk. Toxicological data are typically based on the most toxic and bioavailable chemical species, which may or may not be found in the environment. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2012a), and the values are biased toward overestimating the potential risk to receptors.

The chemical form of the individual COPECs was not determined as part of the investigation. COPECs are generally not 100% bioavailable to receptors in the natural environment because of interference from

other natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil) or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes.

3.4.2. **Reporting Limits**

Reporting limits were adequate (i.e., below NE ESLs) for ecological receptors for all analytes with few exceptions, indicating that the data were adequate for use in the risk assessment:

Thallium –

- Thallium MDLs exceeded the NE ESL for plants.
- Thallium was below background by hypothesis testing.
- Reporting limits were below the minimum LE ESL.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

Dinitrobenzene[1,3-]–

- This analyte was not detected in any sample. Reporting limits were less than the non-cancer based NMSSL for residents or workers.
- The reporting limits were two times higher than the minimum NE ESL for the robin modeled as an herbivore, the deer mouse, and the mountain cottontail.
- Reporting limits were below the minimum LE ESL.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

Hexachlorobenzene –

- This analyte was not detected in any sample. Reporting limits were less than the non-cancer based NMSSL for residents or workers.
- The reporting limits were slightly over 1 times higher than the minimum NE ESL for the robin modeled as an insectivore.
- Reporting limits were below the minimum LE ESL.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

3.4.3. **Exposure and Risk Estimates**

Exposure parameters including the EPC and the intakes likely bias risk estimates high because they presume no movement of receptors in and out of source areas. Sampling focused on areas of known or expected contamination, which biases the EPC high. Receptors are assumed to spend 100% of their time in the contaminated area which results in conservative estimates of exposure.

Another source of uncertainty is inherent in the calculation of exposure and risk estimates. Although the toxicity values are expressed to more than one significant figure, it is unlikely that the toxicity data are this accurate, especially given that the data are extrapolated from laboratory animal studies to wildlife receptors that are mobile in the environment. Likewise, given all the variables inherent in assessing exposure, exposure intakes by ecological receptors also should not be considered more accurate than one significant figure. This means that an HQ identified as 0.8 or 1.2 is actually 1, and an HQ identified as 1.5 is actually 2.

Calculating risk for dioxins is a multi-step process that involves multiplying the measured concentration by a TEF to obtain a value called the TECi that when summed adjusts the measured congener concentrations to that relative to TCDD, where the sum of all TECi is called the TEQ. TEQs were calculated for each sample to obtain a sample concentration, then a UCL95 calculated across all samples. This is consistent with how other analytes are evaluated statistically. It is not expected to bias the risk results high or low.

3.4.4. **Mixture Toxicity**

The assumption of additive effects for multiple COPECs may result in an over- or under-estimation of the potential risk to receptors. Exposure to multiple contaminants may result in other than additive effects. Conservative assumptions made with regards to EPCs would tend to overestimate exposure to any given constituent, and this would suggest that the toxicity of multiple constituents would not be underestimated. Therefore, mixture toxicity is not likely to bias the risk results high or low.

3.4.5. **Toxicity Information**

ESLs are based on toxicity information, and if toxicity data are not available an ESL is missing from the database. ESLs were not available for the cations and anions generally regarded as nutrients (i.e., calcium, magnesium, nitrate, potassium, and sodium). Human health risk was below targets for these nutrients. These inorganics were also below background. ESLs were also not available for iron, but iron was less than its BV and human health risk ratios for residents were 0.2 or lower. Lack of ESLs for these inorganics is not expected to underestimate ecological risk at the site.

Several organic chemicals (Table 3-1) do not have ESLs for any receptor in release 4.2 of the ECORISK Database (LANL 2017; LANL 2020). Predominantly, the constituents lacking ESLs are nondetected organics. In the absence of a chemical-specific ESL, concentrations can be compared with the ESLs for a surrogate chemical, if available. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted. Some chemicals without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk.

Chemicals lacking ESLs (Table 3-1) are often infrequently detected across the site. In these cases, comparisons with human health SLs are presented as part of a qualitative assessment, if human health SLs are available. The comparison of concentrations to human health SLs is a viable alternative for several reasons. Animal studies are used as the basis of toxicity values for human health risk assessments, and are the basic premise of modern toxicology (EPA 1989). In addition, toxicity values derived for the calculation of human health SLs (e.g., histopathology or biochemical changes) may be based on potential adverse effects more sensitive than the ones typically used to derive ESLs (e.g., survival, growth, or reproductive effects). EPA also applies uncertainty factors or modifying factors to ensure the toxicity values are protective (i.e., toxicity values are divided by uncertainty factors resulting in values much lower than initial study results). Since there were no predicted adverse effects on human health, chemicals lacking ESLs are unlikely to pose an ecological risk (Table 3-2). Some of the analytes for which ESLs are not available are addressed below:

- Isophorone had no ESLs. It was detected in one sample. The human health cancer risk and noncancer HQs were below targets. It is likely that this analyte will have no negative effect on ecological receptors.

- There were no ESLs for 3,5-dinitroaniline, which was not detected in any sample. The ESLs for amino-2,6-dinitrotoluene[4-] were used (Attachment B) to evaluate MDLs. HQs were less than 0.1.
- There are no avian LE ESLs for TCDD in the current (LANL 2020) LANL EcoRisk database. However, there is a NE ESL and there were no HQs greater than 1.
- There are no avian NE ESLs for most of the PAHs. However, the HQs for benzo(a)anthracene are all less than 0.1, suggesting other PAHs also might not produce adverse effects.
- There are no avian values for benzoic acid or benzyl alcohol. These did not produce adverse human health effects. There are values for mammals and so some ecological receptors are quantitatively addressed.
- There are no ESLS for isopropyltoluene[4-]. Values for toluene were used; avian values not available.
- There are no avian values for diethylphthalate. This did not produce adverse human health effects. There are values for mammals and so some ecological receptors are quantitatively addressed, and there are avian ESLs for other phthalates which are evaluated in the analysis.
- There are no NE ESLs for birds for HMX or TATB. These did not produce adverse human health effects. There are values for HMX for mammals and so some ecological receptors are quantitatively addressed, and there are avian NE ESLs for a similar compound, RDX, which is evaluated in the analysis. Values for 1,3,5-trinitrobenzene were used to represent TATB.
- There are no NE ESLs for birds for methylene chloride or toluene. These did not produce adverse human health effects. There are values for mammals and so some ecological receptors are quantitatively addressed.
- There are no NE ESLs for birds for aluminum, antimony, or beryllium. Antimony was never detected, and the other inorganics were below BVs.
- There are no avian, invertebrate, or plant NE ESLs for 2-butanone. This analyte was not detected. Mammals are evaluated and so some ecological receptors are quantitatively addressed.
- 1,3-Dintrobenzene MDL exceeded NE ESLs for robin (herbivore), deer mouse (omnivore), and cottontail (herbivore), but did not exceed any LE ESLs. This was not detected and the maximum was less than human health SLs.

TEFs reflect the toxicity of the different dioxin/furan congeners. TEFs for plants and invertebrates are not available. Therefore, the TEFs for mammals were applied to represent these taxa in order to calculate TEQs. In general, mammalian TEFs are the same or higher than avian TEFs, and this results in a higher, more conservative, TEQ. Therefore, applying mammalian TEFs for plants and earthworms is more likely to overestimate than underestimate risk.

3.4.6. **Small-Mammal Field Investigations**

Small mammal trapping and analysis of whole organisms were conducted in the area around the Unit in 2010. This information was considered useful for the current analysis as an additional line of evidence. Field mice were collected around the site and analyzed for dioxins and furans as well as metals, and for polychlorinated biphenyls (PCBs) (Fresquez 2011). Small-mammal community and population parameters were also measured across the site (Bennett and Robinson 2011).

Small mammals expected at the Unit are the deer mouse (*Peromyscus maniculatus*), brush mouse (*Peromyscus boylii*), pinyon mouse (*Peromyscus truei*), silky pocket mouse (*Perognathus flavescens*), western harvest mouse (*Reithrodontomys megalotis*), white-throated woodrat (*Neotoma albigula*), and the Mexican woodrat (*Neotoma mexicana*) (Bennett and Robinson 2011). The vegetation community consists

of piñon (*Pinus edulis Engelm*.), juniper (*Juniperus monosperma [Englem.] Sarg*.) with scattered ponderosa pine (*Pinus ponderosa C. Lawson*) and gambel oak (*Quercus gambelii Nutt*.) (Bennett and Robinson 2011). The capture rate and species diversity were highest at the Unit relative to the control area, and five species were captured. There were no differences in deer mouse sex ratios between the Unit and the control area. Average body weight of adult male deer mice was slightly higher at the Unit than at the control area. The authors of the study concluded that there was no apparent adverse effects on small mammal populations at the Unit relative to controls.

Radionuclides and chemical concentrations in biota were compared to regional statistical reference levels (RSRLs). RSRLs represent natural and fallout levels, and are the upper-level background concentrations (mean plus three standard deviations = 99% confidence level) for radionuclides and chemicals calculated from biota that was collected from regional locations away from the influence of the Laboratory (over nine miles away) (Fresquez 2011). The only analytes that exceeded RSRLs were barium (two out of three samples) and lead (three out of three samples). Dioxins/furans and explosives were not detected. These data suggest that there are no impacts to small mammal populations at the Unit.

3.4.7. **Avian Field Investigations**

Two western bluebird (*Sialia mexicana*) egg samples were obtained in 2018 from the Unit and analyzed for inorganic elements (Gaukler and Stanek 2019).

Concentrations of inorganic elements were compared with the upper-level bounds of background concentrations in bird eggs. The data indicated aluminum, antimony, arsenic, beryllium, cadmium, lead, nickel, silver, or vanadium were not detected in eggs (Gaukler and Stanec 2019). Barium, calcium, chromium, cobalt, iron, magnesium, manganese, mercury, potassium, selenium, sodium, thallium, and zinc were detected but were all below the RSRL for avian eggs. Copper at 4.1 mg/kg in one egg exceeded the RSRL of 3.6 mg/kg. Copper EPCs based on the UCL95 were compared to the ESLs for birds and were all below ESLs, suggesting that there would be no impact to bird populations due to copper. One sample of mountain bluebird (*Sialia currucoides*) eggs was collected in 2019, and no analytes were above the RSRLs (Gaukler and Stanek 2020).

Avian population metrics also do not suggest that birds in the vicinity are being negatively impacted (Hathcock et al 2018). Metrics including species richness and diversity were not statistically different from the Unit than at the control area. Species diversity was higher than at the control area in 2014, and afterwards was similar. Abundance varied in the Unit and control area annually, but abundance in the Unit compared to controls were similar over time, and just slightly lower than controls in 2016 and 2017. Species composition appears more influenced by habitat type, and indicates little difference between the Unit and control sites.

Combined, the egg concentration data and population metrics suggest that adverse health effects are not expected at the observed concentrations.

3.4.8. **Area Use Factors**

The Unit is very small with an areal extent of 1.44 acres (0.58 hectares (ha)). This is approximately the size of the home range (HR) of an individual robin as shown in Table 3-8. The HR is used to calculate area use factors (AUFs) that are used in the EcoPRG equations (LANL 2017). Individual AUFs and population area use factors (PAUFs) may be used to modify the estimate of risk to wildlife receptors to allow estimates to be more site-specific. The application of AUFs or PAUFs reduces potential overestimation of risks for those receptors with HRs larger than the area of contamination being

evaluated. The estimated ecological risk as indicated by the HQ or HI is multiplied by the AUF or PAUF. HQs for plants or invertebrates are not adjusted by area use.

Table 3-8 presents the area use hazard analysis based on NE ESLs. The NE ESLs for each COPC that failed the screening evaluation (i.e., because refined EPCs exceeded the LE ESLs with HQs greater than 0.1) are shown for each receptor. The site specific AUF and PAUFs are shown for an area equivalent to the Unit. The UCL95 EPC is divided by the ESL and multiplied by the PAUF to obtain revised HQs. The habitat is not suitable for Mexican Spotted Owls or other special status species, and so an AUF evaluation was not conducted.

The mercury HQ is above 1 for robin modeled as an insectivore based on comparison of UCL95 values as the refined EPC to the NE ESL for each receptor (Table 3-8). The HQs for copper for plants and earthworms, and the HQ for mercury for earthworms, were greater than 1. No organics produced HQs above 1 (Table 3-8).

Table 3-9 presents the area use hazard analysis based on comparison of the UCL95 values as the EPC to the LE ESLs for each receptor. There are no HQs above 1. Table 3-9 presents HIs for LE ESLs calculated by summing the HQs. HIs are above 1 only for earthworms (HI =2) for the LE ESL comparison. Summing the HQs presumes effects will be additive, when effects may occur on different target organs and not be additive.

3.5. CONCLUSIONS

The ecological risk assessment used a tiered approach for determining if the Unit would present an ecological risk. The results of the initial and highly conservative screening step indicated several inorganics occurred above background concentrations, and several detected organics, would present a potential ecological risk. Maximum concentrations of five detected inorganics (i.e., cadmium, copper, mercury, perchlorate, and silver) exceeded background. Maximum concentrations of these inorganics also exceeded NE ESLs.

Dioxin/furans, some polynuclear aromatic hydrocarbons (PAHs), phthalates, benzoic acid, benzyl alcohol, and explosives were among the organics detected in the unit. Five inorganics (cadmium copper, mercury, perchlorate, and silver) and seven detected organics (benzoic acid, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, HMX, RDX, TCDD TEQ, and TATB) exceeded NE ESLs in the initial screening level evaluation which compared maximum soil concentrations as EPCs to the NE ESLs.

Further evaluation by statistically estimating UCL95's to use as refined EPCs suggested few inorganics or organics would occur at concentrations hazardous to ecological receptors. Use of the UCL95 as the EPC provides a conservative estimate of average exposure across the Unit. Copper and mercury were the only inorganics with an HQ above 0.1 based on dividing the UCL95 by the LE ESL. UCL95's for bis(2-ethylhexyl)phthalate, RDX, TCDD TEQ, and TATB exceeded one or more LE ESLs.

Additional consideration of site ecology and receptor-specific adjustments to exposure by considering home range and site area further reduced the analytes exceeding NE ESLs. Only HQs for copper for earthworms and plants, and mercury for earthworms and robins, were above 1 based on a site-specific hazard analysis and NE ESLs. The HQs above 1 occurred for robins modeled as insectivores, and for plants and earthworms for which the area use evaluation is not relevant as they are largely immobile in the environment. However, the Unit is not vegetated because of its designated use as an OD area, and so plants and invertebrates have no habitat in the Unit. Robins would be unable to forage totally within the unit due to lack of prey and forage items. The LE ESLs are not exceeded for any receptor for any

individual constituents, but the HI for earthworms is 2. This indicates that there is a very low potential for ecological risk at the Unit.

Finally, there is no suggestion of human health risk at the Unit, and the Unit is small relative to surrounding habitat, being only 1.44 acres. Due to human disturbance, ecological receptors are unlikely to remain within the Unit on a regular basis. The Unit is not likely to present an ecological risk to any receptor evaluated.

4. REFERENCES

Bennett, K., and R. Robinson. 2011. Small Mammal Sampling at Open-Detonation Firing Sites. LA-UR-11-00717. January 2011. (Bennett and Robinson 2011)

EPA (U.S. Environmental Protection Agency), December 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final," EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1989)

EPA (U.S. Environmental Protection Agency), 1993. "Wildlife Exposure Factors Handbook," U.S. Environmental Protection Agency document EPA/600/P93/187A, Office of Research and Development, Washington, D.C. (EPA 1993)

EPA (U.S. Environmental Protection Agency), June 5, 1997. "Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final," U.S. Environmental Protection Agency, Environmental Response Team, Edison NJ. (EPA 1997)

EPA (U.S. Environmental Protection Agency), November 2003. "Guidance for Developing Ecological Soil Screening Levels, Evaluation of Dermal Contact and Inhalation Exposure Pathways for the Purpose of Setting Eco-SSLs, Attachment 1-3, U.S. Environmental Protection Agency document OSWER Directive 92857-55, Office of Solid Waste and Emergency Response. (EPA 2003)

EPA (U.S. Environmental Protection Agency), December 2010a. "Final Report Bioavailability of Dioxins and Dioxin-Like Compounds in Soil," Office of Superfund Remediation and Technology Innovation, Environmental Response Team, West Las Vegas, Nevada (http://epa.gov/superfund/health/contaminants/dioxin/pdfs/Final_dioxin_RBA_Report_12_20_10.pdf). (EPA 2010a)

EPA (U.S. Environmental Protection Agency), December 2010b. "Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8=Tetrachloro-p-dioxin and Dioxin-Like Compounds." EPA/100/R 10/005. (EPA 2010b)

EPA (U.S. Environmental Protection Agency), January 2014. "Technical Fact Sheet – N-Nitroso-dimethylamine (NDMA)". https://www.epa.gov/sites/production/files/2014-03/documents/ffrrofactsheet_contaminant_ndma_january2014_final.pdf . (EPA 2014)

EPA (U.S. Environmental Protection Agency), October 2015. "ProUCL Version 5.1.002 User Guide. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations." EPA/600/R-07/041. ORD Site Characterization and Monitoring Technical Support Center. (EPA 2015)

EPA (U.S. Environmental Protection Agency), August 2021. Regional Screening Levels (RSLs) – Generic Tables Dated November 2021. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables. (EPA 2019)

Fresquez, P.R. 2011. Chemical Concentrations In Field Mice Collected From Open-Detonation Firing Sites Ta-36 Minie And Ta-39 Point 6 At Los Alamos National Laboratory. LA-UR-11-10614. May 2011. (Fresquez 2011)

Gaukler, S. and J Stanek. 2019. " Inorganic Element Concentrations in Passerine Eggs Collected at Technical Areas 36, 39, and 16 at Los Alamos National Laboratory". LA-UR-19-25647. June 2019. (Gaukler and Stanek 2019)

Gaukler, S. and J Stanek. 2020. "2019 Results for Avian Monitoring of Inorganic and Organic Element Concentrations in Passerine Eggs and a Nestling Collected from Technical Area 16 Burn Grounds, Technical Area 36 Minie, and Technical Area 39 Point 6 at Los Alamos National Laboratory." March 25 2020. LA-UR-20-22529. (Gaukler and Stanek 2020)

Hathcock, C. D., Bartlow, A. W., and B.E. Thompson. 2018. "2017 Results for Avian Monitoring at the Unit Minie Site, TA-39 Point 6, and TA-16 Burn Ground at Los Alamos National Laboratory". 2018-04-30 (rev.1) LA-UR-18-22897. (Hathcock et al. 2018)

LANL (Los Alamos National Laboratory), September 1998. "Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998)

LANL (Los Alamos National Laboratory), November 2003. "ECORISK Database (Version 2.0)," on CD, Los Alamos, New Mexico. (LANL 2003)

LANL (Los Alamos National Laboratory). 2009. Pajarito Canyon Investigation Report, Revision 1. , Los Alamos National Laboratory document LA-UR-09-04670, Los Alamos, New Mexico. August 2009.

LANL (Los Alamos National Laboratory), November 2012a. "Screening-Level Ecological Risk Assessment Methods, Revision 3," Los Alamos National Laboratory document LA-UR-12-24152, Los Alamos, New Mexico. (LANL 2012a)

LANL (Los Alamos National Laboratory), October 2012b. "ECORISK Database (Release 3.1)," LA-UR-12- 24548, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2012b)

LANL (Los Alamos National Laboratory), 2017. "ECORISK Database User Guide, Revision 1". LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. September 2017. (LANL 2017)

LANL (Los Alamos National Laboratory), 2020. "ECORISK Database (Release 4.2)," Updated Database. LA-UR-12- 24548, Los Alamos National Laboratory, Los Alamos, New Mexico. November 19, 2020. (LANL 2020)

NMED (New Mexico Environment Department). 2017. Risk Assessment Guidance for Site Investigations and Remediation. Volume II. Soil Screening Guidance for Ecological Risk Assessments.2017 Revised. (NMED 2017)

NMED (New Mexico Environment Department). February 2019. Risk Assessment Guidance for Site Investigations and Remediation. Volume I. Soil Screening Guidance for Human Health Risk Assessments. February 2019. Rev. 1 (3/7/19) (NMED 2019)

NMED (New Mexico Environment Department). 2021. New Mexico Soil Screening Levels. December 2021. (NMED 2021)

PubChem. 2022. Compound Summary. N-nitrosodimethylamine. National Library of Medicine. Accessed March 6 2022. https://pubchem.ncbi.nlm.nih.gov/compound/N-nitrosodimethylamine.

Sample, B.E., Suter III, G.W., Efroymson, R.A., and Jones, D.A., May 1998. "A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application," Oak Ridge National Laboratory, Environmental Sciences Division, Publication No. 4783, ORNL/TM13615, Oak Ridge, TN. May 1998 (Sample et al. 1998)

Van den Berg et.al, 2006. The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency factors for Dioxin and Dioxin-like Compounds. ToxiSci Advance Access, July 7, 2006. (Van den Berg et al. 2006)

WHO (World Health Organization). September 2009. "Project For The Re-Evaluation Of Human And Mammalian Toxic Equivalency Factors (TEFS) Of Dioxins And Dioxin-Like Compounds". International Programme on Chemical Safety. http://www.who.int/ipcs/assessment/tef_update/en/ (WHO 2009)

Tables

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Inorganics								
Aluminum	16	1.77E+03	4.14E+03	2.89E+03	7.00E+02	6.24E+00	6.84E+00	16
Antimony	16	3.03E-01	3.32E-01	3.25E-01	2.94E-02	3.03E-01	3.32E-01	0
Arsenic	16	8.44E-01	2.28E+00	1.41E+00	3.37E-01	3.12E-01	3.42E-01	16
Barium	16	2.58E+01	1.15E+02	5.80E+01	2.53E+01	9.18E-02	1.01E-01	16
Beryllium	16	2.08E-01	5.88E-01	3.48E-01	1.19E-01	1.85E-02	2.02E-02	16
Cadmium	16	9.18E-02	4.67E-01	1.41E-01	1.05E-01	9.18E-02	1.01E-01	3
Calcium	16	1.68E+03	5.74E+03	2.99E+03	1.07E+03	7.34E+00	8.05E+00	16
Chromium	16	3.82E+00	4.92E+01	9.05E+00	1.08E+01	1.38E-01	1.51E-01	16
Cobalt	16	2.28E+00	8.44E+00	3.56E+00	1.43E+00	1.38E-01	1.51E-01	16
Copper	16	8.21E+00	5.97E+02	7.06E+01	1.43E+02	2.75E-01	3.02E-01	16
Iron	16	6.51E+03	1.29E+04	8.82E+03	1.77E+03	7.34E+00	8.05E+00	16
Lead	16	4.00E+00	3.52E+01	9.08E+00	7.56E+00	3.03E-01	3.32E-01	16
Magnesium	16	8.53E+02	2.58E+03	1.36E+03	3.90E+02	7.80E+00	8.55E+00	16
Manganese	16	1.19E+02	2.99E+02	1.70E+02	4.59E+01	1.84E-01	2.01E-01	16
Mercury	16	3.43E-03	7.75E-01	5.51E-02	1.92E-01	3.43E-03	3.44E-02	6
Nickel	16	3.35E+00	8.01E+00	6.28E+00	1.43E+00	9.24E-02	1.01E-01	16
Perchlorate	16	4.98E-04	2.96E-02	5.25E-03	8.52E-03	4.96E-04	1.01E-03	11
Potassium	16	3.58E+02	1.26E+03	6.89E+02	2.78E+02	5.87E+00	6.44E+00	16
Selenium	16	4.78E-01	9.37E-01	6.15E-01	1.29E-01	3.33E-01	3.64E-01	16
Silver	16	1.25E-01	2.19E+00	4.25E-01	5.20E-01	9.18E-02	1.01E-01	16
Sodium	16	3.73E+01	9.85E+01	5.33E+01	1.56E+01	6.43E+00	7.04E+00	16
Thallium	16	1.29E-01	2.22E+00	2.77E-01	5.19E-01	1.29E-01	1.42E-01	3
Vanadium	16	9.50E+00	2.90E+01	1.73E+01	4.96E+00	9.18E-02	1.01E-01	16
Zinc	16	1.85E+01	5.32E+01	2.89E+01	1.11E+01	3.67E-01	4.02E-01	16
Organics								
2,4-Diamino-6-nitrotoluene	16	4.93E-01	5.00E-01	4.96E-01	2.93E-03	4.93E-01	5.00E-01	0
2,6-Diamino-4-nitrotoluene	16	6.50E-01	6.60E-01	6.54E-01	4.15E-03	6.50E-01	6.60E-01	0
3,5-Dinitroaniline	16	2.96E-01	3.00E-01	2.98E-01	1.71E-03	2.96E-01	3.00E-01	0
Acenaphthene	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Acenaphthylene	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Acetone	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Amino-2,6-dinitrotoluene[4-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Amino-4,6-dinitrotoluene[2-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Aniline	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Anthracene	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Azobenzene	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Benzene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Benzo(a)anthracene	18	1.00E-02	2.95E-02	1.21E-02	5.04E-03	1.00E-02	1.02E-02	5
Benzo(a)pyrene	18	1.00E-02	2.72E-02	1.19E-02	4.75E-03	1.00E-02	1.02E-02	4
Benzo(b)fluoranthene	18	1.00E-02	3.25E-02	1.33E-02	7.20E-03	1.00E-02	1.02E-02	4
Benzo(g,h,i)perylene	18	1.00E-02	2.21E-02	1.09E-02	2.88E-03	1.00E-02	1.02E-02	2
Benzo(k)fluoranthene	18	1.00E-02	1.48E-02	1.04E-02	1.12E-03	1.00E-02	1.02E-02	2
Benzoic Acid	18	1.67E-01	4.97E-01	2.03E-01	1.00E-01	1.67E-01	1.70E-01	2
Benzyl Alcohol	18	1.00E-01	4.98E-01	1.38E-01	1.03E-01	1.00E-01	1.02E-01	4
Bis(2-chloroethoxy)methane	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Bis(2-chloroethyl)ether	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Bis(2-ethylhexyl)phthalate	18	1.00E-02	1.32E+00	2.25E-01	4.36E-01	1.00E-02	1.02E-02	6
Bromobenzene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Bromochloromethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Bromodichloromethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Bromoform	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Bromomethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Bromophenyl-phenylether[4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Butanone[2-]	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
Butylbenzene[n-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Butylbenzene[sec-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Butylbenzene[tert-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Butylbenzylphthalate	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Carbon Disulfide	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
Carbon Tetrachloride	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chloro-3-methylphenol[4-]	18	1.34E-01	1.36E-01	1.34E-01	6.16E-04	1.34E-01	1.36E-01	0
Chloroaniline[4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Chlorobenzene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chlorodibromomethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Chloroethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chloroform	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chloromethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chloronaphthalene[2-]	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Chlorophenol[2-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Chlorophenyl-phenyl[4-] Ether	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Chlorotoluene[2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chlorotoluene[4-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Chrysene	18	1.00E-02	2.95E-02	1.19E-02	4.91E-03	1.00E-02	1.02E-02	3
Dibenz(a,h)anthracene	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Dibenzofuran	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Dibromo-3-Chloropropane[1,2-]	16	4.66E-04	5.06E-04	4.89E-04	1.05E-05	4.66E-04	5.06E-04	0
Dibromoethane[1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dibromomethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichlorobenzene[1,2-]	34	3.10E-04	1.02E-01	5.36E-02	5.10E-02	3.10E-04	1.02E-01	0
Dichlorobenzene[1,3-]	34	3.10E-04	1.02E-01	5.36E-02	5.10E-02	3.10E-04	1.02E-01	0
Dichlorobenzene[1,4-]	34	3.10E-04	1.02E-01	5.36E-02	5.10E-02	3.10E-04	1.02E-01	0
Dichlorobenzidine[3,3'-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Dichlorodifluoromethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloroethane[1,1-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloroethane[1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloroethene[1,1-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloroethene[cis-1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloroethene[trans-1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichlorophenol[2,4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Dichloropropane[1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloropropane[1,3-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloropropane[2,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloropropene[1,1-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloropropene[cis-1,3-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Dichloropropene[trans-1,3-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Diethylphthalate	18	1.00E-02	1.44E-02	1.03E-02	1.02E-03	1.00E-02	1.02E-02	1
Dimethyl Phthalate	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Dimethylphenol[2,4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Di-n-butylphthalate	18	1.00E-02	7.44E-01	6.10E-02	1.74E-01	1.00E-02	1.02E-02	4
Dinitro-2-methylphenol[4,6-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Dinitrobenzene[1,3-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Dinitrophenol[2,4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Dinitrotoluene[2,4-]	34	1.00E-01	1.50E-01	1.23E-01	2.42E-02	1.00E-01	1.50E-01	0
Dinitrotoluene[2,6-]	34	1.00E-01	1.50E-01	1.23E-01	2.42E-02	1.00E-01	1.50E-01	0
Di-n-octylphthalate	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Diphenylamine	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Ethylbenzene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Fluoranthene	18	1.00E-02	5.33E-02	1.50E-02	1.16E-02	1.00E-02	1.02E-02	4
Fluorene	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	16	6.82E-07	1.13E-04	1.74E-05	2.99E-05	1.66E-06	1.68E-06	16
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	16	4.97E-07	4.02E-06	1.38E-06	1.28E-06	1.66E-06	1.68E-06	8
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Hexachlorobenzene	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Hexachlorobutadiene	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Hexachlorocyclopentadiene	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	16	4.97E-07	6.79E-07	5.15E-07	4.87E-08	1.73E-06	1.75E-06	2
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	16	4.97E-07	1.45E-06	6.23E-07	2.74E-07	1.66E-06	1.68E-06	4
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	16	4.97E-07	1.11E-06	5.77E-07	1.90E-07	1.95E-06	1.97E-06	3
Hexachlorodibenzofuran[1,2,3,4,7,8-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Hexachlorodibenzofuran[1,2,3,6,7,8-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Hexachlorodibenzofuran[1,2,3,7,8,9-]	16	1.71E-06	1.74E-06	4.99E-07	1.67E-09	1.71E-06	1.74E-06	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Hexachloroethane	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Hexanone[2-]	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
HMX	16	1.48E-01	3.87E+00	8.78E-01	9.83E-01	1.48E-01	1.50E-01	11
Indeno(1,2,3-cd)pyrene	18	1.00E-02	2.05E-02	1.08E-02	2.51E-03	1.00E-02	1.02E-02	2
Iodomethane	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
Isophorone	18	1.00E-01	3.24E-01	1.13E-01	5.26E-02	1.00E-01	1.02E-01	1
Isopropylbenzene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Isopropyltoluene[4-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Methyl-2-pentanone[4-]	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
Methylene Chloride	16	1.55E-03	5.73E-03	2.55E-03	1.46E-03	1.55E-03	1.69E-03	5
Methylnaphthalene[2-]	18	1.00E-02	1.02E-02	1.01E-02	4.16E-05	1.00E-02	1.02E-02	0
Methylphenol[2-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Methylphenol[3-,4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Naphthalene	18	1.00E-02	1.51E-02	1.04E-02	1.18E-03	1.00E-02	1.02E-02	1
Nitroaniline[2-]	18	1.10E-01	1.12E-01	1.11E-01	4.16E-04	1.10E-01	1.12E-01	0
Nitroaniline[3-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitroaniline[4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitrobenzene	34	1.00E-01	1.50E-01	1.23E-01	2.42E-02	1.00E-01	1.50E-01	0
Nitrophenol[2-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitrophenol[4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitrosodimethylamine[N-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitroso-di-n-propylamine[N-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Nitrotoluene[2-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Nitrotoluene[3-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Nitrotoluene[4-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	16	4.56E-06	9.20E-04	1.39E-04	2.40E-04	3.31E-06	3.36E-06	16
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	16	9.93E-07	1.63E-05	4.50E-06	5.06E-06	3.31E-06	3.36E-06	9
Oxybis(1-chloropropane)[2,2'-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Pentachlorodibenzodioxin[1,2,3,7,8-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Pentachlorodibenzofuran[1,2,3,7,8-]	16	1.66E-06	1.68E-06	4.99E-07	1.67E-09	1.66E-06	1.68E-06	0
Pentachlorodibenzofuran[2,3,4,7,8-]	16	1.75E-06	1.77E-06	4.99E-07	1.67E-09	1.75E-06	1.77E-06	0
Pentachlorophenol	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
PETN	16	2.46E-01	2.50E-01	2.48E-01	1.69E-03	2.46E-01	2.50E-01	0
Phenanthrene	18	1.00E-02	2.78E-02	1.17E-02	4.34E-03	1.00E-02	1.02E-02	4
Phenol	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Propylbenzene[1-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Pyrene	18	1.00E-02	5.57E-02	1.50E-02	1.18E-02	1.00E-02	1.02E-02	4
Pyridine	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
RDX	16	1.48E-01	4.76E+00	7.88E-01	1.33E+00	1.48E-01	1.50E-01	7
Styrene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
TATB	16	3.33E+00	2.22E+01	1.22E+01	4.73E+00	2.96E-01	1.50E+00	16

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Tetrachlorodibenzodioxin[2,3,7,8-]	16	3.31E-07	3.36E-07	1.01E-07	3.28E-09	3.31E-07	3.36E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	16	1.10E-07	2.51E-07	1.83E-07	3.86E-08	3.31E-07	3.36E-07	8
Tetrachloroethane[1,1,1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Tetrachloroethane[1,1,2,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Tetrachloroethene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Tetryl	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Toluene	16	3.10E-04	2.23E-03	5.75E-04	6.22E-04	3.10E-04	3.37E-04	4
Trichloro-1,2,2-trifluoroethane[1,1,2-]	16	1.55E-03	1.69E-03	1.63E-03	3.54E-05	1.55E-03	1.69E-03	0
Trichlorobenzene[1,2,4-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Trichloroethane[1,1,1-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trichloroethane[1,1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trichloroethene	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trichlorofluoromethane	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trichlorophenol[2,4,5-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Trichlorophenol[2,4,6-]	18	1.00E-01	1.02E-01	1.01E-01	4.16E-04	1.00E-01	1.02E-01	0
Trichloropropane[1,2,3-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trimethylbenzene[1,2,4-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trimethylbenzene[1,3,5-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Trinitrobenzene[1,3,5-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Trinitrotoluene[2,4,6-]	16	1.48E-01	1.50E-01	1.49E-01	7.75E-04	1.48E-01	1.50E-01	0
Tris (o-cresyl) phosphate	16	2.96E-01	3.00E-01	2.98E-01	1.71E-03	2.96E-01	3.00E-01	0
Vinyl Chloride	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Xylene[1,2-]	16	3.10E-04	3.37E-04	3.26E-04	7.01E-06	3.10E-04	3.37E-04	0
Xylene[1,3-]+Xylene[1,4-]	16	6.21E-04	6.75E-04	6.53E-04	1.41E-05	6.21E-04	6.75E-04	0

Notes: Sample size (n) includes duplicate of WST39-18-162834 (WST39-18-162985) and multiple analytical methods.
Abbreviations:
MDL – Method detection limit
mg/kg – milligram per kilogram
SD – Standard deviation

Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations to Background

Parameter Name	Maximum (mg/kg)	Number of Detected Values	Background	
			BV (mg/kg)	Maximum /BV Ratio
Aluminum	4.14E+03	16	29200	0.1
Antimony	4.32E-01	0	0.83	0.5
Arsenic	2.28E+00	16	8.17	0.3
Barium	1.15E+02	16	295	0.4
Beryllium	5.88E-01	16	1.83	0.3
Cadmium	4.67E-01	3	0.4	1.2
Calcium	5.74E+03	16	6120	0.9
Chromium[1]	4.92E+01	16	19.3	2.5
Cobalt	8.44E+00	16	8.64	1.0
Copper	5.97E+02	16	14.7	41
Iron	1.29E+04	16	21500	0.6
Lead[1]	3.52E+01	16	22.3	1.6
Magnesium	2.58E+03	16	4610	0.6
Manganese	2.99E+02	16	671	0.4
Mercury	7.75E-01	6	0.1	7.8
Nickel	8.01E+00	16	15.4	0.5
Perchlorate	2.96E-02	11	--	NA
Potassium	1.26E+03	16	3460	0.4
Selenium	9.37E-01	16	1.52	0.6
Silver	2.19E+00	16	1	2.2
Sodium	9.85E+01	16	915	0.1
Thallium[1]	2.22E+00	3	0.73	3.0
Vanadium	2.90E+01	16	39.6	0.7
Zinc[1]	5.32E+01	16	48.8	1.1

Notes: All data in mg/kg
[1] – Site inorganic <= background by hypothesis testing; see Section 2.2.2
-- No value
Shaded Max/BV cells indicate the inorganic is carried forward; see Section 2.2.2.
If the maximum <BV or by hypothesis testing, no further evaluation is performed
Abbreviations:
BV – Background value
HQ – Noncancer hazard quotient
NA – Not applicable

Table 2- 3. Human Health Screening Assessment for Organics and Inorganics Above Background

Parameter Name	Maximum (mg/kg)	Cancer						Noncancer					
		Res Cancer NMSSL (mg/kg)	Ind. Worker Cancer NMSSL (mg/kg)	Con. Worker Cancer NMSSL (mg/kg)	Max/ Res Cancer Risk	Max/ Ind. Worker Cancer Risk	Max/ Con. Worker Cancer Risk	Res NC NMSSL (mg/kg)	Worker NC NMSSL (mg/kg)	Con. Worker NC NMSSL (mg/kg)	Max/ Res HQ	Max/ Ind. Worker HQ	Max/ Con. Worker HQ
Cadmium	4.67E-01	8.59E+04	4.17E+05	3.61E+03	5E-11	1E-11	1E-09	7.05E+01	1.11E+03	7.21E+01	7E-03	4E-04	6E-03
Copper	5.97E+02	--	--	--	--	--	--	3.13E+03	5.19E+04	1.42E+04	2E-01	1E-02	4E-02
Mercury	7.75E-01	--	--	--	--	--	--	2.35E+01	3.89E+02	7.71E+01	3E-02	2E-03	1E-02
Perchlorate	2.96E-02	--	--	--	--	--	--	5.48E+01	9.08E+02	2.48E+02	5E-04	3E-05	1E-04
Silver	2.19E+00	--	--	--	--	--	--	3.91E+02	6.49E+03	1.77E+03	6E-03	3E-04	1E-03
2,3,7,8-TCDD TEQ	5.03E-06	4.90E-05	2.38E-04	1.72E-03	1E-06	2E-07	3E-08	5.06E-05	8.08E-04	2.26E-04	1E-01	6E-03	2E-02
Benzo(a)anthracene	2.95E-02	1.53E+00	3.23E+01	2.40E+02	2E-07	9E-09	1E-09	--	--	--	--	--	--
Benzo(a)pyrene	2.72E-02	1.12E+00	2.36E+01	1.73E+02	2E-07	1E-08	2E-09	1.74E+01	2.51E+02	1.50E+01	2E-03	1E-04	2E-03
Benzo(b)fluoranthene	3.25E-02	1.53E+00	3.23E+01	2.40E+02	2E-07	1E-08	1E-09	--	--	--	--	--	--
Benzo(g,h,i)perylene	2.21E-02	***1.12E+00***	***2.36E+01***	***1.73E+02***	2E-07	9E-09	1E-09	***1.74E+01***	***2.51E+02***	***1.50E+01***	1E-03	9E-05	1E-03
Benzo(k)fluoranthene	1.48E-02	1.53E+01	3.23E+02	2.31E+03	1E-08	5E-10	6E-11	--	--	--	--	--	--
Benzoic Acid	4.97E-01	--	--	--	--	--	--	**2.50E+05**	**3.30E+06**	**3.30E+06**	2E-06	2E-07	2E-07
Benzyl Alcohol	4.98E-01	--	--	--	--	--	--	**6.30E+03**	**8.20E+04**	**8.20E+04**	8E-05	6E-06	6E-06
Bis(2-ethylhexyl)phthalate	1.32E+00	3.80E+02	1.83E+03	1.34E+04	3E-08	7E-09	1E-09	1.23E+03	1.83E+04	5.38E+03	1E-03	7E-05	2E-04
Chrysene	2.95E-02	1.53E+02	3.23E+03	2.31E+04	2E-09	9E-11	1E-11	--	--	--	--	--	--
Diethylphthalate	1.44E-02	--	--	--	--	--	--	4.93E+04	7.33E+05	2.15E+05	3E-07	2E-08	7E-08
Di-n-butylphthalate	7.44E-01	--	--	--	--	--	--	6.16E+03	9.16E+04	2.69E+04	1E-04	8E-06	3E-05
Fluoranthene	5.33E-02	--	--	--	--	--	--	2.32E+03	3.37E+04	1.00E+04	2E-05	2E-06	5E-06
HMX	3.87E+00	--	--	--	--	--	--	3.85E+03	6.33E+04	1.74E+04	1E-03	6E-05	2E-04
Indeno(1,2,3-cd)pyrene	2.05E-02	1.53E+00	3.23E+01	2.40E+02	1E-07	6E-09	9E-10	--	--	--	--	--	--
Isophorone	3.24E-01	5.61E+03	2.70E+04	1.98E+05	6E-10	1E-10	2E-11	1.23E+04	1.83E+05	5.37E+04	3E-05	2E-06	6E-06
Methylene Chloride	5.73E-03	7.66E+02	1.44E+04	8.96E+04	7E-11	4E-12	6E-13	4.09E+02	5.13E+03	1.21E+03	1E-05	1E-06	5E-06
Naphthalene	1.51E-02	2.26E+01	1.34E+02	6.33E+02	7E-09	1E-09	2E-10	1.62E+02	8.43E+02	1.59E+02	9E-05	2E-05	1E-04
Phenanthrene	2.78E-02	--	--	--	--	--	--	1.74E+03	2.53E+04	7.53E+03	2E-05	1E-06	4E-06
Pyrene	5.57E-02	--	--	--	--	--	--	1.74E+03	2.53E+04	7.53E+03	3E-05	2E-06	7E-06
RDX	4.76E+00	8.31E+01	4.28E+02	2.96E+03	6E-07	1E-07	2E-08	3.01E+02	4.89E+03	1.35E+03	2E-02	1E-03	4E-03
TATB	2.22E+01	--	--	--	--	--	--	***2.20E+03***	***3.20E+04***	***3.20E+04***	1E-02	7E-04	7E-04
Toluene	2.23E-03	--	--	--	--	--	--	5.23E+03	6.13E+04	1.40E+04	4E-07	4E-08	2E-07
Cumulative Cancer Risk or Hazard Index		--	--	--	**3E-06**	**4E-07**	**6E-08**	**--**	**--**	**--**	**3E-01**	**2E-02**	**9E-02**

Notes:
All data in mg/kg
[1] – Site inorganic <= background by hypothesis testing
-- No value
Bolded NMSSL cells indicate the EPA RSL for an HQ of 1 is used. See Section 2.1.3.4.
Bold Italics – a surrogate is applied. See Section 2.1.3.4.
Cancer risk = Maximum/Cancer-based NMSSL x 1E-05
HQ = Maximum/Noncancer-based NMSSL

Abbreviations:
BV – Background value
Con – Construction
EPA – U.S. Environmental Protection Agency
HQ – Noncancer hazard quotient
Ind – Industrial
Max – Maximum
NC – Noncancer
NMSSL – New Mexico soil screening level
Res - Residential
RSL – Regional Screening level

Table 2-4. Dioxin/Furan Data, Human Health TEFs, and TEQs

Parameter Name	TEF	WST36-18-162834			WST36-18-162985			WST36-18-162986			WST36-18-162987		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	8.40E-07	1	8.40E-09	6.82E-07	1	6.82E-09	3.68E-06	1	3.68E-08	7.96E-06	1	7.96E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	5.00E-07	0	5.00E-09	4.97E-07	0	4.97E-09	8.20E-07	1	8.20E-09	1.49E-06	1	1.49E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	5.03E-07	0	1.68E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	5.03E-07	0	1.74E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	5.61E-06	1	1.68E-09	4.56E-06	1	1.37E-09	3.41E-05	1	1.02E-08	7.74E-05	1	2.32E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	9.99E-07	0	3.00E-10	9.94E-07	0	2.98E-10	2.54E-06	1	7.62E-10	5.55E-06	1	1.67E-09
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	5.03E-07	0	1.68E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	5.00E-07	0	5.01E-08	4.97E-07	0	4.98E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.04E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	5.00E-07	0	5.28E-07	4.97E-07	0	5.25E-07	4.98E-07	0	5.28E-07	5.03E-07	0	5.31E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.99E-08	0	3.33E-07	9.94E-08	0	3.31E-07	9.95E-08	0	3.32E-07	1.01E-07	0	3.36E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.10E-07	1	1.10E-08	1.75E-07	1	1.75E-08	1.31E-07	1	1.31E-08	2.27E-07	1	2.27E-08
TEQ				**3.45E-06**			**3.43E-06**			**3.47E-06**			**3.59E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)
WST36-18-162834 and WST36-18-162985 are the duplicate pair.

Table 2-4. Dioxin/Furan Data, Human Health TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162988			WST36-18-162989			WST36-18-162990			WST36-18-162991		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	1.74E-06	1	1.74E-08	1.06E-06	1	1.06E-08	1.11E-06	1	1.11E-08	4.67E-06	1	4.67E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	4.97E-07	0	4.97E-09	4.97E-07	0	4.97E-09	4.98E-07	0	4.98E-09	4.99E-07	0	4.99E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.97E-07	0	1.66E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.99E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.97E-07	0	1.71E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	4.99E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	1.40E-05	1	4.20E-09	1.02E-05	1	3.06E-09	1.01E-05	1	3.03E-09	4.30E-05	1	1.29E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	9.94E-07	0	2.98E-10	9.94E-07	0	2.98E-10	9.95E-07	0	2.99E-10	1.33E-06	1	3.99E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.97E-07	0	1.66E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.99E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.97E-07	0	4.98E-08	4.97E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.98E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.97E-07	0	5.25E-07	4.97E-07	0	5.25E-07	4.98E-07	0	5.28E-07	4.99E-07	0	5.28E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.94E-08	0	3.32E-07	9.94E-08	0	3.32E-07	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.79E-07	1	1.79E-08	1.87E-07	1	1.87E-08	1.71E-07	1	1.71E-08	1.44E-07	1	1.44E-08
TEQ				**3.45E-06**			**3.44E-06**			**3.44E-06**			**3.49E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 2-4. Dioxin/Furan Data, Human Health TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162992			WST36-18-162993			WST36-18-162994			WST36-18-162995		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	2.20E-05	1	2.20E-07	8.35E-06	1	8.35E-08	4.84E-05	1	4.84E-07	1.13E-04	1	1.13E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	3.44E-06	1	3.44E-08	1.29E-06	1	1.29E-08	4.02E-06	1	4.02E-08	3.66E-06	1	3.66E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	5.85E-07	1	5.85E-08	6.79E-07	1	6.79E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	6.27E-07	1	6.27E-08	4.98E-07	0	4.98E-08	1.09E-06	1	1.09E-07	1.45E-06	1	1.45E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	1.11E-06	1	1.11E-07	9.91E-07	1	9.91E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	1.82E-04	1	5.46E-08	6.93E-05	1	2.08E-08	3.90E-04	1	1.17E-07	9.20E-04	1	2.76E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	1.01E-05	1	3.03E-09	3.95E-06	1	1.19E-09	1.39E-05	1	4.17E-09	1.63E-05	1	4.89E-09
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.96E-08	0	3.32E-07	9.97E-08	0	3.32E-07	1.05E-07	0	3.32E-07	9.95E-08	0	3.32E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.73E-07	0	1.73E-08	1.67E-07	0	1.67E-08	2.19E-07	0	2.19E-08	1.59E-07	0	1.59E-08
TEQ				**3.75E-06**			**3.54E-06**			**4.20E-06**			**5.03E-06**

Notes:
Shaded cell is the maximum TEQ.
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 2-4. Dioxin/Furan Data, Human Health TEFs, and TEQs, Cont.

Parameter Name	TEFs	WST36-18-162996			WST36-18-162997			WST36-18-162998			WST36-18-162999		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	4.70E-05	1	4.70E-07	1.59E-05	1	1.59E-07	7.51E-07	1	7.51E-09	8.19E-07	1	8.19E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.48E-06	1	2.48E-08	9.11E-07	1	9.11E-09	4.97E-07	0	4.97E-09	5.01E-07	0	5.01E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	5.01E-07	0	1.67E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.98E-07	0	4.98E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	8.22E-07	1	8.22E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	6.55E-07	1	6.55E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	5.01E-07	0	1.73E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	3.40E-04	1	1.02E-07	1.14E-04	1	3.42E-08	5.49E-06	1	1.65E-09	8.29E-06	1	2.49E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	8.97E-06	1	2.69E-09	2.47E-06	1	7.41E-10	9.93E-07	0	2.98E-10	1.00E-06	0	3.00E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	5.01E-07	0	1.67E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.98E-07	0	4.98E-08	5.00E-07	0	5.01E-08	4.97E-07	0	4.98E-08	5.01E-07	0	5.01E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.98E-07	0	5.28E-07	5.00E-07	0	5.28E-07	4.97E-07	0	5.25E-07	5.01E-07	0	5.31E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07	1.12E-07	0	3.31E-07	1.00E-07	0	3.34E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	2.51E-07	0	2.51E-08	1.78E-07	0	1.78E-08	2.13E-07	0	2.13E-08	2.36E-07	0	2.36E-08
TEQs				**4.08E-06**			**3.64E-06**			**3.44E-06**			**3.47E-06**

Notes:
DC- Detect code (1 = detected, 0 = not detected)
Notes: The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg

Table 2-5. Screening Level Risk Assessment Cumulative Cancer Risk and Hazard Index

Category	Cancer Risk			Hazard Index		
	Resident	Industrial Worker	Construction Worker	Resident	Industrial Worker	Construction Worker
Inorganics	5E-11	1E-11	1E-09	0.2	0.01	0.06
Organics	2E-06	2E-07	3E-08	0.04	0.002	0.008
TCDD TEQ	1E-06	2E-07	3E-08	0.1	0.006	0.02
Total	3E-06	4E-07	6E-08	0.3	0.02	0.09

Notes:
Risk and HI are based on maximum soil concentrations
Cancer risk = Sum of (Maximum/Cancer-based NMSSL x 1E-05) for each detected analyte above background
Hazard Index = Sum of (Maximum/Noncancer-based NMSSL) for each detected analyte above background
NMSSL – New Mexico soil screening level

Table 2-6. Migration to Groundwater Screening Evaluation for Maximum Soil Concentrations of Inorganics above Background and Detected Organics

Parameter Name	Parameter Code	Maximum Reported Result (mg/kg)	NMED Groundwater SSL (mg/kg)	Groundwater SSL Risk Ratio
Cadmium	Cd	4.67E-01	9.39E+00	5E-02
Copper	Cu	5.97E+02	9.15E+02	7E-01
Mercury	Hg	7.75E-01	5.13E+00	2E-01
Perchlorate	ClO4	2.96E-02	1.17E-01	3E-01
Silver	Ag	2.19E+00	1.38E+01	2E-01
Benzo(a)anthracene	56-55-3	2.95E-02	6.37E-01	5E-02
Benzo(a)pyrene	50-32-8	2.72E-02	4.42E+00	6E-03
Benzo(b)fluoranthene	205-99-2	3.25E-02	6.17E+00	5E-03
Benzo(g,h,i)perylene	191-24-2	2.21E-02	***4.42E+00***	5E-03
Benzo(k)fluoranthene	207-08-9	1.48E-02	6.05E+01	2E-04
Benzoic Acid	65-85-0	4.97E-01	**3.00E+02**	2E-03
Benzyl Alcohol	100-51-6	4.98E-01	**9.60E+00**	5E-02
Bis(2-ethylhexyl)phthalate	117-81-7	1.32E+00	2.00E+02	7E-03
Chrysene	218-01-9	2.95E-02	1.86E+02	2E-04
Diethylphthalate	84-66-2	1.44E-02	9.79E+01	1E-04
Di-n-butylphthalate	84-74-2	7.44E-01	3.38E+01	2E-02
Fluoranthene	206-44-0	5.33E-02	1.34E+03	4E-05
HMX	2691-41-0	3.87E+00	1.94E+01	2E-01
Indeno(1,2,3-cd)pyrene	193-39-5	2.05E-02	2.01E+01	1E-03
Isophorone	78-59-1	3.24E-01	4.23E+00	8E-02
Methylene Chloride	75-09-2	5.73E-03	4.71E-01	1E-02
Naphthalene	91-20-3	1.51E-02	5.83E-02	3E-01
Phenanthrene	85-01-8	2.78E-02	8.59E+01	3E-04
Pyrene	129-00-0	5.57E-02	1.92E+02	3E-04
RDX	121-82-4	4.76E+00	5.93E-02	8E+01
TATB	3058-38-6	2.22E+01	***4.20E+01***	5E-01
Toluene	108-88-3	2.23E-03	1.21E+01	2E-04

Notes: Shaded cell – maximum exceeds NMSSL
Bolded values – value is the EPA RSL multiplied by a DAF of 20 for consistency with NMED (2021)
Bold italics – value is a surrogate. See Section 2.2.4.
mg/kg – milligram per kilogram
SSL – soil screening level (NMED 2021)

Table 3-1. Ecological Screening Levels (ESLs)

Analyte Group	Analyte Name	No Effect ESL									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganic Compound	Cadmium	4.30E+02	1.30E+00	4.30E+00	2.90E-01	5.40E-01	5.00E-01	1.40E+02	3.20E+01	5.50E+02	1.00E+01
	Copper	1.10E+03	8.00E+01	3.40E+01	1.40E+01	2.00E+01	6.30E+01	8.00E+01	7.00E+01	4.00E+03	2.60E+02
	Mercury (inorganic)	3.20E-01	5.80E-02	6.70E-02	1.30E-02	2.20E-02	3.00E+00	5.00E-02	3.40E+01	7.60E+01	2.30E+01
	Perchlorate	2.00E+00	3.90E+00	1.20E-01	3.10E+01	2.40E-01	2.10E-01	3.50E+00	4.00E+01	3.30E+00	2.60E-01
	Silver	6.00E+02	1.30E+01	1.00E+01	2.60E+00	4.10E+00	2.40E+01	--	5.60E+02	4.40E+03	1.50E+02
Dioxin/ Furan	2,3,7,8 TCDD	4.10E-06	4.10E-06	4.10E-06	4.10E-06	4.10E-06	5.80E-07	5.00E+00	--	1.00E-04	4.00E-05
High Explosive	HMX	--	--	--	--	--	2.90E+02	1.60E+01	2.70E+03	5.90E+04	4.10E+02
	RDX	7.80E+02	1.10E+01	2.30E+00	2.40E+00	2.30E+00	1.60E+01	8.40E+00	--	7.00E+03	3.80E+01
	TATB	--	--	--	--	--	1.10E+02	1.00E+01	--	1.00E+04	1.50E+02
Polyaromatic Hydrocarbon	Benzo(a)anthracene	2.80E+01	6.40E+00	7.30E-01	8.80E-01	8.00E-01	3.40E+00	--	1.80E+01	1.10E+02	6.10E+00
	Benzo(a)pyrene	--	--	--	--	--	8.40E+01	--	--	3.40E+03	2.60E+02
	Benzo(b)fluoranthene	--	--	--	--	--	5.10E+01	--	1.80E+01	2.40E+03	1.30E+02
	Benzo(g,h,i)perylene	--	--	--	--	--	4.60E+01	--	--	3.60E+03	4.70E+02
	Benzo(k)fluoranthene	--	--	--	--	--	9.90E+01	--	--	4.30E+03	3.30E+02
	Chrysene	--	--	--	--	--	3.10E+00	--	--	1.10E+02	6.30E+00
	Fluoranthene	--	--	--	--	--	3.80E+01	1.00E+01	--	3.90E+03	2.70E+02
	Indeno(1,2,3-cd)pyrene	--	--	--	--	--	1.10E+02	--	--	4.60E+03	5.10E+02
	Naphthalene	2.10E+03	7.80E+01	3.40E+00	1.50E+01	5.70E+00	9.60E+00	--	1.00E+00	5.80E+03	1.40E+01
	Phenanthrene	--	--	--	--	--	1.50E+01	5.50E+00	--	1.90E+03	6.20E+01
	Pyrene	3.00E+03	1.60E+02	6.80E+01	3.30E+01	4.40E+01	3.10E+01	1.00E+01	--	3.10E+03	1.10E+02
Semivolatile Organic compound	Benzoic Acid	--	--	--	--	--	1.30E+00	--	--	2.00E+03	4.60E+00
	Bis(2-ethylhexyl)phthalate	9.30E+00	9.60E-02	1.60E+01	2.00E-02	4.00E-02	1.10E+00	--	--	5.00E+02	1.90E+03
	Diethyl Phthalate	--	--	--	--	--	3.60E+03	--	1.00E+02	2.50E+06	8.80E+03
	Di-n-Butyl Phthalate	2.00E+00	5.20E-02	3.80E-01	1.10E-02	2.10E-02	3.60E+02	--	1.60E+02	6.20E+04	1.70E+04
Volatile Organic Compound	Benzyl Alcohol	--	--	--	--	--	1.20E+02	--	--	1.10E+05	1.90E+02
	Isophorone	--	--	--	--	--	--	--	--	--	--
	Methylene Chloride	--	--	--	--	--	2.60E+00	--	1.60E+03	4.30E+03	3.80E+00
	Toluene	--	--	--	--	--	2.50E+01	--	2.00E+02	1.20E+04	6.60E+01

Table 3-1. Ecological Screening Levels, Cont.

Analyte Group	Analyte Name	Low Effect ESL									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph -producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganic Compound	Cadmium	2.30E+03	7.70E+00	2.30E+01	1.60E+00	3.00E+00	6.80E+00	7.60E+02	1.60E+02	7.40E+03	1.40E+02
	Copper	3.50E+03	2.40E+02	1.00E+02	4.30E+01	6.00E+01	1.00E+02	5.30E+02	4.90E+02	6.70E+03	4.30E+02
	Mercury (inorganic)	3.20E+00	5.80E-01	6.70E-01	1.30E-01	2.20E-01	3.00E+01	5.00E-01	6.40E+01	7.60E+02	2.30E+02
	Perchlorate	4.00E+00	8.00E+00	2.40E-01	6.40E+01	4.90E-01	1.00E+00	3.50E+01	8.00E+01	1.60E+01	1.30E+00
	Silver	6.00E+03	1.30E+02	1.00E+02	2.60E+01	4.10E+01	2.40E+02	--	2.80E+03	4.40E+04	1.50E+03
Dioxin/ Furan	2,3,7,8-TCDD	--	--	--	--	--	3.80E-06	1.00E+01	--	6.80E-04	2.70E-04
High Explosive	HMX	--	--	--	--	--	7.90E+02	1.60E+02	3.50E+03	1.50E+05	1.10E+03
	RDX	1.40E+03	2.20E+01	4.30E+00	4.50E+00	4.40E+00	5.10E+01	1.50E+01	--	2.20E+04	1.20E+02
	TATB	--	--	--	--	--	1.10E+03	2.80E+01	--	1.00E+05	1.50E+03
Polyaromatic Hydrocarbon	Benzo(a)anthracene	2.80E+02	6.40E+01	7.30E+00	8.80E+00	8.00E+00	3.40E+01	--	1.80E+02	1.10E+03	6.10E+01
	Benzo(a)pyrene	--	--	--	--	--	2.60E+02	--	--	1.10E+04	8.30E+02
	Benzo(b)fluoranthene	--	--	--	--	--	5.10E+02	--	1.80E+02	2.40E+04	1.30E+03
	Benzo(g,h,i)perylene	--	--	--	--	--	4.60E+02	--	--	3.60E+04	4.70E+03
	Benzo(k)fluoranthene	--	--	--	--	--	9.90E+02	--	--	4.30E+04	3.30E+03
	Chrysene	--	--	--	--	--	3.10E+01	--	--	1.10E+03	6.30E+01
	Fluoranthene	--	--	--	--	--	3.80E+02	2.30E+01	--	3.90E+04	2.70E+03
	Indeno(1,2,3-cd)pyrene	--	--	--	--	--	1.10E+03		--	4.60E+04	5.10E+03
	Naphthalene	2.10E+04	7.80E+02	3.40E+01	1.50E+02	5.70E+01	2.70E+01		1.00E+01	1.60E+04	4.00E+01
	Phenanthrene	--	--	--	--	--	1.50E+02	1.20E+01	--	1.90E+04	6.20E+02
	Pyrene	3.00E+04	1.60E+03	6.80E+02	3.30E+02	4.40E+02	3.10E+02	2.00E+01	--	3.10E+04	1.10E+03
Semivolatile Organic compound	Benzoic Acid	--	--	--	--	--	1.30E+01	--	--	2.00E+04	4.60E+01
	Bis(2-ethylhexyl)phthalate	9.30E+01	9.60E-01	1.60E+02	2.00E-01	4.00E-01	1.10E+01	--	--	5.00E+03	1.90E+04
	Diethyl Phthalate	--	--	--	--	--	3.60E+04	--	1.00E+03	2.50E+07	8.80E+04
	Di-n-Butyl Phthalate	2.00E+01	5.20E-01	3.80E+00	1.10E-01	2.10E-01	8.60E+02	--	6.00E+02	1.40E+05	4.00E+04
Volatile Organic Compound	Benzyl Alcohol	--	--	--	--	--	1.20E+03	--	--	1.10E+06	1.90E+03
	Isophorone	--	--	--	--	--	--	--	--	--	--
	Methylene Chloride	--	--	--	--	--	2.20E+01	--	1.60E+04	3.60E+04	3.20E+01
	Toluene	--	--	--	--	--	2.50E+02	--	2.00E+03	1.20E+05	6.60E+02

Notes: Source = ESL 4.2, LANL 2021.
Abbreviations:
ESL – Ecological Screening Value
Max– Maximum Exposure Point Concentration

mg/kg – Milligram per kilogram

Table 3-2. Ecological Screening Evaluation for Maximum Soil Concentrations and No Effect ESLs

Category	Parameter Name	Max Result (mg/kg)	Number of Detects	American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganic	Cadmium	0.467	3	1E-03	4E-01	1E-01	2E+00	9E-01	9E-01	3E-03	1E-02	8E-04	5E-02
	Copper	597	16	5E-01	7E+00	2E+01	4E+01	3E+01	9E+00	7E+00	9E+00	1E-01	2E+00
	Mercury	0.775	6	2E+00	1E+01	1E+01	6E+01	4E+01	3E-01	2E+01	2E-02	1E-02	3E-02
	Perchlorate	0.0296	11	1E-02	8E-03	2E-01	1E-03	1E-01	1E-01	8E-03	7E-04	9E-03	1E-01
	Silver	2.19	16	4E-03	2E-01	2E-01	8E-01	5E-01	9E-02	--	4E-03	5E-04	1E-02
Organic	2,3,7,8-TCDD TEQ mammal	5.03E-06	--	--	--	--	--	--	9E+00	1E-06	--	5E-02	1E-01
	2,3,7,8-TCDD TEQ bird	5.06E-06	--	1E+00	1E+00	1E+00	1E+00	1E+00	--	--	--	--	--
	Benzo(a)anthracene	0.0295	5	1E-03	5E-03	4E-02	3E-02	4E-02	9E-03	--	2E-03	3E-04	5E-03
	Benzo(a)pyrene	0.0272	4	--	--	--	--	--	3E-04	--	NA	8E-06	1E-04
	Benzo(b)fluoranthene	0.0325	4	--	--	--	--	--	6E-04	--	2E-03	1E-05	3E-04
	Benzo(g,h,i)perylene	0.0221	2	--	--	--	--	--	5E-04	--	--	6E-06	5E-05
	Benzo(k)fluoranthene	0.0148	2	--	--	--	--	--	1E-04	--	--	3E-06	4E-05
	Benzoic Acid	0.497	2	--	--	--	--	--	4E-01	--	--	2E-04	1E-01
	Benzyl Alcohol	0.498	4	--	--	--	--	--	4E-03	--	--	5E-06	3E-03
	Bis(2-ethylhexyl)phthalate	1.32	6	1E-01	1E+01	8E-02	7E+01	3E+01	1E+00	--	--	3E-03	7E-04
	Chrysene	0.0295	3	--	--	--	--	--	1E-02	--	--	3E-04	5E-03
	Diethylphthalate	0.0144	1	--	--	--	--	--	4E-06	--	1E-04	6E-09	2E-06
	Di-n-butylphthalate	0.744	4	4E-01	1E+01	2E+00	7E+01	4E+01	2E-03	--	5E-03	1E-05	4E-05
	Fluoranthene	0.0533	4	--	--	--	--	--	1E-03	5E-03	--	1E-05	2E-04
	HMX	3.87	11	--	--	--	--	--	1E-02	2E-01	1E-03	7E-05	9E-03
	Indeno(1,2,3-cd)pyrene	0.0205	2	--	--	--	--	--	2E-04	--	--	4E-06	4E-05
	Isophorone	0.324	1	--	--	--	--	--	--	--	--	--	--
	Methylene Chloride	0.0057	5	--	--	--	--	--	2E-03	--	4E-06	1E-06	2E-03
	Naphthalene	0.0151	1	7E-06	2E-04	4E-03	1E-03	3E-03	2E-03	--	2E-02	3E-06	1E-03
	Phenanthrene	0.0278	4	--	--	--	--	--	2E-03	5E-03	--	1E-05	4E-04
	Pyrene	0.0557	4	2E-05	3E-04	8E-04	2E-03	1E-03	2E-03	6E-03	--	2E-05	5E-04
	RDX	4.76	7	6E-03	4E-01	2E+00	2E+00	2E+00	3E-01	6E-01	--	7E-04	1E-01
	TATB	22.2	16	--	--	--	--	--	2E-01	2E+00	--	2E-03	1E-01
	Toluene	0.0022	4	--	--	--	--	--	9E-05	--	1E-05	2E-07	3E-05
Hazard Index (HI)				5E+00	5E+01	4E+01	2E+02	1E+02	2E+01	3E+01	9E+00	2E-01	3E+00

Notes:

Table 2-2 presents the comparison of maximum inorganic concentrations to BV. Only inorganics that exceeded BVs are shown in this table.
Shaded cells indicate the ratio > 0.1 for initial screening evaluation
Only detected data and inorganics above background are reported and evaluated in this table.
Abbreviations:

BV – Background Value
ESL – Ecological Screening Value
Max– Maximum Exposure Point Concentration
mg/kg – milligram per kilogram
-- - no value

Table 3-3. Refined Exposure Point Concentrations (EPCs)

COPC	UCL95 (mg/kg)	UCL Type	Distribution
Cadmium	0.096	Median all data	NA - 3 detect
Copper	240.3	95% Chebyshev (Mean, Sd) UCL	Lognormal
Mercury	0.598	99% KM (Chebyshev) UCL	NDD
Perchlorate	0.0144	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	Gamma
Silver	0.681	95% Jackknife UCL	Lognormal
Mammalian TCDD TEQ	3.91E-06	95% Modified-t UCL	NDD
Avian TCDD TEQ	4.89E-06	95% Student's-t UCL	Normal
Benzoic Acid	0.168	Median all data	NA - 2 detects
Bis(2-ethylhexyl)phthalate	0.493	95% KM (t) UCL	Normal
Di-n-butylphthalate	0.010	Median all data	NA - 4 detects
HMX	1.736	95% Gamma Adjusted KM-UCL (use when n<50)	Gamma
Isophorone	0.101	Median all data	NA - 1 detect
RDX	1.48	95% KM (t) UCL	Normal
TATB	14.52	95% Student's-t UCL	Normal

Notes:
Maximum of the duplicate pair retained
TEQ obtained by calculating TEQs by sample, then calculating UCL95
NDD – no discernable distribution
KM – Kaplan Meier
Sd – Standard deviation
UCL – upper confidence limit

Table 3-4. Ecological Screening Evaluation for Low Effect ESLs and Refined EPCs.

Analyte Name	Refined EPC (mg/kg)	Hazard Quotients for Refined EPCs and LE ESLs									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Cadmium	0.096	4E-05	1E-02	4E-03	6E-02	3E-02	1E-02	1E-04	6E-04	1E-05	7E-04
Copper	240.30	7E-02	1E+00	2E+00	6E+00	4E+00	2E+00	5E-01	5E-01	4E-02	6E-01
Mercury	0.598	2E-01	1E+00	9E-01	5E+00	3E+00	2E-02	1E+00	9E-03	8E-04	3E-03
Perchlorate	0.014	4E-03	2E-03	6E-02	2E-04	3E-02	1E-02	4E-04	2E-04	9E-04	1E-02
Silver	0.681	1E-04	5E-03	7E-03	3E-02	2E-02	3E-03	No ESL	2E-04	2E-05	5E-04
Mammalian TEQ	3.91E-06	--	--	--	--	--	1E+00	4E-07	No ESL	6E-03	1E-02
Avian TEQ	4.89E-06	No ESL	No ESL	No ESL	No ESL	No ESL	--	--	--	--	--
Benzoic Acid	0.168	No ESL	No ESL	No ESL	No ESL	No ESL	1E-02	No ESL	No ESL	8E-06	4E-03
Bis(2-ethylhexyl)phthalate	0.493	5E-03	5E-01	3E-03	2E+00	1E+00	4E-02	No ESL	No ESL	1E-04	3E-05
Di-n-butylphthalate	0.010	5E-04	2E-02	3E-03	9E-02	5E-02	1E-05	No ESL	2E-05	7E-08	3E-07
HMX	1.736	No ESL	No ESL	No ESL	No ESL	No ESL	2E-03	1E-02	5E-04	1E-05	2E-03
Isophorone	0.101	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL
RDX	1.476	1E-03	7E-02	3E-01	3E-01	3E-01	3E-02	1E-01	No ESL	7E-05	1E-02
TATB	14.52	No ESL	No ESL	No ESL	No ESL	No ESL	1E-02	5E-01	No ESL	1E-04	1E-02
HI		**3E-01**	**3E+00**	**4E+00**	**1E+01**	**8E+00**	**4E+00**	**2E+00**	**5E-01**	**4E-02**	**6E-01**

Notes:
Shaded cells represent HQs>0.1
HI is the sum of all HQs
-- - no value
Abbreviations:
ESL – Ecological Screening Level
HI – Hazard Index
LE – Low Effect
mg/kg – milligram per kilogram

Table 3-5. Toxic Equivalency Factors (TEFs) Used for Calculating Ecological TCDD Equivalent Concentrations

Name	CAS	Mammalian TEF[a]	Avian TEF[b]
Chlorinated dibenzo-p-dioxins			
2,3,7,8-TCDD	1746-01-6	1	1
1,2,3,7,8-PeCDD	40321-76-4	1	1
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01	0.001
OCDD	3268-87-9	0.0003	0.0001
Chlorinated dibenzofurans			
2,3,7,8-TCDF	51207-31-9	0.1	1
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1
2,3,4,7,8-PeCDF	57117-31-4	0.3	0.1
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	1
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01
OCDF	39001-02-0	0.0003	0.0001

[a] EPA (2010a,b); WHO (2009)
[b] Van den Berg et al. (2006)

Table 3-6. Dioxin-Furan Concentrations, Mammalian TEFs, and TEQs,

Parameter Name	TEF	WST36-18-162834			WST36-18-162985			WST36-18-162986			WST36-18-162987		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	8.40E-07	1	8.40E-09	6.82E-07	1	6.82E-09	3.68E-06	1	3.68E-08	7.96E-06	1	7.96E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	5.00E-07	0	5.00E-09	4.97E-07	0	4.97E-09	8.20E-07	1	8.20E-09	1.49E-06	1	1.49E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	5.03E-07	0	1.68E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	5.03E-07	0	1.74E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	5.61E-06	1	1.68E-09	4.56E-06	1	1.37E-09	3.41E-05	1	1.02E-08	7.74E-05	1	2.32E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	9.99E-07	0	3.00E-10	9.94E-07	0	2.98E-10	2.54E-06	1	7.62E-10	5.55E-06	1	1.67E-09
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	5.03E-07	0	1.68E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	5.00E-07	0	5.01E-08	4.97E-07	0	4.98E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.04E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	5.00E-07	0	5.28E-07	4.97E-07	0	5.25E-07	4.98E-07	0	5.28E-07	5.03E-07	0	5.31E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.99E-08	0	3.33E-07	9.94E-08	0	3.31E-07	9.95E-08	0	3.32E-07	1.01E-07	0	3.36E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.10E-07	1	1.10E-08	1.75E-07	1	1.75E-08	1.31E-07	1	1.31E-08	2.27E-07	1	2.27E-08
TEQ				**3.45E-06**			**3.43E-06**			**3.47E-06**			**3.59E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)
WST36-18-162834 and WST36-18-162985 are the duplicate pair.

Table 3-6. Dioxin/Furan Concentrations, Mammalian TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162988			WST36-18-162989			WST36-18-162990			WST36-18-162991		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	1.74E-06	1	1.74E-08	1.06E-06	1	1.06E-08	1.11E-06	1	1.11E-08	4.67E-06	1	4.67E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	4.97E-07	0	4.97E-09	4.97E-07	0	4.97E-09	4.98E-07	0	4.98E-09	4.99E-07	0	4.99E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.97E-07	0	1.66E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.99E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.97E-07	0	1.71E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	4.99E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	1.40E-05	1	4.20E-09	1.02E-05	1	3.06E-09	1.01E-05	1	3.03E-09	4.30E-05	1	1.29E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	9.94E-07	0	2.98E-10	9.94E-07	0	2.98E-10	9.95E-07	0	2.99E-10	1.33E-06	1	3.99E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.97E-07	0	1.66E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.99E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.97E-07	0	4.98E-08	4.97E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.98E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.97E-07	0	5.25E-07	4.97E-07	0	5.25E-07	4.98E-07	0	5.28E-07	4.99E-07	0	5.28E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.94E-08	0	3.32E-07	9.94E-08	0	3.32E-07	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.79E-07	1	1.79E-08	1.87E-07	1	1.87E-08	1.71E-07	1	1.71E-08	1.44E-07	1	1.44E-08
TEQ				**3.45E-06**			**3.44E-06**			**3.44E-06**			**3.49E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 3-6. Dioxin/Furan Concentrations, Mammalian TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162992			WST36-18-162993			WST36-18-162994			WST36-18-162995		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	2.20E-05	1	2.20E-07	8.35E-06	1	8.35E-08	4.84E-05	1	4.84E-07	1.13E-04	1	1.13E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	3.44E-06	1	3.44E-08	1.29E-06	1	1.29E-08	4.02E-06	1	4.02E-08	3.66E-06	1	3.66E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	5.85E-07	1	5.85E-08	6.79E-07	1	6.79E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	6.27E-07	1	6.27E-08	4.98E-07	0	4.98E-08	1.09E-06	1	1.09E-07	1.45E-06	1	1.45E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	1.11E-06	1	1.11E-07	9.91E-07	1	9.91E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	1.82E-04	1	5.46E-08	6.93E-05	1	2.08E-08	3.90E-04	1	1.17E-07	9.20E-04	1	2.76E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	1.01E-05	1	3.03E-09	3.95E-06	1	1.19E-09	1.39E-05	1	4.17E-09	1.63E-05	1	4.89E-09
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07	4.98E-07	0	5.28E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.96E-08	0	3.32E-07	9.97E-08	0	3.32E-07	1.05E-07	0	3.32E-07	9.95E-08	0	3.32E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.73E-07	0	1.73E-08	1.67E-07	0	1.67E-08	2.19E-07	0	2.19E-08	1.59E-07	0	1.59E-08
TEQ				**3.75E-06**			**3.54E-06**			**4.20E-06**			**5.03E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 3-6. Dioxin/Furan Concentrations, Mammalian TEFs, and TEQs, Cont.

Parameter Name	TEFs	WST36-18-162996			WST36-18-162997			WST36-18-162998			WST36-18-162999		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	4.70E-05	1	4.70E-07	1.59E-05	1	1.59E-07	7.51E-07	1	7.51E-09	8.19E-07	1	8.19E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.48E-06	1	2.48E-08	9.11E-07	1	9.11E-09	4.97E-07	0	4.97E-09	5.01E-07	0	5.01E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	5.01E-07	0	1.67E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.98E-07	0	4.98E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	8.22E-07	1	8.22E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	6.55E-07	1	6.55E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	5.01E-07	0	1.73E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	3.40E-04	1	1.02E-07	1.14E-04	1	3.42E-08	5.49E-06	1	1.65E-09	8.29E-06	1	2.49E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	8.97E-06	1	2.69E-09	2.47E-06	1	7.41E-10	9.93E-07	0	2.98E-10	1.00E-06	0	3.00E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	5.01E-07	0	1.67E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.98E-07	0	4.98E-08	5.00E-07	0	5.01E-08	4.97E-07	0	4.98E-08	5.01E-07	0	5.01E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.98E-07	0	5.28E-07	5.00E-07	0	5.28E-07	4.97E-07	0	5.25E-07	5.01E-07	0	5.31E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07	1.12E-07	0	3.31E-07	1.00E-07	0	3.34E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	2.51E-07	0	2.51E-08	1.78E-07	0	1.78E-08	2.13E-07	0	2.13E-08	2.36E-07	0	2.36E-08
TEQs				**4.08E-06**			**3.64E-06**			**3.44E-06**			**3.47E-06**

Notes:
DC- Detect code (1 = detected, 0 = not detected)
Notes: The result multiplied by the TEF (Table 3-3) is the TECi. The sum of the TECi values provides the TEQ. The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg

Abbreviations:
TECi – Toxicity Equivalent Concentration for Congener i
TEF – Toxicity Equivalency Factor
TEQ – Toxicity Equivalent Quotient

Table 3-7. Dioxin-Furan Concentrations, Avian TEFs, and TEQs

Parameter Name	TEF	WST36-18-162834			WST36-18-162985			WST36-18-162986			WST36-18-162987		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.001	8.40E-07	1	8.40E-10	6.82E-07	1	6.82E-10	3.68E-06	1	3.68E-09	7.96E-06	1	7.96E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	5.00E-07	0	5.00E-09	4.97E-07	0	4.97E-09	8.20E-07	1	8.20E-09	1.49E-06	1	1.49E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	5.03E-07	0	1.68E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.05	5.00E-07	0	2.50E-08	4.97E-07	0	2.49E-08	4.98E-07	0	2.49E-08	5.03E-07	0	2.52E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.01	5.00E-07	0	5.00E-09	4.97E-07	0	4.97E-09	4.98E-07	0	4.98E-09	5.03E-07	0	5.03E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	5.03E-07	0	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	5.03E-07	0	1.68E-06
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	5.03E-07	0	1.74E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0001	5.61E-06	1	5.61E-10	4.56E-06	1	4.56E-10	3.41E-05	1	3.41E-09	7.74E-05	1	7.74E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0001	9.99E-07	0	9.99E-11	9.94E-07	0	9.94E-11	2.54E-06	1	2.54E-10	5.55E-06	1	5.55E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	5.03E-07	0	1.68E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.1	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	5.03E-07	0	1.68E-07
Pentachlorodibenzofuran[2,3,4,7,8-]	0.1	5.00E-07	0	1.76E-07	4.97E-07	0	1.75E-07	4.98E-07	0	1.76E-07	5.03E-07	0	1.77E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.99E-08	0	3.33E-07	9.94E-08	0	3.31E-07	9.95E-08	0	3.32E-07	1.01E-07	0	3.36E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1	1.10E-07	1	1.10E-07	1.75E-07	1	1.75E-07	1.31E-07	1	1.31E-07	2.27E-07	1	2.27E-07
TEQ				**4.74E-06**			**4.77E-06**			**4.74E-06**			**4.91E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)
WST36-18-162834 and WST36-18-162985 are the duplicate pair.

Table 3-7. Dioxin/Furan Concentrations, Avian TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162988			WST36-18-162989			WST36-18-162990			WST36-18-162991		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.001	1.74E-06	1	1.74E-09	1.06E-06	1	1.06E-09	1.11E-06	1	1.11E-09	4.67E-06	1	4.67E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	4.97E-07	0	4.97E-09	4.97E-07	0	4.97E-09	4.98E-07	0	4.98E-09	4.99E-07	0	4.99E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.97E-07	0	1.66E-08	4.97E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.99E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.05	4.97E-07	0	2.49E-08	4.97E-07	0	2.49E-08	4.98E-07	0	2.49E-08	4.99E-07	0	2.50E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.01	4.97E-07	0	4.97E-09	4.97E-07	0	4.97E-09	4.98E-07	0	4.98E-09	4.99E-07	0	4.99E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.97E-07	0	4.97E-08	4.97E-07	0	4.97E-08	4.98E-07	0	4.98E-08	4.99E-07	0	4.99E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	4.97E-07	0	1.66E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.99E-07	0	1.66E-06
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.97E-07	0	1.71E-07	4.97E-07	0	1.71E-07	4.98E-07	0	1.72E-07	4.99E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0001	1.40E-05	1	1.40E-09	1.02E-05	1	1.02E-09	1.01E-05	1	1.01E-09	4.30E-05	1	4.30E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0001	9.94E-07	0	9.94E-11	9.94E-07	0	9.94E-11	9.95E-07	0	9.95E-11	1.33E-06	1	1.33E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.97E-07	0	1.66E-06	4.97E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.99E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.1	4.97E-07	0	1.66E-07	4.97E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.99E-07	0	1.66E-07
Pentachlorodibenzofuran[2,3,4,7,8-]	0.1	4.97E-07	0	1.75E-07	4.97E-07	0	1.75E-07	4.98E-07	0	1.76E-07	4.99E-07	0	1.76E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.94E-08	0	3.32E-07	9.94E-08	0	3.32E-07	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1	1.79E-07	1	1.79E-07	1.87E-07	1	1.87E-07	1.71E-07	1	1.71E-07	1.44E-07	1	1.44E-07
TEQ				**4.78E-06**			**4.79E-06**			**4.77E-06**			**4.75E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 3-7. Dioxin/Furan Concentrations, Avian TEFs, and TEQs, Cont.

Parameter Name	TEF	WST36-18-162992			WST36-18-162993			WST36-18-162994			WST36-18-162995		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.001	2.20E-05	1	2.20E-08	8.35E-06	1	8.35E-09	4.84E-05	1	4.84E-08	1.13E-04	1	1.13E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	3.44E-06	1	3.44E-08	1.29E-06	1	1.29E-08	4.02E-06	1	4.02E-08	3.66E-06	1	3.66E-08
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08	4.98E-07	0	1.66E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.05	4.98E-07	0	2.49E-08	4.98E-07	0	2.49E-08	5.85E-07	1	2.93E-08	6.79E-07	1	3.40E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.01	6.27E-07	1	6.27E-09	4.98E-07	0	4.98E-09	1.09E-06	1	1.09E-08	1.45E-06	1	1.45E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.98E-07	0	4.98E-08	4.98E-07	0	4.98E-08	1.11E-06	1	1.11E-07	9.91E-07	1	9.91E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07	4.98E-07	0	1.72E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0001	1.82E-04	1	1.82E-08	6.93E-05	1	6.93E-09	3.90E-04	1	3.90E-08	9.20E-04	1	9.20E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0001	1.01E-05	1	1.01E-09	3.95E-06	1	3.95E-10	1.39E-05	1	1.39E-09	1.63E-05	1	1.63E-09
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06	4.98E-07	0	1.66E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.1	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07	4.98E-07	0	1.66E-07
Pentachlorodibenzofuran[2,3,4,7,8-]	0.1	4.98E-07	0	1.76E-07	4.98E-07	0	1.76E-07	4.98E-07	0	1.76E-07	4.98E-07	0	1.76E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.96E-08	0	3.32E-07	9.97E-08	0	3.32E-07	1.05E-07	0	3.32E-07	9.95E-08	0	3.32E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1	1.73E-07	0	1.73E-07	1.67E-07	0	1.67E-07	2.19E-07	0	2.19E-07	1.59E-07	0	1.59E-07
TEQ				**4.84E-06**			**4.79E-06**			**5.01E-06**			**5.06E-06**

Notes:
The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg
DC- Detect code (1 = detected, 0 = not detected)

Table 3-7. Dioxin/Furan Concentrations, Avian TEFs, and TEQs, Cont.

Parameter Name	TEFs	WST36-18-162996			WST36-18-162997			WST36-18-162998			WST36-18-162999		
		Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi	Result (mg/kg)	DC	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.001	4.70E-05	1	4.70E-08	1.59E-05	1	1.59E-08	7.51E-07	1	7.51E-10	8.19E-07	1	8.19E-10
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.48E-06	1	2.48E-08	9.11E-07	1	9.11E-09	4.97E-07	0	4.97E-09	5.01E-07	0	5.01E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	1.66E-08	5.00E-07	0	1.67E-08	4.97E-07	0	1.66E-08	5.01E-07	0	1.67E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.05	4.98E-07	0	2.49E-08	5.00E-07	0	2.50E-08	4.97E-07	0	2.49E-08	5.01E-07	0	2.51E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.01	8.22E-07	1	8.22E-09	5.00E-07	0	5.00E-09	4.97E-07	0	4.97E-09	5.01E-07	0	5.01E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	6.55E-07	1	6.55E-08	5.00E-07	0	5.00E-08	4.97E-07	0	4.97E-08	5.01E-07	0	5.01E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	4.98E-07	0	1.66E-06	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	5.01E-07	0	1.67E-06
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	1.72E-07	5.00E-07	0	1.72E-07	4.97E-07	0	1.71E-07	5.01E-07	0	1.73E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0001	3.40E-04	1	3.40E-08	1.14E-04	1	1.14E-08	5.49E-06	1	5.49E-10	8.29E-06	1	8.29E-10
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0001	8.97E-06	1	8.97E-10	2.47E-06	1	2.47E-10	9.93E-07	0	9.93E-11	1.00E-06	0	1.00E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	1.66E-06	5.00E-07	0	1.67E-06	4.97E-07	0	1.66E-06	5.01E-07	0	1.67E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.1	4.98E-07	0	1.66E-07	5.00E-07	0	1.67E-07	4.97E-07	0	1.66E-07	5.01E-07	0	1.67E-07
Pentachlorodibenzofuran[2,3,4,7,8-]	0.1	4.98E-07	0	1.76E-07	5.00E-07	0	1.76E-07	4.97E-07	0	1.75E-07	5.01E-07	0	1.77E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.95E-08	0	3.32E-07	9.99E-08	0	3.33E-07	1.12E-07	0	3.31E-07	1.00E-07	0	3.34E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1	2.51E-07	0	2.51E-07	1.78E-07	0	1.78E-07	2.13E-07	0	2.13E-07	2.36E-07	0	2.36E-07
TEQs				4.97E-06			4.83E-06			4.81E-06			4.86E-06

Notes:
DC- Detect code (1 = detected, 0 = not detected)
Notes: The result multiplied by the TEF (Table 3-3) is the TECi. The sum of the TECi values provides the TEQ. The TECi are summed in each column to obtain the TEQ. The TEQs are used in ProUCL to obtain a UCL95 EPC.
All data in mg/kg

Abbreviations:
TECi – Toxicity Equivalent Concentration for Congener i
TEF – Toxicity Equivalency Factor
TEQ – Toxicity Equivalent Quotient

Table 3-8. Area Use Factor and Site-Specific Hazard Analysis for TA 36 Based on NE ESLs

COPC Name	CAS	No Effect Ecological Screening Levels (ESLs) for Terrestrial Receptors (mg/kg)									
		American kestrel (top carnivore)	American kestrel (insectivore / carnivore)	American robin (herbivore)	American robin (insectivore)	American robin (omnivore)	Deer mouse (omnivore)	Earthworm (invertebrate)	Generic plant (autotroph)	Gray fox (top carnivore)	Mountain cottontail (herbivore)
Inorganics											
Copper	7440-50-8	1.1E+03	8.0E+01	3.4E+01	1.4E+01	2.0E+01	6.3E+01	8.0E+01	7.0E+01	4.0E+03	2.6E+02
Mercury	7487-94-7	3.2E-01	5.8E-02	6.7E-02	1.3E-02	2.2E-02	3.0E+00	5.0E-02	3.4E+01	7.6E+01	2.3E+01
Organics											
2,3,7,8-TCDD	1746-01-6	4.1E-06	4.1E-06	4.1E-06	4.1E-06	4.1E-06	5.8E-07	5.0E+00	0.0E+00	1.0E-04	4.0E-05
Bis(2-ethylhexyl)phthalate	117-81-7	9.3E+00	9.6E-02	1.6E+01	2.0E-02	4.0E-02	1.1E+00	0.0E+00	0.0E+00	5.0E+02	1.9E+03
RDX	121-82-4	7.8E+02	1.1E+01	2.3E+00	2.4E+00	2.3E+00	1.6E+01	8.4E+00	0.0E+00	7.0E+03	3.8E+01
TATB	3058-38-6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+02	1.0E+01	0.0E+00	1.0E+04	1.5E+02

HR (ha)[a]	106	106	0.42	0.42	0.42	0.077	NA	NA	1038	3.1
Population Area[b]	4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	124
PAUF[c]	0.00014	0.00014	0.035	0.035	0.035	0.19	NA	NA	0.000014	0.004677
AUF[d]	0.0055	0.0055	1.00	1.00	1.00	1.00	NA	NA	0.000559	0.1871

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted NE ESL Hazard Quotients									
		American kestrel (top carnivore)	American kestrel (insectivore / carnivore)	American robin (herbivore)	American robin (insectivore)	American robin (omnivore)	Deer mouse (omnivore)	Earthworm (invertebrate)	Generic plant (autotroph)	Gray fox (top carnivore)	Mountain cottontail (herbivore)
Inorganics											
Copper	240.3	3E-05	4E-04	2E-01	6E-01	4E-01	7E-01	3E+00	3E+00	8E-07	4E-03
Mercury	0.598	3E-04	1E-03	3E-01	2E+00	9E-01	4E-02	1E+01	2E-02	1E-07	1E-04
Organics											
2,3,7,8-TCDD Mammal	3.91E-06	--	--	--	--	--	1E+00	8E-07	NA, No ESL	5E-07	5E-04
2,3,7,8-TCDD Bird	4.89E-06	2E-04	2E-04	4E-02	4E-02	4E-02	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	0.493	7E-06	7E-04	1E-03	9E-01	4E-01	8E-02	NA, No ESL	NA, No ESL	1E-08	1E-06
RDX	1.48	3E-07	2E-05	2E-02	2E-02	2E-02	2E-02	2E-01	NA, No ESL	3E-09	2E-04
TATB	14.52	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	2E-02	1E+00	NA, No ESL	2E-08	5E-04
Hazard Index		5E-04	3E-03	6E-01	3E+00	2E+00	2E+00	2E+01	3E+00	2E-06	6E-03

Notes:
Area of Site (ha): 0.58

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

Table 3-9. Area Use Factors and Site-Specific Hazard Analysis for TA 36 Based on LE ESLs.

COPC Name	CAS	Low Effect Ecological Screening Levels (ESLs) for Terrestrial Receptors (mg/kg)										
		American kestrel (top carnivore)	American kestrel (insectivore / carnivore)	American robin (herbivore)	American robin (insectivore)	American robin (omnivore)	Deer mouse (omnivore)	Earthworm (invertebrate)	Generic plant (autotroph)	Gray fox (top carnivore)	Montane shrew (insectivore)	Mountain cottontail (herbivore)
Inorganics												
Copper	7440-50-8	3.5E+03	2.4E+02	1.0E+02	4.3E+01	6.0E+01	1.0E+02	5.3E+02	4.9E+02	6.7E+03	7.0E+01	4.3E+02
Mercury	7487-94-7	3.2E+00	5.8E-01	6.7E-01	1.3E-01	2.2E-01	3.0E+01	5.0E-01	6.4E+01	7.6E+02	1.7E+01	2.3E+02
Organics												
2,3,7,8-TCDD	1746-01-6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-06	1.0E+01	0.0E+00	6.8E-04	1.9E-06	2.7E-04
Bis(2-ethylhexyl)phthalate	117-81-7	9.3E+01	9.6E-01	1.6E+02	2.0E-01	4.0E-01	1.1E+01	0.0E+00	0.0E+00	5.0E+03	6.0E+00	1.9E+04
RDX	121-82-4	1.4E+03	2.2E+01	4.3E+00	4.5E+00	4.4E+00	5.1E+01	1.5E+01	0.0E+00	2.2E+04	5.3E+01	1.2E+02
TATB	3058-38-6	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E+03	2.8E+01	0.0E+00	1.0E+05	7.2E+03	1.5E+03

HR (ha)[a]	106	106	0.42	0.42	0.42	0.077	NA	NA	1038	0.39	3.1
Population Area[b]	4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	15.6	124
PAUF[c]	0.00014	0.00014	0.035	0.035	0.035	0.19	NA	NA	0.000014	0.037	0.004677
AUF[d]	0.0055	0.0055	1.00	1.00	1.00	1.00	NA	NA	0.000559	1.00	0.1871

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted LE ESL Hazard Quotients										
		American kestrel (top carnivore)	American kestrel (insectivore / carnivore)	American robin (herbivore)	American robin (insectivore)	American robin (omnivore)	Deer mouse (omnivore)	Earthworm (invertebrate)	Generic plant (autotroph)	Gray fox (top carnivore)	Montane shrew (insectivore)	Mountain cottontail (herbivore)
Inorganics												
Copper	240.3	9E-06	1E-04	8E-02	2E-01	1E-01	5E-01	5E-01	5E-01	5E-07	1E-01	3E-03
Mercury	0.598	3E-05	1E-04	3E-02	2E-01	9E-02	4E-03	1E+00	9E-03	1E-08	1E-03	1E-05
Organics												
2,3,7,8-TCDD Mammal	3.91E-06	--	--	--	--	--	2E-01	4E-07	NA, No ESL	8E-08	8E-02	7E-05
2,3,7,8-TCDD Bird	4.89E-06	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	--	--	NA, No ESL	--	--	--
Bis(2-ethylhexyl)phthalate	0.493	7E-07	7E-05	1E-04	9E-02	4E-02	8E-03	3E-02	NA, No ESL	1E-09	3E-03	1E-07
RDX	1.48	1E-07	9E-06	1E-02	1E-02	1E-02	5E-03	5E-02	NA, No ESL	9E-10	1E-03	6E-05
TATB	14.52	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	NA, No ESL	2E-03	NA, No ESL	NA, No ESL	2E-09	7E-05	5E-05
Hazard Index		4E-05	3E-04	1E-01	4E-01	3E-01	5E-01	2E+00	5E-01	5E-07	1E-01	3E-03

Notes:
Area of Site (ha): 0.58

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range
LE - Low Effect

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

Figures

Figure 1-1. Sample Location Map for the Unit OD Area

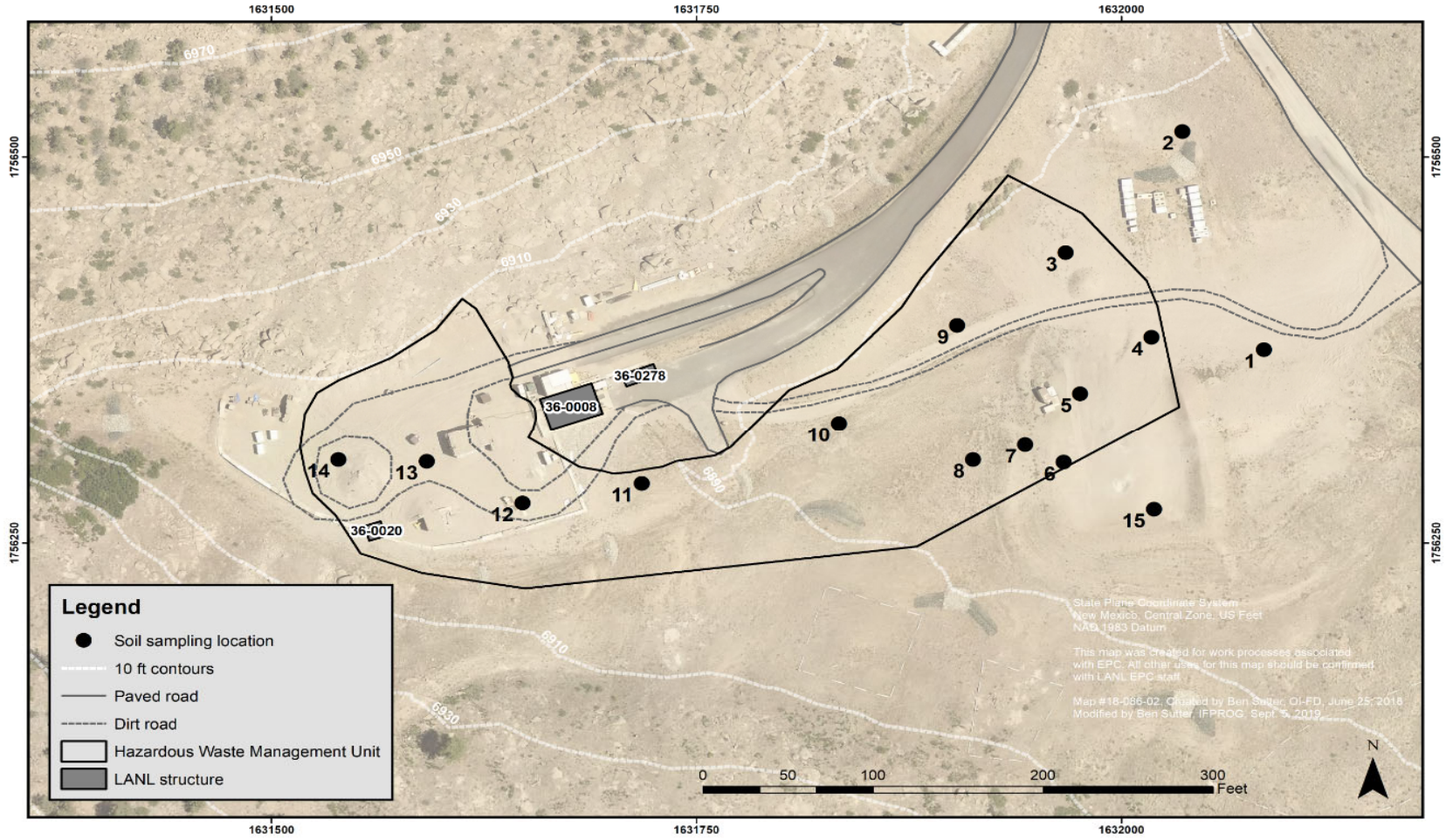
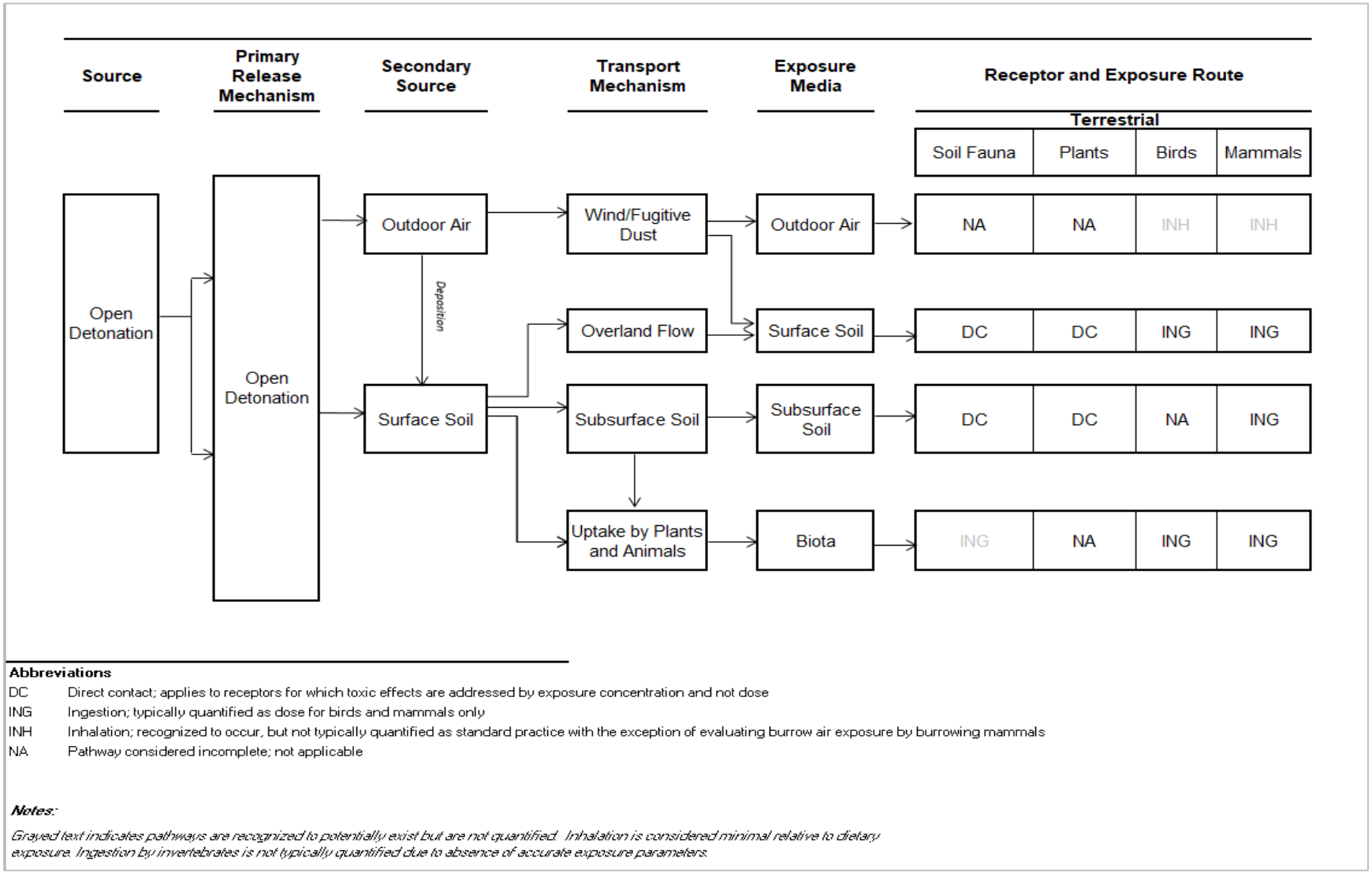


Figure 3-1. Conceptual Site Exposure Model (CSEM) for the Ecological Risk Assessment



UCL Statistics for Data Sets with Non-Detects

User Selected Options			
Date/Time of Computation	**ProUCL 5.13/8/2022 9:53:21 AM**		
From File	**UCL Data TA 36 rev 1.xls**		
Full Precision	**OFF**		
Confidence Coefficient		**95%**	
Number of Bootstrap Operations		**2000**	
Cd			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	1
Number of Detects	3	Number of Non-Detects	12
Number of Distinct Detects	3	Number of Distinct Non-Detects	11
Minimum Detect	0.252	Minimum Non-Detect	0.0918
Maximum Detect	0.467	Maximum Non-Detect	0.101
Variance Detects	0.0137	Percent Non-Detects	80%
Mean Detects	0.333	SD Detects	0.117
Median Detects	0.28	CV Detects	0.351
Skewness Detects	1.621	Kurtosis Detects	N/A
Mean of Logged Detects	-1.138	SD of Logged Detects	0.33
Warning: Data set has only 3 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.342	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.14	KM Standard Error of Mean	0.0334
KM SD	0.105	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.199	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.195	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.24	95% KM Chebyshev UCL	0.285
97.5% KM Chebyshev UCL	0.348	99% KM Chebyshev UCL	0.472
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	13.34	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.025	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	80.02	nu star (bias corrected)	N/A
Mean (detects)	0.333		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.0746
Maximum	0.467	Median	0.01
SD	0.141	CV	1.888
k hat (MLE)	0.485	k star (bias corrected MLE)	0.432
Theta hat (MLE)	0.154	Theta star (bias corrected MLE)	0.173
nu hat (MLE)	14.55	nu star (bias corrected)	12.97
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (12.97, α)	5.874	Adjusted Chi Square Value (12.97, β)	5.296
95% Gamma Approximate UCL (use when n>=50)	0.165	95% Gamma Adjusted UCL (use when n<50)	N/A
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.14	SD (KM)	0.105
Variance (KM)	0.0111	SE of Mean (KM)	0.0334
k hat (KM)	1.762	k star (KM)	1.454

nu hat (KM)	52.86	nu star (KM)	43.62
theta hat (KM)	0.0795	theta star (KM)	0.0963
80% gamma percentile (KM)	0.217	90% gamma percentile (KM)	0.294
95% gamma percentile (KM)	0.369	99% gamma percentile (KM)	0.537
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (43.62, α)	29.48	Adjusted Chi Square Value (43.62, β)	28.05
95% Gamma Approximate KM-UCL (use when n>=50)	0.207	95% Gamma Adjusted KM-UCL (use when n<50)	0.218
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.326	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.117	Mean in Log Scale	-2.455
SD in Original Scale	0.121	SD in Log Scale	0.707
95% t UCL (assumes normality of ROS data)	0.171	95% Percentile Bootstrap UCL	0.17
95% BCA Bootstrap UCL	0.189	95% Bootstrap t UCL	0.217
95% H-UCL (Log ROS)	0.171		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-2.138	KM Geo Mean	0.118
KM SD (logged)	0.515	95% Critical H Value (KM-Log)	2.084
KM Standard Error of Mean (logged)	0.163	95% H-UCL (KM -Log)	0.179
KM SD (logged)	0.515	95% Critical H Value (KM-Log)	2.084
KM Standard Error of Mean (logged)	0.163		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.105	Mean in Log Scale	-2.655
SD in Original Scale	0.126	SD in Log Scale	0.795
95% t UCL (Assumes normality)	0.162	95% H-Stat UCL	0.162
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.199		
Cu			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	1
Minimum	8.21	Mean	74.49
Maximum	597	Median	27.7
SD	147.3	Std. Error of Mean	38.03
Coefficient of Variation	1.977	Skewness	3.638
Normal GOF Test			
Shapiro Wilk Test Statistic	0.441	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.357	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	141.5	95% Adjusted-CLT UCL (Chen-1995)	175.2
		95% Modified-t UCL (Johnson-1978)	147.4
Gamma GOF Test			
A-D Test Statistic	1.465	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.773	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.244	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.23	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.792	k star (bias corrected MLE)	0.678
Theta hat (MLE)	94.01	Theta star (bias corrected MLE)	109.8

nu hat (MLE)	23.77	nu star (bias corrected)	20.35
MLE Mean (bias corrected)	74.49	MLE Sd (bias corrected)	90.44
		Approximate Chi Square Value (0.05)	11.11
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	10.28
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	136.4	95% Adjusted Gamma UCL (use when n<50)	147.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.881	Level	
Lilliefors Test Statistic	0.187	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.22	Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.105	Mean of logged Data	3.561
Maximum of Logged Data	6.392	SD of logged Data	1.056
Assuming Lognormal Distribution			
95% H-UCL	136.7	90% Chebyshev (MVUE) UCL	110.7
95% Chebyshev (MVUE) UCL	134.4	97.5% Chebyshev (MVUE) UCL	167.3
99% Chebyshev (MVUE) UCL	232		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	137	95% Jackknife UCL	141.5
95% Standard Bootstrap UCL	135	95% Bootstrap-t UCL	398.4
95% Hall's Bootstrap UCL	350.1	95% Percentile Bootstrap UCL	148.5
95% BCA Bootstrap UCL	192.9		
90% Chebyshev(Mean, Sd) UCL	188.6	95% Chebyshev(Mean, Sd) UCL	240.3
97.5% Chebyshev(Mean, Sd) UCL	312	99% Chebyshev(Mean, Sd) UCL	452.9
Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	**240.3**		

Hg

General Statistics			
Total Number of Observations	15	Number of Distinct Observations	14
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	9
Number of Distinct Detects	6	Number of Distinct Non-Detects	8
Minimum Detect	0.00476	Minimum Non-Detect	0.00343
Maximum Detect	0.775	Maximum Non-Detect	0.00396
Variance Detects	0.0968	Percent Non-Detects	60%
Mean Detects	0.141	SD Detects	0.311
Median Detects	0.0062	CV Detects	2.211
Skewness Detects	2.434	Kurtosis Detects	5.94
Mean of Logged Detects	-4.006	SD of Logged Detects	2.026
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.531	Shapiro Wilk GOF Test	
		Detected Data Not Normal at 5% Significance	
5% Shapiro Wilk Critical Value	0.788	Level	
Lilliefors Test Statistic	0.452	Lilliefors GOF Test	
		Detected Data Not Normal at 5% Significance	
5% Lilliefors Critical Value	0.325	Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.0583	KM Standard Error of Mean	0.0543
KM SD	0.192	95% KM (BCA) UCL	0.161
95% KM (t) UCL	0.154	95% KM (Percentile Bootstrap) UCL	0.161
95% KM (z) UCL	0.148	95% KM Bootstrap t UCL	9.152
90% KM Chebyshev UCL	0.221	95% KM Chebyshev UCL	0.295
97.5% KM Chebyshev UCL	0.397	99% KM Chebyshev UCL	0.598
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.083	Anderson-Darling GOF Test	
		Detected Data Not Gamma Distributed at 5% Significance	
5% A-D Critical Value	0.762	Level	
K-S Test Statistic	0.388	Kolmogorov-Smirnov GOF	
		Detected Data Not Gamma Distributed at 5% Significance	
5% K-S Critical Value	0.355	Level	

Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.332	k star (bias corrected MLE)	0.277
Theta hat (MLE)	0.424	Theta star (bias corrected MLE)	0.508
nu hat (MLE)	3.98	nu star (bias corrected)	3.324
Mean (detects)	0.141		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.00476	Mean	0.0623
Maximum	0.775	Median	0.01
SD	0.197	CV	3.169
k hat (MLE)	0.412	k star (bias corrected MLE)	0.374
Theta hat (MLE)	0.151	Theta star (bias corrected MLE)	0.167
nu hat (MLE)	12.36	nu star (bias corrected)	11.22
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (11.22, α)	4.719	Adjusted Chi Square Value (11.22, β)	4.211
95% Gamma Approximate UCL (use when n>=50)	0.148	95% Gamma Adjusted UCL (use when n<50)	0.166
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0583	SD (KM)	0.192
Variance (KM)	0.0368	SE of Mean (KM)	0.0543
k hat (KM)	0.0925	k star (KM)	0.118
nu hat (KM)	2.776	nu star (KM)	3.554
theta hat (KM)	0.631	theta star (KM)	0.493
80% gamma percentile (KM)	0.0504	90% gamma percentile (KM)	0.165
95% gamma percentile (KM)	0.333	99% gamma percentile (KM)	0.85
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (3.55, α)	0.554	Adjusted Chi Square Value (3.55, β)	0.432
95% Gamma Approximate KM-UCL (use when n>=50)	0.374	95% Gamma Adjusted KM-UCL (use when n<50)	0.48
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.735	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.361	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.0563	Mean in Log Scale	-7.708
SD in Original Scale	0.199	SD in Log Scale	3.389
95% t UCL (assumes normality of ROS data)	0.147	95% Percentile Bootstrap UCL	0.159
95% BCA Bootstrap UCL	0.211	95% Bootstrap t UCL	4.16
95% H-UCL (Log ROS)	108.7		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-5.008	KM Geo Mean	0.00669
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	3.478
KM Standard Error of Mean (logged)	0.404	95% H-UCL (KM -Log)	0.0697
KM SD (logged)	1.427	95% Critical H Value (KM-Log)	3.478
KM Standard Error of Mean (logged)	0.404		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0574	Mean in Log Scale	-5.382
SD in Original Scale	0.199	SD in Log Scale	1.679
95% t UCL (Assumes normality)	0.148	95% H-Stat UCL	0.111
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
99% KM (Chebyshev) UCL	0.598		
CLO4			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	1

Number of Detects	11	Number of Non-Detects	4
Number of Distinct Detects	11	Number of Distinct Non-Detects	4
Minimum Detect	5.72E-04	Minimum Non-Detect	4.99E-04
Maximum Detect	0.0296	Maximum Non-Detect	5.05E-04
Variance Detects	9.24E-05	Percent Non-Detects	26.67%
Mean Detects	0.00741	SD Detects	0.00961
Median Detects	0.00321	CV Detects	1.298
Skewness Detects	1.612	Kurtosis Detects	1.817
Mean of Logged Detects	-5.724	SD of Logged Detects	1.379
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.27	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.00556	KM Standard Error of Mean	0.00228
KM SD	0.00842	95% KM (BCA) UCL	0.00975
95% KM (t) UCL	0.00958	95% KM (Percentile Bootstrap) UCL	0.00919
95% KM (z) UCL	0.00932	95% KM Bootstrap t UCL	0.0137
90% KM Chebyshev UCL	0.0124	95% KM Chebyshev UCL	0.0155
97.5% KM Chebyshev UCL	0.0198	99% KM Chebyshev UCL	0.0283
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.543	Anderson-Darling GOF Test	
5% A-D Critical Value	0.764	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.223	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.265	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.734	k star (bias corrected MLE)	0.594
Theta hat (MLE)	0.0101	Theta star (bias corrected MLE)	0.0125
nu hat (MLE)	16.14	nu star (bias corrected)	13.07
Mean (detects)	0.00741		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	5.72E-04	Mean	0.0081
Maximum	0.0296	Median	0.00637
SD	0.00821	CV	1.014
k hat (MLE)	0.953	k star (bias corrected MLE)	0.807
Theta hat (MLE)	0.0085	Theta star (bias corrected MLE)	0.01
nu hat (MLE)	28.59	nu star (bias corrected)	24.2
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (24.20, α)	14	Adjusted Chi Square Value (24.20, β)	13.05
95% Gamma Approximate UCL (use when n>=50)	0.014	95% Gamma Adjusted UCL (use when n<50)	0.015
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.00556	SD (KM)	0.00842
Variance (KM)	7.10E-05	SE of Mean (KM)	0.00228
k hat (KM)	0.436	k star (KM)	0.393
nu hat (KM)	13.09	nu star (KM)	11.8
theta hat (KM)	0.0128	theta star (KM)	0.0141
80% gamma percentile (KM)	0.00896	90% gamma percentile (KM)	0.0158
95% gamma percentile (KM)	0.0232	99% gamma percentile (KM)	0.0421
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (11.80, α)	5.099	Adjusted Chi Square Value (11.80, β)	4.567

95% Gamma Approximate KM-UCL (use when n>=50)	0.0129	95% Gamma Adjusted KM-UCL (use when n<50)	0.0144
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.201	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.00546	Mean in Log Scale	-6.608
SD in Original Scale	0.00878	SD in Log Scale	1.914
95% t UCL (assumes normality of ROS data)	0.00946	95% Percentile Bootstrap UCL	0.00938
95% BCA Bootstrap UCL	0.0105	95% Bootstrap t UCL	0.014
95% H-UCL (Log ROS)	0.0798		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-6.225	KM Geo Mean	0.00198
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	3.427
KM Standard Error of Mean (logged)	0.379	95% H-UCL (KM -Log)	0.019
KM SD (logged)	1.399	95% Critical H Value (KM-Log)	3.427
KM Standard Error of Mean (logged)	0.379		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0055	Mean in Log Scale	-6.408
SD in Original Scale	0.00876	SD in Log Scale	1.654
95% t UCL (Assumes normality)	0.00948	95% H-Stat UCL	0.0363
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	**0.0144**		
Ag			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	1
Minimum	0.125	Mean	0.437
Maximum	2.19	Median	0.27
SD	0.536	Std. Error of Mean	0.138
Coefficient of Variation	1.225	Skewness	2.922
Normal GOF Test			
Shapiro Wilk Test Statistic	0.584	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.325	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.681	95% Adjusted-CLT UCL (Chen-1995)	0.776
		95% Modified-t UCL (Johnson-1978)	0.698
Gamma GOF Test			
A-D Test Statistic	1.171	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.754	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.249	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.226	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.47	k star (bias corrected MLE)	1.221
Theta hat (MLE)	0.298	Theta star (bias corrected MLE)	0.358
nu hat (MLE)	44.11	nu star (bias corrected)	36.62
MLE Mean (bias corrected)	0.437	MLE Sd (bias corrected)	0.396
		Approximate Chi Square Value (0.05)	23.77
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	22.5
Assuming Gamma Distribution			

95% Approximate Gamma UCL (use when n>=50))	0.674	95% Adjusted Gamma UCL (use when n<50)	0.712

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.184	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-2.079	Mean of logged Data	-1.204
Maximum of Logged Data	0.784	SD of logged Data	0.788

Assuming Lognormal Distribution

95% H-UCL	0.682	90% Chebyshev (MVUE) UCL	0.658
95% Chebyshev (MVUE) UCL	0.775	97.5% Chebyshev (MVUE) UCL	0.938
99% Chebyshev (MVUE) UCL	1.258		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.665	**95% Jackknife UCL**	**0.681**
95% Standard Bootstrap UCL	0.661	95% Bootstrap-t UCL	1.352
95% Hall's Bootstrap UCL	1.72	95% Percentile Bootstrap UCL	0.681
95% BCA Bootstrap UCL	0.82		
90% Chebyshev(Mean, Sd) UCL	0.852	95% Chebyshev(Mean, Sd) UCL	1.04
97.5% Chebyshev(Mean, Sd) UCL	1.301	99% Chebyshev(Mean, Sd) UCL	1.814

Suggested UCL to Use

95% H-UCL **0.682**

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.

H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.

It is therefore recommended to avoid the use of H-statistic based 95% UCLs.

Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

BenzAc

General Statistics

Total Number of Observations	15	Number of Distinct Observations	6
		Number of Missing Observations	1
Number of Detects	2	Number of Non-Detects	13
Number of Distinct Detects	2	Number of Distinct Non-Detects	4
Minimum Detect	0.458	Minimum Non-Detect	0.167
Maximum Detect	0.497	Maximum Non-Detect	0.17
Variance Detects	7.61E-04	Percent Non-Detects	86.67%
Mean Detects	0.478	SD Detects	0.0276
Median Detects	0.478	CV Detects	0.0578
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.74	SD of Logged Detects	0.0578

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.208	KM Standard Error of Mean	0.0386
KM SD	0.106	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.276	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.272	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.324	95% KM Chebyshev UCL	0.377

97.5% KM Chebyshev UCL	0.45	99% KM Chebyshev UCL	0.593
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	599.3	k star (bias corrected MLE)	N/A
Theta hat (MLE)	7.97E-04	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2397	nu star (bias corrected)	N/A
Mean (detects)	0.478		
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.208	SD (KM)	0.106
Variance (KM)	0.0112	SE of Mean (KM)	0.0386
k hat (KM)	3.881	k star (KM)	3.149
nu hat (KM)	116.4	nu star (KM)	94.47
theta hat (KM)	0.0537	theta star (KM)	0.0662
80% gamma percentile (KM)	0.296	90% gamma percentile (KM)	0.366
95% gamma percentile (KM)	0.431	99% gamma percentile (KM)	0.573
Gamma Kaplan-Meier (KM) Statistics			
		Adjusted Level of Significance (β)	0.0324
Approximate Chi Square Value (94.47, α)	73.05	Adjusted Chi Square Value (94.47, β)	70.74
95% Gamma Approximate KM-UCL (use when n>=50)	0.269	95% Gamma Adjusted KM-UCL (use when n<50)	0.278
Lognormal GOF Test on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.344	Mean in Log Scale	-1.085
SD in Original Scale	0.0679	SD in Log Scale	0.189
95% t UCL (assumes normality of ROS data)	0.374	95% Percentile Bootstrap UCL	0.372
95% BCA Bootstrap UCL	0.377	95% Bootstrap t UCL	0.382
95% H-UCL (Log ROS)	0.377		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.65	KM Geo Mean	0.192
KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.93
KM Standard Error of Mean (logged)	0.13	95% H-UCL (KM -Log)	0.246
KM SD (logged)	0.357	95% Critical H Value (KM-Log)	1.93
KM Standard Error of Mean (logged)	0.13		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.137	Mean in Log Scale	-2.244
SD in Original Scale	0.139	SD in Log Scale	0.611
95% t UCL (Assumes normality)	0.2	95% H-Stat UCL	0.183
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.276	KM H-UCL	0.246
95% KM (BCA) UCL	N/A		
Warning: One or more Recommended UCL(s) not available!			
B2EHP			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	9
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	9
Number of Distinct Detects	6	Number of Distinct Non-Detects	3
Minimum Detect	0.0255	Minimum Non-Detect	0.01
Maximum Detect	1.32	Maximum Non-Detect	0.0102
Variance Detects	0.315	Percent Non-Detects	60%
Mean Detects	0.655	SD Detects	0.561
Median Detects	0.616	CV Detects	0.858
Skewness Detects	0.0747	Kurtosis Detects	-2.718
Mean of Logged Detects	-1.05	SD of Logged Detects	1.523
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.263	Lilliefors GOF Test	

5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.268	KM Standard Error of Mean	0.128
KM SD	0.453	95% KM (BCA) UCL	0.483
95% KM (t) UCL	0.493	95% KM (Percentile Bootstrap) UCL	0.49
95% KM (z) UCL	0.478	95% KM Bootstrap t UCL	0.534
90% KM Chebyshev UCL	0.652	95% KM Chebyshev UCL	0.826
97.5% KM Chebyshev UCL	1.067	99% KM Chebyshev UCL	1.541
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.417	Anderson-Darling GOF Test	
5% A-D Critical Value	0.717	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.275	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.342	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.93	k star (bias corrected MLE)	0.576
Theta hat (MLE)	0.704	Theta star (bias corrected MLE)	1.136
nu hat (MLE)	11.16	nu star (bias corrected)	6.915
Mean (detects)	0.655		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.268
Maximum	1.32	Median	0.01
SD	0.468	CV	1.749
k hat (MLE)	0.359	k star (bias corrected MLE)	0.332
Theta hat (MLE)	0.746	Theta star (bias corrected MLE)	0.808
nu hat (MLE)	10.77	nu star (bias corrected)	9.948
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (9.95, α)	3.91	Adjusted Chi Square Value (9.95, β)	3.456
95% Gamma Approximate UCL (use when n>=50)	0.682	95% Gamma Adjusted UCL (use when n<50)	0.771
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.268	SD (KM)	0.453
Variance (KM)	0.205	SE of Mean (KM)	0.128
k hat (KM)	0.35	k star (KM)	0.325
nu hat (KM)	10.51	nu star (KM)	9.74
theta hat (KM)	0.765	theta star (KM)	0.825
80% gamma percentile (KM)	0.418	90% gamma percentile (KM)	0.782
95% gamma percentile (KM)	1.194	99% gamma percentile (KM)	2.255
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.74, α)	3.78	Adjusted Chi Square Value (9.74, β)	3.335
95% Gamma Approximate KM-UCL (use when n>=50)	0.69	95% Gamma Adjusted KM-UCL (use when n<50)	0.782
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.863	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.25	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.266	Mean in Log Scale	-3.773
SD in Original Scale	0.469	SD in Log Scale	2.692
95% t UCL (assumes normality of ROS data)	0.48	95% Percentile Bootstrap UCL	0.472
95% BCA Bootstrap UCL	0.495	95% Bootstrap t UCL	0.576
95% H-UCL (Log ROS)	61.91		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-3.183	KM Geo Mean	0.0415
KM SD (logged)	1.951	95% Critical H Value (KM-Log)	4.468
KM Standard Error of Mean (logged)	0.552	95% H-UCL (KM -Log)	2.859

KM SD (logged)	1.951	95% Critical H Value (KM-Log)	4.468
KM Standard Error of Mean (logged)	0.552		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.265	Mean in Log Scale	-3.593
SD in Original Scale	0.47	SD in Log Scale	2.334
95% t UCL (Assumes normality)	0.479	95% H-Stat UCL	10.91
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	**0.493**		

DNBP

General Statistics			
Total Number of Observations	15	Number of Distinct Observations	7
		Number of Missing Observations	1
Number of Detects	4	Number of Non-Detects	11
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	0.0131	Minimum Non-Detect	0.01
Maximum Detect	0.744	Maximum Non-Detect	0.0102
Variance Detects	0.118	Percent Non-Detects	73.33%
Mean Detects	0.239	SD Detects	0.343
Median Detects	0.1	CV Detects	1.435
Skewness Detects	1.776	Kurtosis Detects	3.132
Mean of Logged Detects	-2.459	SD of Logged Detects	1.785
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.779	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.333	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.0711	KM Standard Error of Mean	0.0549
KM SD	0.184	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.168	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.161	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.236	95% KM Chebyshev UCL	0.31
97.5% KM Chebyshev UCL	0.414	99% KM Chebyshev UCL	0.617
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.292	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at 5%	
5% A-D Critical Value	0.677	Significance Level	
K-S Test Statistic	0.257	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at 5%	
5% K-S Critical Value	0.408	Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.601	k star (bias corrected MLE)	0.317
Theta hat (MLE)	0.398	Theta star (bias corrected MLE)	0.755
nu hat (MLE)	4.805	nu star (bias corrected)	2.535
Mean (detects)	0.239		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.0711
Maximum	0.744	Median	0.01
SD	0.19	CV	2.678
k hat (MLE)	0.463	k star (bias corrected MLE)	0.415
Theta hat (MLE)	0.154	Theta star (bias corrected MLE)	0.172
nu hat (MLE)	13.88	nu star (bias corrected)	12.44
Adjusted Level of Significance (β)	0.0324		

Approximate Chi Square Value (12.44, α)	5.517	Adjusted Chi Square Value (12.44, β)	4.96
95% Gamma Approximate UCL (use when n>=50)	0.16	95% Gamma Adjusted UCL (use when n<50)	N/A
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0711	SD (KM)	0.184
Variance (KM)	0.0339	SE of Mean (KM)	0.0549
k hat (KM)	0.149	k star (KM)	0.164
nu hat (KM)	4.483	nu star (KM)	4.92
theta hat (KM)	0.476	theta star (KM)	0.434
80% gamma percentile (KM)	0.0829	90% gamma percentile (KM)	0.213
95% gamma percentile (KM)	0.384	99% gamma percentile (KM)	0.873
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.92, α)	1.115	Adjusted Chi Square Value (4.92, β)	0.912
95% Gamma Approximate KM-UCL (use when n>=50)	0.314	95% Gamma Adjusted KM-UCL (use when n<50)	0.384
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.204	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.064	Mean in Log Scale	-8.202
SD in Original Scale	0.193	SD in Log Scale	4.354
95% t UCL (assumes normality of ROS data)	0.152	95% Percentile Bootstrap UCL	0.161
95% BCA Bootstrap UCL	0.21	95% Bootstrap t UCL	1.472
95% H-UCL (Log ROS)	193999		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-4.033	KM Geo Mean	0.0177
KM SD (logged)	1.24	95% Critical H Value (KM-Log)	3.146
KM Standard Error of Mean (logged)	0.37	95% H-UCL (KM -Log)	0.109
KM SD (logged)	1.24	95% Critical H Value (KM-Log)	3.146
KM Standard Error of Mean (logged)	0.37		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0675	Mean in Log Scale	-4.534
SD in Original Scale	0.192	SD in Log Scale	1.536
95% t UCL (Assumes normality)	0.155	95% H-Stat UCL	0.158
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.168		
HMX			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	1
Number of Detects	11	Number of Non-Detects	4
Number of Distinct Detects	11	Number of Distinct Non-Detects	2
Minimum Detect	0.158	Minimum Non-Detect	0.148
Maximum Detect	3.87	Maximum Non-Detect	0.149
Variance Detects	1.064	Percent Non-Detects	26.67%
Mean Detects	1.209	SD Detects	1.032
Median Detects	0.978	CV Detects	0.853
Skewness Detects	1.932	Kurtosis Detects	4.369
Mean of Logged Detects	-0.113	SD of Logged Detects	0.852
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	**Detected Data Not Normal at 5% Significance Level**	
Lilliefors Test Statistic	0.226	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	**Detected Data appear Normal at 5% Significance Level**	
Detected Data appear Approximate Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.926	KM Standard Error of Mean	0.261
KM SD	0.964	95% KM (BCA) UCL	1.41

95% KM (t) UCL	**1.386**	95% KM (Percentile Bootstrap) UCL	1.38
95% KM (z) UCL	1.356	95% KM Bootstrap t UCL	1.698
90% KM Chebyshev UCL	1.709	95% KM Chebyshev UCL	2.064
97.5% KM Chebyshev UCL	2.557	99% KM Chebyshev UCL	3.524
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.204	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at 5%	
5% A-D Critical Value	0.74	**Significance Level**	
K-S Test Statistic	0.128	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at 5%	
5% K-S Critical Value	0.259	**Significance Level**	
Detected data appear Gamma Distributed at 5%			
Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.799	k star (bias corrected MLE)	1.369
Theta hat (MLE)	0.672	Theta star (bias corrected MLE)	0.883
nu hat (MLE)	39.58	nu star (bias corrected)	30.12
Mean (detects)	1.209		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and			
BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.889
Maximum	3.87	Median	0.652
SD	1.03	CV	1.158
k hat (MLE)	0.528	k star (bias corrected MLE)	0.467
Theta hat (MLE)	1.685	Theta star (bias corrected MLE)	1.906
nu hat (MLE)	15.83	nu star (bias corrected)	14
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (14.00, α)	6.57	Adjusted Chi Square Value (14.00, β)	5.954
95% Gamma Approximate UCL (use when n>=50)	1.895	95% Gamma Adjusted UCL (use when n<50)	2.091
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.926	SD (KM)	0.964
Variance (KM)	0.93	SE of Mean (KM)	0.261
k hat (KM)	0.923	k star (KM)	0.783
nu hat (KM)	27.68	nu star (KM)	23.48
theta hat (KM)	1.004	theta star (KM)	1.183
80% gamma percentile (KM)	1.515	90% gamma percentile (KM)	2.264
95% gamma percentile (KM)	3.028	99% gamma percentile (KM)	4.836
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (23.48, α)	13.45	Adjusted Chi Square Value (23.48, β)	12.52
		95% Gamma Adjusted KM-UCL (use when	
95% Gamma Approximate KM-UCL (use when n>=50)	1.616	**n<50)**	**1.736**
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.98	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.85	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.132	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.251	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.92	Mean in Log Scale	-0.651
SD in Original Scale	1.004	SD in Log Scale	1.181
95% t UCL (assumes normality of ROS data)	1.376	95% Percentile Bootstrap UCL	1.353
95% BCA Bootstrap UCL	1.498	95% Bootstrap t UCL	1.691
95% H-UCL (Log ROS)	2.733		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.592	KM Geo Mean	0.553
KM SD (logged)	1.056	95% Critical H Value (KM-Log)	2.835
KM Standard Error of Mean (logged)	0.286	95% H-UCL (KM -Log)	2.151
KM SD (logged)	1.056	95% Critical H Value (KM-Log)	2.835
KM Standard Error of Mean (logged)	0.286		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.906	Mean in Log Scale	-0.776
SD in Original Scale	1.015	SD in Log Scale	1.347

95% t UCL (Assumes normality)	1.368	95% H-Stat UCL	3.788

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL **1.386**

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Isophorone

General Statistics

Total Number of Observations	15	Number of Distinct Observations	4
		Number of Missing Observations	1
Number of Detects	1	Number of Non-Detects	14
Number of Distinct Detects	1	Number of Distinct Non-Detects	3

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Isophorone was not processed!

RDX

General Statistics

Total Number of Observations	15	Number of Distinct Observations	10
		Number of Missing Observations	1
Number of Detects	7	Number of Non-Detects	8
Number of Distinct Detects	7	Number of Distinct Non-Detects	3
Minimum Detect	0.196	Minimum Non-Detect	0.148
Maximum Detect	4.76	Maximum Non-Detect	0.15
Variance Detects	2.991	Percent Non-Detects	53.33%
Mean Detects	1.611	SD Detects	1.729
Median Detects	0.608	CV Detects	1.074
Skewness Detects	1.112	Kurtosis Detects	0.366
Mean of Logged Detects	-0.151	SD of Logged Detects	1.281

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.824	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.29	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.831	KM Standard Error of Mean	0.367
KM SD	1.315	95% KM (BCA) UCL	1.478
95% KM (t) UCL	1.476	95% KM (Percentile Bootstrap) UCL	1.437
95% KM (z) UCL	1.434	95% KM Bootstrap t UCL	1.842
90% KM Chebyshev UCL	1.931	95% KM Chebyshev UCL	2.429
97.5% KM Chebyshev UCL	3.12	99% KM Chebyshev UCL	4.479

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.462	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at 5%	
5% A-D Critical Value	0.73	Significance Level	
K-S Test Statistic	0.241	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at 5%	
5% K-S Critical Value	0.32	Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.929	k star (bias corrected MLE)	0.626
Theta hat (MLE)	1.734	Theta star (bias corrected MLE)	2.573
nu hat (MLE)	13	nu star (bias corrected)	8.762
Mean (detects)	1.611		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.757
Maximum	4.76	Median	0.01
SD	1.402	CV	1.852
k hat (MLE)	0.306	k star (bias corrected MLE)	0.289
Theta hat (MLE)	2.475	Theta star (bias corrected MLE)	2.618
nu hat (MLE)	9.174	nu star (bias corrected)	8.673
Adjusted Level of Significance (β)	0.0324		
Approximate Chi Square Value (8.67, α)	3.13	Adjusted Chi Square Value (8.67, β)	2.734
95% Gamma Approximate UCL (use when n>=50)	2.097	95% Gamma Adjusted UCL (use when n<50)	2.401
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.831	SD (KM)	1.315
Variance (KM)	1.729	SE of Mean (KM)	0.367
k hat (KM)	0.399	k star (KM)	0.364
nu hat (KM)	11.97	nu star (KM)	10.91
theta hat (KM)	2.081	theta star (KM)	2.284
80% gamma percentile (KM)	1.323	90% gamma percentile (KM)	2.384
95% gamma percentile (KM)	3.565	99% gamma percentile (KM)	6.566
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.91, α)	4.518	Adjusted Chi Square Value (10.91, β)	4.023
95% Gamma Approximate KM-UCL (use when n>=50)	2.005	95% Gamma Adjusted KM-UCL (use when n<50)	2.252
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.225	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.766	Mean in Log Scale	-2.198
SD in Original Scale	1.397	SD in Log Scale	2.263
95% t UCL (assumes normality of ROS data)	1.401	95% Percentile Bootstrap UCL	1.378
95% BCA Bootstrap UCL	1.647	95% Bootstrap t UCL	1.894
95% H-UCL (Log ROS)	31.1		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.089	KM Geo Mean	0.336
KM SD (logged)	1.195	95% Critical H Value (KM-Log)	3.066
KM Standard Error of Mean (logged)	0.333	95% H-UCL (KM -Log)	1.828
KM SD (logged)	1.195	95% Critical H Value (KM-Log)	3.066
KM Standard Error of Mean (logged)	0.333		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.791	Mean in Log Scale	-1.457
SD in Original Scale	1.382	SD in Log Scale	1.517
95% t UCL (Assumes normality)	1.42	95% H-Stat UCL	3.229
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	**1.476**		
TATB			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	15
		Number of Missing Observations	1
Minimum	3.33	Mean	12.29
Maximum	22.2	Median	12.7
SD	4.898	Std. Error of Mean	1.265
Coefficient of Variation	0.399	Skewness	-0.203
Normal GOF Test			
Shapiro Wilk Test Statistic	0.955	Shapiro Wilk GOF Test	

		Data appear Normal at 5% Significance	
5% Shapiro Wilk Critical Value	0.881	**Level**	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
		Data appear Normal at 5% Significance	
5% Lilliefors Critical Value	0.22	**Level**	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	14.52	95% Adjusted-CLT UCL (Chen-1995)	14.3
		95% Modified-t UCL (Johnson-1978)	14.5
Gamma GOF Test			
A-D Test Statistic	0.768	Anderson-Darling Gamma GOF Test	
		Data Not Gamma Distributed at 5%	
5% A-D Critical Value	0.739	Significance Level	
K-S Test Statistic	0.205	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at 5%	
5% K-S Critical Value	0.222	Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.988	k star (bias corrected MLE)	4.034
Theta hat (MLE)	2.464	Theta star (bias corrected MLE)	3.046
nu hat (MLE)	149.6	nu star (bias corrected)	121
MLE Mean (bias corrected)	12.29	MLE Sd (bias corrected)	6.118
		Approximate Chi Square Value (0.05)	96.63
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	93.95
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	15.39	95% Adjusted Gamma UCL (use when n<50)	15.83
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.235	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.22	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.203	Mean of logged Data	2.405
Maximum of Logged Data	3.1	SD of logged Data	0.523
Assuming Lognormal Distribution			
95% H-UCL	17.01	90% Chebyshev (MVUE) UCL	17.83
95% Chebyshev (MVUE) UCL	20.21	97.5% Chebyshev (MVUE) UCL	23.51
99% Chebyshev (MVUE) UCL	30.01		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	14.37	95% Jackknife UCL	14.52
95% Standard Bootstrap UCL	14.25	95% Bootstrap-t UCL	14.39
95% Hall's Bootstrap UCL	14.5	95% Percentile Bootstrap UCL	14.26
95% BCA Bootstrap UCL	14.31		
90% Chebyshev(Mean, Sd) UCL	16.08	95% Chebyshev(Mean, Sd) UCL	17.8
97.5% Chebyshev(Mean, Sd) UCL	20.19	99% Chebyshev(Mean, Sd) UCL	24.87
Suggested UCL to Use			
95% Student's-t UCL	**14.52**		

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

UCL Statistics for Uncensored Full Data Sets		
User Selected Options		
Date/Time of Computation	**ProUCL 5.1 3/7/2022 7:32:40 PM**	
From File	**WorkSheet.xls**	
Full Precision	**OFF**	
Confidence Coefficient	**95%**	
Number of Bootstrap Operations	**2000**	
TEQ HH and Mammal		
General Statistics		
Total Number of Observations	15	Number of Distinct Observations 11
		Number of Missing Observations 1.00E+00
Minimum	3.44E-06	Mean 3.70E-06

Maximum	5.03E-06	Median	3.49E-06
SD	4.38E-07	Std. Error of Mean	1.13E-07
Coefficient of Variation	N/A	Skewness	2.375
Normal GOF Test			
Shapiro Wilk Test Statistic	0.654	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.287	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3.90E-06	95% Adjusted-CLT UCL (Chen-1995)	3.96E-06
		95% Modified-t UCL (Johnson-1978)	3.91E-06
Gamma GOF Test			
A-D Test Statistic	1.939	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.279	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	8.78E+01	k star (bias corrected MLE)	7.03E+01
Theta hat (MLE)	4.21E-08	Theta star (bias corrected MLE)	5.26E-08
nu hat (MLE)	2.63E+03	nu star (bias corrected)	2.11E+03
MLE Mean (bias corrected)	3.70E-06	MLE Sd (bias corrected)	4.41E-07
		Approximate Chi Square Value (0.05)	2003
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	1990
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	3.89E-06	95% Adjusted Gamma UCL (use when n<50)	3.92E-06
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.685	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.272	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.22	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-12.58	Mean of logged Data	-12.51
Maximum of Logged Data	-12.2	SD of logged Data	0.107
Assuming Lognormal Distribution			
95% H-UCL	3.89E-06	90% Chebyshev (MVUE) UCL	4.00E-06
95% Chebyshev (MVUE) UCL	4.14E-06	97.5% Chebyshev (MVUE) UCL	4.34E-06
99% Chebyshev (MVUE) UCL	4.71E-06		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	3.88E-06	95% Jackknife UCL	3.90E-06
95% Standard Bootstrap UCL	3.88E-06	95% Bootstrap-t UCL	4.11E-06
95% Hall's Bootstrap UCL	4.43E-06	95% Percentile Bootstrap UCL	3.90E-06
95% BCA Bootstrap UCL	3.95E-06		
90% Chebyshev(Mean, Sd) UCL	4.04E-06	95% Chebyshev(Mean, Sd) UCL	4.19E-06
97.5% Chebyshev(Mean, Sd) UCL	4.40E-06	99% Chebyshev(Mean, Sd) UCL	4.82E-06

Suggested UCL to Use			
95% Student's-t UCL	3.90E-06	or 95% Modified-t UCL	3.91E-06
UCL Statistics for Uncensored Full Data Sets			
Avian TEQ			
General Statistics			
Total Number of Observations	15	Number of Distinct Observations	13
		Number of Missing Observations	1
Minimum	4.74E-06	Mean	4.85E-06
Maximum	5.06E-06	Median	4.81E-06
SD	9.88E-08	Std. Error of Mean	2.55E-08
Coefficient of Variation	N/A	Skewness	1.113
Normal GOF Test			
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	**Data Not Normal at 5% Significance Level**	
Lilliefors Test Statistic	0.188	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4.89E-06	95% Adjusted-CLT UCL (Chen-1995)	4.90E-06
		95% Modified-t UCL (Johnson-1978)	4.89E-06
Gamma GOF Test			
A-D Test Statistic	0.904	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.734	**Data Not Gamma Distributed at 5% Significance Level**	
K-S Test Statistic	0.209	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.221	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2612	k star (bias corrected MLE)	2089
Theta hat (MLE)	1.86E-09	Theta star (bias corrected MLE)	2.32E-09
nu hat (MLE)	78347	nu star (bias corrected)	62679
MLE Mean (bias corrected)	4.85E-06	MLE Sd (bias corrected)	1.06E-07
		Approximate Chi Square Value (0.05)	62098
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	62027
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	4.89E-06	95% Adjusted Gamma UCL (use when n<50)	4.90E-06
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.881	**Data Not Lognormal at 5% Significance Level**	
Lilliefors Test Statistic	0.185	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.22	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-12.26	Mean of logged Data	-12.24
Maximum of Logged Data	-12.19	SD of logged Data	0.0202
Assuming Lognormal Distribution			
95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	4.92E-06
95% Chebyshev (MVUE) UCL	4.96E-06	97.5% Chebyshev (MVUE) UCL	5.00E-06
99% Chebyshev (MVUE) UCL	5.10E-06		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			

95% CLT UCL	4.89E-06	95% Jackknife UCL	4.89E-06
95% Standard Bootstrap UCL	4.89E-06	95% Bootstrap-t UCL	4.91E-06
95% Hall's Bootstrap UCL	4.89E-06	95% Percentile Bootstrap UCL	4.89E-06
95% BCA Bootstrap UCL	4.89E-06		
90% Chebyshev(Mean, Sd) UCL	4.92E-06	95% Chebyshev(Mean, Sd) UCL	4.96E-06
97.5% Chebyshev(Mean, Sd) UCL	5.00E-06	99% Chebyshev(Mean, Sd) UCL	5.10E-06
Suggested UCL to Use			
95% Student's-t UCL	**4.89E-06**		

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and
skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006). However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.1 3/1/2022 6:10:36 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: CD(site)
Sample 2 Data: CD(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	39
Number of Missing Observations	1	0
Number of Non-Detects	12	36
Number of Detect Data	3	3
Minimum Non-Detect	0.0918	0.4
Maximum Non-Detect	0.101	2
Percent Non-detects	80.00%	92.31%
Minimum Detect	0.252	0.6
Maximum Detect	0.467	2.6
Mean of Detects	0.333	1.533
Median of Detects	0.28	1.4
SD of Detects	0.117	1.007
KM Mean	0.14	0.49
KM SD	0.105	0.381

Sample 1 vs Sample 2 Gehan Test
H0: Mean/Median of Sample 1 <= Mean/Median of background

Gehan z Test Value	-0.262
Critical z (0.05)	1.645
P-Value	**0.603**

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)
Use of Gehan or T-W test is suggested when multiple detection limits are present

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:26:34 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Cr(site)
Sample 2 Data: Cr(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	173
Number of Missing Observations	1	1
Number of Non-Detects	0	0
Number of Detect Data	15	173
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	3.82	1.9
Maximum Detect	49.2	36.5
Mean of Detects	9.231	9.04
Median of Detects	6.67	8.6
SD of Detects	11.18	4.363

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	966
Standardized WMW U-Stat	-2.237
Mean (U)	1298
SD(U) - Adj ties	202.1
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.987

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 <= Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:32:50 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Cu(site)

Sample 2 Data: Cu(bkg)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	174
Number of Missing Observations	1	0
Number of Non-Detects	0	2
Number of Detect Data	15	172
Minimum Non-Detect	N/A	0.5
Maximum Non-Detect	N/A	0.5
Percent Non-detects	0.00%	1.15%
Minimum Detect	8.21	0.6
Maximum Detect	597	16
Mean of Detects	74.49	6.125
Median of Detects	27.7	5.8
SD of Detects	147.3	2.523

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	2699
Standardized WMW U-Stat	6.266
Mean (U)	1305
SD(U) - Adj ties	203.3
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1.86E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 > Sample 2

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:20:51 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Hg(site)

Sample 2 Data: Hg(bkg)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	39
Number of Missing Observations	1	0
Number of Non-Detects	9	37
Number of Detect Data	6	2
Minimum Non-Detect	0.00343	0.1
Maximum Non-Detect	0.00396	0.1
Percent Non-detects	60.00%	94.87%
Minimum Detect	0.00476	0.1
Maximum Detect	0.775	0.1
Mean of Detects	0.141	0.1
Median of Detects	0.0062	0.1
SD of Detects	0.311	0

WMW test is meant for a Single Detection Limit Case
Use of Gehan or T-W test is suggested when multiple detection limits are present
All observations <= 0.1 (Max DL) are ranked the same
Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2
All observations are identical in at least one group
No analysis will be performed

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:36:25 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Pb(site)
Sample 2 Data: Pb(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	173
Number of Missing Observations	1	1
Number of Non-Detects	0	9
Number of Detect Data	15	164
Minimum Non-Detect	N/A	4
Maximum Non-Detect	N/A	4
Percent Non-detects	0.00%	5.20%
Minimum Detect	4.13	4
Maximum Detect	35.2	28
Mean of Detects	9.42	13.24
Median of Detects	6.52	13
SD of Detects	7.702	4.738

Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	775
Standardized WMW U-Stat	-3.186
Mean (U)	1298
SD(U) - Adj ties	201.8
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.999

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:39:29 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ag(site)
Sample 2 Data: Ag(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	113
Number of Missing Observations	1	0
Number of Non-Detects	0	112

Number of Detect Data	15	1
Minimum Non-Detect	N/A	0.4
Maximum Non-Detect	N/A	2
Percent Non-detects	0.00%	99.12%
Minimum Detect	0.125	1.9
Maximum Detect	2.19	1.9
Mean of Detects	0.437	1.9
Median of Detects	0.27	1.9
SD of Detects	0.536	N/A

WMW test is meant for a Single Detection Limit Case
Use of Gehan or T-W test is suggested when multiple detection limits are present
All observations <= 2 (Max DL) are ranked the same
Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2
All observations are identical in at least one group
No analysis will be performed

Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:44:26 PM
From File	ProUCL BKG STATS.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Tl(site)
Sample 2 Data: Tl(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	173
Number of Missing Observations	1	1
Number of Non-Detects	12	68
Number of Detect Data	3	105
Minimum Non-Detect	0.129	0.125
Maximum Non-Detect	0.141	1
Percent Non-detects	80.00%	39.31%
Minimum Detect	0.158	0.2
Maximum Detect	2.22	1
Mean of Detects	0.887	0.332
Median of Detects	0.282	0.2
SD of Detects	1.156	0.176
KM Mean	0.281	0.262
KM SD	0.52	0.172

Sample 1 vs Sample 2 Gehan Test
H0: Mean/Median of Sample 1 <= Mean/Median of background

Gehan z Test Value	-3.244
Critical z (0.05)	1.645
P-Value	0.999

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

Date/Time of Computation	ProUCL 5.13/1/2022 7:49:22 PM
From File	ProUCL BKG STATS.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Zn(site)
Sample 2 Data: Zn(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	15	172
Number of Missing Observations	1	0
Number of Non-Detects	0	0
Number of Detect Data	15	172
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	18.5	14

Maximum Detect	53.2	75.5
Mean of Detects	29.54	31.52
Median of Detects	25.3	30.75
SD of Detects	11.23	9.002
Wilcoxon-Mann-Whitney (WMW) Test		
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2		
Sample 1 Rank Sum W-Stat	1139	
Standardized WMW U-Stat	-1.351	
Mean (U)	1290	
SD(U) - Adj ties	200.9	
Approximate U-Stat Critical Value (0.05)	1.645	
P-Value (Adjusted for Ties)	0.912	
Conclusion with Alpha = 0.05		
Do Not Reject H0, Conclude Sample 1 <= Sample 2		
P-Value >= alpha (0.05)		

ATTACHMENT B. LANL ECORISK DATABASE FOR SOIL (MG/KG)

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	Deer mouse (Mammalian omnivore)	0.00000058	0.0000038	SOIL_DM(ip)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	Earthworm (Soil-dwelling invertebrate)	5	10	SOIL_EW_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	Gray fox (Mammalian top carnivore)	0.0001	0.00068	SOIL_RF(f)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	Montane shrew (Mammalian insectivore)	0.00000029	0.0000019	SOIL_MS(i)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	Mountain cottontail (Mammalian herbivore)	0.00004	0.00027	SOIL_DC(p)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	American kestrel (Avian top carnivore)	4.10E-06		
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	American kestrel (insectivore / carnivore)	4.10E-06		
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	American robin (Avian herbivore)	4.10E-06		
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	American robin (Avian insectivore)	4.10E-06		
Dioxin/ Furan	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	American robin (Avian omnivore)	4.10E-06		
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Deer mouse (Mammalian omnivore)	23	230	SOIL_DM(ip)_19406-51-0
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Earthworm (Soil-dwelling invertebrate)	18	180	SOIL_EW_19406-51-0
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Generic plant (Terrestrial autotroph - producer)	33	330	SOIL_GP_19406-51-0
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Gray fox (Mammalian top carnivore)	6700	67000	SOIL_RF(f)_19406-51-0
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Montane shrew (Mammalian insectivore)	12	120	SOIL_MS(i)_19406-51-0
High Explosive	3,5-Dinitroaniline Use amino-2,6-dinitrotoluene[4-	618-87-1	Mountain cottontail (Mammalian herbivore)	320	3200	SOIL_DC(p)_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Deer mouse (Mammalian omnivore)	23	230	SOIL_DM(ip)_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Earthworm (Soil-dwelling invertebrate)	18	180	SOIL_EW_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Generic plant (Terrestrial autotroph - producer)	33	330	SOIL_GP_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Gray fox (Mammalian top carnivore)	6700	67000	SOIL_RF(f)_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Montane shrew (Mammalian insectivore)	12	120	SOIL_MS(i)_19406-51-0
High Explosive	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Mountain cottontail (Mammalian herbivore)	320	3200	SOIL_DC(p)_19406-51-0
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Deer mouse (Mammalian omnivore)	23	230	SOIL_DM(ip)_35572-78-2
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Earthworm (Soil-dwelling invertebrate)	43	430	SOIL_EW_35572-78-2
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Generic plant (Terrestrial autotroph - producer)	14	140	SOIL_GP_35572-78-2
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Gray fox (Mammalian top carnivore)	9700	97000	SOIL_RF(f)_35572-78-2
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Montane shrew (Mammalian insectivore)	16	160	SOIL_MS(i)_35572-78-2
High Explosive	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Mountain cottontail (Mammalian herbivore)	110	1100	SOIL_DC(p)_35572-78-2
High Explosive	Dinitrobenzene[1,3-]	99-65-0	American kestrel (Avian top carnivore)	120	1200	SOIL_AK(f)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	American kestrel (insectivore / carnivore)	9.3	93	SOIL_AK(fi)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian herbivore)	0.079	0.79	SOIL_AR(p)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian insectivore)	1.6	16	SOIL_AR(i)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian omnivore)	0.15	1.5	SOIL_AR(ip)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	Deer mouse (Mammalian omnivore)	0.072	0.16	SOIL_DM(ip)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	Gray fox (Mammalian top carnivore)	82	190	SOIL_RF(f)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	Montane shrew (Mammalian insectivore)	0.95	2.2	SOIL_MS(i)_99-65-0
High Explosive	Dinitrobenzene[1,3-]	99-65-0	Mountain cottontail (Mammalian herbivore)	0.091	0.21	SOIL_DC(p)_99-65-0
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Deer mouse (Mammalian omnivore)	20	200	SOIL_DM(ip)_121-14-2
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Earthworm (Soil-dwelling invertebrate)	18	180	SOIL_EW_121-14-2
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Generic plant (Terrestrial autotroph - producer)	6	60	SOIL_GP_121-14-2
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Gray fox (Mammalian top carnivore)	2000	20000	SOIL_RF(f)_121-14-2
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Montane shrew (Mammalian insectivore)	14	140	SOIL_MS(i)_121-14-2
High Explosive	Dinitrotoluene[2,4-]	121-14-2	Mountain cottontail (Mammalian herbivore)	74	740	SOIL_DC(p)_121-14-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	American kestrel (Avian top carnivore)	18000	180000	SOIL_AK(f)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	American kestrel (insectivore / carnivore)	680	6800	SOIL_AK(fi)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian herbivore)	52	520	SOIL_AR(p)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian insectivore)	130	1300	SOIL_AR(i)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian omnivore)	74	740	SOIL_AR(ip)_606-20-2

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
High Explosive	Dinitrotoluene[2,6-]	606-20-2	Deer mouse (Mammalian omnivore)	4	40	SOIL_DM(ip)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	Earthworm (Soil-dwelling invertebrate)	30	44	SOIL_EW_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	Gray fox (Mammalian top carnivore)	1300	13000	SOIL_RF(f)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	Montane shrew (Mammalian insectivore)	7.6	76	SOIL_MS(i)_606-20-2
High Explosive	Dinitrotoluene[2,6-]	606-20-2	Mountain cottontail (Mammalian herbivore)	6.7	67	SOIL_DC(p)_606-20-2
High Explosive	HMX	2691-41-0	Deer mouse (Mammalian omnivore)	290	790	SOIL_DM(ip)_2691-41-0
High Explosive	HMX	2691-41-0	Earthworm (Soil-dwelling invertebrate)	16	160	SOIL_EW_2691-41-0
High Explosive	HMX	2691-41-0	Generic plant (Terrestrial autotroph - producer)	2700	3500	SOIL_GP_2691-41-0
High Explosive	HMX	2691-41-0	Gray fox (Mammalian top carnivore)	59000	150000	SOIL_RF(f)_2691-41-0
High Explosive	HMX	2691-41-0	Montane shrew (Mammalian insectivore)	1100	2900	SOIL_MS(i)_2691-41-0
High Explosive	HMX	2691-41-0	Mountain cottontail (Mammalian herbivore)	410	1100	SOIL_DC(p)_2691-41-0
High Explosive	Nitroglycerine	55-63-0	Deer mouse (Mammalian omnivore)	70	740	SOIL_DM(ip)_55-63-0
High Explosive	Nitroglycerine	55-63-0	Earthworm (Soil-dwelling invertebrate)	13	130	SOIL_EW_55-63-0
High Explosive	Nitroglycerine	55-63-0	Generic plant (Terrestrial autotroph - producer)	21	210	SOIL_GP_55-63-0
High Explosive	Nitroglycerine	55-63-0	Gray fox (Mammalian top carnivore)	69000	730000	SOIL_RF(f)_55-63-0
High Explosive	Nitroglycerine	55-63-0	Montane shrew (Mammalian insectivore)	1200	13000	SOIL_MS(i)_55-63-0
High Explosive	Nitroglycerine	55-63-0	Mountain cottontail (Mammalian herbivore)	88	930	SOIL_DC(p)_55-63-0
High Explosive	Nitrotoluene[2-]	88-72-2	Deer mouse (Mammalian omnivore)	9.8	98	SOIL_DM(ip)_88-72-2
High Explosive	Nitrotoluene[2-]	88-72-2	Gray fox (Mammalian top carnivore)	6000	60000	SOIL_RF(f)_88-72-2
High Explosive	Nitrotoluene[2-]	88-72-2	Montane shrew (Mammalian insectivore)	22	220	SOIL_MS(i)_88-72-2
High Explosive	Nitrotoluene[2-]	88-72-2	Mountain cottontail (Mammalian herbivore)	15	150	SOIL_DC(p)_88-72-2
High Explosive	Nitrotoluene[3-]	99-08-1	Deer mouse (Mammalian omnivore)	12	120	SOIL_DM(ip)_99-08-1
High Explosive	Nitrotoluene[3-]	99-08-1	Gray fox (Mammalian top carnivore)	7000	70000	SOIL_RF(f)_99-08-1
High Explosive	Nitrotoluene[3-]	99-08-1	Montane shrew (Mammalian insectivore)	19	190	SOIL_MS(i)_99-08-1
High Explosive	Nitrotoluene[3-]	99-08-1	Mountain cottontail (Mammalian herbivore)	21	210	SOIL_DC(p)_99-08-1
High Explosive	Nitrotoluene[4-]	99-99-0	Deer mouse (Mammalian omnivore)	21	210	SOIL_DM(ip)_99-99-0
High Explosive	Nitrotoluene[4-]	99-99-0	Gray fox (Mammalian top carnivore)	13000	130000	SOIL_RF(f)_99-99-0
High Explosive	Nitrotoluene[4-]	99-99-0	Montane shrew (Mammalian insectivore)	41	410	SOIL_MS(i)_99-99-0
High Explosive	Nitrotoluene[4-]	99-99-0	Mountain cottontail (Mammalian herbivore)	36	360	SOIL_DC(p)_99-99-0
High Explosive	PETN	78-11-5	Deer mouse (Mammalian omnivore)	100	1000	SOIL_DM(ip)_78-11-5
High Explosive	PETN	78-11-5	Gray fox (Mammalian top carnivore)	47000	470000	SOIL_RF(f)_78-11-5
High Explosive	PETN	78-11-5	Montane shrew (Mammalian insectivore)	1000	10000	SOIL_MS(i)_78-11-5
High Explosive	PETN	78-11-5	Mountain cottontail (Mammalian herbivore)	120	1200	SOIL_DC(p)_78-11-5
High Explosive	RDX	121-82-4	American kestrel (Avian top carnivore)	780	1400	SOIL_AK(f)_121-82-4
High Explosive	RDX	121-82-4	American kestrel (insectivore / carnivore)	11	22	SOIL_AK(fi)_121-82-4
High Explosive	RDX	121-82-4	American robin (Avian herbivore)	2.3	4.3	SOIL_AR(p)_121-82-4
High Explosive	RDX	121-82-4	American robin (Avian insectivore)	2.4	4.5	SOIL_AR(i)_121-82-4
High Explosive	RDX	121-82-4	American robin (Avian omnivore)	2.3	4.4	SOIL_AR(ip)_121-82-4
High Explosive	RDX	121-82-4	Deer mouse (Mammalian omnivore)	16	51	SOIL_DM(ip)_121-82-4
High Explosive	RDX	121-82-4	Earthworm (Soil-dwelling invertebrate)	8.4	15	SOIL_EW_121-82-4
High Explosive	RDX	121-82-4	Gray fox (Mammalian top carnivore)	7000	22000	SOIL_RF(f)_121-82-4
High Explosive	RDX	121-82-4	Montane shrew (Mammalian insectivore)	16	53	SOIL_MS(i)_121-82-4
High Explosive	RDX	121-82-4	Mountain cottontail (Mammalian herbivore)	38	120	SOIL_DC(p)_121-82-4
High Explosive	Tetryl	479-45-8	Deer mouse (Mammalian omnivore)	1.5	7.2	SOIL_DM(ip)_479-45-8
High Explosive	Tetryl	479-45-8	Gray fox (Mammalian top carnivore)	960	4600	SOIL_RF(f)_479-45-8
High Explosive	Tetryl	479-45-8	Montane shrew (Mammalian insectivore)	60	280	SOIL_MS(i)_479-45-8
High Explosive	Tetryl	479-45-8	Mountain cottontail (Mammalian herbivore)	1.8	8.9	SOIL_DC(p)_479-45-8
High Explosive	TATB Use 1,3,5-TNB	3058-38-6	Deer mouse (Mammalian omnivore)	110	1100	SOIL_DM(ip)_99-35-4
High Explosive	TATB Use 1,3,5-TNB	3058-38-6	Earthworm (Soil-dwelling invertebrate)	10	28	SOIL_EW_99-35-4
High Explosive	TATB Use 1,3,5-TNB	3058-38-6	Gray fox (Mammalian top carnivore)	10000	100000	SOIL_RF(f)_99-35-4
High Explosive	TATB Use 1,3,5-TNB	3058-38-6	Montane shrew (Mammalian insectivore)	720	7200	SOIL_MS(i)_99-35-4
High Explosive	TATB Use 1,3,5-TNB	3058-38-6	Mountain cottontail (Mammalian herbivore)	150	1500	SOIL_DC(p)_99-35-4

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
High Explosive	Trinitrobenzene[1,3,5-]	99-35-4	Deer mouse (Mammalian omnivore)	110	1100	SOIL_DM(ip)_99-35-4
High Explosive	Trinitrobenzene[1,3,5-]	99-35-4	Earthworm (Soil-dwelling invertebrate)	10	28	SOIL_EW_99-35-4
High Explosive	Trinitrobenzene[1,3,5-]	99-35-4	Gray fox (Mammalian top carnivore)	10000	100000	SOIL_RF(f)_99-35-4
High Explosive	Trinitrobenzene[1,3,5-]	99-35-4	Montane shrew (Mammalian insectivore)	720	7200	SOIL_MS(i)_99-35-4
High Explosive	Trinitrobenzene[1,3,5-]	99-35-4	Mountain cottontail (Mammalian herbivore)	150	1500	SOIL_DC(p)_99-35-4
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	American kestrel (Avian top carnivore)	3100	5700	SOIL_AK(f)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	American kestrel (insectivore / carnivore)	1300	2400	SOIL_AK(fi)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian herbivore)	7.5	13	SOIL_AR(p)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian insectivore)	120	220	SOIL_AR(i)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian omnivore)	14	26	SOIL_AR(ip)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Deer mouse (Mammalian omnivore)	95	440	SOIL_DM(ip)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Earthworm (Soil-dwelling invertebrate)	32	58	SOIL_EW_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Generic plant (Terrestrial autotroph - producer)	62	120	SOIL_GP_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Gray fox (Mammalian top carnivore)	26000	120000	SOIL_RF(f)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Montane shrew (Mammalian insectivore)	1900	9100	SOIL_MS(i)_118-96-7
High Explosive	Trinitrotoluene[2,4,6-]	118-96-7	Mountain cottontail (Mammalian herbivore)	110	540	SOIL_DC(p)_118-96-7
Inorganic	Aluminum	7429-90-5	American kestrel (Avian top carnivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_AK(f)_AL
Inorganic	Aluminum	7429-90-5	American kestrel (insectivore / carnivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_AK(fi)_AL
Inorganic	Aluminum	7429-90-5	American robin (Avian herbivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_AR(p)_AL
Inorganic	Aluminum	7429-90-5	American robin (Avian insectivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_AR(i)_AL
Inorganic	Aluminum	7429-90-5	American robin (Avian omnivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_AR(ip)_AL
Inorganic	Aluminum	7429-90-5	Deer mouse (Mammalian omnivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_DM(ip)_AL
Inorganic	Aluminum	7429-90-5	Earthworm (Soil-dwelling invertebrate)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_EW_AL
Inorganic	Aluminum	7429-90-5	Generic plant (Terrestrial autotroph - producer)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_GP_AL
Inorganic	Aluminum	7429-90-5	Gray fox (Mammalian top carnivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_RF(f)_AL
Inorganic	Aluminum	7429-90-5	Montane shrew (Mammalian insectivore)	pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.		SOIL_MS(i)_AL
Inorganic	Aluminum	7429-90-5	Mountain cottontail (Mammalian herbivore)	pH dependent. Aluminum is identified as a COPC only at		SOIL_DC(p)_AL

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
				sites where the soil pH is less than 5.5.		
Inorganic	Antimony	7440-36-0	Deer mouse (Mammalian omnivore)	2.3	23	SOIL_DM(ip)_SB
Inorganic	Antimony	7440-36-0	Earthworm (Soil-dwelling invertebrate)	78	780	SOIL_EW_SB
Inorganic	Antimony	7440-36-0	Generic plant (Terrestrial autotroph - producer)	11	58	SOIL_GP_SB
Inorganic	Antimony	7440-36-0	Gray fox (Mammalian top carnivore)	46	460	SOIL_RF(f)_SB
Inorganic	Antimony	7440-36-0	Montane shrew (Mammalian insectivore)	7.9	79	SOIL_MS(i)_SB
Inorganic	Antimony	7440-36-0	Mountain cottontail (Mammalian herbivore)	2.7	27	SOIL_DC(p)_SB
Inorganic	Arsenic	7440-38-2	American kestrel (Avian top carnivore)	740	7400	SOIL_AK(f)_AS
Inorganic	Arsenic	7440-38-2	American kestrel (insectivore / carnivore)	100	1000	SOIL_AK(fi)_AS
Inorganic	Arsenic	7440-38-2	American robin (Avian herbivore)	34	340	SOIL_AR(p)_AS
Inorganic	Arsenic	7440-38-2	American robin (Avian insectivore)	15	150	SOIL_AR(i)_AS
Inorganic	Arsenic	7440-38-2	American robin (Avian omnivore)	21	210	SOIL_AR(ip)_AS
Inorganic	Arsenic	7440-38-2	Deer mouse (Mammalian omnivore)	32	51	SOIL_DM(ip)_AS
Inorganic	Arsenic	7440-38-2	Earthworm (Soil-dwelling invertebrate)	6.8	68	SOIL_EW_AS
Inorganic	Arsenic	7440-38-2	Generic plant (Terrestrial autotroph - producer)	18	91	SOIL_GP_AS
Inorganic	Arsenic	7440-38-2	Gray fox (Mammalian top carnivore)	820	1300	SOIL_RF(f)_AS
Inorganic	Arsenic	7440-38-2	Montane shrew (Mammalian insectivore)	19	31	SOIL_MS(i)_AS
Inorganic	Arsenic	7440-38-2	Mountain cottontail (Mammalian herbivore)	110	180	SOIL_DC(p)_AS
Inorganic	Barium	7440-39-3	American kestrel (Avian top carnivore)	24000	44000	SOIL_AK(f)_BA
Inorganic	Barium	7440-39-3	American kestrel (insectivore / carnivore)	7500	13000	SOIL_AK(fi)_BA
Inorganic	Barium	7440-39-3	American robin (Avian herbivore)	720	1200	SOIL_AR(p)_BA
Inorganic	Barium	7440-39-3	American robin (Avian insectivore)	820	1400	SOIL_AR(i)_BA
Inorganic	Barium	7440-39-3	American robin (Avian omnivore)	770	1300	SOIL_AR(ip)_BA
Inorganic	Barium	7440-39-3	Deer mouse (Mammalian omnivore)	1800	8700	SOIL_DM(ip)_BA
Inorganic	Barium	7440-39-3	Earthworm (Soil-dwelling invertebrate)	330	3200	SOIL_EW_BA
Inorganic	Barium	7440-39-3	Generic plant (Terrestrial autotroph - producer)	110	260	SOIL_GP_BA
Inorganic	Barium	7440-39-3	Gray fox (Mammalian top carnivore)	41000	190000	SOIL_RF(f)_BA
Inorganic	Barium	7440-39-3	Montane shrew (Mammalian insectivore)	2100	10000	SOIL_MS(i)_BA
Inorganic	Barium	7440-39-3	Mountain cottontail (Mammalian herbivore)	2900	14000	SOIL_DC(p)_BA
Inorganic	Beryllium	7440-41-7	Deer mouse (Mammalian omnivore)	56	560	SOIL_DM(ip)_BE
Inorganic	Beryllium	7440-41-7	Earthworm (Soil-dwelling invertebrate)	40	400	SOIL_EW_BE
Inorganic	Beryllium	7440-41-7	Generic plant (Terrestrial autotroph - producer)	2.5	25	SOIL_GP_BE
Inorganic	Beryllium	7440-41-7	Gray fox (Mammalian top carnivore)	420	4200	SOIL_RF(f)_BE
Inorganic	Beryllium	7440-41-7	Montane shrew (Mammalian insectivore)	35	350	SOIL_MS(i)_BE
Inorganic	Beryllium	7440-41-7	Mountain cottontail (Mammalian herbivore)	89	890	SOIL_DC(p)_BE
Inorganic	Boron	#N/A	American kestrel (Avian top carnivore)	960	4700	SOIL_AK(f)_B
Inorganic	Boron	#N/A	American kestrel (insectivore / carnivore)	37	180	SOIL_AK(fi)_B
Inorganic	Boron	#N/A	American robin (Avian herbivore)	2	10	SOIL_AR(p)_B
Inorganic	Boron	#N/A	American robin (Avian insectivore)	7.1	35	SOIL_AR(i)_B
Inorganic	Boron	#N/A	American robin (Avian omnivore)	3.1	15	SOIL_AR(ip)_B
Inorganic	Boron	#N/A	Deer mouse (Mammalian omnivore)	55	550	SOIL_DM(ip)_B
Inorganic	Boron	#N/A	Generic plant (Terrestrial autotroph - producer)	36	86	SOIL_GP_B
Inorganic	Boron	#N/A	Gray fox (Mammalian top carnivore)	21000	210000	SOIL_RF(f)_B
Inorganic	Boron	#N/A	Montane shrew (Mammalian insectivore)	130	1300	SOIL_MS(i)_B
Inorganic	Boron	#N/A	Mountain cottontail (Mammalian herbivore)	84	840	SOIL_DC(p)_B
Inorganic	Cadmium	7440-43-9	American kestrel (Avian top carnivore)	430	2300	SOIL_AK(f)_CD
Inorganic	Cadmium	7440-43-9	American kestrel (insectivore / carnivore)	1.3	7.7	SOIL_AK(fi)_CD
Inorganic	Cadmium	7440-43-9	American robin (Avian herbivore)	4.3	23	SOIL_AR(p)_CD
Inorganic	Cadmium	7440-43-9	American robin (Avian insectivore)	0.29	1.6	SOIL_AR(i)_CD
Inorganic	Cadmium	7440-43-9	American robin (Avian omnivore)	0.54	3	SOIL_AR(ip)_CD
Inorganic	Cadmium	7440-43-9	Deer mouse (Mammalian omnivore)	0.5	6.8	SOIL_DM(ip)_CD
Inorganic	Cadmium	7440-43-9	Earthworm (Soil-dwelling invertebrate)	140	760	SOIL_EW_CD
Inorganic	Cadmium	7440-43-9	Generic plant (Terrestrial autotroph - producer)	32	160	SOIL_GP_CD
Inorganic	Cadmium	7440-43-9	Gray fox (Mammalian top carnivore)	550	7400	SOIL_RF(f)_CD
Inorganic	Cadmium	7440-43-9	Montane shrew (Mammalian insectivore)	0.27	3.6	SOIL_MS(i)_CD
Inorganic	Cadmium	7440-43-9	Mountain cottontail (Mammalian herbivore)	10	140	SOIL_DC(p)_CD

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
Inorganic	Chromium (total)	16065-83-1	American kestrel (Avian top carnivore)	860	2700	SOIL_AK(f)_CR
Inorganic	Chromium (total)	16065-83-1	American kestrel (insectivore / carnivore)	170	560	SOIL_AK(fi)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian herbivore)	51	160	SOIL_AR(p)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian insectivore)	23	73	SOIL_AR(i)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian omnivore)	32	100	SOIL_AR(ip)_CR
Inorganic	Chromium (total)	16065-83-1	Deer mouse (Mammalian omnivore)	110	11000	SOIL_DM(ip)_CR
Inorganic	Chromium (total)	16065-83-1	Gray fox (Mammalian top carnivore)	1800	180000	SOIL_RF(f)_CR
Inorganic	Chromium (total)	16065-83-1	Montane shrew (Mammalian insectivore)	63	6300	SOIL_MS(i)_CR
Inorganic	Chromium (total)	16065-83-1	Mountain cottontail (Mammalian herbivore)	410	41000	SOIL_DC(p)_CR
Inorganic	Chromium(+6)	#N/A	American kestrel (Avian top carnivore)	3600	36000	SOIL_AK(f)_CR(+6)
Inorganic	Chromium(+6)	#N/A	American kestrel (insectivore / carnivore)	1400	14000	SOIL_AK(fi)_CR(+6)
Inorganic	Chromium(+6)	#N/A	American robin (Avian herbivore)	210	2100	SOIL_AR(p)_CR(+6)
Inorganic	Chromium(+6)	#N/A	American robin (Avian insectivore)	140	1400	SOIL_AR(i)_CR(+6)
Inorganic	Chromium(+6)	#N/A	American robin (Avian omnivore)	160	1600	SOIL_AR(ip)_CR(+6)
Inorganic	Chromium(+6)	#N/A	Deer mouse (Mammalian omnivore)	850	5500	SOIL_DM(ip)_CR(+6)
Inorganic	Chromium(+6)	#N/A	Earthworm (Soil-dwelling invertebrate)	0.34	3.4	SOIL_EW_CR(+6)
Inorganic	Chromium(+6)	#N/A	Generic plant (Terrestrial autotroph - producer)	0.35	4	SOIL_GP_CR(+6)
Inorganic	Chromium(+6)	#N/A	Gray fox (Mammalian top carnivore)	7200	46000	SOIL_RF(f)_CR(+6)
Inorganic	Chromium(+6)	#N/A	Montane shrew (Mammalian insectivore)	510	3300	SOIL_MS(i)_CR(+6)
Inorganic	Chromium(+6)	#N/A	Mountain cottontail (Mammalian herbivore)	1600	10000	SOIL_DC(p)_CR(+6)
Inorganic	Cobalt	7440-48-4	American kestrel (Avian top carnivore)	2300	5200	SOIL_AK(f)_CO
Inorganic	Cobalt	7440-48-4	American kestrel (insectivore / carnivore)	620	1400	SOIL_AK(fi)_CO
Inorganic	Cobalt	7440-48-4	American robin (Avian herbivore)	130	300	SOIL_AR(p)_CO
Inorganic	Cobalt	7440-48-4	American robin (Avian insectivore)	76	170	SOIL_AR(i)_CO
Inorganic	Cobalt	7440-48-4	American robin (Avian omnivore)	97	210	SOIL_AR(ip)_CO
Inorganic	Cobalt	7440-48-4	Deer mouse (Mammalian omnivore)	400	1000	SOIL_DM(ip)_CO
Inorganic	Cobalt	7440-48-4	Generic plant (Terrestrial autotroph - producer)	13	130	SOIL_GP_CO
Inorganic	Cobalt	7440-48-4	Gray fox (Mammalian top carnivore)	5400	14000	SOIL_RF(f)_CO
Inorganic	Cobalt	7440-48-4	Montane shrew (Mammalian insectivore)	240	640	SOIL_MS(i)_CO
Inorganic	Cobalt	7440-48-4	Mountain cottontail (Mammalian herbivore)	1000	2800	SOIL_DC(p)_CO
Inorganic	Copper	7440-50-8	American kestrel (Avian top carnivore)	1100	3500	SOIL_AK(f)_CU
Inorganic	Copper	7440-50-8	American kestrel (insectivore / carnivore)	80	240	SOIL_AK(fi)_CU
Inorganic	Copper	7440-50-8	American robin (Avian herbivore)	34	100	SOIL_AR(p)_CU
Inorganic	Copper	7440-50-8	American robin (Avian insectivore)	14	43	SOIL_AR(i)_CU
Inorganic	Copper	7440-50-8	American robin (Avian omnivore)	20	60	SOIL_AR(ip)_CU
Inorganic	Copper	7440-50-8	Deer mouse (Mammalian omnivore)	63	100	SOIL_DM(ip)_CU
Inorganic	Copper	7440-50-8	Earthworm (Soil-dwelling invertebrate)	80	530	SOIL_EW_CU
Inorganic	Copper	7440-50-8	Generic plant (Terrestrial autotroph - producer)	70	490	SOIL_GP_CU
Inorganic	Copper	7440-50-8	Gray fox (Mammalian top carnivore)	4000	6700	SOIL_RF(f)_CU
Inorganic	Copper	7440-50-8	Montane shrew (Mammalian insectivore)	42	70	SOIL_MS(i)_CU
Inorganic	Copper	7440-50-8	Mountain cottontail (Mammalian herbivore)	260	430	SOIL_DC(p)_CU
Inorganic	Cyanide (total)	#N/A	American kestrel (Avian top carnivore)	0.59	5.9	SOIL_AK(f)_CN(-1)
Inorganic	Cyanide (total)	#N/A	American kestrel (insectivore / carnivore)	0.36	3.6	SOIL_AK(fi)_CN(-1)
Inorganic	Cyanide (total)	#N/A	American robin (Avian herbivore)	0.1	1	SOIL_AR(p)_CN(-1)
Inorganic	Cyanide (total)	#N/A	American robin (Avian insectivore)	0.098	0.98	SOIL_AR(i)_CN(-1)
Inorganic	Cyanide (total)	#N/A	American robin (Avian omnivore)	0.099	0.99	SOIL_AR(ip)_CN(-1)
Inorganic	Cyanide (total)	#N/A	Deer mouse (Mammalian omnivore)	330	3300	SOIL_DM(ip)_CN(-1)
Inorganic	Cyanide (total)	#N/A	Gray fox (Mammalian top carnivore)	3300	33000	SOIL_RF(f)_CN(-1)
Inorganic	Cyanide (total)	#N/A	Montane shrew (Mammalian insectivore)	330	3300	SOIL_MS(i)_CN(-1)
Inorganic	Cyanide (total)	#N/A	Mountain cottontail (Mammalian herbivore)	790	7900	SOIL_DC(p)_CN(-1)
Inorganic	Fluoride	#N/A	American kestrel (Avian top carnivore)	2200	22000	SOIL_AK(f)_F(-1)
Inorganic	Fluoride	#N/A	American kestrel (insectivore / carnivore)	910	9100	SOIL_AK(fi)_F(-1)
Inorganic	Fluoride	#N/A	American robin (Avian herbivore)	170	1700	SOIL_AR(p)_F(-1)
Inorganic	Fluoride	#N/A	American robin (Avian insectivore)	120	1200	SOIL_AR(i)_F(-1)
Inorganic	Fluoride	#N/A	American robin (Avian omnivore)	140	1400	SOIL_AR(ip)_F(-1)
Inorganic	Fluoride	#N/A	Deer mouse (Mammalian omnivore)	1100	2100	SOIL_DM(ip)_F(-1)
Inorganic	Fluoride	#N/A	Gray fox (Mammalian top carnivore)	13000	24000	SOIL_RF(f)_F(-1)

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
Inorganic	Fluoride	#N/A	Montane shrew (Mammalian insectivore)	870	1600	SOIL_MS(i)_F(-1)
Inorganic	Fluoride	#N/A	Mountain cottontail (Mammalian herbivore)	2600	4800	SOIL_DC(p)_F(-1)
Inorganic	Lead	7439-92-1	American kestrel (Avian top carnivore)	540	1000	SOIL_AK(f)_PB
Inorganic	Lead	7439-92-1	American kestrel (insectivore / carnivore)	83	160	SOIL_AK(fi)_PB
Inorganic	Lead	7439-92-1	American robin (Avian herbivore)	18	36	SOIL_AR(p)_PB
Inorganic	Lead	7439-92-1	American robin (Avian insectivore)	11	23	SOIL_AR(i)_PB
Inorganic	Lead	7439-92-1	American robin (Avian omnivore)	14	28	SOIL_AR(ip)_PB
Inorganic	Lead	7439-92-1	Deer mouse (Mammalian omnivore)	120	230	SOIL_DM(ip)_PB
Inorganic	Lead	7439-92-1	Earthworm (Soil-dwelling invertebrate)	1700	8400	SOIL_EW_PB
Inorganic	Lead	7439-92-1	Generic plant (Terrestrial autotroph - producer)	120	570	SOIL_GP_PB
Inorganic	Lead	7439-92-1	Gray fox (Mammalian top carnivore)	3700	7000	SOIL_RF(f)_PB
Inorganic	Lead	7439-92-1	Montane shrew (Mammalian insectivore)	93	170	SOIL_MS(i)_PB
Inorganic	Lead	7439-92-1	Mountain cottontail (Mammalian herbivore)	310	600	SOIL_DC(p)_PB
Inorganic	Lithium	#N/A	Deer mouse (Mammalian omnivore)	100	480	SOIL_DM(ip)_LI
Inorganic	Lithium	#N/A	Gray fox (Mammalian top carnivore)	870	4100	SOIL_RF(f)_LI
Inorganic	Lithium	#N/A	Montane shrew (Mammalian insectivore)	75	350	SOIL_MS(i)_LI
Inorganic	Lithium	#N/A	Mountain cottontail (Mammalian herbivore)	150	750	SOIL_DC(p)_LI
Inorganic	Manganese	7439-96-5	American kestrel (Avian top carnivore)	60000	120000	SOIL_AK(f)_MN
Inorganic	Manganese	7439-96-5	American kestrel (insectivore / carnivore)	24000	50000	SOIL_AK(fi)_MN
Inorganic	Manganese	7439-96-5	American robin (Avian herbivore)	1300	2700	SOIL_AR(p)_MN
Inorganic	Manganese	7439-96-5	American robin (Avian insectivore)	2200	4700	SOIL_AR(i)_MN
Inorganic	Manganese	7439-96-5	American robin (Avian omnivore)	1600	3500	SOIL_AR(ip)_MN
Inorganic	Manganese	7439-96-5	Deer mouse (Mammalian omnivore)	1400	5400	SOIL_DM(ip)_MN
Inorganic	Manganese	7439-96-5	Earthworm (Soil-dwelling invertebrate)	450	4500	SOIL_EW_MN
Inorganic	Manganese	7439-96-5	Generic plant (Terrestrial autotroph - producer)	220	1100	SOIL_GP_MN
Inorganic	Manganese	7439-96-5	Gray fox (Mammalian top carnivore)	40000	150000	SOIL_RF(f)_MN
Inorganic	Manganese	7439-96-5	Montane shrew (Mammalian insectivore)	2800	10000	SOIL_MS(i)_MN
Inorganic	Manganese	7439-96-5	Mountain cottontail (Mammalian herbivore)	2000	7500	SOIL_DC(p)_MN
Inorganic	Mercury (inorganic)	7487-94-7	American kestrel (Avian top carnivore)	0.32	3.2	SOIL_AK(f)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American kestrel (insectivore / carnivore)	0.058	0.58	SOIL_AK(fi)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian herbivore)	0.067	0.67	SOIL_AR(p)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian insectivore)	0.013	0.13	SOIL_AR(i)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian omnivore)	0.022	0.22	SOIL_AR(ip)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Deer mouse (Mammalian omnivore)	3	30	SOIL_DM(ip)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Earthworm (Soil-dwelling invertebrate)	0.05	0.5	SOIL_EW_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Generic plant (Terrestrial autotroph - producer)	34	64	SOIL_GP_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Gray fox (Mammalian top carnivore)	76	760	SOIL_RF(f)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Montane shrew (Mammalian insectivore)	1.7	17	SOIL_MS(i)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Mountain cottontail (Mammalian herbivore)	23	230	SOIL_DC(p)_HGI
Inorganic	Mercury (methyl)	#N/A	American kestrel (Avian top carnivore)	0.009	0.09	SOIL_AK(f)_HGM
Inorganic	Mercury (methyl)	#N/A	American kestrel (insectivore / carnivore)	0.0015	0.015	SOIL_AK(fi)_HGM
Inorganic	Mercury (methyl)	#N/A	American robin (Avian herbivore)	0.066	0.66	SOIL_AR(p)_HGM
Inorganic	Mercury (methyl)	#N/A	American robin (Avian insectivore)	0.00035	0.0035	SOIL_AR(i)_HGM
Inorganic	Mercury (methyl)	#N/A	American robin (Avian omnivore)	0.00071	0.0071	SOIL_AR(ip)_HGM
Inorganic	Mercury (methyl)	#N/A	Deer mouse (Mammalian omnivore)	0.0062	0.031	SOIL_DM(ip)_HGM
Inorganic	Mercury (methyl)	#N/A	Earthworm (Soil-dwelling invertebrate)	2.5	12	SOIL_EW_HGM
Inorganic	Mercury (methyl)	#N/A	Gray fox (Mammalian top carnivore)	0.14	0.74	SOIL_RF(f)_HGM
Inorganic	Mercury (methyl)	#N/A	Montane shrew (Mammalian insectivore)	0.0031	0.015	SOIL_MS(i)_HGM
Inorganic	Mercury (methyl)	#N/A	Mountain cottontail (Mammalian herbivore)	1.9	9.8	SOIL_DC(p)_HGM
Inorganic	Molybdenum	#N/A	American kestrel (Avian top carnivore)	1100	11000	SOIL_AK(f)_MO
Inorganic	Molybdenum	#N/A	American kestrel (insectivore / carnivore)	90	900	SOIL_AK(fi)_MO
Inorganic	Molybdenum	#N/A	American robin (Avian herbivore)	18	180	SOIL_AR(p)_MO
Inorganic	Molybdenum	#N/A	American robin (Avian insectivore)	15	150	SOIL_AR(i)_MO
Inorganic	Molybdenum	#N/A	American robin (Avian omnivore)	16	160	SOIL_AR(ip)_MO
Inorganic	Nickel	7440-02-0	American kestrel (Avian top carnivore)	2000	8100	SOIL_AK(f)_NI
Inorganic	Nickel	7440-02-0	American kestrel (insectivore / carnivore)	110	440	SOIL_AK(fi)_NI
Inorganic	Nickel	7440-02-0	American robin (Avian herbivore)	120	500	SOIL_AR(p)_NI

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
Inorganic	Nickel	7440-02-0	American robin (Avian insectivore)	20	81	SOIL_AR(i)_NI
Inorganic	Nickel	7440-02-0	American robin (Avian omnivore)	35	130	SOIL_AR(ip)_NI
Inorganic	Nickel	7440-02-0	Deer mouse (Mammalian omnivore)	20	40	SOIL_DM(ip)_NI
Inorganic	Nickel	7440-02-0	Earthworm (Soil-dwelling invertebrate)	280	1300	SOIL_EW_NI
Inorganic	Nickel	7440-02-0	Generic plant (Terrestrial autotroph - producer)	38	270	SOIL_GP_NI
Inorganic	Nickel	7440-02-0	Gray fox (Mammalian top carnivore)	1200	2500	SOIL_RF(f)_NI
Inorganic	Nickel	7440-02-0	Montane shrew (Mammalian insectivore)	10	21	SOIL_MS(i)_NI
Inorganic	Nickel	7440-02-0	Mountain cottontail (Mammalian herbivore)	270	540	SOIL_DC(p)_NI
Inorganic	Perchlorate	14797-73-0	American kestrel (Avian top carnivore)	2	4	SOIL_AK(f)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American kestrel (insectivore / carnivore)	3.9	8	SOIL_AK(fi)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian herbivore)	0.12	0.24	SOIL_AR(p)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian insectivore)	31	64	SOIL_AR(i)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian omnivore)	0.24	0.49	SOIL_AR(ip)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Deer mouse (Mammalian omnivore)	0.21	1	SOIL_DM(ip)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Earthworm (Soil-dwelling invertebrate)	3.5	35	SOIL_EW_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Generic plant (Terrestrial autotroph - producer)	40	80	SOIL_GP_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Gray fox (Mammalian top carnivore)	3.3	16	SOIL_RF(f)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Montane shrew (Mammalian insectivore)	31	150	SOIL_MS(i)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Mountain cottontail (Mammalian herbivore)	0.26	1.3	SOIL_DC(p)_ClO4(-1)
Inorganic	Selenium	7782-49-2	American kestrel (Avian top carnivore)	74	140	SOIL_AK(f)_SE
Inorganic	Selenium	7782-49-2	American kestrel (insectivore / carnivore)	3.7	7.5	SOIL_AK(fi)_SE
Inorganic	Selenium	7782-49-2	American robin (Avian herbivore)	0.98	1.9	SOIL_AR(p)_SE
Inorganic	Selenium	7782-49-2	American robin (Avian insectivore)	0.71	1.4	SOIL_AR(i)_SE
Inorganic	Selenium	7782-49-2	American robin (Avian omnivore)	0.83	1.6	SOIL_AR(ip)_SE
Inorganic	Selenium	7782-49-2	Deer mouse (Mammalian omnivore)	0.82	1.2	SOIL_DM(ip)_SE
Inorganic	Selenium	7782-49-2	Earthworm (Soil-dwelling invertebrate)	4.1	41	SOIL_EW_SE
Inorganic	Selenium	7782-49-2	Generic plant (Terrestrial autotroph - producer)	0.52	3	SOIL_GP_SE
Inorganic	Selenium	7782-49-2	Gray fox (Mammalian top carnivore)	92	130	SOIL_RF(f)_SE
Inorganic	Selenium	7782-49-2	Montane shrew (Mammalian insectivore)	0.7	1	SOIL_MS(i)_SE
Inorganic	Selenium	7782-49-2	Mountain cottontail (Mammalian herbivore)	2.2	3.4	SOIL_DC(p)_SE
Inorganic	Silver	7440-22-4	American kestrel (Avian top carnivore)	600	6000	SOIL_AK(f)_AG
Inorganic	Silver	7440-22-4	American kestrel (insectivore / carnivore)	13	130	SOIL_AK(fi)_AG
Inorganic	Silver	7440-22-4	American robin (Avian herbivore)	10	100	SOIL_AR(p)_AG
Inorganic	Silver	7440-22-4	American robin (Avian insectivore)	2.6	26	SOIL_AR(i)_AG
Inorganic	Silver	7440-22-4	American robin (Avian omnivore)	4.1	41	SOIL_AR(ip)_AG
Inorganic	Silver	7440-22-4	Deer mouse (Mammalian omnivore)	24	240	SOIL_DM(ip)_AG
Inorganic	Silver	7440-22-4	Generic plant (Terrestrial autotroph - producer)	560	2800	SOIL_GP_AG
Inorganic	Silver	7440-22-4	Gray fox (Mammalian top carnivore)	4400	44000	SOIL_RF(f)_AG
Inorganic	Silver	7440-22-4	Montane shrew (Mammalian insectivore)	14	140	SOIL_MS(i)_AG
Inorganic	Silver	7440-22-4	Mountain cottontail (Mammalian herbivore)	150	1500	SOIL_DC(p)_AG
Inorganic	Strontium (stable)	#N/A	Deer mouse (Mammalian omnivore)	95	950	SOIL_DM(ip)_SR
Inorganic	Strontium (stable)	#N/A	Gray fox (Mammalian top carnivore)	19000	190000	SOIL_RF(f)_SR
Inorganic	Strontium (stable)	#N/A	Montane shrew (Mammalian insectivore)	1000	10000	SOIL_MS(i)_SR
Inorganic	Strontium (stable)	#N/A	Mountain cottontail (Mammalian herbivore)	110	1100	SOIL_DC(p)_SR
Inorganic	Thallium	7440-28-0	American kestrel (Avian top carnivore)	100	1000	SOIL_AK(f)_TL
Inorganic	Thallium	7440-28-0	American kestrel (insectivore / carnivore)	48	480	SOIL_AK(fi)_TL
Inorganic	Thallium	7440-28-0	American robin (Avian herbivore)	6.9	69	SOIL_AR(p)_TL
Inorganic	Thallium	7440-28-0	American robin (Avian insectivore)	4.5	45	SOIL_AR(i)_TL
Inorganic	Thallium	7440-28-0	American robin (Avian omnivore)	5.5	55	SOIL_AR(ip)_TL
Inorganic	Thallium	7440-28-0	Deer mouse (Mammalian omnivore)	0.72	7.2	SOIL_DM(ip)_TL
Inorganic	Thallium	7440-28-0	Generic plant (Terrestrial autotroph - producer)	0.05	0.5	SOIL_GP_TL
Inorganic	Thallium	7440-28-0	Gray fox (Mammalian top carnivore)	5	50	SOIL_RF(f)_TL
Inorganic	Thallium	7440-28-0	Montane shrew (Mammalian insectivore)	0.42	4.2	SOIL_MS(i)_TL
Inorganic	Thallium	7440-28-0	Mountain cottontail (Mammalian herbivore)	1.2	12	SOIL_DC(p)_TL
Inorganic	Titanium	#N/A	Deer mouse (Mammalian omnivore)	150	1500	SOIL_DM(ip)_TI
Inorganic	Titanium	#N/A	Gray fox (Mammalian top carnivore)	8600	86000	SOIL_RF(f)_TI
Inorganic	Titanium	#N/A	Montane shrew (Mammalian insectivore)	77	770	SOIL_MS(i)_TI

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
Inorganic	Titanium	#N/A	Mountain cottontail (Mammalian herbivore)	2800	28000	SOIL_DC(p)_TI
Inorganic	Uranium	#N/A	American kestrel (Avian top carnivore)	26000	260000	SOIL_AK(f)_U
Inorganic	Uranium	#N/A	American kestrel (insectivore / carnivore)	14000	140000	SOIL_AK(fi)_U
Inorganic	Uranium	#N/A	American robin (Avian herbivore)	1500	15000	SOIL_AR(p)_U
Inorganic	Uranium	#N/A	American robin (Avian insectivore)	1100	11000	SOIL_AR(i)_U
Inorganic	Uranium	#N/A	American robin (Avian omnivore)	1200	12000	SOIL_AR(ip)_U
Inorganic	Uranium	#N/A	Deer mouse (Mammalian omnivore)	740	1800	SOIL_DM(ip)_U
Inorganic	Uranium	#N/A	Generic plant (Terrestrial autotroph - producer)	25	250	SOIL_GP_U
Inorganic	Uranium	#N/A	Gray fox (Mammalian top carnivore)	4800	12000	SOIL_RF(f)_U
Inorganic	Uranium	#N/A	Montane shrew (Mammalian insectivore)	480	1200	SOIL_MS(i)_U
Inorganic	Uranium	#N/A	Mountain cottontail (Mammalian herbivore)	1000	2600	SOIL_DC(p)_U
Inorganic	Vanadium	7440-62-2	American kestrel (Avian top carnivore)	110	230	SOIL_AK(f)_V
Inorganic	Vanadium	7440-62-2	American kestrel (insectivore / carnivore)	56	110	SOIL_AK(fi)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian herbivore)	6.8	13	SOIL_AR(p)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian insectivore)	4.7	9.5	SOIL_AR(i)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian omnivore)	5.5	11	SOIL_AR(ip)_V
Inorganic	Vanadium	7440-62-2	Deer mouse (Mammalian omnivore)	470	1000	SOIL_DM(ip)_V
Inorganic	Vanadium	7440-62-2	Generic plant (Terrestrial autotroph - producer)	60	80	SOIL_GP_V
Inorganic	Vanadium	7440-62-2	Gray fox (Mammalian top carnivore)	3200	6900	SOIL_RF(f)_V
Inorganic	Vanadium	7440-62-2	Montane shrew (Mammalian insectivore)	290	610	SOIL_MS(i)_V
Inorganic	Vanadium	7440-62-2	Mountain cottontail (Mammalian herbivore)	740	1500	SOIL_DC(p)_V
Inorganic	Zinc	7440-66-6	American kestrel (Avian top carnivore)	2600	7000	SOIL_AK(f)_ZN
Inorganic	Zinc	7440-66-6	American kestrel (insectivore / carnivore)	220	590	SOIL_AK(fi)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian herbivore)	330	120	SOIL_AR(p)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian insectivore)	47	120	SOIL_AR(i)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian omnivore)	83	220	SOIL_AR(ip)_ZN
Inorganic	Zinc	7440-66-6	Deer mouse (Mammalian omnivore)	170	1700	SOIL_DM(ip)_ZN
Inorganic	Zinc	7440-66-6	Earthworm (Soil-dwelling invertebrate)	120	930	SOIL_EW_ZN
Inorganic	Zinc	7440-66-6	Generic plant (Terrestrial autotroph - producer)	160	810	SOIL_GP_ZN
Inorganic	Zinc	7440-66-6	Gray fox (Mammalian top carnivore)	9600	94000	SOIL_RF(f)_ZN
Inorganic	Zinc	7440-66-6	Montane shrew (Mammalian insectivore)	99	980	SOIL_MS(i)_ZN
Inorganic	Zinc	7440-66-6	Mountain cottontail (Mammalian herbivore)	1800	18000	SOIL_DC(p)_ZN
Organic	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	Earthworm (Soil-dwelling invertebrate)	1.8	81.5	SOIL_EW_1763-23-1
Organic	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	Generic plant (Terrestrial autotroph - producer)	62.2	80.8	SOIL_GP_1763-23-1
Organic	Perfluorooctanoic acid (PFOA)	335-67-1	Earthworm (Soil-dwelling invertebrate)	12.2	101.1	SOIL_EW_335-67-1
Organic	Perfluorooctanoic acid (PFOA)	335-67-1	Generic plant (Terrestrial autotroph - producer)	41.1	62.1	SOIL_GP_335-67-1
Organic	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	Earthworm (Soil-dwelling invertebrate)	198	1977	SOIL_EW_TPH F2F3
Organic	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	Generic plant (Terrestrial autotroph - producer)	81.2	419	SOIL_GP_TPH F2F3
Organic	Total Petroleum Hydrocarbon DRO	TPH-DRO	Earthworm (Soil-dwelling invertebrate)	198	1977	SOIL_EW_TPH F2F3
Organic	Total Petroleum Hydrocarbon DRO	TPH-DRO	Generic plant (Terrestrial autotroph - producer)	81.2	419	SOIL_GP_TPH F2F3
PAH	Acenaphthene	83-32-9	Deer mouse (Mammalian omnivore)	160	1600	SOIL_DM(ip)_83-32-9
PAH	Acenaphthene	83-32-9	Generic plant (Terrestrial autotroph - producer)	0.25	2	SOIL_GP_83-32-9
PAH	Acenaphthene	83-32-9	Gray fox (Mammalian top carnivore)	29000	290000	SOIL_RF(f)_83-32-9
PAH	Acenaphthene	83-32-9	Montane shrew (Mammalian insectivore)	130	1300	SOIL_MS(i)_83-32-9
PAH	Acenaphthene	83-32-9	Mountain cottontail (Mammalian herbivore)	530	5300	SOIL_DC(p)_83-32-9
PAH	Acenaphthylene	208-96-8	Deer mouse (Mammalian omnivore)	160	1600	SOIL_DM(ip)_208-96-8
PAH	Acenaphthylene	208-96-8	Gray fox (Mammalian top carnivore)	28000	280000	SOIL_RF(f)_208-96-8
PAH	Acenaphthylene	208-96-8	Montane shrew (Mammalian insectivore)	120	1200	SOIL_MS(i)_208-96-8
PAH	Acenaphthylene	208-96-8	Mountain cottontail (Mammalian herbivore)	540	5400	SOIL_DC(p)_208-96-8
PAH	Anthracene	120-12-7	Deer mouse (Mammalian omnivore)	300	3000	SOIL_DM(ip)_120-12-7
PAH	Anthracene	120-12-7	Generic plant (Terrestrial autotroph - producer)	6.8	9	SOIL_GP_120-12-7
PAH	Anthracene	120-12-7	Gray fox (Mammalian top carnivore)	38000	380000	SOIL_RF(f)_120-12-7

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
PAH	Anthracene	120-12-7	Montane shrew (Mammalian insectivore)	210	2100	SOIL_MS(i)_120-12-7
PAH	Anthracene	120-12-7	Mountain cottontail (Mammalian herbivore)	1200	12000	SOIL_DC(p)_120-12-7
PAH	Benzo(a)anthracene	56-55-3	American kestrel (Avian top carnivore)	28	280	SOIL_AK(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American kestrel (insectivore / carnivore)	6.4	64	SOIL_AK(fi)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian herbivore)	0.73	7.3	SOIL_AR(p)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian insectivore)	0.88	8.8	SOIL_AR(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian omnivore)	0.8	8	SOIL_AR(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Deer mouse (Mammalian omnivore)	3.4	34	SOIL_DM(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Generic plant (Terrestrial autotroph - producer)	18	180	SOIL_GP_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Gray fox (Mammalian top carnivore)	110	1100	SOIL_RF(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Montane shrew (Mammalian insectivore)	4	40	SOIL_MS(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Mountain cottontail (Mammalian herbivore)	6.1	61	SOIL_DC(p)_56-55-3
PAH	Benzo(a)pyrene	50-32-8	Deer mouse (Mammalian omnivore)	84	260	SOIL_DM(ip)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Gray fox (Mammalian top carnivore)	3400	11000	SOIL_RF(f)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Montane shrew (Mammalian insectivore)	62	190	SOIL_MS(i)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Mountain cottontail (Mammalian herbivore)	260	830	SOIL_DC(p)_50-32-8
PAH	Benzo(b)fluoranthene	205-99-2	Deer mouse (Mammalian omnivore)	51	510	SOIL_DM(ip)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Generic plant (Terrestrial autotroph - producer)	18	180	SOIL_GP_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Gray fox (Mammalian top carnivore)	2400	24000	SOIL_RF(f)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Montane shrew (Mammalian insectivore)	44	440	SOIL_MS(i)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Mountain cottontail (Mammalian herbivore)	130	1300	SOIL_DC(p)_205-99-2
PAH	Benzo(g,h,i)perylene	191-24-2	Deer mouse (Mammalian omnivore)	46	460	SOIL_DM(ip)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Gray fox (Mammalian top carnivore)	3600	36000	SOIL_RF(f)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Montane shrew (Mammalian insectivore)	25	250	SOIL_MS(i)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Mountain cottontail (Mammalian herbivore)	470	4700	SOIL_DC(p)_191-24-2
PAH	Benzo(k)fluoranthene	207-08-9	Deer mouse (Mammalian omnivore)	99	990	SOIL_DM(ip)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Gray fox (Mammalian top carnivore)	4300	43000	SOIL_RF(f)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Montane shrew (Mammalian insectivore)	71	710	SOIL_MS(i)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Mountain cottontail (Mammalian herbivore)	330	3300	SOIL_DC(p)_207-08-9
PAH	Chrysene	218-01-9	Deer mouse (Mammalian omnivore)	3.1	31	SOIL_DM(ip)_218-01-9
PAH	Chrysene	218-01-9	Gray fox (Mammalian top carnivore)	110	1100	SOIL_RF(f)_218-01-9
PAH	Chrysene	218-01-9	Montane shrew (Mammalian insectivore)	3.1	31	SOIL_MS(i)_218-01-9
PAH	Chrysene	218-01-9	Mountain cottontail (Mammalian herbivore)	6.3	63	SOIL_DC(p)_218-01-9
PAH	Dibenzo(a,h)anthracene	53-70-3	Deer mouse (Mammalian omnivore)	22	220	SOIL_DM(ip)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Gray fox (Mammalian top carnivore)	850	8500	SOIL_RF(f)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Montane shrew (Mammalian insectivore)	14	140	SOIL_MS(i)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Mountain cottontail (Mammalian herbivore)	84	840	SOIL_DC(p)_53-70-3
PAH	Fluoranthene	206-44-0	Deer mouse (Mammalian omnivore)	38	380	SOIL_DM(ip)_206-44-0
PAH	Fluoranthene	206-44-0	Earthworm (Soil-dwelling invertebrate)	10	23	SOIL_EW_206-44-0
PAH	Fluoranthene	206-44-0	Gray fox (Mammalian top carnivore)	3900	39000	SOIL_RF(f)_206-44-0
PAH	Fluoranthene	206-44-0	Montane shrew (Mammalian insectivore)	22	220	SOIL_MS(i)_206-44-0
PAH	Fluoranthene	206-44-0	Mountain cottontail (Mammalian herbivore)	270	2700	SOIL_DC(p)_206-44-0
PAH	Fluorene	86-73-7	Deer mouse (Mammalian omnivore)	340	680	SOIL_DM(ip)_86-73-7
PAH	Fluorene	86-73-7	Earthworm (Soil-dwelling invertebrate)	3.7	19	SOIL_EW_86-73-7
PAH	Fluorene	86-73-7	Gray fox (Mammalian top carnivore)	50000	100000	SOIL_RF(f)_86-73-7
PAH	Fluorene	86-73-7	Montane shrew (Mammalian insectivore)	250	510	SOIL_MS(i)_86-73-7
PAH	Fluorene	86-73-7	Mountain cottontail (Mammalian herbivore)	1100	2300	SOIL_DC(p)_86-73-7
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Deer mouse (Mammalian omnivore)	110	1100	SOIL_DM(ip)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Gray fox (Mammalian top carnivore)	4600	46000	SOIL_RF(f)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Montane shrew (Mammalian insectivore)	71	710	SOIL_MS(i)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Mountain cottontail (Mammalian herbivore)	510	5100	SOIL_DC(p)_193-39-5
PAH	Methylnaphthalene[2-]	91-57-6	Deer mouse (Mammalian omnivore)	24	240	SOIL_DM(ip)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Gray fox (Mammalian top carnivore)	4900	49000	SOIL_RF(f)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Montane shrew (Mammalian insectivore)	16	160	SOIL_MS(i)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Mountain cottontail (Mammalian herbivore)	110	1100	SOIL_DC(p)_91-57-6
PAH	Naphthalene	91-20-3	American kestrel (Avian top carnivore)	2100	21000	SOIL_AK(f)_91-20-3
PAH	Naphthalene	91-20-3	American kestrel (insectivore / carnivore)	78	780	SOIL_AK(fi)_91-20-3

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
PAH	Naphthalene	91-20-3	American robin (Avian herbivore)	3.4	34	SOIL_AR(p)_91-20-3
PAH	Naphthalene	91-20-3	American robin (Avian insectivore)	15	150	SOIL_AR(i)_91-20-3
PAH	Naphthalene	91-20-3	American robin (Avian omnivore)	5.7	57	SOIL_AR(ip)_91-20-3
PAH	Naphthalene	91-20-3	Deer mouse (Mammalian omnivore)	9.6	27	SOIL_DM(ip)_91-20-3
PAH	Naphthalene	91-20-3	Generic plant (Terrestrial autotroph - producer)	1	10	SOIL_GP_91-20-3
PAH	Naphthalene	91-20-3	Gray fox (Mammalian top carnivore)	5800	16000	SOIL_RF(f)_91-20-3
PAH	Naphthalene	91-20-3	Montane shrew (Mammalian insectivore)	28	79	SOIL_MS(i)_91-20-3
PAH	Naphthalene	91-20-3	Mountain cottontail (Mammalian herbivore)	14	40	SOIL_DC(p)_91-20-3
PAH	Phenanthrene	85-01-8	Deer mouse (Mammalian omnivore)	15	150	SOIL_DM(ip)_85-01-8
PAH	Phenanthrene	85-01-8	Earthworm (Soil-dwelling invertebrate)	5.5	12	SOIL_EW_85-01-8
PAH	Phenanthrene	85-01-8	Gray fox (Mammalian top carnivore)	1900	19000	SOIL_RF(f)_85-01-8
PAH	Phenanthrene	85-01-8	Montane shrew (Mammalian insectivore)	11	110	SOIL_MS(i)_85-01-8
PAH	Phenanthrene	85-01-8	Mountain cottontail (Mammalian herbivore)	62	620	SOIL_DC(p)_85-01-8
PAH	Pyrene	129-00-0	American kestrel (Avian top carnivore)	3000	30000	SOIL_AK(f)_129-00-0
PAH	Pyrene	129-00-0	American kestrel (insectivore / carnivore)	160	1600	SOIL_AK(fi)_129-00-0
PAH	Pyrene	129-00-0	American robin (Avian herbivore)	68	680	SOIL_AR(p)_129-00-0
PAH	Pyrene	129-00-0	American robin (Avian insectivore)	33	330	SOIL_AR(i)_129-00-0
PAH	Pyrene	129-00-0	American robin (Avian omnivore)	44	440	SOIL_AR(ip)_129-00-0
PAH	Pyrene	129-00-0	Deer mouse (Mammalian omnivore)	31	310	SOIL_DM(ip)_129-00-0
PAH	Pyrene	129-00-0	Earthworm (Soil-dwelling invertebrate)	10	20	SOIL_EW_129-00-0
PAH	Pyrene	129-00-0	Gray fox (Mammalian top carnivore)	3100	31000	SOIL_RF(f)_129-00-0
PAH	Pyrene	129-00-0	Montane shrew (Mammalian insectivore)	23	230	SOIL_MS(i)_129-00-0
PAH	Pyrene	129-00-0	Mountain cottontail (Mammalian herbivore)	110	1100	SOIL_DC(p)_129-00-0
SVOC	Benzoic Acid	65-85-0	Deer mouse (Mammalian omnivore)	1.3	13	SOIL_DM(ip)_65-85-0
SVOC	Benzoic Acid	65-85-0	Gray fox (Mammalian top carnivore)	2000	20000	SOIL_RF(f)_65-85-0
SVOC	Benzoic Acid	65-85-0	Montane shrew (Mammalian insectivore)	1	10	SOIL_MS(i)_65-85-0
SVOC	Benzoic Acid	65-85-0	Mountain cottontail (Mammalian herbivore)	4.6	46	SOIL_DC(p)_65-85-0
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American kestrel (Avian top carnivore)	9.3	93	SOIL_AK(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American kestrel (insectivore / carnivore)	0.096	0.96	SOIL_AK(fi)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian herbivore)	16	160	SOIL_AR(p)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian insectivore)	0.02	0.2	SOIL_AR(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian omnivore)	0.04	0.4	SOIL_AR(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Deer mouse (Mammalian omnivore)	1.1	11	SOIL_DM(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Gray fox (Mammalian top carnivore)	500	5000	SOIL_RF(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Montane shrew (Mammalian insectivore)	0.6	6	SOIL_MS(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Mountain cottontail (Mammalian herbivore)	1900	19000	SOIL_DC(p)_117-81-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Deer mouse (Mammalian omnivore)	160	1600	SOIL_DM(ip)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Gray fox (Mammalian top carnivore)	23000	230000	SOIL_RF(f)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Montane shrew (Mammalian insectivore)	90	900	SOIL_MS(i)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Mountain cottontail (Mammalian herbivore)	2400	24000	SOIL_DC(p)_85-68-7
SVOC	Carbazole	86-74-8	Deer mouse (Mammalian omnivore)	79	790	SOIL_DM(ip)_86-74-8
SVOC	Carbazole	86-74-8	Gray fox (Mammalian top carnivore)	13000	130000	SOIL_RF(f)_86-74-8
SVOC	Carbazole	86-74-8	Montane shrew (Mammalian insectivore)	110	1100	SOIL_MS(i)_86-74-8
SVOC	Carbazole	86-74-8	Mountain cottontail (Mammalian herbivore)	140	1400	SOIL_DC(p)_86-74-8
SVOC	Chlorobenzene	108-90-7	Deer mouse (Mammalian omnivore)	53	530	SOIL_DM(ip)_108-90-7
SVOC	Chlorobenzene	108-90-7	Earthworm (Soil-dwelling invertebrate)	2.4	24	SOIL_EW_108-90-7
SVOC	Chlorobenzene	108-90-7	Gray fox (Mammalian top carnivore)	25000	250000	SOIL_RF(f)_108-90-7
SVOC	Chlorobenzene	108-90-7	Montane shrew (Mammalian insectivore)	43	430	SOIL_MS(i)_108-90-7
SVOC	Chlorobenzene	108-90-7	Mountain cottontail (Mammalian herbivore)	170	1700	SOIL_DC(p)_108-90-7
SVOC	Chlorophenol[2-]	95-57-8	American kestrel (Avian top carnivore)	310	3100	SOIL_AK(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American kestrel (insectivore / carnivore)	14	140	SOIL_AK(fi)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian herbivore)	0.39	3.9	SOIL_AR(p)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian insectivore)	2.6	26	SOIL_AR(i)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian omnivore)	0.68	6.8	SOIL_AR(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Deer mouse (Mammalian omnivore)	0.54	5.4	SOIL_DM(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Gray fox (Mammalian top carnivore)	340	3400	SOIL_RF(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Montane shrew (Mammalian insectivore)	2.3	23	SOIL_MS(i)_95-57-8

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
SVOC	Chlorophenol[2-]	95-57-8	Mountain cottontail (Mammalian herbivore)	0.74	7.4	SOIL_DC(p)_95-57-8
SVOC	Dibenzofuran	132-64-9	Generic plant (Terrestrial autotroph - producer)	6.1	61	SOIL_GP_132-64-9
SVOC	Diethyl Phthalate	84-66-2	Deer mouse (Mammalian omnivore)	3600	36000	SOIL_DM(ip)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Generic plant (Terrestrial autotroph - producer)	100	1000	SOIL_GP_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Gray fox (Mammalian top carnivore)	2500000	25000000	SOIL_RF(f)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Montane shrew (Mammalian insectivore)	3600	36000	SOIL_MS(i)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Mountain cottontail (Mammalian herbivore)	8800	88000	SOIL_DC(p)_84-66-2
SVOC	Dimethyl Phthalate	131-11-3	Deer mouse (Mammalian omnivore)	38	460	SOIL_DM(ip)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Earthworm (Soil-dwelling invertebrate)	10	100	SOIL_EW_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Gray fox (Mammalian top carnivore)	48000	590000	SOIL_RF(f)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Montane shrew (Mammalian insectivore)	80	980	SOIL_MS(i)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Mountain cottontail (Mammalian herbivore)	60	740	SOIL_DC(p)_131-11-3
SVOC	Di-n-Butyl Phthalate	84-74-2	American kestrel (Avian top carnivore)	2	20	SOIL_AK(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American kestrel (insectivore / carnivore)	0.052	0.52	SOIL_AK(fi)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian herbivore)	0.38	3.8	SOIL_AR(p)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian insectivore)	0.011	0.11	SOIL_AR(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian omnivore)	0.021	0.21	SOIL_AR(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Deer mouse (Mammalian omnivore)	360	860	SOIL_DM(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Generic plant (Terrestrial autotroph - producer)	160	600	SOIL_GP_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Gray fox (Mammalian top carnivore)	62000	140000	SOIL_RF(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Montane shrew (Mammalian insectivore)	180	450	SOIL_MS(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Mountain cottontail (Mammalian herbivore)	17000	40000	SOIL_DC(p)_84-74-2
SVOC	Di-n-octylphthalate	117-84-0	Deer mouse (Mammalian omnivore)	1.8	18	SOIL_DM(ip)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Gray fox (Mammalian top carnivore)	1300	13000	SOIL_RF(f)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Montane shrew (Mammalian insectivore)	0.91	9.1	SOIL_MS(i)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Mountain cottontail (Mammalian herbivore)	8400	84000	SOIL_DC(p)_117-84-0
SVOC	Methylphenol[2-]	95-48-7	Deer mouse (Mammalian omnivore)	580	5800	SOIL_DM(ip)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Generic plant (Terrestrial autotroph - producer)	0.67	7	SOIL_GP_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Gray fox (Mammalian top carnivore)	160000	1600000	SOIL_RF(f)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Montane shrew (Mammalian insectivore)	1500	15000	SOIL_MS(i)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Mountain cottontail (Mammalian herbivore)	880	8800	SOIL_DC(p)_95-48-7
SVOC	Methylphenol[3-]	108-39-4	Generic plant (Terrestrial autotroph - producer)	0.69	7	SOIL_GP_108-39-4
SVOC	Nitroaniline[2-]	88-74-4	Deer mouse (Mammalian omnivore)	5.3	10	SOIL_DM(ip)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Gray fox (Mammalian top carnivore)	2200	4400	SOIL_RF(f)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Montane shrew (Mammalian insectivore)	6.5	13	SOIL_MS(i)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Mountain cottontail (Mammalian herbivore)	11	22	SOIL_DC(p)_88-74-4
SVOC	Nitrobenzene	98-95-3	Deer mouse (Mammalian omnivore)	4.8	48	SOIL_DM(ip)_98-95-3
SVOC	Nitrobenzene	98-95-3	Earthworm (Soil-dwelling invertebrate)	2.2	22	SOIL_EW_98-95-3
SVOC	Nitrobenzene	98-95-3	Gray fox (Mammalian top carnivore)	4100	41000	SOIL_RF(f)_98-95-3
SVOC	Nitrobenzene	98-95-3	Montane shrew (Mammalian insectivore)	21	210	SOIL_MS(i)_98-95-3
SVOC	Nitrobenzene	98-95-3	Mountain cottontail (Mammalian herbivore)	6.7	67	SOIL_DC(p)_98-95-3
SVOC	Pentachloronitrobenzene	82-68-8	American kestrel (Avian top carnivore)	110	1100	SOIL_AK(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American kestrel (insectivore / carnivore)	3.3	33	SOIL_AK(fi)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian herbivore)	21	210	SOIL_AR(p)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian insectivore)	0.7	7	SOIL_AR(i)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian omnivore)	1.3	13	SOIL_AR(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Deer mouse (Mammalian omnivore)	22	220	SOIL_DM(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Gray fox (Mammalian top carnivore)	3500	35000	SOIL_RF(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Montane shrew (Mammalian insectivore)	11	110	SOIL_MS(i)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Mountain cottontail (Mammalian herbivore)	930	9300	SOIL_DC(p)_82-68-8
SVOC	Pentachlorophenol	87-86-5	American kestrel (Avian top carnivore)	57	570	SOIL_AK(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American kestrel (insectivore / carnivore)	1.7	17	SOIL_AK(fi)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian herbivore)	29	290	SOIL_AR(p)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian insectivore)	0.36	3.6	SOIL_AR(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian omnivore)	0.72	7.2	SOIL_AR(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Deer mouse (Mammalian omnivore)	1.5	15	SOIL_DM(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Earthworm (Soil-dwelling invertebrate)	31	150	SOIL_EW_87-86-5

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
SVOC	Pentachlorophenol	87-86-5	Generic plant (Terrestrial autotroph - producer)	5	50	SOIL_GP_87-86-5
SVOC	Pentachlorophenol	87-86-5	Gray fox (Mammalian top carnivore)	230	2300	SOIL_RF(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Montane shrew (Mammalian insectivore)	0.81	8.1	SOIL_MS(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Mountain cottontail (Mammalian herbivore)	180	1800	SOIL_DC(p)_87-86-5
SVOC	Phenol	108-95-2	Deer mouse (Mammalian omnivore)	37	370	SOIL_DM(ip)_108-95-2
SVOC	Phenol	108-95-2	Earthworm (Soil-dwelling invertebrate)	1.8	18	SOIL_EW_108-95-2
SVOC	Phenol	108-95-2	Generic plant (Terrestrial autotroph - producer)	0.79	8	SOIL_GP_108-95-2
SVOC	Phenol	108-95-2	Gray fox (Mammalian top carnivore)	43000	430000	SOIL_RF(f)_108-95-2
SVOC	Phenol	108-95-2	Montane shrew (Mammalian insectivore)	640	6400	SOIL_MS(i)_108-95-2
SVOC	Phenol	108-95-2	Mountain cottontail (Mammalian herbivore)	47	470	SOIL_DC(p)_108-95-2
VOC	Acetone	67-64-1	American kestrel (Avian top carnivore)	66000	660000	SOIL_AK(f)_67-64-1
VOC	Acetone	67-64-1	American kestrel (insectivore / carnivore)	840	8400	SOIL_AK(fi)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian herbivore)	7.5	75	SOIL_AR(p)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian insectivore)	170	1700	SOIL_AR(i)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian omnivore)	14	140	SOIL_AR(ip)_67-64-1
VOC	Acetone	67-64-1	Deer mouse (Mammalian omnivore)	1.2	6.3	SOIL_DM(ip)_67-64-1
VOC	Acetone	67-64-1	Gray fox (Mammalian top carnivore)	7800	39000	SOIL_RF(f)_67-64-1
VOC	Acetone	67-64-1	Montane shrew (Mammalian insectivore)	15	79	SOIL_MS(i)_67-64-1
VOC	Acetone	67-64-1	Mountain cottontail (Mammalian herbivore)	1.6	8	SOIL_DC(p)_67-64-1
VOC	Benzene	71-43-2	Deer mouse (Mammalian omnivore)	24	240	SOIL_DM(ip)_71-43-2
VOC	Benzene	71-43-2	Gray fox (Mammalian top carnivore)	18000	180000	SOIL_RF(f)_71-43-2
VOC	Benzene	71-43-2	Montane shrew (Mammalian insectivore)	49	490	SOIL_MS(i)_71-43-2
VOC	Benzene	71-43-2	Mountain cottontail (Mammalian herbivore)	38	380	SOIL_DC(p)_71-43-2
VOC	Benzyl Alcohol	100-51-6	Deer mouse (Mammalian omnivore)	120	1200	SOIL_DM(ip)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Gray fox (Mammalian top carnivore)	110000	1100000	SOIL_RF(f)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Montane shrew (Mammalian insectivore)	270	2700	SOIL_MS(i)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Mountain cottontail (Mammalian herbivore)	190	1900	SOIL_DC(p)_100-51-6
VOC	Butanone[2-]	78-93-3	Deer mouse (Mammalian omnivore)	350	920	SOIL_DM(ip)_78-93-3
VOC	Butanone[2-]	78-93-3	Gray fox (Mammalian top carnivore)	1300000	3500000	SOIL_RF(f)_78-93-3
VOC	Butanone[2-]	78-93-3	Montane shrew (Mammalian insectivore)	2700	6900	SOIL_MS(i)_78-93-3
VOC	Butanone[2-]	78-93-3	Mountain cottontail (Mammalian herbivore)	470	1200	SOIL_DC(p)_78-93-3
VOC	Carbon Disulfide	75-15-0	Deer mouse (Mammalian omnivore)	0.81	8.1	SOIL_DM(ip)_75-15-0
VOC	Carbon Disulfide	75-15-0	Gray fox (Mammalian top carnivore)	190	1900	SOIL_RF(f)_75-15-0
VOC	Carbon Disulfide	75-15-0	Montane shrew (Mammalian insectivore)	1.2	12	SOIL_MS(i)_75-15-0
VOC	Carbon Disulfide	75-15-0	Mountain cottontail (Mammalian herbivore)	1.4	14	SOIL_DC(p)_75-15-0
VOC	Chloroaniline[4-]	106-47-8	Earthworm (Soil-dwelling invertebrate)	1.8	18	SOIL_EW_106-47-8
VOC	Chloroaniline[4-]	106-47-8	Generic plant (Terrestrial autotroph - producer)	1	10	SOIL_GP_106-47-8
VOC	Chloroform	67-66-3	Deer mouse (Mammalian omnivore)	8	21	SOIL_DM(ip)_67-66-3
VOC	Chloroform	67-66-3	Gray fox (Mammalian top carnivore)	8900	24000	SOIL_RF(f)_67-66-3
VOC	Chloroform	67-66-3	Montane shrew (Mammalian insectivore)	8.2	22	SOIL_MS(i)_67-66-3
VOC	Chloroform	67-66-3	Mountain cottontail (Mammalian herbivore)	19	52	SOIL_DC(p)_67-66-3
VOC	Dichlorobenzene[1,2-]	95-50-1	Deer mouse (Mammalian omnivore)	1.5	15	SOIL_DM(ip)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Gray fox (Mammalian top carnivore)	480	4800	SOIL_RF(f)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Montane shrew (Mammalian insectivore)	0.92	9.2	SOIL_MS(i)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Mountain cottontail (Mammalian herbivore)	12	120	SOIL_DC(p)_95-50-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Deer mouse (Mammalian omnivore)	1.2	12	SOIL_DM(ip)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Gray fox (Mammalian top carnivore)	380	3800	SOIL_RF(f)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Montane shrew (Mammalian insectivore)	0.74	7.4	SOIL_MS(i)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Mountain cottontail (Mammalian herbivore)	13	130	SOIL_DC(p)_541-73-1
VOC	Dichlorobenzene[1,4-]	106-46-7	Deer mouse (Mammalian omnivore)	1.5	6	SOIL_DM(ip)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Earthworm (Soil-dwelling invertebrate)	1.2	12	SOIL_EW_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Gray fox (Mammalian top carnivore)	470	1800	SOIL_RF(f)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Montane shrew (Mammalian insectivore)	0.89	3.5	SOIL_MS(i)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Mountain cottontail (Mammalian herbivore)	12	49	SOIL_DC(p)_106-46-7
VOC	Dichloroethane[1,1-]	75-34-3	Deer mouse (Mammalian omnivore)	210	2100	SOIL_DM(ip)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	Gray fox (Mammalian top carnivore)	250000	2500000	SOIL_RF(f)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	Montane shrew (Mammalian insectivore)	290	2900	SOIL_MS(i)_75-34-3

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
VOC	Dichloroethane[1,1-]	75-34-3	Mountain cottontail (Mammalian herbivore)	410	4100	SOIL_DC(p)_75-34-3
VOC	Dichloroethane[1,2-]	107-06-2	American kestrel (Avian top carnivore)	1300	2700	SOIL_AK(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American kestrel (insectivore / carnivore)	22	44	SOIL_AK(fi)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian herbivore)	0.85	1.6	SOIL_AR(p)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian insectivore)	4.5	9	SOIL_AR(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian omnivore)	1.4	2.8	SOIL_AR(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Deer mouse (Mammalian omnivore)	27	270	SOIL_DM(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Gray fox (Mammalian top carnivore)	36000	360000	SOIL_RF(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Montane shrew (Mammalian insectivore)	91	910	SOIL_MS(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Mountain cottontail (Mammalian herbivore)	39	390	SOIL_DC(p)_107-06-2
VOC	Dichloroethene[1,1-]	75-35-4	Deer mouse (Mammalian omnivore)	14	140	SOIL_DM(ip)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Gray fox (Mammalian top carnivore)	14000	140000	SOIL_RF(f)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Montane shrew (Mammalian insectivore)	11	110	SOIL_MS(i)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Mountain cottontail (Mammalian herbivore)	44	440	SOIL_DC(p)_75-35-4
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Deer mouse (Mammalian omnivore)	25	250	SOIL_DM(ip)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Gray fox (Mammalian top carnivore)	25000	250000	SOIL_RF(f)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Montane shrew (Mammalian insectivore)	24	240	SOIL_MS(i)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Mountain cottontail (Mammalian herbivore)	64	640	SOIL_DC(p)_540-59-0
VOC	Diphenylamine	122-39-4	American kestrel (Avian top carnivore)	3900	6500	SOIL_AK(f)_122-39-4
VOC	Diphenylamine	122-39-4	American kestrel (insectivore / carnivore)	49	81	SOIL_AK(fi)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian herbivore)	78	130	SOIL_AR(p)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian insectivore)	10	16	SOIL_AR(i)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian omnivore)	17	29	SOIL_AR(ip)_122-39-4
VOC	Hexachlorobenzene	118-74-1	American kestrel (Avian top carnivore)	12	120	SOIL_AK(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American kestrel (insectivore / carnivore)	0.37	3.7	SOIL_AK(fi)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian herbivore)	83	830	SOIL_AR(p)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian insectivore)	0.079	0.79	SOIL_AR(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian omnivore)	0.15	1.5	SOIL_AR(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Deer mouse (Mammalian omnivore)	0.39	3.9	SOIL_DM(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Earthworm (Soil-dwelling invertebrate)	10	100	SOIL_EW_118-74-1
VOC	Hexachlorobenzene	118-74-1	Generic plant (Terrestrial autotroph - producer)	10	100	SOIL_GP_118-74-1
VOC	Hexachlorobenzene	118-74-1	Gray fox (Mammalian top carnivore)	59	590	SOIL_RF(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Montane shrew (Mammalian insectivore)	0.2	2	SOIL_MS(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Mountain cottontail (Mammalian herbivore)	910	9100	SOIL_DC(p)_118-74-1
VOC	Hexanone[2-]	591-78-6	American kestrel (Avian top carnivore)	290	2900	SOIL_AK(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	American kestrel (insectivore / carnivore)	1.7	17	SOIL_AK(fi)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian herbivore)	0.47	4.7	SOIL_AR(p)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian insectivore)	0.36	3.6	SOIL_AR(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian omnivore)	0.41	4.1	SOIL_AR(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	Deer mouse (Mammalian omnivore)	6.1	23	SOIL_DM(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	Gray fox (Mammalian top carnivore)	5900	22000	SOIL_RF(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	Montane shrew (Mammalian insectivore)	5.4	20	SOIL_MS(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	Mountain cottontail (Mammalian herbivore)	17	65	SOIL_DC(p)_591-78-6
VOC	Iodomethane	74-88-4	American kestrel (Avian top carnivore)	46	92	SOIL_AK(f)_74-88-4
VOC	Iodomethane	74-88-4	American kestrel (insectivore / carnivore)	0.29	0.59	SOIL_AK(fi)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian herbivore)	0.038	0.076	SOIL_AR(p)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian insectivore)	0.062	0.12	SOIL_AR(i)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian omnivore)	0.047	0.095	SOIL_AR(ip)_74-88-4
VOC	Methyl-2-pentanone[4-]	108-10-1	Deer mouse (Mammalian omnivore)	9.7	97	SOIL_DM(ip)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Gray fox (Mammalian top carnivore)	18000	180000	SOIL_RF(f)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Montane shrew (Mammalian insectivore)	15	150	SOIL_MS(i)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Mountain cottontail (Mammalian herbivore)	17	170	SOIL_DC(p)_108-10-1
VOC	Methylene Chloride	75-09-2	Deer mouse (Mammalian omnivore)	2.6	22	SOIL_DM(ip)_75-09-2
VOC	Methylene Chloride	75-09-2	Generic plant (Terrestrial autotroph - producer)	1600	16000	SOIL_GP_75-09-2
VOC	Methylene Chloride	75-09-2	Gray fox (Mammalian top carnivore)	4300	36000	SOIL_RF(f)_75-09-2
VOC	Methylene Chloride	75-09-2	Montane shrew (Mammalian insectivore)	9.2	79	SOIL_MS(i)_75-09-2
VOC	Methylene Chloride	75-09-2	Mountain cottontail (Mammalian herbivore)	3.8	32	SOIL_DC(p)_75-09-2

Group	Name	CAS	Receptor	NE ESL	LE ESL	ESL ID
VOC	Styrene	100-42-5	Earthworm (Soil-dwelling invertebrate)	1.2	12	SOIL_EW_100-42-5
VOC	Styrene	100-42-5	Generic plant (Terrestrial autotroph - producer)	3.2	32	SOIL_GP_100-42-5
VOC	Tetrachloroethene	127-18-4	Deer mouse (Mammalian omnivore)	0.35	1.7	SOIL_DM(ip)_127-18-4
VOC	Tetrachloroethene	127-18-4	Generic plant (Terrestrial autotroph - producer)	10	100	SOIL_GP_127-18-4
VOC	Tetrachloroethene	127-18-4	Gray fox (Mammalian top carnivore)	120	630	SOIL_RF(f)_127-18-4
VOC	Tetrachloroethene	127-18-4	Montane shrew (Mammalian insectivore)	0.18	0.94	SOIL_MS(i)_127-18-4
VOC	Tetrachloroethene	127-18-4	Mountain cottontail (Mammalian herbivore)	9.5	47	SOIL_DC(p)_127-18-4
VOC	**Isopropyltoluene[4-].** Use toluene	99-87-6	Deer mouse (Mammalian omnivore)	25	250	SOIL_DM(ip)_108-88-3
VOC	**Isopropyltoluene[4-].** Use toluene	99-87-6	Generic plant (Terrestrial autotroph - producer)	200	2000	SOIL_GP_108-88-3
VOC	**Isopropyltoluene[4-].** Use toluene	99-87-6	Gray fox (Mammalian top carnivore)	12000	120000	SOIL_RF(f)_108-88-3
VOC	**Isopropyltoluene[4-].** Use toluene	99-87-6	Montane shrew (Mammalian insectivore)	23	230	SOIL_MS(i)_108-88-3
VOC	**Isopropyltoluene[4-].** Use toluene	99-87-6	Mountain cottontail (Mammalian herbivore)	66	660	SOIL_DC(p)_108-88-3
VOC	Toluene	108-88-3	Deer mouse (Mammalian omnivore)	25	250	SOIL_DM(ip)_108-88-3
VOC	Toluene	108-88-3	Generic plant (Terrestrial autotroph - producer)	200	2000	SOIL_GP_108-88-3
VOC	Toluene	108-88-3	Gray fox (Mammalian top carnivore)	12000	120000	SOIL_RF(f)_108-88-3
VOC	Toluene	108-88-3	Montane shrew (Mammalian insectivore)	23	230	SOIL_MS(i)_108-88-3
VOC	Toluene	108-88-3	Mountain cottontail (Mammalian herbivore)	66	660	SOIL_DC(p)_108-88-3
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Deer mouse (Mammalian omnivore)	0.51	5.1	SOIL_DM(ip)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Earthworm (Soil-dwelling invertebrate)	1.2	12	SOIL_EW_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Gray fox (Mammalian top carnivore)	110	1100	SOIL_RF(f)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Montane shrew (Mammalian insectivore)	0.27	2.7	SOIL_MS(i)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Mountain cottontail (Mammalian herbivore)	12	120	SOIL_DC(p)_120-82-1
VOC	Trichloroethane[1,1,1-]	71-55-6	Deer mouse (Mammalian omnivore)	400	4000	SOIL_DM(ip)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Gray fox (Mammalian top carnivore)	310000	3100000	SOIL_RF(f)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Montane shrew (Mammalian insectivore)	260	2600	SOIL_MS(i)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Mountain cottontail (Mammalian herbivore)	2000	20000	SOIL_DC(p)_71-55-6
VOC	Trichloroethene	79-01-6	Deer mouse (Mammalian omnivore)	54	540	SOIL_DM(ip)_79-01-6
VOC	Trichloroethene	79-01-6	Gray fox (Mammalian top carnivore)	42000	420000	SOIL_RF(f)_79-01-6
VOC	Trichloroethene	79-01-6	Montane shrew (Mammalian insectivore)	42	420	SOIL_MS(i)_79-01-6
VOC	Trichloroethene	79-01-6	Mountain cottontail (Mammalian herbivore)	190	1900	SOIL_DC(p)_79-01-6
VOC	Trichlorofluoromethane	75-69-4	Deer mouse (Mammalian omnivore)	97	650	SOIL_DM(ip)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Gray fox (Mammalian top carnivore)	62000	420000	SOIL_RF(f)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Montane shrew (Mammalian insectivore)	52	350	SOIL_MS(i)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Mountain cottontail (Mammalian herbivore)	1800	12000	SOIL_DC(p)_75-69-4
VOC	Vinyl Chloride	75-01-4	Deer mouse (Mammalian omnivore)	0.13	1.3	SOIL_DM(ip)_75-01-4
VOC	Vinyl Chloride	75-01-4	Gray fox (Mammalian top carnivore)	110	1100	SOIL_RF(f)_75-01-4
VOC	Vinyl Chloride	75-01-4	Montane shrew (Mammalian insectivore)	0.12	1.2	SOIL_MS(i)_75-01-4
VOC	Vinyl Chloride	75-01-4	Mountain cottontail (Mammalian herbivore)	0.34	3.4	SOIL_DC(p)_75-01-4
VOC	Xylene (Total)	1330-20-7	American kestrel (Avian top carnivore)	13000	130000	SOIL_AK(f)_1330-20-7
VOC	Xylene (Total)	1330-20-7	American kestrel (insectivore / carnivore)	190	1900	SOIL_AK(fi)_1330-20-7
VOC	Xylene (Total)	1330-20-7	American robin (Avian herbivore)	89	890	SOIL_AR(p)_1330-20-7
VOC	Xylene (Total)	1330-20-7	American robin (Avian insectivore)	41	410	SOIL_AR(i)_1330-20-7
VOC	Xylene (Total)	1330-20-7	American robin (Avian omnivore)	56	560	SOIL_AR(ip)_1330-20-7
VOC	Xylene (Total)	1330-20-7	Deer mouse (Mammalian omnivore)	1.9	2.4	SOIL_DM(ip)_1330-20-7
VOC	Xylene (Total)	1330-20-7	Generic plant (Terrestrial autotroph - producer)	100	1000	SOIL_GP_1330-20-7
VOC	Xylene (Total)	1330-20-7	Gray fox (Mammalian top carnivore)	750	930	SOIL_RF(f)_1330-20-7
VOC	Xylene (Total)	1330-20-7	Montane shrew (Mammalian insectivore)	1.4	1.8	SOIL_MS(i)_1330-20-7
VOC	Xylene (Total)	1330-20-7	Mountain cottontail (Mammalian herbivore)	7.6	9.5	SOIL_DC(p)_1330-20-7

Supplement 4-8

Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk Screening Assessments

OPEN DETONATION UNIT AT TECHNICAL AREA 39
HUMAN HEALTH AND ECOLOGICAL
RISK-SCREENING ASSESSMENTS

May 16, 2022

EXECUTIVE SUMMARY

The area around the open detonation (OD) area near Building 6 at Technical Area (TA) 39 (the TA-39-6 OD Unit) within the Los Alamos National Laboratory (LANL) was sampled as part of the application process for a Resource Conservation and Recovery Act (RCRA) permit to perform hazardous waste treatment operations. The TA-39-6 OD Unit is referred to as "the Unit" in the remainder of this risk assessment. Surface soil and tuff samples were collected in September 2018 and analyzed for inorganic and organic compounds. Data from these samples were used to conduct human health and ecological risk-screening assessments to determine whether hazardous contaminants from ongoing treatment operations are being released to soil at levels that pose an unacceptable risk to human health or the environment.

Screening criteria for these assessments require that residential, industrial, and construction worker exposure scenarios be evaluated, despite that the TA-39-6 OD Unit is not located at a residential location. For the human health risk assessment, a hypothetical future resident and industrial exposure scenarios were evaluated by comparing the maximum exposure point concentration for each analyte to the New Mexico Environment Department (NMED) soil screening levels (NMSSLs) (NMED 2021). The following conclusions are made:

- **Detected inorganics were compared to background values (BVs) and risk-based screening levels (NMSSLs).** Six detected inorganics exceeded background, although four of those were only 1.2 to 1.3 times higher than background. No inorganics exceeded risk-based screening levels (SLs).

- **Detected organics were compared to risk-based NMSSLs.** Maximum concentrations of detected analytes were compared to the NMSSLs. There are no individual constituents that exceed NMSSLs.

- **Cumulative Cancer Risks (CCR) and Hazard Indices (HI) were calculated.** The sum of the cancer risks (CR) is called a CCR, and the sum of the noncancer hazard quotients (HQs) is called an HI. The CCRs are less than the NMED target cancer risk of $1x10^{-5}$. The HIs do not exceed the target value of one.

- The screening evaluation indicates that hypothetical future residents, general workers, or construction workers are not at risk due to exposure to soils at the Unit.

Potential risk to ecological receptors was evaluated by analyzing different lines of evidence that were weighed to draw a conclusion regarding the potential for adverse ecological effects. This included:

- **Comparing maximum exposure point concentrations (EPC) to no effect (NE) ecological screening levels (ESLs).** There were 10 analytes that exceeded NE ESLs to produce HQs greater than 0.1. There were no ESLs for calcium, which was detected and slightly elevated above background.

- **Comparing upper 95th percentile confidence limits (UCL95) as the refined EPC to low effect (LE) ESLs.** There were six analytes that exceeded LE ESLs.

- **Calculating HIs.** The HIs for NE ESL and LE ESL comparisons exceeded 1.

- **Application of site-specific area use factors.** Only plants had HQs above 1 for the area use factor analysis. There were no analytes that exceeded LE ESLs once the areal extent of the Unit was taken into consideration in conjunction with typical home range for ecological receptors. The HIs for plants and earthworms were 2 and 3 respectively for NE ESLs, and less than 1 for LE ESLs. Plants and earthworms are not expected to occur in the Unit due to intended use and presence of bare ground.

- **Avian and mammalian population and tissue data.** There was no indication that bird or mammal populations are being affected. Tissue concentrations were not elevated relative to regional statistical reference levels (RSRLs).

- There is no apparent risk to ecological receptors at the Unit.

TABLE OF CONTENTS

Page No.

1. Introduction 1
2. Human Health Risk Assessment 1
2.1. Conceptual Site Model 1
2.1.1. Receptors 1
2.1.2. Exposure Pathways 1
2.2. Approach for Identification of Chemicals of Potential Concern 2
2.2.1. Sampling and Data Analysis 2
2.2.2. Comparison to Background 2
2.2.3. Comparison of Maximum Exposure Point Concentrations to NMSSLs 3
2.2.4. NMSSLs and Surrogates 3
2.2.5. Evaluation of Refined EPCs 6
2.3. Screening Evaluation 6
2.3.1. Data Analysis 6
2.3.2. Comparison to Background 6
2.3.3. Comparison of Maximum EPCs to NMSSLs 7
2.3.4. Lead 7
2.3.5. Dioxin/Furans 7
2.3.6. Migration to Groundwater 7
2.3.7. Data Analysis Conclusions 8
2.4. Uncertainty Analysis 8
2.4.1. Data and Data Analysis 8
2.4.2. Exposure Assessment 8
2.4.3. Toxicity Values 8
2.4.4. Additive Approach 9
2.5. Conclusions 9
3. ECOLOGICAL SCREENING ASSESSMENT 10
3.1. Introduction 10
3.2. Problem Formulation and Conceptual Site Exposure Model 11
3.2.1. Data Summary 11
3.2.2. Receptors and Pathways 11
3.2.3. Technical Decision Point and Recommendations 12
3.3. Screening Evaluation 12
3.3.1. Inorganics 13
3.3.2. Dioxin and Furans 13
3.3.3. Other Organics 14

3.4. Uncertainty Analysis 14
3.4.1. Chemical Form 14
3.4.2. Reporting Limits 14
3.4.3. Exposure Parameters and Risk Estimates 15
3.4.4. Mixture Toxicity 15
3.4.5. COPECs without ESLs 16
3.4.6. Small-Mammal Field Investigations 16
3.4.7. Avian Field Investigations 17
3.4.8. Area Use Factors 17
3.5. Conclusions 18
4. References 18

LIST OF ATTACHMENTS

Attachment A. ProUCL Output For Upper Confidence Limit Calculations 56
Attachment B. LANL Ecorisk 4.2 Database (mg/kg) for Organics and Inorganics Above Background- Soil 73

LIST OF TABLES

Table 2-1. Summary Statistics for Fall 2018 Data 22
Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations To Background 27
Table 2-3. Verification of MDLs for Nondetects for Data Useability 28
Table 2-4. Human Health Risk Screening For Detected Analytes Above Background 34
Table 2-5. Dioxin/Furan Data and Human Health TEFs 35
Table 2-6. Human Health TECs and TEQs for Dioxin Furan Samples 38
Table 2-7. Maximum 2,3,7,8 TCDD TEQ Cancer Risk and Hazard by Receptor 40
Table 2-8. Comparison of Maximum EPCs to Groundwater Protection Screening Levels 40
Table 3-1. Ecological Screening Levels 41
Table 3-2. Ecological Risk Evaluation For Maximum EPCs and NE ESLs 43
Table 3-3. Ecological Risk Evaluation For Refined EPCs and LE ESLs 44
Table 3-4. Toxic Equivalency Factors (TEFs) Used for Calculating Ecological TCDD Equivalent Concentrations 45
Table 3-5. Dioxin-Furan Mammal TECi, and TEQs by Sample 46
Table 3-6. Dioxin-Furan Avian TECs and TEQs by Sample 48
Table 3-7. Area Use Factors for TA 39-6 and Risks based on the NE ESL 50
Table 3-8. Area Use Factors for TA 39-6 and Risks based on the LE ESL. 51

LIST OF FIGURES

Figure 1-1. Location of TA-39 at the Los Alamos National Laboratory 53
Figure 1-2. Sample Location Map for TA-39-6 OD Area 54
Figure 3-1. Conceptual Site Exposure Model for the ERA 55

ACRONYMS AND ABBREVIATIONS

AUF	Area Use Factor
BMP	Best Management Practice
BV	Background Value
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
CCR	Cumulative Cancer Risk
CR	Cancer Risk
CSEM	Conceptual Site Exposure Model
DAF	Dilution Attenuation Factor
EPA	Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESL	Ecological Screening Level
ha	Hectare
HHRA	Human Health Risk Assessment
HI	Hazard Index
HMX	Cyclotetramethylene-tetranitramine
HQ	Hazard Quotient
HR	Home Range
LANL	Los Alamos National Laboratory
LD50	Lethal Dose for Half of the Population
LE	Low Effect
LOAEL	Lowest Observed Adverse Effect Level
MDL	Method Detection Limit
MTGW	Migration to Groundwater
NE	No Effect
NMED	New Mexico Environment Department
NMSSL	New Mexico Soil Screening Levels
NOAEL	No Observed Adverse Effect Level
OD	Open Detonation
PAHs	Polynuclear Aromatic Hydrocarbons
PAUF	Population Area Use Factor
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RSL	Regional Screening Level
RSRL	Regional Statistical Reference Levels
SF	Cancer Slope Factor
SL	Screening Level
SVOC	Semi-volatile Organic Compounds
TA	Technical Area
TATB	2,4,6-Triamino-1,3,5-trinitrobenzene
TECi	Toxicity Equivalent Concentration for congener ***i***
TEF	Toxicity Equivalency Factor
TEQ	Toxicity Equivalent Quotient

TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
UCL95	95% Upper Confidence Limit of The Mean
VOC	Volatile Organic Compound
WHO	World Health Organization

1. INTRODUCTION

The area around the open detonation (OD) area near Building 6 at Technical Area (TA) 39 (the TA-39-6 OD Unit) within the Los Alamos National Laboratory (LANL) was sampled as part of the application process for a Resource Conservation and Recovery Act (RCRA) permit to perform hazardous waste treatment operations. The TA-39-6 OD Unit is referred to as "the Unit" in the remainder of this risk assessment.

The Unit is a hazardous waste management unit located in the southern portion of LANL (Figure 1-1). The Unit consists of a relatively flat, sand covered area that measures approximately 40 feet by 40 feet and is located directly to the west of Building 6 (the control building) (Figure 1-2). The Unit has historically been used for experimental, sanitization, and waste treatment OD activities.

Steep canyon walls that rise to heights of 100 feet or higher form a semicircle around the Unit and act to attenuate the force of the detonations. Although the Unit is used to treat both solid and liquid explosive hazardous waste, the primary use of the unit is for nontreatment-related experimental test detonations. The last hazardous waste treatment shot at the site occurred on December 9, 2014. Upgrades to the firing pad at the Unit in recent years include a concrete retaining wall and storm water best management practices (BMPs) that improve fragment capture and minimize runoff from the firing site to the surrounding areas, respectively.

One surface soil sampling event of the top 2 inches of soil and tuff at 12 discrete locations and one duplicate (Figure 1-2) was conducted in and around the Unit on September 27, 2018. Sample collection included soil both in and out of potential run-off areas; however, sample collection did not include rocks, debris, or vegetation. Data from these samples were used to conduct human health and ecological risk assessments to determine whether hazardous contaminants from ongoing treatment operations are being released to soil at levels that pose an unacceptable risk to human health or the environment.

The results of the risk assessments are presented in the following sections.

2. HUMAN HEALTH RISK ASSESSMENT

2.1. CONCEPTUAL SITE MODEL

The primary land use is industrial because only authorized Laboratory workers currently have access to the area around the Unit. Laboratory workers are the primary human receptors, and the industrial scenario is the defining scenario for the human health risk-screening assessment (i.e., the scenario on which decisions are based).

2.1.1. Receptors

Because the site is located within the boundaries of an operational facility (TA-39), the reasonably foreseeable future land use will continue to be industrial. An industrial worker and a construction worker exposure scenario are evaluated. A Hypothetical Future Residential exposure is also assessed and provided for comparison purposes.

2.1.2. Exposure Pathways

The release of contaminants from open detonation operations has potentially occurred for many years. Releases are transported primarily by wind, which rapidly disperses the material in ambient air. Most material is likely deposited close to the source(s), and concentrations are expected to decrease with distance from the source. Exposure to a site worker may occur through various surface soil contact pathways. Potential exposure pathways are:

- Incidental ingestion of surface soil
- Inhalation of fugitive dust or volatiles emanating from surface soil
- Dermal contact with surface soil

Surface water is not considered an exposure pathway. Storm water discharges from the Unit are regulated under the Clean Water Act by the National Pollutant Discharge Elimination System permit program under the LANL Storm Water Individual Permit. The LANL Storm Water Individual Permit contains nonnumeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program and implementation of corrective actions where necessary, to minimize pollutants in LANL's storm water discharges. Grading for runoff and erosion control has been performed in the area of the Unit. In addition, berms and infiltration systems have been installed. In addition, berms and infiltration systems have been installed. This, combined with the distance to the nearest surface water, makes it unlikely that impacts to surface water east of the Unit will occur.

Published precipitation data for TA-39 do not exist; however, TA-49, located west of TA39-6, has an annual precipitation of 22.27 inches per year, as summarized in LANL (2009). The evaporation rate of freestanding water exceeds the average annual precipitation. Hydrologic information for the area north of the Unit is presented in the Pajarito Canyon Investigation Report, Revision 1 (LANL, 2009). Generally, on the Pajarito Plateau, dry canyons have relatively small catchment areas (less than 13 square kilometers), experience infrequent surface flows, and have limited or no saturated alluvial systems. The hydrologic conditions yield little down canyon, near-surface contaminant migration and are characterized by very slow unsaturated water flow from the surface to the regional aquifer. Because surface-water flow is infrequent and shallow alluvial groundwater is not common, contaminants largely remain near their original sources, predominantly in soil and sediment. Net infiltration beneath dry canyons is low, with rates generally believed to be less than tens of mm/yr. and commonly on the order of 1 mm/yr. or less. Finally, transport times to the regional aquifer beneath dry canyons are expected to exceed hundreds of years.

Groundwater in the unit is not utilized for potable purposes. The closest water supply wells into the regional aquifer are over a mile northeast and upgradient with respect to groundwater flow direction. The depth to groundwater is approximately 1000 feet, suggesting percolation to groundwater is unlikely to occur. Furthermore, evapotranspiration exceeds precipitation, resulting in infiltration rates of less than 10 milliliters per year. Migration to groundwater is not indicated as a viable exposure pathway.

2.2. APPROACH FOR IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

2.2.1. Sampling and Data Analysis

Twelve surface soil samples and one duplicate were collected September 27, 2018. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 to 2 inches below ground surface. The duplicate pair was point 1 and 1 dup (field sample identification WST39-18-162832 and WST39-18-162973). Each sample set was analyzed for the following:

- Semi-Volatile Organic Compounds (SVOCs)
- Volatile Organic Compounds (VOCs)
- Total Metals
- Dioxins/Furans
- High Explosives

A staged approach was used for the risk assessment. Duplicates were evaluated consistent with the New Mexico Environment Department (NMED) guidance (NMED 2019) which states that in the initial screening assessment the maximum, and not the average, of the duplicate pair must be used. Figure 1-1 shows a map of the site location, and Figure 1-2 shows site features and the current sampling locations from which data were obtained for use in the risk assessment.

2.2.2. Comparison to Background

The background data used in this evaluation is presented in the report "Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory," (LANL, 1998). The

background data are used in the RCRA corrective action process to distinguish between contaminated and uncontaminated media and have been accepted by NMED. As stated in the background report, the background dataset was collected as follows:

> "Twenty-one soil profiles distributed across the Pajarito Plateau were described in the field and were sampled for inorganic chemical analyses. These samples provide information about the varied soils and geomorphic settings that occur on the Pajarito Plateau, allowing for an evaluation of the variability in soil characteristics and chemistry within several of the soil series previously described by Nyhan et al. (1978, 05702). Most sampled soils were collected from mesa tops. Other geomorphic settings sampled include hillslopes and canyon bottoms." (LANL, 1998)

The locations sampled as part of the background study were not impacted by deposition from the historical operation of the OD units or other firing sites. Background values (BVs) were obtained from this document to use in comparison to site data.

An attribution analysis (NMED 2019) was conducted by comparing the inorganic site data BVs. Analytes less than BVs were eliminated from further evaluation. Analytes greater than BVs were evaluated with statistical hypothesis tests to determine whether or not the site data were significantly different from background. No further evaluation is necessary for analytes for which the maximum is less than the BV, and these data are not compared to NMED (2021) risk-based soil screening levels (NMSSLs). Organic analytes are not compared to background values as a matter of standard practice, although there are naturally occurring sources of organic constituents.

2.2.3. Comparison of Maximum Exposure Point Concentrations to NMSSLs

The maximum concentration was used as the maximum exposure point concentration (EPC), which is the environmental concentration to which the receptors are potentially exposed. The screening approach used the maximum of all detected data, including the duplicate pair, for the initial screening evaluation. The maximum concentration of each analyte was divided by its NMED (2021) NMSSL. For the HHRA, this meant using two screening levels (SLs) based on toxicity endpoints, i.e., a cancer and noncancer SL were used to obtain a cancer risk (CR) and noncancer hazard quotient (HQ), respectively.

All analytes that exceeded the NMSSLs were considered to have "failed" the initial screen. These are considered to be contaminants of potential concern (COPCs).

2.2.4. NMSSLs and Surrogates

Where an NMSSL (NMED 2021) was not available, the U.S. Environmental Protection Agency (EPA) Regional Screening Level (RSL) for residential soils was applied as an SL for residential use, and the RSL for industrial commercial soil was used as the SL for industrial and construction workers. Consistent with NMED guidance, EPA cancer-based RSLs were adjusted to a CR level of $1x10^{-5}$ by multiplying the RSL by 10; noncancer RSLs were based on a HQ of 1. If an RSL was also not available, a suitable surrogate is proposed if physicochemical data suggest identifying a suitable surrogate. Most of the surrogates are proposed for nondetected analytes in order to verify that method detection limits (MDLs) are suitable for performing risk assessment.

NMSSLs were available for all inorganics. The toxicity values for NMED mercuric salts were used for the SL as this is the form expected in arid soils. Per NMED (2019), lead is evaluated with the EPA toxicity values of 400 mg/kg in soil for residents and 800 mg/kg for workers.

The NMED protection from migration to groundwater (MTGW) SLs are used to assess potential migration to groundwater risks assuming human receptors then consume groundwater. Where MTGW SLs are unavailable, surrogates based on EPA RSLs are proposed. In these cases, the EPA RSL for protection of migration to groundwater was used. The EPA RSL for protection of migration to groundwater is based on a dilution

attenuation factor (DAF) of 1, whereas the NMED SL-SSL is based on a DAF of 20. For consistency with NMED, the EPA RSL migration to groundwater values were multiplied by a factor of 20.

Surrogates were obtained for the following analytes because NMSSLs were not available; and although most are not detected, the SL is needed to verify that the MDL is adequate for use in the risk assessment:

- 2,4-Diamino-6-nitrotoluene – There is no NMSSL or RSL. Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 2,6-Diamino-4-nitrotoluene – Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 3,5-Dinitroaniline – There is no NMSSL. Use the amino-2,6-dinitrotoluene[4-] RSL as surrogate based on structural similarity.
- Acenaphthylene – There is no NMSSL or RSL. The NMSSLs for acenaphthene were used as a surrogate based on structural similarity.
- Aniline - There is no NMSSL. The RSLs were used as a surrogate.
- Azobenzene - There is no NMSSL. The RSLs were used as a surrogate.
- Benzo(g,h,i)perylene – There is no NMSSL or RSL. The NMSSLs for benzo(a)pyrene were used as a surrogate.
- Benzoic Acid - There is no NMSSL. RSLs were used as a surrogate.
- Benzyl Alcohol- There is no NMSSL. RSLs were used as a surrogate.
- Bis(2-chloroethoxy)methane- There is no NMSSL. RSLs were used as a surrogate.
- Bromobenzene - There is no NMSSL. RSLs were used as a surrogate.
- Bromochloromethane - There is no NMSSL. RSLs were used as a surrogate.
- Bromophenyl-phenylether[4-] – There is no NMSSL or RSL. The RSL for pentabromodiphenyl ether was used.
- Butylbenzene isomers – There are no NMSSLs. The RSLs are used as surrogates.
- Butylbenzylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Chloro-3-methylphenol[4-]– There are no NMSSLs. The RSLs are used as surrogates.
- Chloroaniline[4-] – There are no NMSSLs. The RSLs are used as surrogates.
- Chlorophenyl-phenyl[4-] Ether– There is no NMSSL or RSL. No recommendation for a surrogate is made.
- Chlorotoluene[4-] – Use the NMSSLs for the o-chlorotoluene isomer because the RSLs for the two isomers are the same.
- Dibenzofuran – There are no NMSSLs. The RSLs are used as surrogates.

- Dichlorobenzene[1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,4-dichlorobenzene were used as it may be the more toxic isomer considering it has cancer-based as well as noncancer-based endpoints.
- Dichloropropane[2,2-] – There is no NMSSL or RSL. The NMSSLs for 1,2-dichloropropane were used. The RSL is higher for 1,3 than 1,2 dichloropropane, and therefore this is considered conservative.
- Dichloropropane[1,3-] – There is no NMSSL. The NMSSLs for 1,2-dichloropropane were used.
- Dichloropropene[1,1-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[cis-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[trans-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dimethyl phthalate– There is no NMSSL or RSL. The NMSSLs for diethyl phthalate were used.
- Dinitrobenzene[1,3-] – There are no NMSSLs. The RSLs are used as surrogates.
- Di-n-octylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Diphenylamine – There are no NMSSLs. The RSLs are used as surrogates.
- Hexanone[2] – There are no NMSSLs. The RSLs are used as surrogates.
- Iodomethane – There is no NMSSL or RSL. No recommendation for a surrogate is made.
- 4-Isopropyltoluene – There is no NMSSL. The NMSSL values for toluene were used as a surrogate.
- Methylphenols – There are no NMSSLs for these compounds. The RSLs were applied for 2- and 4-methylphenol. The RSLs for 3-methylphenol were used for 3,4-methylphenol as most conservative option.
- Nitroanilines – There are no NMSSLs for these compounds. The RSLs were applied for 2- and 4-nitroaniline. The RSL for 4-nitroaniline was applied to 3-nitroaniline.
- Nitrophenols – There are no NMSSLs or RSLs for these compounds. The RSLs for phenol were applied for 2- and 4-nitrophenol.
- Nitroso-di-n-propylamine[N-] – There are no NMSSLs. The RSLs were applied.
- PETN - There is no NMSSL for PETN. RSLs were used as a surrogate.
- Propylbenzene[1-] – There are no NMSSLs. The RSLs are used as surrogates.
- Pyridine– There are no NMSSLs. The RSLs are used as surrogates.
- 1,3,5-Trinitrobenzene – There is no NMSSL. RSLs for 1,3,5-trinitrobenzene were used as a surrogate.
- TATB – There is no NMSSL or RSL for TATB. RSLs for 1,3,5-trinitrobenzene were used as a surrogate because of structural similarity.
- Trimethylbenzenes – There are no NMSSLs. The RSLs are used as surrogates.
- Tris (o-cresyl) phosphate – There is no NMSSL or RSL. The RSL for tris(2-ethylhexyl)phosphate was applied as a similar structure without halogen substitutions.

2.2.5. Evaluation of Refined EPCs

A refinement of the EPCs was performed if the HI or the CCR based on maxima exceeded target levels of 1 or $1x10^{-5}$, respectively. The maximum of each duplicate pair was retained prior to calculating an upper 95th percent confidence limit on the mean (UCL95). The UCL95 concentrations were compared to SLs, and any analytes above the SLs are evaluated further.

2.3. SCREENING EVALUATION

The following sections present the human health risk-screening assessment for the Unit.

2.3.1. Data Analysis

The summary statistics and maximum values used as EPCs are presented in Table 2-1.

The EPC based on the maximum concentration for each detected analyte was compared with the industrial and residential soil SLs to obtain a HQ or CR, and the HI was calculated by summing the HQs and the CCR was calculated by summing the CRs (NMED 2019). The chemical SLs used in the evaluations were obtained from current NMED guidance (NMED 2020) or from the most recent RSLs (EPA 2021) if an NMED value was not available.

The NMSSLs for carcinogens are equivalent to a 1×10^{-5} cancer risk, and for noncarcinogens the NMSSLs correlate to a ratio or HQ of 1. The cancer-based EPA RSLs as surrogates were multiplied by 10 to adjust them to a cancer risk level of $1x10^{-5}$, consistent with the NMSSLs. Any detected organic analytes that exceeded the SLs were considered COPCs. Any inorganic analytes that exceeded both background and the SL were also considered COPCs.

The exposure interval for industrial workers is 0–1 ft bgs and for hypothetical future residents and construction workers the exposure interval is 0–10 ft bgs. Since all data fall within the 0–1 ft depth interval, the available data set was used for all receptors.

Antimony, cadmium, selenium, silver, and thallium were not detected in any of the 12 samples and one duplicate. Mercury was detected in 7 samples, and the remaining inorganics were detected in all samples (Table 2-1).

Many of the organics are not detected. Organics that were detected are the energetics or explosives HMX [cyclotetramethylene-tetranitramine] and TATB. SVOCs detected include the polynuclear aromatic hydrocarbons (PAHs) fluoranthene and pyrene, two phthalates (butylbenzyl- and di-n-butylphthalate) and benzoic acid, and the volatile benzyl alcohol was detected (Table 2-1). Five dioxin/furan congeners were detected.

2.3.2. Comparison to Background

The maximum detected result was used as the initial EPC (Table 2-2) and compared to background. Background values for the site are from the 1998 background report (LANL 1998). There were no BVs for perchlorate; however, perchlorate was not detected in any samples. The maximum concentration of the following inorganics exceeded BVs:

- Calcium
- Chromium
- Copper
- Mercury
- Vanadium
- Zinc

Wilcoxon-Mann-Whitney two sample hypothesis tests were performed on these inorganics, with the exception of mercury, for which Gehan's test was considered more appropriate due to differing detection limits in the site data. The minimum of the duplicate pair was removed from the data prior to statistical analysis. Each inorganic, with the exception of mercury, was statistically significantly higher in the site samples than in the all horizon soils (All H) background dataset. Mercury was not statistically higher in site samples than in background soils; however, due to the low number of detections and because all values for background data were the same, the statistical tests are not robust. Therefore, mercury was also retained for further evaluation. The ProUCL (EPA 2015) output is presented in Attachment A. All six inorganics listed above carry forward for comparison to NMSSLs.

2.3.3. Comparison of Maximum EPCs to NMSSLs

None of the inorganics exceeded the residential, general worker, or construction worker NMSSLs (NMED 2021). There was therefore no elevated cancer risk or noncancer hazard indicated for the Unit for any inorganic. All reporting limits were adequate when compared to risk-based NMSSLs for nondetected inorganics or organics with the exception of nitrosodimethylamine[N-] (Table 2-3), as determined by cancer risks and HQs less than the targets of $1x10^{-5}$ and 1, respectively. There were no rejected (R-qualified) inorganic data in the dataset.

A few organics were detected in the surface soil samples (Table 2-1). These include energetics or explosives (e.g., HMX [cyclotetramethylene-tetranitramine] and TATB). The SVOCs fluoranthene and pyrene were detected in one sample. Phthalates (e.g., butylbenzyl- and di-n-butylphthalate) were also detected (Table 2-1), as were benzyl alcohol and benzoic acid.

No individual detected constituents exceeded NMSSLs (NMED 2020) (Table 2-4). The CCR for the evaluation of maximum detected soil concentrations for cancer-based health effects was $3x10^{-7}$ for hypothetical future residents, $6x10^{-8}$ for general workers, and $8x10^{-9}$ for construction workers (Table 2-4). The noncancer-based sum of the screening level HQs for maximum detected soil concentrations was 0.2 for residents, 0.01 for general workers, and 0.1 for construction workers (Table 2-4).

2.3.4. Lead

Maximum lead concentrations were less than BVs. Lead was not evaluated further.

2.3.5. Dioxin/Furans

The dioxin/furans are organics but are evaluated in the analysis differently than other organics. Dioxins/furans were detected in the surface soil samples (Table 2-5). The detection status is indicated by a zero for nondetect, and a 1 for a detected value.

The evaluation of the dioxin/furans is summarized in Table 2-6. The measured detected concentration or the MDL for nondetects for each congener in each sample is multiplied by the toxicity equivalency factor (TEF) (Table 2-5) to produce the toxicity equivalent concentration (TECi) (Table 2-6). Summing the TECi yields the toxicity equivalent quotient (TEQ). Dividing the maximum TEQ by the residential or industrial NMSSLs (Table 2-7) produces a CR or HQ which for all samples was less than target levels of $1x10^{-5}$ or 1, respectively. Therefore, the dioxins and furans do not exceed risk-based SLs. This maximum TEQ was also used to calculate the HI reported in Table 2-4.

2.3.6. Migration to Groundwater

The maximum concentrations were compared to the groundwater protection MTGW SLs (NMED 2020) (Table 2-8). None of the detected analytes and inorganics greater than background exceeded the groundwater protection SLs. There is no potential impact to groundwater due to analytes detected at the Unit. There are some reporting limits that exceed MTGW SL values.

Given that there is no human health risk due to direct contact exposure pathways, and that groundwater is very deep, groundwater impacts are not indicated.

2.3.7. Data Analysis Conclusions

The risk analysis for all inorganic and organic analytes was based on comparison of the maximum detected value as the EPC. There are no individual constituents that exceed NMED residential, commercial/industrial, or construction worker NMSSLs. The CCR does not exceed $1x10^{-5}$ for any receptor, and the HIs do not exceed a value of one. The screening evaluation indicates that hypothetical future residents, general workers, or construction workers are not at risk due to exposure to soils at the Unit.

2.4. UNCERTAINTY ANALYSIS

The human health risk assessment has inherent uncertainties associated with data and data evaluation, exposure assessment, and the toxicity values on which the SLs are based. Each or all of these uncertainties may affect the assessment results, biasing the risk assessment results high or low.

2.4.1. Data and Data Analysis

Uncertainties in the data or its analysis may include errors in sampling, laboratory analysis, and data analysis. Data evaluation uncertainties are expected to have little effect on the assessment results because the data have undergone validation to minimize errors, and any errors are not expected to bias the results high or low. The J-flagged (estimated) qualification of detected concentrations of some organic COPCs does not affect the assessment. The data represent deposition from more than 60 years of operation into 2019. Therefore, the data and subsequently the screening assessment results represent current baseline conditions.

The use of a judgmental sampling design biases the risk results high since samples were targeted to locations where contamination was most likely to occur or known to occur from past sampling events.

The use of the maximum as the EPC is also expected to bias risk estimates high, erring towards being conservative. Use of the maximum as the EPC overestimates exposure, as by definition all other concentrations are below this value.

2.4.2. Exposure Assessment

The exposure assessment assumptions bias the risk results high (i.e., overestimate risk). The assumptions for the industrial SLs are that the potentially exposed individual is a Laboratory worker who is outside at the Unit for 8 hours per day for 225 days per year (NMED 2019), and who spends the entire 8 hours on-site within the contaminated area. Assumptions for the residential SLs are that the potentially exposed individual is a hypothetical future resident who is present 24 hours per day for 350 days per year (NMED 2019) and spends the entire 24 hours on-site within the contaminated area. Because it is unlikely the worker or resident would be within the Unit for the entire time, the screening assessments overestimate the exposure. As a result, risks may be overestimated.

Assumptions underlying the exposure parameters, routes of exposure, and intake rates for routes of exposure are consistent with NMED parameters and default values (NMED 2019). In the absence of site-specific data, several upper-bound values for the assumptions may be combined to estimate exposure for any one pathway, and the resulting risk estimate can exceed the 99th percentile. Therefore, uncertainties in the assumptions underlying the exposure pathways may contribute to risk assessments that overestimate the reasonably expected risk levels.

2.4.3. Toxicity Values

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (slope factors [SFs] and reference doses [RfDs]) were used to derive the risk-based screening values used in the screening evaluation (NMED 2019). Uncertainties were identified in four areas with respect to the toxicity values: (1) extrapolation from animals to humans, (2) variability between individuals in the human population, (3) the derivation of RfDs and SFs, and (4) the chemical form of the COPC.

The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in each of these steps, potentially biasing the estimate high and resulting in the overestimation of potential risk.

For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no observed adverse effect level (NOAEL). The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment. This factor of 10 is generally considered to result in a conservative estimate of risk for noncarcinogenic COPCs.

The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision that could lead to an over- or underestimation of risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen.

COPCs may be bound to the environmental matrix and not be available for absorption into the human body following ingestion. However, the exposure scenarios typically default to the assumption that the COPCs are bioavailable. This assumption can lead to an overestimation of the total exposure and overestimate risk.

2.4.4. Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown and possible interactions could be synergistic or antagonistic, resulting in either an underestimation or overestimation of the potential risk by assuming additivity. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated by the HI considering individual COPCs act by different mechanisms and on different target organs but are addressed additively. Cancer risks are typically assumed to be additive.

2.5. CONCLUSIONS

Inorganics were compared to BVs and risk-based SLs. Six inorganics equaled or exceeded background. No inorganics exceeded risk-based SLs. The cancer risks were less than $1x10^{-5}$ and noncancer screening level HQs than 1 for inorganics for workers or hypothetical residents.

Organics were compared to risk-based SLs. There were a few organics detected, including some energetics, some SVOCs, and dioxin/furans. However, maximum concentrations of any of the detected analytes were below SLs for all constituents. The maximum TEQ for dioxin/furans did not exceed the TCDD SL. The Unit does not present an elevated cancer risk or noncancer hazard to human health due to exposure to soils. The following interpretation can be made from the analysis:

- For the hypothetical future residential scenario, inorganics above background, and maximum detected concentrations for each analyte, the noncancer HI (0.2) is less than the NMED target level of 1. The CCR of $3x10^{-7}$ is also below the NMED target level of $1x10^{-5}$.

- Based on an industrial scenario, inorganics above background, and maximum detected concentrations for each analyte, the noncancer HIs (0.01) and CCRs ($6x10^{-8}$) are less than the NMED target levels of 1 and $1x10^{-5}$, respectively.

- For the construction worker scenario, inorganics above background, and maximum detected concentrations for each analyte, the noncancer HI (0.1) is less than the NMED target level of 1. The CCR of $8x10^{-9}$ is also below the NMED target level of $1x10^{-5}$.

- The concentration of each dioxin/furan congener was summed to obtain a TEQ which was compared to the NMED NMSSL for TCDD. Cancer risk and HQs for each receptor were below target levels.

- Summing the maximum dioxin/furan ratio with the other cancer risks and HIs provides a CCR of $3x10^{-7}$ and a total HI of 0.2 for residential use, a CCR of $6x10^{-8}$ and a total HI of 0.01 for commercial/industrial use, and a CCR of $8x10^{-9}$ and a total HI of 0.1 for construction workers.

- The maximum lead concentration of 15.6 mg/kg is less than the background value of 22.3 mg/kg and is much less than the residential SL (400 mg/kg).

- There are no elevated human health risks for exposure to soils based on this evaluation.

- There are no potential impacts to groundwater based on comparison of maximum concentrations of detected analytes including those inorganics above background to NMED MTGW SLs.

3. ECOLOGICAL SCREENING ASSESSMENT

3.1. INTRODUCTION

The ecological risk assessment (ERA) for the Unit is presented in the following sections. The ecological risk-screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs with Ecological Screening Levels (ESLs) in accordance with Laboratory guidance (LANL 2012a) and NMED (2017) guidance. Site information including ESLs, biological studies, and historical information were reviewed and a site visit was conducted. A preliminary conceptual site exposure model (CSEM) was prepared.

The ESLs obtained from the ECORISK Database, Version 4.2 (LANL 2017; LANL 2020) for detected chemicals and inorganics above background are presented in Table 3-1. The ESLs are based on toxicity data for laboratory species similar to those expected to occur at the site, and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined to be lethal to 50% of the test population (LD50s). Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values, are presented in the ECORISK Database, Versions 2.0, 3.1, 4.1, and 4.2 (LANL 2003; LANL 2012b; LANL 2017; LANL 2019; LANL 2020).

The screening evaluation is conducted by dividing the EPCs by the ESLs to obtain a HQ calculated for each COPEC and screening receptor. As a generalization, the higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. HQs greater than 0.1 are used to identify COPECs requiring additional evaluation.

Individual HQs for a receptor are summed to derive a HI. An HI greater than 1 indicates that further assessment may be needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analyses provide a conservative indication of potential adverse effects and are designed to minimize the potential of overlooking possible COPECs at the site.

3.2. PROBLEM FORMULATION AND CONCEPTUAL SITE EXPOSURE MODEL

The Unit is a terrestrial ecosystem. The area is disturbed with little to no vegetation present. Vegetation increases with distance from the OD area and consists of grasses and shrubs. There are likely terrestrial birds and small mammals including deer mice (*Peromyscus maniculatus*) or ground squirrels using the area, although intermittently due to the lack of food or cover. There is not enough vegetation within the Unit to support large herbivores.

Due to the site history, there is the potential for energetic compounds or their breakdown products to be present in surface soils. Terrestrial animals and plants may contact surface soils and be exposed. This possibility led to the collection of data and ecological risk assessment.

3.2.1. Data Summary

Soil samples used in this analysis were collected in September 2018. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 - 2 inches below ground surface. Each sample set was analyzed for the following:

- VOCs –12 samples and one duplicate
- SVOCs –12 samples and one duplicate
- Total Metals –12 samples and one duplicate
- Dioxins/Furans –12 samples and one duplicate
- High Explosives –12 samples and one duplicate

Some organics were analyzed by more than one method, resulting in an apparently higher sample count (i.e., 2,4 and 2,6 dinitrotoluene, nitrobenzene, dichlorobenzenes). Figure 1-2 shows a map of the site including the current sampling locations from which data were obtained for use in the risk assessment, and habitat in the immediate site vicinity is also shown in Figure 1-2.

3.2.2. Receptors and Pathways

Exposure pathways are considered complete if all of the following components are present (EPA, 1989; NMED, 2017):

- A source and mechanism for hazardous waste/constituent release into the environment;
- An environmental transport medium or mechanism;
- A point of contact directly between the receptor and site-related contaminated media, or indirectly via dietary ingestion of prey or forage items contaminated by contact with site related contaminants; and
- An exposure route leading to interaction of the contaminant with target organs within the receptor.

If any of the above components are missing from the exposure pathway, it is not a complete pathway for the site.

The primary potentially complete ecological exposure pathways are based on direct or indirect contact with surface soils. These include root uptake, incidental ingestion of soil, and biotic uptake leading to food-web transport. Exposure of plants and soil invertebrates is not related to dietary pathways but is the result of direct contact with, and uptake from, the surrounding medium. For terrestrial wildlife, most exposure is through the oral pathway from the diet and incidental ingestion of soil (Sample et al. 1998). The dermal contact and inhalation pathways are not typically assessed quantitatively in ecological risk assessments, based on guidance indicating the

ingestion route is most important to terrestrial animals (EPA 1997; EPA 2003). Dermal exposure to wildlife is mitigated by the fur or feathers covering the bodies of most vertebrates and the incidental consumption of soil during grooming is included in the direct soil ingestion estimates.

Although inhalation is recognized to occur, it is typically considered insignificant relative to ingestion and only quantified for burrowing animals where volatile organics are present in the subsurface. Respirable dust particles are most likely ingested rather than inhaled, and this pathway is considered negligible (EPA 1997; EPA 2003), while non-respirable dust is ingested and accounted for in incidental soil ingestion values for wildlife species (EPA 1993; EPA 2003). Therefore, the exposure pathways considered in the development of the ESLs used in the risk-screening assessment capture the primary exposure for wildlife receptors.

A CSEM was developed for the site (Figure 3-1) showing the major receptor categories. The primary contaminant source is the testing of explosives and detonation of explosives for waste management at the site. Any uncombusted material, if present, could remain in soil or be released to air as fugitive dust. Materials in surface soil could potentially be carried by overland flow or percolate into the subsurface with rain, whereas material in air could be transported by wind. Receptors could contact contaminants within the immediate site area, up to the site boundary, or slightly beyond. The use of stormwater BMPs reduces the potential for migration beyond the Unit.

Terrestrial flora (i.e., plants) and fauna (e.g., invertebrates, birds, and mammals) are the general categories of ecological receptors that could be exposed. There are multiple avian and mammalian receptors evaluated in this ERA (Table 3-1). All receptors are evaluated if habitat is suitable. Habitat for the montane shrew (i.e., riparian areas) is not present, and this receptor is not evaluated.

3.2.3. Technical Decision Point and Recommendations

Because of the ecological habitat near the Unit boundaries, and because of the potential for exposure, the data were used to perform a quantitative screening level ecological evaluation.

3.3. SCREENING EVALUATION

The summary statistics for the data were presented in Table 2-1. Maximum detected concentrations of each analyte are used as the initial EPC. The EPCs and the screening results for the ecological screening assessment are presented in Table 3-2. Any analytes for which the measured maximum detected value exceeded the no effect (NE) ESL were considered COPECs and were evaluated further by calculating UCL95s and comparing the UCL95s to the LE ESLs (Table 3-3). The approach was as follows:

- An attribution analysis (NMED 2019) was conducted by comparing the inorganic site data to BVs. Analytes less than BVs were eliminated from further evaluation.
- The screening approach then used the maximum of all detected data for the initial screening evaluation. The maximum concentration of each analyte was divided by the NE ESL for each of the receptors.
- All analytes that exceeded the NE ESLs were considered to have “failed” the initial screen. These are considered to be COPECs.
- A refinement of the EPCs was performed. The maximum of each duplicate pair was retained prior to calculating a UCL95. The UCL95 concentrations were compared to LE ESLs, and any analytes above the LE ESLs are evaluated further with population area use factors (PAUFs).

3.3.1. Inorganics

There are two inorganics that exceed site BVs by a factor of 2 or more, and four that are slightly above background. All six inorganics exceeded background based on hypothesis tests. The maximum concentration of each of these was compared to the minimum no effect (NE) ESL, if one was available, to determine if the resulting HQ >0.1. The analytes that exceed ecological SLs are as follows (Table 3-1):

- Calcium – no ESLs, and only 1.2 times above BV. There were no adverse human health effects. Not evaluated further due to lack of ESLs and likelihood of low toxicity.
- Chromium – exceeds NE ESLs
- Copper – exceeds NE ESLs
- Mercury – exceeds NE ESLs
- Vanadium - exceeds NE ESLs
- Zinc– exceeds NE ESLs

If the maximum exceeded the BV and the ratio of the maximum to the risk-based SL was greater than 0.1, a UCL95 was calculated with the USEPA ProUCL 5.1.002 software (EPA 2015). This UCL95 was then compared to the LE ESLs (Table 3-3) consistent with the NMED (2017) Tier II approach. Note that comparison to the UCL95s was made prior to incorporating area use factors (AUFs) or PAUFs into the analysis. Receptor-specific dietary composition is built into the receptor-specific ESLs. The maximum concentration for each of the samples in the duplicate pair 1 and 1 dup (Figure 1-2) were retained and the minimum removed from the analysis, and the UCL95 calculated with a sample size of 12.

UCL95 values for chromium, copper, mercury, vanadium, and zinc exceeded the LE ESL with UCL95/ESL ratios above 0.1. This suggests some limited potential for adverse ecological effects at the Unit, and therefore the COPECs producing HQs above 1 are evaluated in more detail in the uncertainty analysis.

3.3.2. Dioxin and Furans

Dioxins and furans are evaluated in a multi-step process that takes the concentration of each congener in each sample and multiplies it by a TEF for mammals or birds (Table 3-4). The resulting TECi values (Table 3-5, Table 3-6) are summed to obtain TEQs for mammals and birds.

The maximum TEQ is divided by the mammalian and other receptor NE ESLs for species that could occur in the Unit (Table 3-2). Due to lack of its preferred riparian habitat and lack of dense cover, the montane shrew is not expected to occur. All other terrestrial receptors were retained for evaluation.

Dioxin and furans were detected in multiple samples in the September 2018 data set. The TEFs for birds and mammals were applied to calculate a mammal and bird TEQ for each sample. The HQ for the maximum TCDD TEQ exceeded 0.1 for avian species, deer mouse, and mountain cottontail. There was no ESL for plants. The TEQs were used to estimate a refined EPC with ProUCL (EPA 2015) based on the UCL95 statistic.

The potential for risk was then investigated further. There is no LE ESL for birds, and further ecological risk to avian species cannot be quantified. The HQ for deer mouse exceeds 0.1 (Table 3-3). The dioxin/furans are further evaluated in the Uncertainty Analysis (Section 3.4.3).

3.3.3. Other Organics

For this risk assessment, the highest concentration found, regardless of the method used, or whether the sample was a primary sample or a duplicate, was used as the basis of the EPC in the initial screening-level assessment. This is considered conservative for the evaluation of potential risks.

Organic analytes are not compared to any background values, although there are naturally occurring sources of organic constituents. Organics are compared to risk-based ESLs.

Maximum concentrations of four organics exceeded one or more ESLs (Table 3-2). These were benzoic acid, di-n-butylphthalate, HMX, and TATB. UCL95 values were calculated and compared to the LE ESLs (Table 3-3), and the refined EPCs were less than ESLs. The other organics do not contribute significantly to the HI.

There was only one detection of benzoic acid, fluoranthene, and pyrene, two detections of butylbenzylphthalate, and four detections of di-n-butylphthalate once duplicates are removed. The low detection frequency means that a robust UCL95 cannot be calculated for these organics. Therefore, a median of the detected concentrations and the reported detection limit values was calculated and used as the estimate of the EPC. This approach is consistent with ProUCL guidance (EPA 2015) that recommends use of alternative statistics when detection frequency is low.

3.4. UNCERTAINTY ANALYSIS

3.4.1. Chemical Form

Inorganic analytes can speciate into different forms with varying degrees of toxicity. The assumptions used in the ESL derivations are conservative and not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. These factors tend to result in conservative ESL estimates, which may lead to an overestimation of the potential risk. Toxicological data are typically based on the most toxic and bioavailable chemical species, which may or may not be found in the environment. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2012a), and the values are biased toward overestimating the potential risk to receptors.

The chemical form of the individual COPECs was not determined as part of the investigation. COPECs may undergo natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil) or rapid oxidation or reduction changes that render harmful chemical forms less available to biotic processes.

3.4.2. Reporting Limits

The evaluation was focused on detected values. Reporting limits were adequate (i.e., below ESLs) for all nondetected analytes with several exceptions, indicating that the data were adequate for use in the risk assessment:

Bis(2-ethylhexyl)phthalate –

- This analyte was not detected in any sample. Reporting limits were less than the cancer or noncancer based NMSSL for residents or workers.
- The maximum MDL (0.0101 mg/kg) produced an HQ of 2 for robin modeled as an insectivore.
- The maximum nondetected value was flagged as having blank contamination and may be biased high.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

Dinitrobenzene[1,3-] –

- This analyte was not detected in any sample. Reporting limits were less than the cancer or noncancer based NMSSL for residents or workers.
- The maximum reporting limit (0.15 mg/kg) was two times higher than the minimum NE ESL. All reporting limits were similar. The maximum HQ was 2 for robin modeled as an herbivore.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

Thallium -

- This analyte was not detected in any sample. Reporting limits were less than the cancer or noncancer based NMSSL for residents or workers.
- The highest HQ was 2. This was for plants.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.
- This analyte is not considered further. This is not expected to bias the risk assessment results high or low.

3.4.3. Exposure Parameters and Risk Estimates

Exposure parameters including the EPC and the intakes likely bias risk estimates high because they presume no movement of receptors in and out of source areas. Sampling focused on areas of known or expected contamination, which biases the EPC high. Receptors are assumed to spend 100% of their time in the contaminated area which results in conservative estimates of exposure.

Another source of uncertainty is inherent in the calculation of exposure and risk estimates. Although the toxicity values are expressed to more than one significant figure, it is unlikely that the toxicity data are this accurate, especially given that the data are extrapolated from laboratory animal studies to wildlife receptors that are mobile in the environment. Likewise, given all the variables inherent in assessing exposure, exposure intakes by ecological receptors also should not be considered more accurate than one significant figure. This means that an HQ identified as 0.95 or 1.2 is actually 1, and an HQ identified as 1.5 is actually 2.

Calculating risk for dioxins is a multi-step process that involves multiplying the measured concentration by a TEF to obtain a value called the TECi that when summed adjusts the measured congener concentrations to that relative to TCDD, where the sum of all TECi is called the TEQ. ProUCL (EPA 2015) accommodates both detected and nondetected results, reducing bias and uncertainty by not ignoring the influence of nondetects on the EPC. Therefore, TEQs were calculated for each sample, then UCL95 was calculated from all the TEQs. This procedure of calculating UCL95s was considered to be slightly more accurate and similar to how sample data are used to estimate UCL95 values for other analytes.

3.4.4. Mixture Toxicity

The assumption of additive effects for multiple COPECs may result in an over- or under-estimation of the potential risk to receptors. Calculating the HI assumes additivity with respect to toxicity. Exposure to multiple contaminants may result in other than additive effects. Conservative assumptions made with regards to EPCs would tend to overestimate exposure to any given constituent, and this would suggest that the toxicity of multiple constituents would not be underestimated. Therefore, mixture toxicity is not likely to bias the risk results high or low.

3.4.5. COPECs without ESLs

ESLs were not available for the cations and anions generally regarded as nutrients such as calcium, magnesium, nitrate, potassium, and sodium. ESLs were also not available for iron, but human health risk ratios for residents were 0.4 or lower. Only calcium was above background levels established for the site with a ratio of site maximum to background of 1.2. There is no human health risk or hazard for calcium. Lack of ESLs for these inorganics is not expected to underestimate risk at the site.

Several organic chemicals do not have ESLs for any receptor in release 4.2 of the ECORISK Database (LANL 2020). Predominantly, the constituents lacking ESLs are nondetected organics. In the absence of a chemical-specific ESL, concentrations can be compared with the ESLs for a surrogate chemical, if available. Comparison to surrogate ESLs can provide an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted. Some chemicals without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk.

The chemical TATB was detected in six samples. TATB did not have any ESLs for use in the evaluation. The toxicity values for 1,3,5-trinitrobenzene for mammals and invertebrates were used as a surrogate based on structural similarity. There were no avian surrogates available.

Chemicals lacking ESLs are often infrequently detected across the site. In these cases, comparisons with human health SLs are presented as part of a qualitative assessment, if human health SLs are available. The comparison of concentrations to human health SLs is a viable alternative for several reasons. Animal studies are used as the basis of toxicity values for human health risk assessments and are the basic premise of modern toxicology (EPA 1989). In addition, toxicity values derived for the calculation of human health SLs (e.g., histopathology or biochemical changes) may be based on potential adverse effects more sensitive than the ones typically used to derive ESLs (e.g., survival, growth, or reproductive effects). EPA also applies uncertainty factors or modifying factors to ensure the toxicity values are protective (i.e., toxicity values are divided by uncertainty factors resulting in values much lower than initial study results).

Since there were no predicted adverse effects on human health, chemicals lacking ESLs are unlikely to pose an ecological risk.

3.4.6. Small-Mammal Field Investigations

Small mammal trapping and analysis of whole organisms were conducted in the area around the Unit in August and September 2010 to evaluate small mammal abundance and occurrence relative to background. Small-mammal community and population parameters were also measured across the site (Bennett and Robinson 2011). This information was considered useful for the current analysis as an additional line of evidence. Field mice were collected around the site and analyzed for dioxins and furans as well as metals, and for polychlorinated biphenyls (PCBs) (Fresquez 2011).

Small mammals that could occur at the Unit are the deer mouse (*Peromyscus maniculatus*), brush mouse (*Peromyscus boylii*), pinyon mouse (*Peromyscus truei*), silky pocket mouse (*Perognathus flavescens*), western harvest mouse (*Reithrodontomys megalotis*), white-throated woodrat (*Neotoma albigula*), and the Mexican woodrat (*Neotoma 16exicana*) (Bennett and Robinson 2011). The Unit is located at the bottom of Ancho Canyon. The vegetation community consists of piñon (*Pinus edulis Engelm*.)-juniper (*Juniperus monosperma [Englem.] Sarg*.) with scattered ponderosa pine (*Pinus ponderosa C. Lawson*) and gambel oak (*Quercus gambelii Nutt*.) (Bennett and Robinson 2011).

The capture rate was higher at the Unit relative to the control area, but the Unit exhibited lower diversity and lower eveness. There were five species captured, including the rock pocket mouse (*Chaetodipus intermedius*) which had never been caught at LANL before. In addition, Mexican woodrats, deer mice, harvest mice, and brush

mice were collected. There were no differences in deer mouse sex ratios or body weight between the Unit and the control area. The authors of the study concluded that there was no apparent adverse effects on small mammal populations at the Unit relative to controls.

Radionuclides and chemical concentrations in biota were compared to regional statistical reference levels (RSRLs). RSRLs represent natural and fallout levels and are the upper-level background concentrations (mean plus three standard deviations = 99% confidence level) for radionuclides and chemicals calculated from biota that was collected from regional locations away from the influence of the Laboratory (over nine miles away) (Fresquez 2011). The only analytes that exceeded RSRLs were barium (two out of three samples) and lead (three out of three samples). Barium and lead soil concentrations were below BVs in the current data set. Dioxins/furans and explosives were not detected. These data suggest that there are no impacts to small mammal populations at the Unit.

3.4.7. Avian Field Investigations

One western bluebird (*Sialia 17exicana*) and one ash-throated flycatcher (*Myiarchus cinerascens*) egg sample were obtained in 2018 from the Unit and analyzed for inorganic elements (Gaukler and Stanek 2019). Concentrations of inorganic elements were compared with the upper-level bounds of background concentrations in bird eggs as represented by the RSRL. The data indicated aluminum, antimony, arsenic, beryllium, cadmium, chromium, lead, nickel, silver, thallium, or vanadium were not detected in eggs (Gaukler and Stanec 2019). Barium, cobalt, and zinc were detected, but were below the RSRL.

Calcium, copper, iron, magnesium, manganese, mercury, potassium, selenium and sodium, were detected in bluebird eggs above the RSRL for avian eggs. Whereas mercury and selenium egg concentrations were below LOAELs, no benchmarks were available for copper, iron, or manganese (Gaukler and Stanek 2019). The other inorganics are considered macronutrients. Most of these inorganics above RSRLs in eggs were either not detected in soils or were detected with maximum soil concentrations below soil BVs. Only copper, mercury, and vanadium soil UCL95 EPCs exceeded NE ESLs, and copper and vanadium soil UCL95s exceeded LE ESLs. In the current data set analyzed for this report, none of the UCL95 EPCs for soil for the detected inorganics above BVs were above NE ESLs once area use factors were incorporated into the analysis. One sample consisting of four western bluebird eggs was collected in 2019, and no detected analytes were above the RSRLs (Gaukler and Stanek 2020).

Avian population metrics also do not suggest that birds in the vicinity are being negatively impacted (Hathcock et al. 2018). The avian population transect at the Unit was in a canyon bottom, whereas the control areas were on mesa tops. This could lead to differences in species identified and population metrics between the Unit and control areas. Species diversity was significantly higher at the Unit in 2013, 2014, and 2016 than at the control areas. Abundance varied in the Unit and control areas annually, but abundance in the Unit compared to controls was similar over time. Combined, the egg concentration data and population metrics suggest that adverse health effects are not expected at the observed concentrations.

3.4.8. Area Use Factors

The Unit is very small with an aerial extent of 40 by 40 feet (0.037 acres or 0.015 hectares (ha)). This is less than the size of the home range (HR) of an individual robin or a deer mouse as shown in Table 3-7. The HR is used to calculate AUFs that are used in the EcoPRG equations (LANL 2017). Individual AUFs and PAUFs may be used to modify the estimate of risk to wildlife receptors to allow estimates to be more site-specific. The application of AUFs or PAUFs reduces potential overestimation of risks for those receptors with HRs larger than the area of contamination being evaluated. The estimated ecological risk as indicated by the HQ or HI is multiplied by the AUF or PAUF. HQs for plants or invertebrates are not adjusted by AUFs or PAUFs.

Table 3-7 presents the area use hazard analysis based on NE ESLs. The NE ESLs for each COPC that failed the screening evaluation (i.e., because EPCs exceeded the SLs) are shown for each receptor. The site specific AUF and PAUFs are shown for an area equivalent to the Unit. The UCL95 EPC is divided by the ESL and multiplied

by the PAUF to obtain revised HQs. The habitat is not suitable for Mexican Spotted Owls or other special status species, and so an AUF evaluation was not conducted.

There were no HQs above 1, or even above 0.1, for birds or mammals based on comparison of UCL95 values as the EPC to the NE ESLs for each receptor (Table 3-7) when PAUFs were accounted for. The HQ for copper for plants was 2. The HI for earthworms and plants are 3 and 2, respectively.

Table 3-8 presents the area use hazard analysis based on comparison of the UCL95 values as the EPC to the LE ESLs for each receptor. There are no HQs or HIs above 1.

3.5. CONCLUSIONS

The ecological risk assessment used a tiered approach for determining if the Unit would present an ecological risk. The results of the initial and highly conservative screening step indicated several inorganics occurring above background concentrations, and several detected organics, would present an ecological risk. Maximum concentrations of six detected inorganics exceeded background (calcium, chromium, copper, mercury, vanadium, and zinc). There is no ESL for calcium, but there was no human health risk. Maximum concentrations of other inorganics exceeded NE ESLs.

Dioxin/furans, some polynuclear aromatic hydrocarbons (PAHs), phthalates, benzoic acid, benzyl alcohol, volatile organics, and two explosives were detected in the unit. Of the detected organics, only four (benzoic acid, di-n-butylphthalate, HMX, and TATB) exceeded ESLs in the initial screening level evaluation which compared maximum detected values to the NE ESLs. There were HQs above 1 for TCDD.

Further evaluation by statistically estimating UCL95's to use as EPCs in soil suggested organics would occur at concentrations hazardous to ecological receptors. Use of the UCL95 as the EPC provides a conservative estimate of average exposure across the Unit. Inorganics exceeded the LE ESLs. None of the UCL95's for organics exceeded ESLs.

Additional consideration of site ecology and receptor-specific adjustments to exposure by considering home range and site area further reduced the analytes exceeding NE ESLs. Only HQs for copper exceeded 1. This was for plants for which the area use evaluation is not relevant as they are immobile in the environment. However, the Unit is not vegetated because of its designated use as an OD area, and so plants have marginal habitat in the Unit. The LE ESLs are not exceeded for any receptor based on a LE ESL hazard analysis.

The results of the ERA indicate that the Unit does not present a significant ecological risk to any receptor evaluated.

4. REFERENCES

ATSDR. 2012. *Toxicological Profile for Chromium*. September 2012. Pg 374. https://www.atsdr.cdc.gov/toxprofiles/tp7.pdf

Bennett, K., and R. Robinson. 2011. *Small Mammal Sampling at Open-Detonation Firing Sites*. LA-UR-11-00717. January 2011. (Bennett and Robinson 2011)

EPA (U.S. Environmental Protection Agency), December 1989. *"Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final,"* EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1989)

EPA (U.S. Environmental Protection Agency), 1993. *"Wildlife Exposure Factors Handbook,"* U.S. Environmental Protection Agency document EPA/600/P93/187A, Office of Research and Development, Washington, D.C. (EPA 1993)

EPA (U.S. Environmental Protection Agency), June 5, 1997. *"Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final,"* U.S. Environmental Protection Agency, Environmental Response Team, Edison NJ. (EPA 1997)

EPA (U.S. Environmental Protection Agency), November 2003. *"Guidance for Developing Ecological Soil Screening Levels, Evaluation of Dermal Contact and Inhalation Exposure Pathways for the Purpose of Setting Eco-SSLs, Attachment 1-3,* U.S. Environmental Protection Agency document OSWER Directive 92857-55, Office of Solid Waste and Emergency Response. (EPA 2003)

EPA (U.S. Environmental Protection Agency), December 2010a. *"Final Report Bioavailability of Dioxins and Dioxin-Like Compounds in Soil,"* Office of Superfund Remediation and Technology Innovation, Environmental Response Team, West Las Vegas, Nevada (http://epa.gov/superfund/health/contaminants/dioxin/pdfs/Final_dioxin_RBA_Report_12_20_10.p df). (EPA 2010a)

EPA (U.S. Environmental Protection Agency), December 2010b. *"Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8=Tetrachloro-p-dioxin and Dioxin-Like Compounds."* EPA/100/R 10/005. (EPA 2010b)

EPA (U.S. Environmental Protection Agency), January 2014. *"Technical Fact Sheet – N-Nitroso-dimethylamine (NDMA)"*. https://www.epa.gov/sites/production/files/2014-03/documents/ffrrofactsheet_contaminant_ndma_january2014_final.pdf . (EPA 2014)

EPA (U.S. Environmental Protection Agency), October 2015. *"ProUCL Version 5.1.002 User Guide. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations."* EPA/600/R-07/041. ORD Site Characterization and Monitoring Technical Support Center. (EPA 2015)

EPA (U.S. Environmental Protection Agency), November 2021. *Regional Screening Levels (RSLs) – Generic Tables* Dated November 2021. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables. (EPA 2021)

Fresquez, P.R. 2011. *Chemical Concentrations In Field Mice Collected From Open-Detonation Firing Sites Ta-36 Minie And Ta-39 Point 6 At Los Alamos National Laboratory*. LA-UR-11-10614. May 2011. (Fresquez 2011)

Gaukler, S. and J Stanek. 2019. *" Inorganic Element Concentrations in Passerine Eggs Collected at Technical Areas 36, 39, and 16 at Los Alamos National Laboratory".* LA-UR-19-25647. June 2019. (Gaukler and Stanek 2019)

Gaukler, S. and J Stanek. 2020. *"2019 Results for Avian Monitoring of Inorganic and Organic Element Concentrations in Passerine Eggs and a Nestling Collected from Technical Area 16 Burn Grounds, Technical Area 36 Minie, and Technical Area 39 Point 6 at Los Alamos National Laboratory."* March 25, 2020. LA-UR-20-22529. (Gaukler and Stanek 2020)

Hathcock, C. D., Bartlow, A. W., and B.E. Thompson. 2018. *"2017 Results for Avian Monitoring at the TA-36 Minie Site, TA-39 Point 6, and TA-16 Burn Ground at Los Alamos National Laboratory".* 2018-04-30 (rev.1) LA-UR-18-22897. (Hathcock et al. 2018)

LANL (Los Alamos National Laboratory), September 1998. *"Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory,"* Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998)

LANL (Los Alamos National Laboratory), November 2003. *"ECORISK Database (Version 2.0),"* on CD, Los Alamos, New Mexico. (LANL 2003)

LANL (Los Alamos National Laboratory). 2009. *"Pajarito Canyon Investigation Report, Revision 1."* Los Alamos National Laboratory document LA-UR-09-04670, Los Alamos, New Mexico. August 2009.

LANL (Los Alamos National Laboratory), November 2012. *"Screening-Level Ecological Risk Assessment Methods, Revision 3,"* Los Alamos National Laboratory document LA-UR-12-24152, Los Alamos, New Mexico. (LANL 2012a)

LANL (Los Alamos National Laboratory), October 2012. *"ECORISK Database (Release 3.1),"* LA-UR-12-24548, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2012b)

LANL (Los Alamos National Laboratory), 2017. *"ECORISK Database User Guide, Revision 1".* LA-UR-17-26376. Los Alamos National Laboratory, Los Alamos, New Mexico. September 2017. (LANL 2017)

LANL (Los Alamos National Laboratory), 2019. *"ECORISK Database (Release 4.1),"* March 2019 Release. (LANL 2019)

LANL (Los Alamos National Laboratory), 2020. *"ECORISK Database (Release 4.2),"* Updated Database. LA-UR-12- 24548, Los Alamos National Laboratory, Los Alamos, New Mexico. November 19, 2020. (LANL 2020)

NMED (New Mexico Environment Department). 2021. *New Mexico Soil Screening Levels*. December 2021. (NMED 2021)

NMED (New Mexico Environment Department). 2017. *Risk Assessment Guidance for Site Investigations and Remediation. Volume II. Soil Screening Guidance for Ecological Risk Assessments.* 2017 Revised. (NMED 2017)

NMED (New Mexico Environment Department). February 2019. *Risk Assessment Guidance for Site Investigations and Remediation. Volume I. Soil Screening Guidance for Human Health Risk Assessments.* February 2019. Rev. 1 (3/7/19) (NMED 2019)

NMED (New Mexico Environment Department). 2021. *New Mexico Soil Screening Levels*. December 2021. (NMED 2021)

Sample, B.E., Suter III, G.W., Efroymson, R.A., and Jones, D.A., May 1998. *"A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application,"* Oak Ridge National Laboratory, Environmental Sciences Division, Publication No. 4783, ORNL/TM13615, Oak Ridge, TN. May 1998 (Sample et al. 1998)

Van den Berg et.al, 2006. *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency factors for Dioxin and Dioxin-like Compounds.* ToxiSci Advance Access, July 7, 2006. (Van den Berg et al. 2006)

WHO (World Health Organization). September 2009. *"Project For The Re-Evaluation Of Human And Mammalian Toxic Equivalency Factors (TEFS) Of Dioxins And Dioxin-Like Compounds".* International Programme on Chemical Safety. http://www.who.int/ipcs/assessment/tef_update/en/ (WHO 2009)

TABLES

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	n	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detects
INORGANICS								
Aluminum	13	1.76E+03	5.28E+03	3.90E+03	8.48E+02	6.24E+00	6.82E+00	13
Antimony	13	3.07E-01	3.24E+00	1.82E+00	1.45E+00	3.07E-01	3.24E+00	0
Arsenic	13	3.65E-01	1.28E+00	8.13E-01	2.07E-01	3.10E-01	3.36E-01	13
Barium	13	1.68E+01	8.86E+01	4.29E+01	1.75E+01	9.17E-02	1.00E-01	13
Beryllium	13	1.43E-01	2.32E-01	1.90E-01	2.68E-02	1.83E-02	1.99E-02	13
Cadmium	13	9.17E-02	1.00E-01	9.52E-02	2.23E-03	9.17E-02	1.00E-01	0
Calcium	13	5.88E+02	7.16E+03	4.67E+03	1.76E+03	7.34E+00	8.02E+00	13
Chromium	13	3.22E+00	4.79E+01	1.64E+01	1.18E+01	1.38E-01	1.50E-01	13
Cobalt	13	2.25E+00	8.95E+00	5.59E+00	1.85E+00	1.38E-01	1.50E-01	13
Copper	13	4.92E+00	1.74E+02	5.78E+01	5.23E+01	2.75E-01	3.01E-01	13
Iron	13	9.03E+03	2.14E+04	1.49E+04	3.77E+03	7.34E+00	8.02E+00	13
Lead	13	5.83E+00	1.56E+01	8.98E+00	2.88E+00	3.03E-01	3.31E-01	13
Magnesium	13	3.75E+02	3.74E+03	2.40E+03	8.21E+02	7.80E+00	8.52E+00	13
Manganese	13	1.47E+02	2.81E+02	2.14E+02	3.80E+01	1.83E-01	2.01E-01	13
Mercury	13	3.55E-03	1.31E-01	3.37E-02	4.50E-02	3.48E-03	3.93E-03	7
Nickel	13	1.27E+00	1.38E+01	8.19E+00	2.94E+00	9.17E-02	9.95E-02	13
Perchlorate	13	4.86E-04	5.04E-04	4.94E-04	5.39E-06	4.86E-04	5.04E-04	0
Potassium	13	3.74E+02	8.12E+02	6.21E+02	1.18E+02	5.87E+00	6.42E+00	13
Selenium	13	3.30E-01	3.58E-01	3.46E-01	9.48E-03	3.30E-01	3.58E-01	0
Silver	13	1.67E-01	6.85E-01	3.77E-01	1.65E-01	9.17E-02	1.00E-01	0
Sodium	13	1.28E+02	3.99E+02	2.76E+02	6.65E+01	6.42E+00	7.02E+00	13
Thallium	13	1.28E-01	1.39E-01	1.34E-01	3.84E-03	1.28E-01	1.39E-01	0
Vanadium	13	1.14E+01	4.83E+01	3.17E+01	1.10E+01	9.17E-02	1.00E-01	13
Zinc	13	2.44E+01	6.25E+01	3.89E+01	1.15E+01	3.67E-01	4.01E-01	13
ORGANICS								
2,4-Diamino-6-nitrotoluene	13	4.93E-01	5.00E-01	4.97E-01	2.94E-03	4.93E-01	5.00E-01	0
2,6-Diamino-4-nitrotoluene	13	6.50E-01	6.60E-01	6.56E-01	4.17E-03	6.50E-01	6.60E-01	0
3,5-Dinitroaniline	13	2.96E-01	3.00E-01	2.98E-01	1.71E-03	2.96E-01	3.00E-01	0
Acenaphthene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Acenaphthylene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Acetone	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Amino-2,6-dinitrotoluene[4-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Amino-4,6-dinitrotoluene[2-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Aniline	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Anthracene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Azobenzene	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Benzene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Benzo(a)anthracene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Benzo(a)pyrene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	n	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detects
Benzo(b)fluoranthene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Benzo(g,h,i)perylene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Benzo(k)fluoranthene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Benzoic Acid	13	1.67E-01	4.83E-01	1.92E-01	8.75E-02	1.67E-01	1.68E-01	1
Benzyl Alcohol	13	1.00E-01	1.65E+00	3.93E-01	4.81E-01	1.00E-01	1.01E-01	7
Bis(2-chloroethoxy)methane	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Bis(2-chloroethyl)ether	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Bis(2-ethylhexyl)phthalate	13	1.00E-02	3.05E-02	1.23E-02	5.70E-03	1.00E-02	1.01E-02	0
Bromobenzene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Bromochloromethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Bromodichloromethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Bromoform	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Bromomethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Bromophenyl-phenylether[4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Butanone[2-]	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Butylbenzene[n-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Butylbenzene[sec-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Butylbenzene[tert-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Butylbenzylphthalate	13	1.00E-02	6.35E-02	1.59E-02	1.56E-02	1.00E-02	1.01E-02	2
Carbon Disulfide	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Carbon Tetrachloride	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chloro-3-methylphenol[4-]	13	1.34E-01	1.34E-01	1.34E-01	3.73E-09	1.34E-01	1.34E-01	0
Chloroaniline[4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Chlorobenzene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chlorodibromomethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chloroethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chloroform	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chloromethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chloronaphthalene[2-]	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Chlorophenol[2-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Chlorophenyl-phenyl[4-] Ether	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Chlorotoluene[2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chlorotoluene[4-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Chrysene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Dibenz(a,h)anthracene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Dibenzofuran	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Dibromo-3-Chloropropane[1,2-]	13	4.93E-04	5.04E-04	4.99E-04	4.97E-06	4.93E-04	5.04E-04	0
Dibromoethane[1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dibromomethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichlorobenzene[1,2-]	26	3.28E-04	1.01E-01	5.05E-02	5.11E-02	3.28E-04	1.01E-01	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	n	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detects
Dichlorobenzene[1,3-]	26	3.28E-04	1.01E-01	5.05E-02	5.11E-02	3.28E-04	1.01E-01	0
Dichlorobenzene[1,4-]	26	3.28E-04	1.01E-01	5.05E-02	5.11E-02	3.28E-04	1.01E-01	0
Dichlorobenzidine[3,3'-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Dichlorodifluoromethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloroethane[1,1-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloroethane[1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloroethene[1,1-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloroethene[cis-1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloroethene[trans-1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichlorophenol[2,4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Dichloropropane[1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloropropane[1,3-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloropropane[2,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloropropene[1,1-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloropropene[cis-1,3-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Dichloropropene[trans-1,3-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Diethylphthalate	13	1.00E-02	1.28E-02	1.03E-02	7.62E-04	1.00E-02	1.01E-02	0
Dimethyl Phthalate	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Dimethylphenol[2,4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Di-n-butylphthalate	13	1.00E-02	1.00E-01	2.30E-02	2.63E-02	1.00E-02	1.01E-02	5
Dinitro-2-methylphenol[4,6-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Dinitrobenzene[1,3-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Dinitrophenol[2,4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Dinitrotoluene[2,4-]	26	1.00E-01	1.50E-01	1.25E-01	2.48E-02	1.00E-01	1.50E-01	0
Dinitrotoluene[2,6-]	26	1.00E-01	1.50E-01	1.25E-01	2.48E-02	1.00E-01	1.50E-01	0
Di-n-octylphthalate	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Diphenylamine	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Ethylbenzene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Fluoranthene	13	1.00E-02	1.87E-02	1.07E-02	2.39E-03	1.00E-02	1.01E-02	1
Fluorene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	13	5.01E-07	1.17E-05	4.91E-06	3.79E-06	1.65E-06	1.67E-06	12
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	13	4.96E-07	2.21E-06	7.84E-07	4.81E-07	1.65E-06	1.67E-06	6
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Heptachlorodibenzofurans (Total)	13	0.00E+00	1.22E-05	1.82E-06	3.35E-06			7
Hexachlorobenzene	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Hexachlorobutadiene	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Hexachlorocyclopentadiene	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.73E-06	1.75E-06	0
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.94E-06	1.97E-06	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	n	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detects
Hexachlorodibenzofuran[1,2,3,4,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Hexachlorodibenzofuran[1,2,3,6,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Hexachlorodibenzofuran[1,2,3,7,8,9-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.71E-06	1.73E-06	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Hexachloroethane	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Hexanone[2-]	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
HMX	13	1.48E-01	6.66E+00	9.80E-01	1.80E+00	1.48E-01	1.50E-01	7
Indeno(1,2,3-cd)pyrene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Iodomethane	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Isophorone	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Isopropylbenzene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Isopropyltoluene[4-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Methyl-2-pentanone[4-]	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Methylene Chloride	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Methylnaphthalene[2-]	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Methylphenol[2-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Methylphenol[3-,4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Naphthalene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Nitroaniline[2-]	13	1.10E-01	1.11E-01	1.11E-01	4.39E-04	1.10E-01	1.11E-01	0
Nitroaniline[3-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitroaniline[4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitrobenzene	26	1.00E-01	1.50E-01	1.25E-01	2.48E-02	1.00E-01	1.50E-01	0
Nitrophenol[2-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitrophenol[4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitrosodimethylamine[N-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitroso-di-n-propylamine[N-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Nitrotoluene[2-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Nitrotoluene[3-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Nitrotoluene[4-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	13	1.96E-06	9.57E-05	4.10E-05	3.26E-05	3.31E-06	3.35E-06	13
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	13	9.93E-07	1.92E-05	2.99E-06	4.94E-06	3.31E-06	3.35E-06	7
Oxybis(1-chloropropane)[2,2'-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Pentachlorodibenzodioxin[1,2,3,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Pentachlorodibenzofuran[1,2,3,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.65E-06	1.67E-06	0
Pentachlorodibenzofuran[2,3,4,7,8-]	13	4.96E-07	5.02E-07	4.99E-07	2.02E-09	1.75E-06	1.77E-06	0
Pentachlorophenol	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
PETN	13	2.46E-01	2.50E-01	2.49E-01	1.61E-03	2.46E-01	2.50E-01	0
Phenanthrene	13	1.00E-02	1.01E-02	1.01E-02	5.06E-05	1.00E-02	1.01E-02	0
Phenol	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Propylbenzene[1-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0

Table 2-1. Summary Statistics for Fall 2018 Data

Analyte Name	n	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detects
Pyrene	13	1.00E-02	1.61E-02	1.05E-02	1.67E-03	1.00E-02	1.01E-02	1
Pyridine	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
RDX	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Styrene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
TATB	13	2.96E-01	6.76E+00	1.37E+00	1.97E+00	2.96E-01	3.00E-01	6
Tetrachlorodibenzodioxin[2,3,7,8-]	13	9.93E-08	1.00E-07	9.98E-08	2.18E-10	3.31E-07	3.35E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	13	1.05E-07	5.60E-07	2.67E-07	1.62E-07	3.31E-07	3.35E-07	11
Tetrachloroethane[1,1,1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Tetrachloroethane[1,1,2,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Tetrachloroethene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Tetryl	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Toluene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trichloro-1,2,2-trifluoroethane[1,1,2-]	13	1.64E-03	1.68E-03	1.66E-03	1.80E-05	1.64E-03	1.68E-03	0
Trichlorobenzene[1,2,4-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Trichloroethane[1,1,1-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trichloroethane[1,1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trichloroethene	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trichlorofluoromethane	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trichlorophenol[2,4,5-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Trichlorophenol[2,4,6-]	13	1.00E-01	1.01E-01	1.01E-01	5.06E-04	1.00E-01	1.01E-01	0
Trichloropropane[1,2,3-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trimethylbenzene[1,2,4-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trimethylbenzene[1,3,5-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Trinitrobenzene[1,3,5-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Trinitrotoluene[2,4,6-]	13	1.48E-01	1.50E-01	1.49E-01	8.01E-04	1.48E-01	1.50E-01	0
Tris (o-cresyl) phosphate	13	2.96E-01	3.00E-01	2.98E-01	1.71E-03	2.96E-01	3.00E-01	0
Vinyl Chloride	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Xylene[1,2-]	13	3.28E-04	3.36E-04	3.32E-04	3.33E-06	3.28E-04	3.36E-04	0
Xylene[1,3-]+Xylene[1,4-]	13	6.57E-04	6.73E-04	6.65E-04	6.86E-06	6.57E-04	6.73E-04	0

Notes: Sample size (n) includes duplicate of WST39-18-162832 (WST39-18-162973) and multiple analytical methods.

Abbreviations:
MDL – method detection limit
mg/kg – milligram per kilogram
n – sample size
SD - standard deviation

Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations To Background

Parameter Name	Maximum Result (mg/kg)	Number of Detected Values	Background Threshold Value (BV) (mg/kg)	Ratio of Maximum/ BV
Aluminum	5280.00	13	29200	0.2
Arsenic	1.28	13	8.17	0.2
Barium	88.60	13	295	0.3
Beryllium	0.23	13	1.83	0.1
Calcium	7160.00	13	6120	1.2
Chromium	47.90	13	19.3	2
Cobalt	8.95	13	8.64	1.0
Copper	174.00	13	14.7	12
Iron	21400.00	13	21500	1
Lead	15.60	13	22.3	0.7
Magnesium	3740.00	13	4610	0.8
Manganese	281.00	13	671	0.4
Mercury	0.13	7	0.1	1.3
Nickel	13.80	13	15.4	0.9
Potassium	812.00	13	3460	0.2
Sodium	399.00	13	915	0.4
Vanadium	48.30	13	39.6	1.2
Zinc	62.50	13	48.8	1.3

Notes:
All data in mg/kg. Shaded Max/BV cells indicate the maximum>BV
All inorganics above BVs carry forward on the basis of hypothesis testing. See Section 2.3.2.

Table 2-3. Verification of MDLs for Nondetects for Data Useability

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Antimony	3.24	NV	NA	NV	NA	NV	NA	3.13E+01	1E-01	5.19E+02	6E-03	1.42E+02	2E-02
Cadmium	0.10	8.59E+04	1E-11	4.17E+05	2E-12	3.61E+03	3E-10	7.05E+01	1E-03	1.11E+03	9E-05	7.21E+01	1E-03
Mercury	0.004	NV	NA	NV	NA	NV	NA	2.35E+01	2E-04	3.89E+02	1E-05	7.71E+01	5E-05
Perchlorate	0.0005	NV	NA	NV	NA	NV	NA	5.48E+01	9E-06	9.08E+02	6E-07	2.48E+02	2E-06
Selenium	0.36	NV	NA	NV	NA	NV	NA	3.91E+02	9E-04	6.49E+03	6E-05	1.75E+03	2E-04
Silver	0.69	NV	NA	NV	NA	NV	NA	3.91E+02	2E-03	6.49E+03	1E-04	1.77E+03	4E-04
Thallium	0.14	NV	NA	NV	NA	NV	NA	7.82E-01	2E-01	1.30E+01	1E-02	3.54E+00	4E-02
2,4-Diamino-6-nitrotoluene	5.00E-01	3.16E+01	2E-07	1.65E+02	3E-08	1.13E+03	4E-09	6.16E+00	8E-02	9.16E+01	5E-03	2.69E+01	2E-02
2,6-Diamino-4-nitrotoluene	6.60E-01	3.16E+01	2E-07	1.65E+02	4E-08	1.13E+03	6E-09	6.16E+00	1E-01	9.16E+01	7E-03	2.69E+01	2E-02
3,5-Dinitroaniline	3.00E-01	NV	NA	NV	NA	NV	NA	7.64E+00	4E-02	1.25E+02	2E-03	1.73E+01	2E-02
Acenaphthene	1.01E-02	NV	NA	NV	NA	NV	NA	3.48E+03	3E-06	5.05E+04	2E-07	1.51E+04	7E-07
Acenaphthylene	1.01E-02	NV	NA	NV	NA	NV	NA	3.48E+03	3E-06	5.05E+04	2E-07	1.51E+04	7E-07
Acetone	1.68E-03	NV	NA	NV	NA	NV	NA	6.63E+04	3E-08	9.60E+05	2E-09	2.42E+05	7E-09
Amino-2,6-dinitrotoluene[4-]	1.50E-01	NV	NA	NV	NA	NV	NA	7.64E+00	2E-02	1.25E+02	1E-03	1.73E+01	9E-03
Amino-4,6-dinitrotoluene[2-]	1.50E-01	NV	NA	NV	NA	NV	NA	7.70E+00	2E-02	1.27E+02	1E-03	1.73E+01	9E-03
Aniline	1.01E-01	9.50E+02	1E-09	4.00E+03	3E-10	4.00E+03	3E-10	4.40E+02	2E-04	5.70E+03	2E-05	5.70E+03	2E-05
Anthracene	1.01E-02	NV	NA	NV	NA	NV	NA	1.74E+04	6E-07	2.53E+05	4E-08	7.53E+04	1E-07
Azobenzene	1.01E-01	5.60E+01	2E-08	2.60E+02	4E-09	2.60E+02	4E-09	NV	NA	NV	NA	NV	NA
Benzene	3.36E-04	1.78E+01	2E-10	8.72E+01	4E-11	4.23E+02	8E-12	1.14E+02	3E-06	7.29E+02	5E-07	1.42E+02	2E-06
Benzo(a)anthracene	1.01E-02	1.53E+00	7E-08	3.23E+01	3E-09	2.40E+02	4E-10	NV	NA	NV	NA	NV	NA
Benzo(a)pyrene	1.01E-02	1.12E+00	9E-08	2.36E+01	4E-09	1.73E+02	6E-10	1.74E+01	6E-04	2.51E+02	4E-05	1.50E+01	7E-04
Benzo(g,h,i)perylene	1.01E-02	1.12E+00	9E-08	2.36E+01	4E-09	1.73E+02	6E-10	1.74E+01	6E-04	2.51E+02	4E-05	1.50E+01	7E-04
Benzo(k)fluoranthene	1.01E-02	1.53E+01	7E-09	3.23E+02	3E-10	2.31E+03	4E-11	NV	NA	NV	NA	NV	NA
Benzoic Acid	1.68E-01	NV	NA	NV	NA	NV	NA	2.50E+05	7E-07	3.30E+06	5E-08	3.30E+06	5E-08
Benzyl Alcohol	1.01E-01	NV	NA	NV	NA	NV	NA	6.30E+03	2E-05	8.20E+04	1E-06	8.20E+04	1E-06
Bis(2-chloroethoxy)methane	1.01E-01	NV	NA	NV	NA	NV	NA	1.90E+02	5E-04	2.50E+03	4E-05	2.50E+03	4E-05
Bis(2-chloroethyl)ether	1.01E-01	3.11E+00	3E-07	1.57E+01	6E-08	1.95E+00	5E-07	NV	NA	NV	NA	NV	NA

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Bis(2-ethylhexyl)phthalate	3.05E-02	3.80E+02	8E-10	1.83E+03	2E-10	1.34E+04	2E-11	1.23E+03	2E-05	1.83E+04	2E-06	5.38E+03	6E-06
Bromobenzene	3.36E-04	NV	NA	NV	NA	NV	NA	2.90E+02	1E-06	1.80E+03	2E-07	1.80E+03	2E-07
Bromochloromethane	3.36E-04	NV	NA	NV	NA	NV	NA	1.50E+02	2E-06	6.30E+02	5E-07	6.30E+02	5E-07
Bromodichloromethane	3.36E-04	6.19E+00	5E-10	3.02E+01	1E-10	1.43E+02	2E-11	1.56E+03	2E-07	2.60E+04	1E-08	7.08E+03	5E-08
Bromoform	3.36E-04	6.74E+02	5E-12	1.76E+03	2E-12	2.37E+04	1E-13	1.23E+03	3E-07	1.83E+04	2E-08	5.38E+03	6E-08
Bromomethane	3.36E-04	NV	NA	NV	NA	NV	NA	1.77E+01	2E-05	9.45E+01	4E-06	1.79E+01	2E-05
Bromophenyl-phenylether[4-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.60E+02	6E-04	2.30E+03	4E-05	2.30E+03	4E-05
Butanone[2-]	1.68E-03	NV	NA	NV	NA	NV	NA	3.74E+04	4E-08	4.11E+05	4E-09	9.17E+04	2E-08
Butylbenzene[n-]	3.36E-04	NV	NA	NV	NA	NV	NA	3.90E+03	9E-08	5.80E+04	6E-09	5.80E+04	6E-09
Butylbenzene[sec-]	3.36E-04	NV	NA	NV	NA	NV	NA	7.80E+03	4E-08	1.20E+05	3E-09	1.20E+05	3E-09
Butylbenzene[tert-]	3.36E-04	NV	NA	NV	NA	NV	NA	7.80E+03	4E-08	1.20E+05	3E-09	1.20E+05	3E-09
Butylbenzylphthalate	1.01E-02	2.90E+03	3E-11	1.20E+04	8E-12	1.20E+04	8E-12	1.30E+04	8E-07	1.60E+05	6E-08	1.60E+05	6E-08
Carbon Disulfide	1.68E-03	NV	NA	NV	NA	NV	NA	1.55E+03	1E-06	8.54E+03	2E-07	1.62E+03	1E-06
Carbon Tetrachloride	3.36E-04	1.07E+01	3E-10	5.25E+01	6E-11	2.52E+02	1E-11	1.44E+02	2E-06	1.02E+03	3E-07	2.02E+02	2E-06
Chloro-3-methylphenol[4-]	1.34E-01	NV	NA	NV	NA	NV	NA	6.30E+03	2E-05	8.20E+04	2E-06	8.20E+04	2E-06
Chloroaniline[4-]	1.01E-01	2.70E+01	4E-08	1.10E+02	9E-09	1.10E+02	9E-09	3.20E+01	3E-03	4.10E+02	2E-04	4.10E+02	2E-04
Chlorobenzene	3.36E-04	NV	NA	NV	NA	NV	NA	3.78E+02	9E-07	2.16E+03	2E-07	4.12E+02	8E-07
Chlorodibromomethane	3.36E-04	1.39E+01	2E-10	6.74E+01	5E-11	3.40E+02	1E-11	1.23E+03	3E-07	1.83E+04	2E-08	5.38E+03	6E-08
Chloroethane	3.36E-04	NV	NA	NV	NA	NV	NA	1.90E+04	2E-08	8.95E+04	4E-09	1.66E+04	2E-08
Chloroform	3.36E-04	5.90E+00	6E-10	2.87E+01	1E-10	1.34E+02	3E-11	3.06E+02	1E-06	2.00E+03	2E-07	3.91E+02	9E-07
Chloromethane	3.36E-04	4.11E+01	8E-11	2.01E+02	2E-11	9.56E+02	4E-12	2.68E+02	1E-06	1.26E+03	3E-07	2.35E+02	1E-06
Chloronaphthalene[2-]	1.01E-02	NV	NA	NV	NA	NV	NA	6.26E+03	2E-06	1.04E+05	1E-07	2.83E+04	4E-07
Chlorophenol[2-]	1.01E-01	NV	NA	NV	NA	NV	NA	3.91E+02	3E-04	6.49E+03	2E-05	1.77E+03	6E-05
Chlorophenyl-phenyl[4-] Ether	1.01E-01	NV	NA	NV	NA	NV	NA	NV	NA	NV	NA	NV	NA
Chlorotoluene[2-]	3.36E-04	NV	NA	NV	NA	NV	NA	1.56E+03	2E-07	2.60E+04	1E-08	7.08E+03	5E-08
Chlorotoluene[4-]	3.36E-04	NV	NA	NV	NA	NV	NA	1.56E+03	2E-07	2.60E+04	1E-08	7.08E+03	5E-08
Chrysene	1.01E-02	1.53E+02	7E-10	3.23E+03	3E-11	2.31E+04	4E-12	NV	NA	NV	NA	NV	NA

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Dibenz(a,h)anthracene	1.01E-02	1.53E-01	7E-07	3.23E+00	3E-08	2.40E+01	4E-09	NV	NA	NV	NA	NV	NA
Dibenzofuran	1.01E-01	NV	NA	NV	NA	NV	NA	7.80E+01	1E-03	1.20E+03	8E-05	1.20E+03	8E-05
Dibromo-3-Chloropropane[1,2-]	5.04E-04	8.58E-02	6E-08	1.18E+00	4E-09	5.53E+00	9E-10	5.88E+00	9E-05	4.11E+01	1E-05	8.29E+00	6E-05
Dibromoethane[1,2-]	3.36E-04	6.72E-01	5E-09	3.31E+00	1E-09	1.63E+01	2E-10	1.35E+02	2E-06	7.38E+02	5E-07	1.40E+02	2E-06
Dibromomethane	3.36E-04	NV	NA	NV	NA	NV	NA	5.79E+01	6E-06	2.88E+02	1E-06	5.39E+01	6E-06
Dichlorobenzene[1,2-]	1.01E-01	NV	NA	NV	NA	NV	NA	2.15E+03	5E-05	1.30E+04	8E-06	2.50E+03	4E-05
Dichlorobenzene[1,3-]	1.01E-01	1.29E+03	8E-10	6.73E+03	2E-10	4.59E+04	2E-11	5.48E+03	2E-05	9.08E+04	1E-06	2.48E+04	4E-06
Dichlorobenzene[1,4-]	1.01E-01	1.29E+03	8E-10	6.73E+03	2E-10	4.59E+04	2E-11	5.48E+03	2E-05	9.08E+04	1E-06	2.48E+04	4E-06
Dichlorobenzidine[3,3'-]	1.01E-01	1.18E+01	9E-08	5.70E+01	2E-08	4.10E+02	2E-09	NV	NA	NV	NA	NV	NA
Dichlorodifluoromethane	3.36E-04	NV	NA	NV	NA	NV	NA	1.82E+02	2E-06	8.65E+02	4E-07	1.61E+02	2E-06
Dichloroethane[1,1-]	3.36E-04	7.86E+01	4E-11	3.83E+02	9E-12	1.82E+03	2E-12	1.56E+04	2E-08	2.60E+05	1E-09	7.08E+04	5E-09
Dichloroethane[1,2-]	3.36E-04	8.32E+00	4E-10	4.07E+01	8E-11	1.95E+02	2E-11	5.56E+01	6E-06	2.86E+02	1E-06	5.38E+01	6E-06
Dichloroethene[1,1-]	3.36E-04	NV	NA	NV	NA	NV	NA	4.40E+02	8E-07	2.26E+03	1E-07	4.24E+02	8E-07
Dichloroethene[cis-1,2-]	3.36E-04	NV	NA	NV	NA	NV	NA	1.56E+02	2E-06	2.60E+03	1E-07	7.08E+02	5E-07
Dichloroethene[trans-1,2-]	3.36E-04	NV	NA	NV	NA	NV	NA	2.10E+02	2E-06	1.10E+03	3E-07	2.06E+02	2E-06
Dichlorophenol[2,4-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.85E+02	5E-04	2.75E+03	4E-05	8.07E+02	1E-04
Dichloropropane[1,2-]	3.36E-04	1.78E+01	2E-10	8.68E+01	4E-11	4.15E+02	8E-12	2.90E+01	1E-05	1.37E+02	2E-06	2.54E+01	1E-05
Dichloropropane[1,3-]	3.36E-04	1.78E+01	2E-10	8.68E+01	4E-11	4.15E+02	8E-12	2.90E+01	1E-05	1.37E+02	2E-06	2.54E+01	1E-05
Dichloropropane[2,2-]	3.36E-04	1.78E+01	2E-10	8.68E+01	4E-11	4.15E+02	8E-12	2.90E+01	1E-05	1.37E+02	2E-06	2.54E+01	1E-05
Dichloropropene[1,1-]	3.36E-04	2.93E+01	1E-10	1.46E+02	2E-11	7.81E+02	4E-12	1.41E+02	2E-06	6.95E+02	5E-07	1.30E+02	3E-06
Dichloropropene[cis-1,3-]	3.36E-04	2.93E+01	1E-10	1.46E+02	2E-11	7.81E+02	4E-12	1.41E+02	2E-06	6.95E+02	5E-07	1.30E+02	3E-06

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Dichloropropene[trans-1,3-]	3.36E-04	2.93E+01	1E-10	1.46E+02	2E-11	7.81E+02	4E-12	1.41E+02	2E-06	6.95E+02	5E-07	1.30E+02	3E-06
Diethylphthalate	1.28E-02	NV	NA	NV	NA	NV	NA	4.93E+04	3E-07	7.33E+05	2E-08	2.15E+05	6E-08
Dimethyl Phthalate	1.01E-02	NV	NA	NV	NA	NV	NA	4.93E+04	2E-07	7.33E+05	1E-08	2.15E+05	5E-08
Dimethylphenol[2,4-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.23E+03	8E-05	1.83E+04	6E-06	5.38E+03	2E-05
Di-n-butylphthalate	1.01E-02	NV	NA	NV	NA	NV	NA	6.16E+03	2E-06	9.16E+04	1E-07	2.69E+04	4E-07
Dinitro-2-methylphenol[4,6-]	1.01E-01	NV	NA	NV	NA	NV	NA	4.93E+00	2E-02	7.33E+01	1E-03	2.15E+01	5E-03
Dinitrobenzene[1,3-]	1.50E-01	NV	NA	NV	NA	NV	NA	6.30E+00	2E-02	8.20E+01	2E-03	8.20E+01	2E-03
Dinitrophenol[2,4-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.23E+02	8E-04	1.83E+03	6E-05	5.38E+02	2E-04
Dinitrotoluene[2,4-]	1.50E-01	1.71E+01	9E-08	8.23E+01	2E-08	6.00E+02	3E-09	1.23E+02	1E-03	1.82E+03	8E-05	5.36E+02	3E-04
Dinitrotoluene[2,6-]	1.50E-01	3.56E+00	4E-07	1.72E+01	9E-08	1.65E+02	9E-09	1.85E+01	8E-03	2.76E+02	5E-04	8.09E+01	2E-03
Di-n-octylphthalate	1.01E-02	NV	NA	NV	NA	NV	NA	6.30E+02	2E-05	8.20E+03	1E-06	8.20E+03	1E-06
Diphenylamine	1.01E-01	NV	NA	NV	NA	NV	NA	6.30E+03	2E-05	8.20E+04	1E-06	8.20E+04	1E-06
Ethylbenzene	3.36E-04	7.51E+01	4E-11	3.68E+02	9E-12	1.77E+03	2E-12	3.93E+03	9E-08	2.90E+04	1E-08	5.80E+03	6E-08
Fluoranthene	1.01E-02	NV	NA	NV	NA	NV	NA	2.32E+03	4E-06	3.37E+04	3E-07	1.00E+04	1E-06
Fluorene	1.01E-02	NV	NA	NV	NA	NV	NA	2.32E+03	4E-06	3.37E+04	3E-07	1.00E+04	1E-06
Hexachlorobenzene	1.01E-01	3.33E+00	3E-07	1.60E+01	6E-08	1.17E+02	9E-09	4.93E+01	2E-03	7.33E+02	1E-04	2.15E+02	5E-04
Hexachlorobutadiene	1.01E-01	6.83E+01	1E-08	5.21E+01	2E-08	2.40E+03	4E-10	6.16E+01	2E-03	9.16E+02	1E-04	2.69E+02	4E-04
Hexachlorocyclopentadiene	1.01E-01	NV	NA	NV	NA	NV	NA	2.30E+00	4E-02	5.49E+03	2E-05	8.67E+02	1E-04
Hexachloroethane	1.01E-01	1.33E+02	8E-09	6.41E+02	2E-09	4.67E+03	2E-10	4.31E+01	2E-03	6.41E+02	2E-04	1.88E+02	5E-04
Isopropylbenzene	3.36E-04	NV	NA	NV	NA	NV	NA	2.36E+03	1E-07	1.42E+04	2E-08	2.74E+03	1E-07
Isopropyltoluene[4-]	3.36E-04	NV	NA	NV	NA	NV	NA	5.23E+03	6E-08	6.13E+04	5E-09	1.40E+04	2E-08
Methyl-2-pentanone[4-]	1.68E-03	NV	NA	NV	NA	NV	NA	5.81E+03	3E-07	8.16E+04	2E-08	2.02E+04	8E-08
Nitrophenol[2-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.85E+04	5E-06	2.75E+05	4E-07	7.74E+04	1E-06
Nitrophenol[4-]	1.01E-01	NV	NA	NV	NA	NV	NA	1.85E+04	5E-06	2.75E+05	4E-07	7.74E+04	1E-06
Nitrosodimethylamine[N-]	1.01E-01	2.34E-02	4E-05	5.03E-01	2E-06	3.66E+00	3E-07	4.93E-01	2E-01	7.33E+00	1E-02	2.14E+00	5E-02
Nitroso-di-n-propylamine[N-]	1.01E-01	7.80E-01	1E-06	3.30E+00	3E-07	3.30E+00	3E-07	NV	NA	NV	NA	NV	NA

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Nitrotoluene[2-]	1.50E-01	3.16E+01	5E-08	1.65E+02	9E-09	1.13E+03	1E-09	7.04E+01	2E-03	1.17E+03	1E-04	3.19E+02	5E-04
Nitrotoluene[3-]	1.50E-01	NV	NA	NV	NA	NV	NA	6.16E+00	2E-02	9.16E+01	2E-03	2.69E+01	6E-03
Nitrotoluene[4-]	1.50E-01	3.33E+02	5E-09	1.60E+03	9E-10	1.18E+04	1E-10	2.47E+02	6E-04	3.67E+03	4E-05	1.08E+03	1E-04
Oxybis(1-chloropropane)[2,2'-]	1.01E-01	9.93E+01	1E-08	5.19E+02	2E-09	3.54E+03	3E-10	NV	NA	NV	NA	NV	NA
Pentachlorophenol	1.01E-01	9.85E+00	1E-07	4.45E+01	2E-08	3.46E+02	3E-09	2.34E+02	4E-04	3.18E+03	3E-05	9.89E+02	1E-04
PETN	2.50E-01	1.30E+03	2E-09	5.30E+03	5E-10	5.30E+03	5E-10	NV	NA	NV	NA	NV	NA
Phenanthrene	1.01E-02	NV	NA	NV	NA	NV	NA	1.74E+03	6E-06	2.53E+04	4E-07	7.53E+03	1E-06
Phenol	1.01E-01	NV	NA	NV	NA	NV	NA	1.85E+04	5E-06	2.75E+05	4E-07	7.74E+04	1E-06
Propylbenzene[1-]	3.36E-04	NV	NA	NV	NA	NV	NA	3.80E+03	9E-08	2.40E+04	1E-08	2.40E+04	1E-08
Pyrene	1.01E-02	NV	NA	NV	NA	NV	NA	1.74E+03	6E-06	2.53E+04	4E-07	7.53E+03	1E-06
Pyridine	1.01E-01	NV	NA	NV	NA	NV	NA	7.80E+01	1E-03	1.20E+03	8E-05	1.20E+03	8E-05
RDX	1.50E-01	8.31E+01	2E-08	4.28E+02	4E-09	2.96E+03	5E-10	3.01E+02	5E-04	4.89E+03	3E-05	1.35E+03	1E-04
Styrene	3.36E-04	NV	NA	NV	NA	NV	NA	7.26E+03	5E-08	5.13E+04	7E-09	1.02E+04	3E-08
TATB	3.00E-01	NV	NA	NV	NA	NV	NA	2.20E+03	1E-04	3.20E+04	9E-06	3.20E+04	9E-06
Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	4.90E-05	2E-08	2.38E-04	4E-09	1.72E-03	6E-10	5.06E-05	2E-03	8.08E-04	1E-04	2.26E-04	4E-04
Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	NV	NA	NV	NA	NV	NA	5.08E+04	3E-08	2.43E+05	7E-09	4.53E+04	4E-08
Trichlorobenzene[1,2,4-]	1.01E-01	2.40E+02	4E-09	1.25E+03	8E-10	8.54E+03	1E-10	8.29E+01	1E-03	4.23E+02	2E-04	7.91E+01	1E-03
Trichloroethane[1,1,1-]	3.36E-04	NV	NA	NV	NA	NV	NA	1.44E+04	2E-08	7.25E+04	5E-09	1.36E+04	2E-08
Trichloroethane[1,1,2-]	3.36E-04	1.88E+01	2E-10	9.21E+01	4E-11	4.30E+03	8E-13	2.61E+00	1E-04	1.24E+01	3E-05	2.30E+00	1E-04
Trichloroethene	3.36E-04	1.55E+01	2E-10	1.12E+02	3E-11	5.37E+03	6E-13	6.77E+00	5E-05	3.65E+01	9E-06	6.90E+00	5E-05
Trichlorofluoromethane	3.36E-04	NV	NA	NV	NA	NV	NA	1.23E+03	3E-07	6.03E+03	6E-08	1.13E+03	3E-07
Trichlorophenol[2,4,5-]	1.01E-01	NV	NA	NV	NA	NV	NA	6.16E+03	2E-05	9.16E+04	1E-06	2.69E+04	4E-06
Trichlorophenol[2,4,6-]	1.01E-01	4.84E+02	2E-09	2.33E+03	4E-10	1.70E+04	6E-11	6.16E+01	2E-03	9.16E+02	1E-04	2.69E+02	4E-04
Trichloropropane[1,2,3-]	3.36E-04	5.10E-02	7E-08	1.21E+00	3E-09	8.26E+00	4E-10	7.09E+00	5E-05	3.40E+01	1E-05	6.31E+00	5E-05
Trimethylbenzene[1,2,4-]	3.36E-04	NV	NA	NV	NA	NV	NA	3.00E+02	1E-06	1.80E+03	2E-07	1.80E+03	2E-07
Trimethylbenzene[1,3,5-]	3.36E-04	NV	NA	NV	NA	NV	NA	2.70E+02	1E-06	1.50E+03	2E-07	1.50E+03	2E-07

Name	Max. MDL (mg/kg)	Res. Cancer NMSSL (mg/kg)	Res. Cancer Risk	CI Cancer NMSSL (mg/kg)	CI Cancer Risk	Con Cancer NMSSL (mg/kg)	Con Cancer Risk	Res. NC NMSSL (mg/kg)	Res. HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Vinyl Chloride	3.36E-04	7.42E-01	5E-09	2.84E+01	1E-10	1.61E+02	2E-11	1.13E+02	3E-06	8.16E+02	4E-07	1.62E+02	2E-06
Xylene[1,2-]	3.36E-04	NV	NA	NV	NA	NV	NA	8.05E+02	4E-07	3.94E+03	9E-08	7.36E+02	5E-07
Xylene[1,3-]+Xylene[1,4-]	6.73E-04	NV	NA	NV	NA	NV	NA	8.71E+02	8E-07	4.28E+03	2E-07	7.98E+02	8E-07

Notes: All cancer risks and HQs were below the target levels of $1x10^{-5}$ and 1, respectively
The maximum result is the highest method detection limit (MDL) reported

CI – Commercial/industrial worker
Con – Construction worker
HQ – Hazard quotient
Max – Maximum
mg/kg – Milligram per kilogram
NC - Noncancer
NMSSL – New Mexico soil screening level (NMED 2021)
NA – not applicable
NV – no value
Res - residential

Table 2-4. Human Health Risk Screening For Detected Analytes Above Background

Category	Name	Max Result (mg/kg)	Cancer						Noncancer					
			Res Cancer NMSSL (mg/kg)	Res Cancer Risk	CI Worker Cancer NMSSL (mg/kg)	CI Worker Cancer Risk	Con Worker Cancer NMSSL (mg/kg)	Con Worker Cancer Risk	Res Noncancer NMSSL (mg/kg)	Res HQ	CI NC NMSSL	CI HQ	Con NC NMSSL	Con HQ
Inorganic	Calcium	7160.00	NV	NA	NV	NA	NV	NA	1.30E+07	5E-04	3.24E+07	2E-04	8.85E+06	8E-04
	Chromium	47.90	NV	NA	NV	NA	NV	NA	1.17E+05	4E-04	1.95E+06	2E-05	5.31E+05	9E-05
	Copper	174.00	NV	NA	NV	NA	NV	NA	3.13E+03	6E-02	5.19E+04	3E-03	1.42E+04	1E-02
	Mercury	0.13	NV	NA	NV	NA	NV	NA	2.35E+01	6E-03	3.89E+02	3E-04	7.71E+01	2E-03
	Vanadium	48.30	NV	NA	NV	NA	NV	NA	3.94E+02	1E-01	6.53E+03	7E-03	6.14E+02	8E-02
	Zinc	62.50	NV	NA	NV	NA	NV	NA	2.35E+04	3E-03	3.89E+05	2E-04	1.06E+05	6E-04
Organic	Benzoic Acid	0.483	NV	NA	NV	NA	NV	NA	2.50E+05	2E-06	3.30E+06	1E-07	3.30E+06	1E-07
	Benzyl Alcohol	1.65	NV	NA	NV	NA	NV	NA	6.30E+03	3E-04	8.20E+04	2E-05	8.20E+04	2E-05
	Butylbenzyl-phthalate	0.0635	2.90E+03	2E-10	1.20E+04	5E-11	1.2E+04	5E-11	1.30E+04	5E-06	1.60E+05	4E-07	1.60E+05	4E-07
	Di-n-butylphthalate	0.1	NV	NA	NV	NA	NV	NA	6.16E+03	2E-05	9.16E+04	1E-06	2.69E+04	4E-06
	Fluoranthene	0.0187	NV	NA	NV	NA	NV	NA	2.32E+03	8E-06	3.37E+04	6E-07	1.00E+04	2E-06
	HMX	6.66	NV	NA	NV	NA	NV	NA	3.85E+03	2E-03	6.33E+04	1E-04	1.74E+04	4E-04
	Pyrene	0.0161	NV	NA	NV	NA	NV	NA	1.74E+03	9E-06	2.53E+04	6E-07	7.53E+03	2E-06
	TATB	6.76	NV	NA	NV	NA	NV	NA	2.20E+03	3E-03	3.20E+04	2E-04	3.20E+04	2E-04
	2,3,6,8 TCDD TEQ	1.33E-06	4.90E-05	3E-07	2.38E-04	6E-08	1.72E-03	8E-09	5.06E-05	3E-02	8.08E-04	2E-03	2.26E-4	6E-03
Cumulative Cancer Risk or Hazard Index				3E-07		6E-08		8E-09		2E-01		1E-02		1E-01

Notes: All cancer risks and HQs were below the target levels of $1x10^{-5}$ and 1, respectively
CI – Commercial/industrial worker
Con – Construction worker
HQ – Hazard quotient
Max – Maximum
mg/kg – Milligram per kilogram
NC – Noncancer
NMSSL – New Mexico soil screening level (NMED 2021)
NA – Not applicable
NV – No value
Res - Resident

Table 2-5. Dioxin/Furan Data and Human Health TEFs

Parameter Name	TEFs	Point 1 WST39-18-162832		Point 1 Dup WST39-18-162973		Point 2 WST39-18-162974		Point 3 WST39-18-162975		Point 4 WST39-18-162976		Point 5 WST39-18-162977	
		Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	8.52E-06	1	9.83E-06	1	4.57E-06	1	3.49E-06	1	5.01E-07	0	8.28E-07	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	9.01E-07	1	1.00E-06	1	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	7.21E-05	1	8.89E-05	1	3.58E-05	1	2.99E-05	1	1.96E-06	1	5.50E-06	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	2.49E-06	1	2.73E-06	1	1.38E-06	1	9.97E-07	0	1.00E-06	0	1.00E-06	0
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	4.98E-07	0	5.02E-07	0	5.02E-07	0	4.98E-07	0	5.01E-07	0	5.01E-07	0
Tetrachlorodibenzodioxin[2,3,7,8-]	1	9.97E-08	0	1.00E-07	0	1.00E-07	0	9.97E-08	0	1.00E-07	0	1.00E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	3.65E-07	1	3.63E-07	1	2.01E-07	1	2.57E-07	1	1.05E-07	0	1.36E-07	1

Table 2-5., Dioxin/Furan Data and Human Health TEFs, cont.

Name	Point 6 WST39-18-162978		Point 7 WST39-18-162979		Point 8 WST39-18-162980		Point 9 WST39-18-162981		Point 10 WST39-18-162982	
	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	8.60E-06	1	5.86E-06	1	1.13E-06	1	6.07E-07	1	5.21E-06	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	7.97E-07	1	2.21E-06	1	4.98E-07	0	4.98E-07	0	6.88E-07	1
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5.49E-05	1	6.84E-05	1	9.66E-06	1	3.91E-06	1	4.10E-05	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.51E-06	1	1.92E-05	1	9.97E-07	0	9.96E-07	0	1.18E-06	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	0	4.98E-07	0	4.98E-07	0	4.98E-07	0	4.99E-07	0
Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	0	9.97E-08	0	9.97E-08	0	9.96E-08	0	9.97E-08	0
Tetrachlorodibenzofuran[2,3,7,8-]	1.87E-07	1	1.16E-07	0	1.44E-07	1	1.06E-07	1	5.50E-07	1

Table 2-5., Dioxin/Furan Data and Human Health TEFs, cont.

Parameter Name	CAS	Point 11 WST39-18-162983		Point 12 WST39-18-162984	
		Result (mg/kg)	DC	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	35822-46-9	1.17E-05	1	3.01E-06	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	67562-39-4	1.10E-06	1	4.96E-07	0
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	55673-89-7	4.98E-07	0	4.96E-07	0
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	39227-28-6	4.98E-07	0	4.96E-07	0
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	57653-85-7	4.98E-07	0	4.96E-07	0
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	19408-74-3	4.98E-07	0	4.96E-07	0
Hexachlorodibenzofuran[1,2,3,4,7,8-]	70648-26-9	4.98E-07	0	4.96E-07	0
Hexachlorodibenzofuran[1,2,3,6,7,8-]	57117-44-9	4.98E-07	0	4.96E-07	0
Hexachlorodibenzofuran[1,2,3,7,8,9-]	72918-21-9	4.98E-07	0	4.96E-07	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	60851-34-5	4.98E-07	0	4.96E-07	0
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3268-87-9	9.57E-05	1	2.49E-05	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	39001-02-0	3.40E-06	1	9.93E-07	0
Pentachlorodibenzodioxin[1,2,3,7,8-]	40321-76-4	4.98E-07	0	4.96E-07	0
Pentachlorodibenzofuran[1,2,3,7,8-]	57117-41-6	4.98E-07	0	4.96E-07	0
Pentachlorodibenzofuran[2,3,4,7,8-]	57117-31-4	4.98E-07	0	4.96E-07	0
Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	9.96E-08	0	9.93E-08	0
Tetrachlorodibenzofuran[2,3,7,8-]	51207-31-9	5.60E-07	1	3.75E-07	1

Notes:
DC- Detect code (1 = detected, 0 = not detected)
mg/kg – milligram per kilogram
TEF – toxicity equivalent factor

Table 2-6. Human Health TECs and TEQs for Dioxin Furan Samples

Congener Name	Point 1 WST39-18-162832	Point 1-Dup WST39-18-162973	Point 2 WST39-18-162974	Point 3 WST39-18-162975	Point 4 WST39-18-162976	Point 5 WST39-18-162977	Point 6 WST39-18-162978
	TECi	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	8.52E-08	9.83E-08	4.57E-08	3.49E-08	5.01E-09	8.28E-09	8.60E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	9.01E-09	1.00E-08	5.02E-09	4.98E-09	5.01E-09	5.01E-09	7.97E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	5.02E-09	5.02E-09	4.98E-09	5.01E-09	5.01E-09	5.02E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.16E-08	2.667E-08	1.074E-08	8.97E-09	5.88E-10	1.65E-09	1.65E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.47E-10	8.19E-10	4.14E-10	2.99E-10	3.00E-10	3.00E-10	7.53E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	5.02E-07	5.02E-07	4.98E-07	5.01E-07	5.01E-07	5.02E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.49E-08	1.506E-08	1.506E-08	1.49E-08	1.50E-08	1.50E-08	1.51E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.49E-07	1.506E-07	1.506E-07	1.49E-07	1.50E-07	1.50E-07	1.51E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	1.00E-07	1.00E-07	9.97E-08	1.00E-07	1.00E-07	1.00E-07
Tetrachlorodibenzofuran[2,3,7,8-]	3.65E-08	3.63E-08	2.01E-08	2.57E-08	1.05E-08	1.36E-08	1.87E-08
TEQ	1.27E-06	1.30 E-06	1.21E-06	1.19E-06	1.14E-06	1.15E-06	1.25E-06

Notes: The TECi are summed in each column to obtain the TEQ.

Table 2-6. Human Health TECs and TEQs for Dioxin Furan Samples, cont.

Congener Name	Point 7 WST39-18-162979	Point 8 WST39-18-162980	Point 9 WST39-18-162981	Point 10 WST39-18-162982	Point 11 WST39-18-162983	Point 12 WST39-18-162984
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.86E-08	1.13E-08	6.07E-09	5.21E-08	1.17E-07	3.01E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.21E-08	4.98E-09	4.98E-09	6.88E-09	1.10E-08	4.96E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	4.98E-09	4.98E-09	4.99E-09	4.98E-09	4.96E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.05E-08	2.90E-09	1.17E-09	1.23E-08	2.87E-08	7.47E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5.76E-09	2.99E-10	2.99E-10	3.54E-10	1.02E-09	2.98E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	4.98E-07	4.98E-07	4.99E-07	4.98E-07	4.96E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.49E-08	1.49E-08	1.49E-08	1.50E-08	1.49E-08	1.49E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.49E-07	1.49E-07	1.49E-07	1.50E-07	1.49E-07	1.49E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	9.97E-08	9.96E-08	9.97E-08	9.96E-08	9.93E-08
Tetrachlorodibenzofuran[2,3,7,8-]	1.16E-08	1.44E-08	1.06E-08	5.50E-08	5.60E-08	3.75E-08
TEQ	1.23E-06	1.15E-06	1.14E-06	1.24E-06	1.33E-06	1.19E-06

Notes: Shaded cell indicates the maximum TEQ
TECi – toxicity equivalent concentration for each congener (product of measured concentration or MDL for nondetects and the TEF)
TEF – toxicity equivalent factor
TEQ – toxicity equivalent quotient (sum of the TECi values)

Table 2-7. Maximum 2,3,7,8 TCDD TEQ Cancer Risk and Hazard by Receptor

Receptor	Maximum TCDD TEQ (mg/kg)	NMSSL TCDD-Cancer (mg/kg)	Cancer Risk	NMSSL – TCDD Noncancer (mg/kg)	HQ
Residential	1.33E-06	4.90E-05	3E-07	5.06E-05	3E-02
Commercial/Industrial	1.33E-06	2.38E-04	6E-08	8.08E-04	2E-03
Construction Worker	1.33E-06	1.72E-03	8E-09	2.26E-04	6E-03

Table 2-8. Comparison of Maximum EPCs to Groundwater Protection Screening Levels

Category	Name	Maximum Result (mg/kg)	MTGW SL (mg/kg)	Maximum/ MTGW Ratio
Inorganics	Calcium	7160.00	NV	NA
	Chromium	47.90	4.91E+08	1E-07
	Copper	174.00	9.15E+02	2E-01
	Mercury	0.13	5.13E+00	3E-02
	Vanadium	48.30	1.26E+03	4E-02
	Zinc	62.50	7.41E+03	8E-03
Organics	Benzoic Acid	0.483	3.00E+02	2E-03
	Benzyl Alcohol	1.65	9.60E+00	2E-01
	Butylbenzylphthalate	0.0635	4.80E+01	1E-03
	Di-n-butylphthalate	0.1	3.38E+01	3E-03
	Fluoranthene	0.0187	1.34E+03	1E-05
	HMX	6.66	1.94E+01	3E-01
	Pyrene	0.0161	1.92E+02	8E-05
	TATB	6.76	4.20E+01	2E-01
Dioxin/Furans	2,3,7,8 TCDD TEQ	1.33E-06	2.24E-04	6E-03

Notes: Ratios are less than 1 indicating maximum values are below MTGW SLs
mg/kg- milligram per kilogram
MTGW SL – NMED (2021) groundwater protection screening level

Table 3-1. Ecological Screening Levels

Group	Name	No Effect ESL									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics	Chromium (total)	8.60E+02	1.70E+02	5.10E+01	2.30E+01	3.20E+01	1.10E+02			1.80E+03	4.10E+02
	Copper	1.10E+03	8.00E+01	3.40E+01	1.40E+01	2.00E+01	6.30E+01	8.00E+01	7.00E+01	4.00E+03	2.60E+02
	Mercury (inorganic)	3.20E-01	5.80E-02	6.70E-02	1.30E-02	2.20E-02	3.00E+00	5.00E-02	3.40E+01	7.60E+01	2.30E+01
	Vanadium	1.10E+02	5.60E+01	6.80E+00	4.70E+00	5.50E+00	4.70E+02		6.00E+01	3.20E+03	7.40E+02
	Zinc	2.60E+03	2.20E+02	3.30E+02	4.70E+01	8.30E+01	1.70E+02	1.20E+02	1.60E+02	9.60E+03	1.80E+03
Dioxin/ Furan	Tetrachlorodibenzo dioxin[2,3,7,8-]	4.10E-06	4.10E-06	4.10E-06	4.10E-06	4.10E-06	5.80E-07	5.00E+00		1.00E-04	4.00E-05
Explosive	HMX						2.90E+02	1.60E+01	2.70E+03	5.90E+04	4.10E+02
	TATB						1.10E+02	1.00E+01		1.00E+04	1.50E+02
PA Hs	Fluoranthene						3.80E+01	1.00E+01		3.90E+03	2.70E+02
	Pyrene	3.00E+03	1.60E+02	6.80E+01	3.30E+01	4.40E+01	3.10E+01	1.00E+01		3.10E+03	1.10E+02
SVOCs	Benzoic Acid						1.30E+00			2.00E+03	4.60E+00
	Butyl Benzyl Phthalate						1.60E+02			2.30E+04	2.40E+03
	Di-n-Butyl Phthalate	2.00E+00	5.20E-02	3.80E-01	1.10E-02	2.10E-02	3.60E+02		1.60E+02	6.20E+04	1.70E+04
VOC	Benzyl Alcohol						1.20E+02			1.10E+05	1.90E+02

Group	Analyte Name	Low Effect ESL									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics	Chromium (total)	2.70E+03	5.60E+02	1.60E+02	7.30E+01	1.00E+02	1.10E+04			1.80E+05	4.10E+04
	Copper	3.50E+03	2.40E+02	1.00E+02	4.30E+01	6.00E+01	1.00E+02	5.30E+02	4.90E+02	6.70E+03	4.30E+02
	Mercury (inorganic)	3.20E+00	5.80E-01	6.70E-01	1.30E-01	2.20E-01	3.00E+01	5.00E-01	6.40E+01	7.60E+02	2.30E+02
	Vanadium	2.30E+02	1.10E+02	1.30E+01	9.50E+00	1.10E+01	1.00E+03		8.00E+01	6.90E+03	1.50E+03
	Zinc	7.00E+03	5.90E+02	1.20E+02	1.20E+02	2.20E+02	1.70E+03	9.30E+02	8.10E+02	9.40E+04	1.80E+04
Dioxin/ Furan	2,3,7,8 TCDD						3.80E-06	1.00E+01		6.80E-04	2.70E-04
Explosive	HMX						7.90E+02	1.60E+02	3.50E+03	1.50E+05	1.10E+03
	TATB						1.10E+03	2.80E+01		1.00E+05	1.50E+03
PAH	Fluoranthene						3.80E+02	2.30E+01		3.90E+04	2.70E+03
	Pyrene	3.00E+04	1.60E+03	6.80E+02	3.30E+02	4.40E+02	3.10E+02	2.00E+01		3.10E+04	1.10E+03
SVOC	Benzoic Acid						1.30E+01			2.00E+04	4.60E+01
	Butyl Benzyl Phthalate						1.60E+03			2.30E+05	2.40E+04
	Di-n-Butyl Phthalate	2.00E+01	5.20E-01	3.80E+00	1.10E-01	2.10E-01	8.60E+02		6.00E+02	1.40E+05	4.00E+04
VOC	Benzyl Alcohol						1.20E+03			1.10E+06	1.90E+03

Notes: ESL source LANL (2020)
Only detected analytes and inorganics above background are reported.

Abbreviations:
BV – Background Value
ESL – Ecological Screening Value
Max– Maximum Exposure Point Concentration
mg/kg – Milligram per Kilogram
LE – Low Effect
NE – No Effect

Table 3-2. Ecological Risk Evaluation For Maximum EPCs and NE ESLs

Category	Parameter Name	Maximum EPC (mg/kg)	Number of Detects	American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganic	Calcium	7160	13	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
	Chromium	47.9	13	6E-02	3E-01	9E-01	2E+00	1E+00	4E-01	NV	NV	3E-02	1E-01
	Copper	174	13	2E-01	2E+00	5E+00	1E+01	9E+00	3E+00	2E+00	2E+00	4E-02	7E-01
	Mercury	0.131	7	4E-01	2E+00	2E+00	1E+01	6E+00	4E-02	3E+00	4E-03	2E-03	6E-03
	Vanadium	48.3	13	4E-01	9E-01	7E+00	1E+01	9E+00	1E-01	NV	8E-01	2E-02	7E-02
	Zinc	62.5	13	2E-02	3E-01	2E-01	1E+00	8E-01	4E-01	5E-01	4E-01	7E-03	3E-02
Organic	Benzoic Acid	0.483	1	NV	NV	NV	NV	NV	4E-01	NV	NV	2E-04	1E-01
	Benzyl Alcohol	1.65	7	NV	NV	NV	NV	NV	1E-02	NV	NV	2E-05	9E-03
	Butylbenzylphthalate	0.0635	2	NV	NV	NV	NV	NV	4E-04	NV	NV	3E-06	3E-05
	Di-n-butylphthalate	0.1	5	5E-02	2E+00	3E-01	9E+00	5E+00	3E-04	NV	6E-04	2E-06	6E-06
	Fluoranthene	0.0187	1	NV	NV	NV	NV	NV	5E-04	2E-03	NV	5E-06	7E-05
	HMX	6.66	7	NV	NV	NV	NV	NV	2E-02	4E-01	2E-03	1E-04	2E-02
	Pyrene	0.0161	1	5E-06	1E-04	2E-04	5E-04	4E-04	5E-04	2E-03	NV	5E-06	1E-04
	TATB	6.76	6	NV	NV	NV	NV	NV	6E-02	7E-01	NV	7E-04	5E-02
	2,3,7,8 TCDD TEQ [Bird]	2.02E-06	NA	5E-01	5E-01	5E-01	5E-01	5E-01	NV	NV	NV	NV	NV
	2,3,7,8 TCDD TEQ [Mammal]	1.33E-06	NA	NV	NV	NV	NV	NV	2E+00	3E-07	NV	1E-02	5E+00
	Hazard Index (HI)			2E+00	8E+00	2E+01	5E+01	3E+01	6E+00	6E+00	4E+00	1E-01	6E+00

Notes:
Shaded cells indicate the ratio > 0.1 for initial screening evaluation
HI is the sum of all HQs

Abbreviations:
EPC – exposure point concentration
ESL – ecological screening level
HI – hazard Index
mg/kg – milligram per kilogram
NE – no effect
NV – No value

Table 3-3. Ecological Risk Evaluation For Refined EPCs and LE ESLs

Analyte Name	Refined EPC (mg/kg)	Hazard Quotients (HQs) for Refined EPCs and LE ESLs									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Calcium	5624	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV
Chromium (total)	23.27	9E-03	4E-02	1E-01	3E-01	2E-01	2E-03	NV	NV	1E-04	6E-04
Copper	109.4	3E-02	5E-01	1E+00	3E+00	2E+00	1E+00	2E-01	2E-01	2E-02	3E-01
Mercury (inorganic)	0.054	2E-02	9E-02	8E-02	4E-01	2E-01	2E-03	1E-01	8E-04	7E-05	2E-04
Vanadium	38.2	2E-01	3E-01	3E+00	4E+00	3E+00	4E-02	NV	5E-01	6E-03	3E-02
Zinc	45.51	7E-03	8E-02	4E-01	4E-01	2E-01	3E-02	5E-02	6E-02	5E-04	3E-03
Benzoic Acid	0.168	NV	NV	NV	NV	NV	1E-02	NV	NV	8E-06	4E-03
Benzyl Alcohol	0.683	NV	NV	NV	NV	NV	6E-04	NV	NV	6E-07	4E-04
Butyl Benzyl Phthalate	0.010	NV	NV	NV	NV	NV	6E-06	NV	NV	4E-08	4E-07
Di-n-Butyl Phthalate	0.010	5E-04	2E-02	3E-03	9E-02	5E-02	1E-05	NV	2E-05	7E-08	3E-07
Fluoranthene	0.010	NV	NV	NV	NV	NV	3E-05	4E-04	NV	3E-07	4E-06
HMX	3.874	NV	NV	NV	NV	NV	5E-03	2E-02	1E-03	3E-05	4E-03
Pyrene	0.010	3E-07	6E-06	1E-05	3E-05	2E-05	3E-05	5E-04	NV	3E-07	9E-06
TATB	2.938	NV	NV	NV	NV	NV	3E-03	1E-01	NV	3E-05	2E-03
2,3,7,8 TCDD TEQ	1.8E-06 (bird) 1.24-06 (mammal)	NV	NV	NV	NV	NV	3E-01	1E-07	NV	2E-03	5E-03
Hazard Index		2E-01	1E+00	5E+00	8E+00	6E+00	1E+00	5E-01	8E-01	2E-02	3E-01

Notes:Shaded cells indicate the ratio > 0.1
Hazard Index is the sum of all HQs

Abbreviations:
EPC – Exposure point concentration
ESL – Ecological Screening Level
HQ – Hazard quotient
LE – Low Effect
mg/kg – milligram per kilogram
NV – No value

Table 3-4. Toxic Equivalency Factors (TEFs) Used for Calculating Ecological TCDD Equivalent Concentrations

Name	CAS	Mammalian TEF[a]	Avian TEF[b]
Chlorinated dibenzo-p-dioxins			
2,3,7,8-TCDD	1746-01-6	1	1
1,2,3,7,8-PeCDD	40321-76-4	1	1
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01	0.001
OCDD	3268-87-9	0.0003	0.0001
Chlorinated dibenzofurans			
2,3,7,8-TCDF	51207-31-9	0.1	1
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1
2,3,4,7,8-PeCDF	57117-31-4	0.3	0.1
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	1
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01
OCDF	39001-02-0	0.0003	0.0001

[a] EPA (2010a,b); WHO (2009)
[b] Van den Berg et al. (1998)

Table 3-5. Dioxin-Furan Mammal TECi, and TEQs by Sample

	Point 1 WST39-18-162832	Point 1-Dup WST39-18-162973	Point 2 WST39-18-162974	Point 3 WST39-18-162975	Point 4 WST39-18-162976	Point 5 WST39-18-162977	Point 6 WST39-18-162978
Congener Name	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	8.52E-08	9.83E-08	4.57E-08	3.49E-08	5.01E-09	8.28E-09	8.60E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	9.01E-09	1.00E-08	5.02E-09	4.98E-09	5.01E-09	5.01E-09	7.97E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	5.02E-09	5.02E-09	4.98E-09	5.01E-09	5.01E-09	5.02E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.16E-08	2.67E-08	1.07E-08	8.97E-09	5.88E-10	1.65E-09	1.65E-08
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.47E-10	8.19E-10	4.14E-10	2.99E-10	3.00E-10	3.00E-10	7.53E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	5.02E-07	5.02E-07	4.98E-07	5.01E-07	5.01E-07	5.02E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.49E-08	1.51E-08	1.51E-08	1.49E-08	1.50E-08	1.50E-08	1.51E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.49E-07	1.51E-07	1.51E-07	1.49E-07	1.50E-07	1.50E-07	1.51E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	1.00E-07	1.00E-07	9.97E-08	1.00E-07	1.00E-07	1.00E-07
Tetrachlorodibenzofuran[2,3,7,8-]	3.65E-08	3.63E-08	2.01E-08	2.57E-08	1.05E-08	1.36E-08	1.87E-08
TEQ	**1.27E-06**	**1.30E-06**	**1.21E-06**	**1.19E-06**	**1.14E-06**	**1.15E-06**	**1.25E-06**

Table 3-5. Dioxin-Furan Mammal TECi, and TEQs by Sample, cont.

	Point 7 WST39-18-162979	Point 8 WST39-18-162980	Point 9 WST39-18-162981	Point 10 WST39-18-162982	Point 11 WST39-18-162983	Point 12 WST39-18-162984
Congener Name	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.86E-08	1.13E-08	6.07E-09	5.21E-08	1.17E-07	3.01E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.21E-08	4.98E-09	4.98E-09	6.88E-09	1.10E-08	4.96E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	4.98E-09	4.98E-09	4.99E-09	4.98E-09	4.96E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.05E-08	2.90E-09	1.17E-09	1.23E-08	2.87E-08	7.47E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5.76E-09	2.99E-10	2.99E-10	3.54E-10	1.02E-09	2.98E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	4.98E-07	4.98E-07	4.99E-07	4.98E-07	4.96E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.49E-08	1.49E-08	1.49E-08	1.50E-08	1.49E-08	1.49E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.49E-07	1.49E-07	1.49E-07	1.50E-07	1.49E-07	1.49E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	9.97E-08	9.96E-08	9.97E-08	9.96E-08	9.93E-08
Tetrachlorodibenzofuran[2,3,7,8-]	1.16E-08	1.44E-08	1.06E-08	5.50E-08	5.60E-08	3.75E-08
TEQ	**1.23E-06**	**1.15E-06**	**1.14E-06**	**1.24E-06**	**1.33E-06**	**1.19E-06**

Notes: The data and detection status were reported in Table 2-5. The TEFs for mammals are reported in Table 3-4.
All data in mg/kg.

Abbreviations:
TECi – Toxicity Equivalent Concentration for Congener i;
TEF – Toxicity Equivalency Factor;
TEQ – Toxicity Equivalent Quotient

Table 3-6. Dioxin-Furan Avian TECs and TEQs by Sample	Point 1 WST39-18-162832	Point 1-Dup WST39-18-162973	Point 2 WST39-18-162974	Point 3 WST39-18-162975	Point 4 WST39-18-162976	Point 5 WST39-18-162977	Point 6 WST39-18-162978
Congener Name	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**	**TECi**
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	8.52E-09	9.83E-09	4.57E-09	3.49E-09	5.01E-10	8.28E-10	8.60E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	9.01E-09	1.00E-08	5.02E-09	4.98E-09	5.01E-09	5.01E-09	7.97E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	5.02E-09	5.02E-09	4.98E-09	5.01E-09	5.01E-09	5.02E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	2.49E-08	2.51E-08	2.51E-08	2.49E-08	2.51E-08	2.51E-08	2.51E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-09	5.02E-09	5.02E-09	4.98E-09	5.01E-09	5.01E-09	5.02E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	5.02E-07	5.02E-07	4.98E-07	5.01E-07	5.01E-07	5.02E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7.21E-09	8.89E-09	3.58E-09	2.99E-09	1.96E-10	5.50E-10	5.49E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.49E-10	2.73E-10	1.38E-10	9.97E-11	1.00E-10	1.00E-10	2.51E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	5.02E-07	5.02E-07	4.98E-07	5.01E-07	5.01E-07	5.02E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-08	5.02E-08	5.02E-08	4.98E-08	5.01E-08	5.01E-08	5.02E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	1.00E-07	1.00E-07	9.97E-08	1.00E-07	1.00E-07	1.00E-07
Tetrachlorodibenzofuran[2,3,7,8-]	3.65E-07	3.63E-07	2.01E-07	2.57E-07	1.05E-07	1.36E-07	1.87E-07
TEQ	**1.82E-06**	**1.83E-06**	**1.65E-06**	**1.70E-06**	**1.55E-06**	**1.58E-06**	**1.65E-06**

Table 3-6. Dioxin-Furan Avian TECs and TEQs by Sample, cont.

Congener Name	Point 7 WST39-18-162979	Point 8 WST39-18-162980	Point 9 WST39-18-162981	Point 10 WST39-18-162982	Point 11 WST39-18-162983	Point 12 WST39-18-162984
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.86E-09	1.13E-09	6.07E-10	5.21E-09	1.17E-08	3.01E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.21E-08	4.98E-09	4.98E-09	6.88E-09	1.10E-08	4.96E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.98E-09	4.98E-09	4.98E-09	4.99E-09	4.98E-09	4.96E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	2.49E-08	2.49E-08	2.49E-08	2.50E-08	2.49E-08	2.48E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-09	4.98E-09	4.98E-09	4.99E-09	4.98E-09	4.96E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	4.98E-07	4.98E-07	4.99E-07	4.98E-07	4.96E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	6.84E-09	9.66E-10	3.91E-10	4.10E-09	9.57E-09	2.49E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.92E-09	9.97E-11	9.96E-11	1.18E-10	3.40E-10	9.93E-11
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	4.98E-07	4.98E-07	4.99E-07	4.98E-07	4.96E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-08	4.98E-08	4.98E-08	4.99E-08	4.98E-08	4.96E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	9.97E-08	9.96E-08	9.97E-08	9.96E-08	9.93E-08
Tetrachlorodibenzofuran[2,3,7,8-]	1.16E-07	1.44E-07	1.06E-07	5.50E-07	5.60E-07	3.75E-07
TEQ	**1.58E-06**	**1.58E-06**	**1.54E-06**	**2.00E-06**	**2.02E-06**	**1.81E-06**

Notes: The data and detection status were reported in Table 2-5. The TEFs for birds are reported in Table 3-4.
All data in mg/kg.

Abbreviations:
TECi – Toxicity Equivalent Concentration for Congener i;
TEF – Toxicity Equivalency Factor;
TEQ – Toxicity Equivalent Quotient

Table 3-7. Area Use Factors for TA 39-6 and Risks based on the NE ESL

COPC Name	CAS	No Effect Ecological Screening Levels (ESLs) for Terrestrial Receptors (mg/kg)									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Calcium	Ca	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL
Chromium (total)	16065-83-1	860	170	51	23	32	110	No ESL	No ESL	1800	410
Copper	7440-50-8	1100	80	34	14	20	63	80	70	4000	260
Mercury (inorganic)	7487-94-7	0.32	0.058	0.067	0.013	0.022	3	0.05	34	76	23
Vanadium	7440-62-2	110	56	6.8	4.7	5.5	470	No ESL	60	3200	740
Zinc	7440-66-6	2600	220	330	47	83	170	120	160	9600	1800
Benzoic Acid	65-85-0	No ESL	No ESL	No ESL	No ESL	No ESL	1.3	No ESL	No ESL	2000	4.6
Benzyl Alcohol	100-51-6	No ESL	No ESL	No ESL	No ESL	No ESL	120	No ESL	No ESL	110000	190
Butylbenzylphthalate	85-68-7	No ESL	No ESL	No ESL	No ESL	No ESL	160	No ESL	No ESL	23000	2400
Di-n-butylphthalate	84-74-2	2	0.052	0.38	0.011	0.021	360	No ESL	160	62000	17000
Fluoranthene	206-44-0	No ESL	No ESL	No ESL	No ESL	No ESL	38	10	No ESL	3900	270
HMX	2691-41-0	No ESL	No ESL	No ESL	No ESL	No ESL	290	16	2700	59000	410
Pyrene	129-00-0	3000	160	68	33	44	31	10	No ESL	3100	110
TATB	3058-38-6	No ESL	No ESL	No ESL	No ESL	No ESL	110	10	No ESL	10000	150
2,3,7,8 TCDD	1746-01-6	4.10E-06	4.10E-06	4.10E-06	4.10E-06	4.10E-06	5.80E-07	5.00E+00	No ESL	1.00E-04	4.00E-05

HR (ha)[a]	106	106	0.42	0.42	0.42	0.077	NA	NA	1038	3.1
Population Area[b]	4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	124
PAUF[c]	0.000004	0.000004	0.001	0.001	0.001	0.005	NA	NA	2.41E-07	0.0001
AUF[d]	0.0001	0.0001	0.04	0.04	0.04	0.19	NA	NA	9.63E-06	0.005

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted NE ESL Hazard Quotients									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics											
Calcium	5624.00	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL
Chromium	23.27	1E-07	5E-07	4E-04	9E-04	6E-04	1E-03	No ESL	No ESL	3E-09	7E-06
Copper	109.40	4E-07	5E-06	3E-03	7E-03	5E-03	8E-03	1E+00	2E+00	7E-09	5E-05
Mercury	0.0536	6E-07	3E-06	7E-04	4E-03	2E-03	9E-05	1E+00	2E-03	2E-10	3E-07
Vanadium	38.20	1E-06	2E-06	5E-03	7E-03	6E-03	4E-04	No ESL	6E-01	3E-09	6E-06
Zinc	45.51	6E-08	7E-07	1E-04	9E-04	5E-04	1E-03	4E-01	3E-01	1E-09	3E-06
Organics											
Benzoic Acid	0.168	No ESL	No ESL	No ESL	No ESL	No ESL	6E-04	No ESL	No ESL	2E-11	4E-06
Benzyl Alcohol	0.683	No ESL	No ESL	No ESL	No ESL	No ESL	3E-05	No ESL	No ESL	1E-12	4E-07
Butylbenzylphthalate	0.01	No ESL	No ESL	No ESL	No ESL	No ESL	3E-07	No ESL	No ESL	1E-13	5E-10
Di-n-butylphthalate	0.01	2E-08	7E-07	2E-05	8E-04	4E-04	1E-07	No ESL	6E-05	4E-14	7E-11
Fluoranthene	0.01	No ESL	No ESL	No ESL	No ESL	No ESL	1E-06	1E-03	No ESL	6E-13	4E-09
HMX	3.874	No ESL	No ESL	No ESL	No ESL	No ESL	7E-05	2E-01	1E-03	2E-11	1E-06
Pyrene	0.01	1E-11	2E-10	1E-07	3E-07	2E-07	2E-06	1E-03	No ESL	8E-13	1E-08
TATB	2.938	No ESL	No ESL	No ESL	No ESL	No ESL	1E-04	3E-01	No ESL	7E-11	2E-06
2,3,7,8 TCDD (bird)	1.80E-06	2E-06	2E-06	4E-04	4E-04	4E-04	NA	NA	NA	NA	NA
2,3,7,8 TCDD (mammal)	1.24E-06	NA	NA	NA	NA	NA	1E-02	2E-07	No ESL	3E-09	4E-06
Hazard Index		4E-06	1E-05	1E-02	2E-02	2E-02	2E-02	3E+00	2E+00	2E-08	8E-05

Notes: the mammal TCDD TEQ is used for earthworms
Area of Site (ha): 0.015

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

Table 3-8. Area Use Factors for TA 39-6 and Risks based on the LE ESL.

COPC Name	CAS	Low Effect Ecological Screening Levels (LE ESLs) for Terrestrial Receptors (mg/kg)									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Calcium	Ca	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL
Chromium (total)	16065-83-1	2700	560	160	73	100	11000	No ESL	No ESL	180000	41000
Copper	7440-50-8	3500	240	100	43	60	100	530	490	6700	430
Mercury (inorganic)	7487-94-7	3.2	0.58	0.67	0.13	0.22	30	0.5	64	760	230
Vanadium	7440-62-2	230	110	13	9.5	11	1000	No ESL	80	6900	1500
Zinc	7440-66-6	7000	590	120	120	220	1700	930	810	94000	18000
Benzoic Acid	65-85-0	No ESL	No ESL	No ESL	No ESL	No ESL	13	No ESL	No ESL	20000	46
Benzyl Alcohol	100-51-6	No ESL	No ESL	No ESL	No ESL	No ESL	1200	No ESL	No ESL	1100000	1900
Butylbenzylphthalate	85-68-7	No ESL	No ESL	No ESL	No ESL	No ESL	1600	No ESL	No ESL	230000	24000
Di-n-butylphthalate	84-74-2	20	0.52	3.8	0.11	0.21	860	No ESL	600	140000	40000
Fluoranthene	206-44-0	No ESL	No ESL	No ESL	No ESL	No ESL	380	23	No ESL	39000	2700
HMX	2691-41-0	No ESL	No ESL	No ESL	No ESL	No ESL	790	160	3500	150000	1100
Pyrene	129-00-0	30000	1600	680	330	440	310	20	No ESL	31000	1100
TATB	3058-38-6	No ESL	No ESL	No ESL	No ESL	No ESL	1100	28	No ESL	100000	1500
2,3,7,8 TCDD	1746-01-6	No ESL	No ESL	No ESL	No ESL	No ESL	0.0000038	10	No ESL	0.00068	0.00027

HR (ha)[a]	106	106	0.42	0.42	0.42	0.077	NA	NA	1038	3.1
Population Area[b]	4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	124
PAUF[c]	0.000004	0.000004	0.001	0.001	0.001	0.005	NA	NA	2.41E-07	0.0001
AUF[d]	0.0001	0.0001	0.04	0.04	0.04	0.19	NA	NA	9.63E-06	0.005

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted LE ESL Hazard Quotients									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics											
Calcium	5624.00	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL	No ESL
Chromium	23.27	3E-08	1E-07	1E-04	3E-04	2E-04	1E-05	No ESL	No ESL	3E-11	7E-08
Copper	109.40	1E-07	2E-06	1E-03	2E-03	2E-03	5E-03	2E-01	2E-01	4E-09	3E-05
Mercury	0.0536	6E-08	3E-07	7E-05	4E-04	2E-04	9E-06	1E-01	8E-04	2E-11	3E-08
Vanadium	38.20	6E-07	1E-06	3E-03	4E-03	3E-03	2E-04	No ESL	5E-01	1E-09	3E-06
Zinc	45.51	2E-08	3E-07	3E-04	3E-04	2E-04	1E-04	5E-02	6E-02	1E-10	3E-07
Organics											
Benzoic Acid	0.168	No ESL	No ESL	No ESL	No ESL	No ESL	6E-05	No ESL	No ESL	2E-12	4E-07
Benzyl Alcohol	0.683	No ESL	No ESL	No ESL	No ESL	No ESL	3E-06	No ESL	No ESL	1E-13	4E-08
Butylbenzylphthalate	0.01	No ESL	No ESL	No ESL	No ESL	No ESL	3E-08	No ESL	No ESL	1E-14	5E-11
Di-n-butylphthalate	0.01	2E-09	7E-08	2E-06	8E-05	4E-05	6E-08	No ESL	2E-05	2E-14	3E-11
Fluoranthene	0.01	No ESL	No ESL	No ESL	No ESL	No ESL	1E-07	4E-04	No ESL	6E-14	4E-10
HMX	3.874	No ESL	No ESL	No ESL	No ESL	No ESL	2E-05	2E-02	1E-03	6E-12	4E-07
Pyrene	0.01	1E-12	2E-11	1E-08	3E-08	2E-08	2E-07	5E-04	No ESL	8E-14	1E-09
TATB	2.938	No ESL	No ESL	No ESL	No ESL	No ESL	1E-05	1E-01	No ESL	7E-12	2E-07
2,3,7,8 TCDD TEQ (mammal)	1.24E-06	No ESL	No ESL	No ESL	No ESL	No ESL	2E-03	1E-07	No ESL	4E-10	6E-07
Hazard Index		8E-07	4E-06	4E-03	7E-03	5E-03	7E-03	5E-01	8E-01	6E-09	4E-05

Notes: the mammal TCDD TEQ is used for earthworms
Area of Site (ha): 0.015

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

FIGURES

Figure 1-1. Location of TA-39 at the Los Alamos National Laboratory

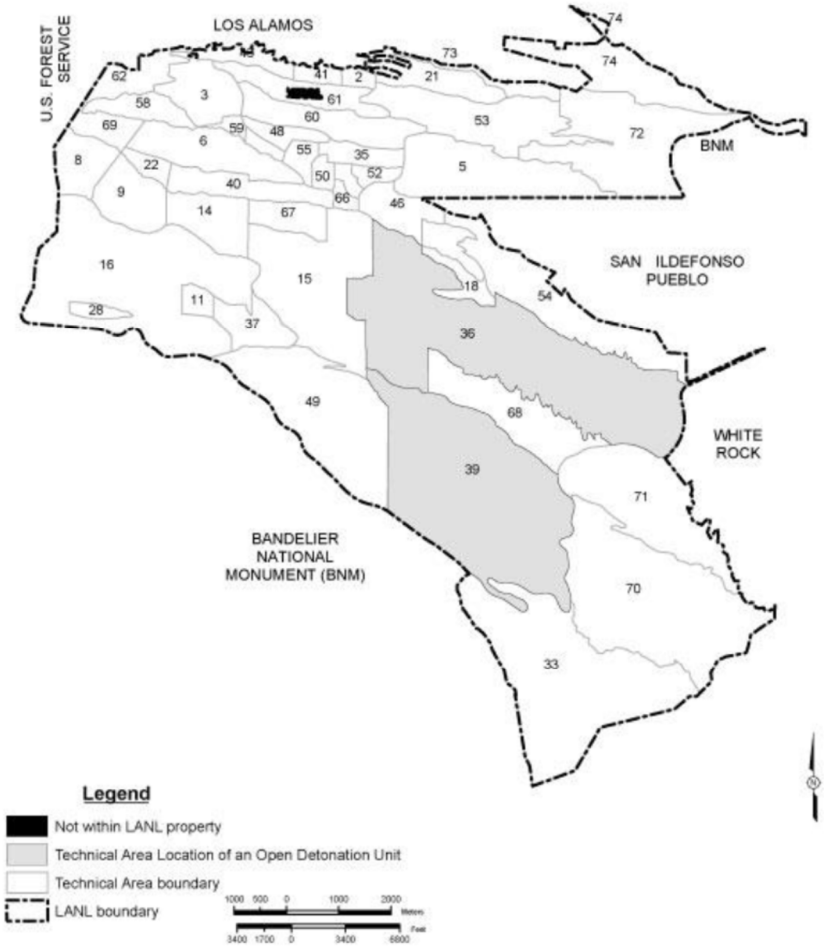


Figure 1-2. Sample Location Map for TA-39-6 OD Area

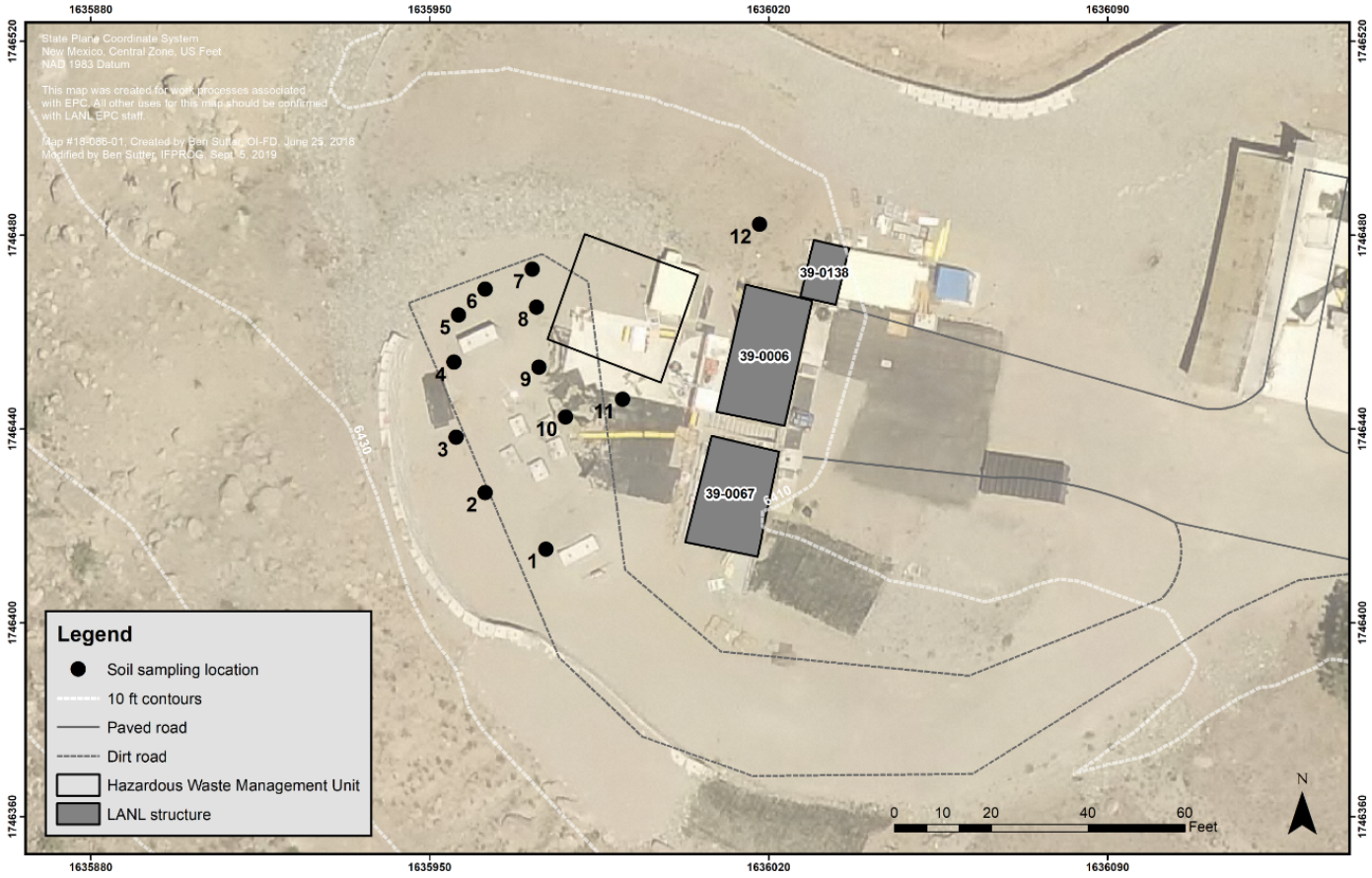
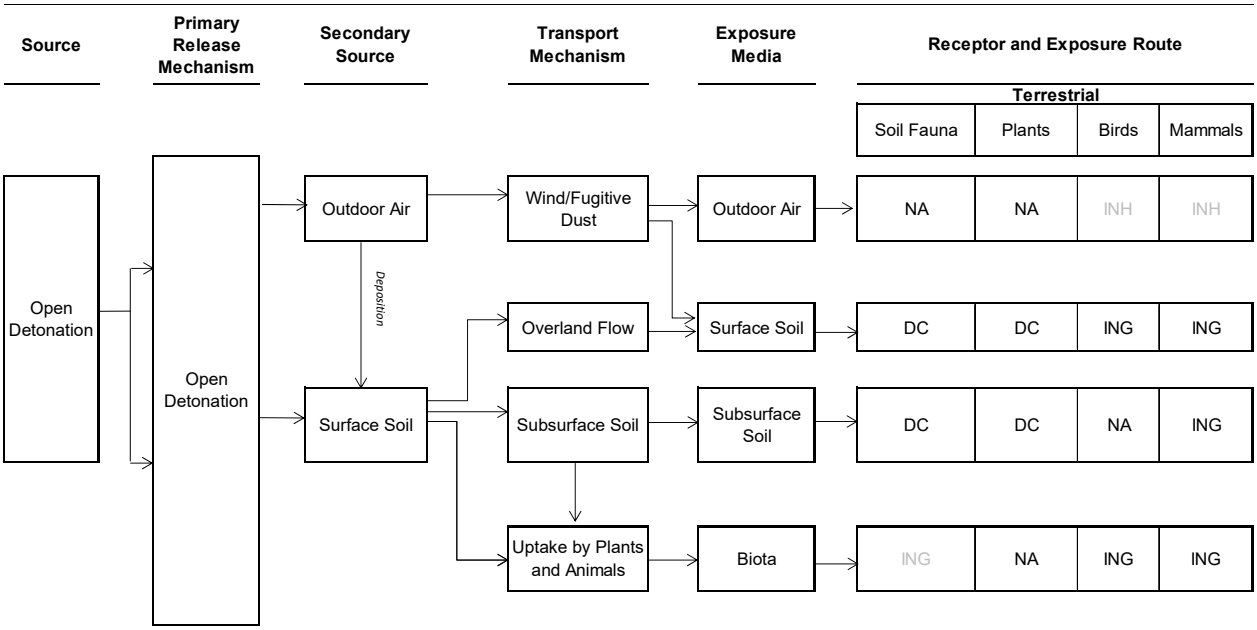


Figure 3-1. Conceptual Site Exposure Model for the ERA



Abbreviations

DC	Direct contact; applies to receptors for which toxic effects are addressed by exposure concentration and not dose
ING	Ingestion; typically quantified as dose for birds and mammals only
INH	Inhalation; recognized to occur, but not typically quantified as standard practice with the exception of evaluating burrow air exposure by burrowing mammals
NA	Pathway considered incomplete; not applicable

Notes:

Grayed text indicates pathways are recognized to potentially exist but are not quantified. Inhalation is considered minimal relative to dietary exposure. Ingestion by invertebrates is not typically quantified due to absence of accurate exposure parameters.

ATTACHMENT A. PROUCL OUTPUT FOR UPPER CONFIDENCE LIMIT CALCULATIONS

Summary of UCL95s Used in ERA. ProUCL output is reported below.

ERA	UCL95 (mg/kg)	UCL Type	Distribution
Calcium	5624.00	95% Student's-t UCL	Normal
Chromium	23.27	95% Student's-t UCL	Normal
Copper	109.40	95% Adjusted Gamma UCL (use when n<50)	Gamma
Mercury	0.0536	95% KM (t) UCL	Normal
Vanadium	38.20	95% Student's-t UCL	Normal
Zinc	45.51	95% Student's-t UCL	Normal
Benzoic Acid	0.168	Median all	1 detect
Benzyl Alcohol	0.683	95% KM (t) UCL	Normal
Butyl Benzyl Phthalate	0.01	Median all	2 detects
Di-n-Butyl Phthalate	0.01	Median all	4 detects
Fluoranthene	0.01	Median all	1 detect
HMX	3.874	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	Gamma
Pyrene	0.01	Median all	1 detect
TATB	2.938	95% Gamma Adjusted KM-UCL (use when n<50)	Gamma
Tetrachlorodibenzofuran[2,3,7,8-] (mammal)	1.24E-06	95% Student's-t UCL	Normal

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects - Max of Duplicate pair

User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 12:50:06 PM
From File	BKG data for ProUCL tests.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Ca(ta39 6)
Sample 2 Data: Ca(bkg)

Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	173
Number of Non-Detects	0	0
Number of Detect Data	12	173
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	588	500
Maximum Detect	7160	14000
Mean of Detects	4669	2644
Median of Detects	4925	2100
SD of Detects	1841	1771

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1782
Standardized WMW U-Stat	3.712
Mean (U)	1038
SD(U) - Adj ties	179.3
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1.03E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 12:53:54 PM
From File	BKG data for ProUCL tests.xls
Full Precision	OFF
Confidence Coefficient	95%

Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Cr(ta39 6)
Sample 2 Data: Cr(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	173
Number of Non-Detects	0	0
Number of Detect Data	12	173
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	3.22	1.9
Maximum Detect	47.9	36.5
Mean of Detects	16.95	9.04
Median of Detects	12.25	8.6
SD of Detects	12.19	4.363

Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1687
Standardized WMW U-Stat	3.182
Mean (U)	1038
SD(U) - Adj ties	179.3
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	7.31E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 12:55:29 PM
From File	BKG data for ProUCL tests.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Cu(ta39 6)
Sample 2 Data: Cu(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	174
Number of Non-Detects	0	2
Number of Detect Data	12	172
Minimum Non-Detect	N/A	0.5
Maximum Non-Detect	N/A	0.5
Percent Non-detects	0.00%	1.15%
Minimum Detect	4.92	0.6
Maximum Detect	174	16
Mean of Detects	60.27	6.125
Median of Detects	52.1	5.8
SD of Detects	53.77	2.523

Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	2046
Standardized WMW U-Stat	5.12
Mean (U)	1044
SD(U) - Adj ties	180.4
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	1.52E-07

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 12:57:44 PM
From File	BKG data for ProUCL tests.xls

Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: V(ta39 6)
Sample 2 Data: V(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	174
Number of Non-Detects	0	0
Number of Detect Data	12	174
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	11.4	4
Maximum Detect	48.3	56.5
Mean of Detects	32.33	21.26
Median of Detects	30.05	21
SD of Detects	11.21	8.925

Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1740
Standardized WMW U-Stat	3.423
Mean (U)	1044
SD(U) - Adj ties	180.3
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	3.10E-04

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects
User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 1:01:09 PM
From File	BKG data for ProUCL tests.xls
Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Hg(ta39 6)
Sample 2 Data: Hg(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	39
Number of Non-Detects	6	37
Number of Detect Data	6	2
Minimum Non-Detect	0.00355	0.1
Maximum Non-Detect	0.0039	0.1
Percent Non-detects	50.00%	94.87%
Minimum Detect	0.00507	0.1
Maximum Detect	0.131	0.1
Mean of Detects	0.0554	0.1
Median of Detects	0.038	0.1
SD of Detects	0.0522	0
KM Mean	0.0295	0.1
KM SD	0.0425	0

Sample 1 vs Sample 2 Gehan Test
H0: Mean/Median of Sample 1 <= Mean/Median of background

Gehan z Test Value	1.363
Critical z (0.05)	1.645
P-Value	0.0865

Conclusion with Alpha = 0.05
Do Not Reject H0, Conclude Sample 1 <= Sample 2
P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.14/27/2022 1:02:44 PM
From File	BKG data for ProUCL tests.xls

Full Precision	OFF
Confidence Coefficient	95%
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median

Sample 1 Data: Zn(ta39 6)
Sample 2 Data: Zn(bkg)
Raw Statistics

	Sample 1	Sample 2
Number of Valid Data	12	172
Number of Non-Detects	0	0
Number of Detect Data	12	172
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non-detects	0.00%	0.00%
Minimum Detect	24.4	14
Maximum Detect	62.5	75.5
Mean of Detects	39.34	31.52
Median of Detects	37.95	30.75
SD of Detects	11.9	9.002

Wilcoxon-Mann-Whitney (WMW) Test
H0: Mean/Median of Sample 1 <= Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1540
Standardized WMW U-Stat	2.41
Mean (U)	1032
SD(U) - Adj ties	178.2
Approximate U-Stat Critical Value (0.05)	1.645
P-Value (Adjusted for Ties)	0.00798

Conclusion with Alpha = 0.05
Reject H0, Conclude Sample 1 > Sample 2
P-Value < alpha (0.05)

UCL Statistics for Data Sets with Non-Detects — Maximum of duplicate pair used in analysis

User Selected Options

Date/Time of Computation	ProUCL 5.1 5/11/2022 9:03:53 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Ca
General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	1
Minimum	588	Mean	4669
Maximum	7160	Median	4925
SD	1841	Std. Error of Mean	531.6
Coefficient of Variation	0.394	Skewness	-0.813

Normal GOF Test

Shapiro Wilk Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.118	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level
Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5624	95% Adjusted-CLT UCL (Chen-1995)	5410
		95% Modified-t UCL (Johnson-1978)	5603

Gamma GOF Test

A-D Test Statistic	0.79	Anderson-Darling Gamma GOF Test	
		Data Not Gamma Distributed at 5%	
5% A-D Critical Value	0.736	Significance Level	
K-S Test Statistic	0.19	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.247	5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level
Gamma Statistics

k hat (MLE)	3.829	k star (bias corrected MLE)	2.927
Theta hat (MLE)	1219	Theta star (bias corrected MLE)	1595
nu hat (MLE)	91.89	nu star (bias corrected)	70.25
MLE Mean (bias corrected)	4669	MLE Sd (bias corrected)	2729
		Approximate Chi Square Value (0.05)	51.96
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	49.56

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	6313	95% Adjusted Gamma UCL (use when n<50)	6618
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.717	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.242	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.377	Mean of logged Data	8.312
Maximum of Logged Data	8.876	SD of logged Data	0.669
Assuming Lognormal Distribution			
95% H-UCL	8222	90% Chebyshev (MVUE) UCL	7991
95% Chebyshev (MVUE) UCL	9352	97.5% Chebyshev (MVUE) UCL	11240
99% Chebyshev (MVUE) UCL	14950		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	5543	95% Jackknife UCL	5624
95% Standard Bootstrap UCL	5502	95% Bootstrap-t UCL	5488
95% Hall's Bootstrap UCL	5458	95% Percentile Bootstrap UCL	5499
95% BCA Bootstrap UCL	5389		
90% Chebyshev(Mean, Sd) UCL	6264	95% Chebyshev(Mean, Sd) UCL	6986
97.5% Chebyshev(Mean, Sd) UCL	7989	99% Chebyshev(Mean, Sd) UCL	9958
Suggested UCL to Use			
95% Student's-t UCL	5624		

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Cr

General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	1
Minimum	3.22	Mean	16.95
Maximum	47.9	Median	12.25
SD	12.19	Std. Error of Mean	3.519
Coefficient of Variation	0.719	Skewness	1.748
Normal GOF Test			
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.233	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	23.27	95% Adjusted-CLT UCL (Chen-1995)	24.63
		95% Modified-t UCL (Johnson-1978)	23.56
Gamma GOF Test			
A-D Test Statistic	0.431	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.74	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.186	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.248	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.558	k star (bias corrected MLE)	1.974
Theta hat (MLE)	6.624	Theta star (bias corrected MLE)	8.584
nu hat (MLE)	61.4	nu star (bias corrected)	47.38
MLE Mean (bias corrected)	16.95	MLE Sd (bias corrected)	12.06
		Approximate Chi Square Value (0.05)	32.58
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	30.72
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	24.64	95% Adjusted Gamma UCL (use when n<50)	26.14
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.951	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.169	Mean of logged Data	2.622
Maximum of Logged Data	3.869	SD of logged Data	0.683

Assuming Lognormal Distribution

95% H-UCL	28.41	90% Chebyshev (MVUE) UCL	27.43
95% Chebyshev (MVUE) UCL	32.17	97.5% Chebyshev (MVUE) UCL	38.73
99% Chebyshev (MVUE) UCL	51.64		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	22.73	95% Jackknife UCL	23.27
95% Standard Bootstrap UCL	22.49	95% Bootstrap-t UCL	28.51
95% Hall's Bootstrap UCL	53.81	95% Percentile Bootstrap UCL	22.75
95% BCA Bootstrap UCL	23.77		
90% Chebyshev(Mean, Sd) UCL	27.5	95% Chebyshev(Mean, Sd) UCL	32.28
97.5% Chebyshev(Mean, Sd) UCL	38.92	99% Chebyshev(Mean, Sd) UCL	51.96

Suggested UCL to Use

95% Student's-t UCL	23.27

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test

When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Cu

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	1
Minimum	4.92	Mean	60.27
Maximum	174	Median	52.1
SD	53.77	Std. Error of Mean	15.52
Coefficient of Variation	0.892	Skewness	1.407

Normal GOF Test

Shapiro Wilk Test Statistic	0.818	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.234	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	88.14	95% Adjusted-CLT UCL (Chen-1995)	92.54
		95% Modified-t UCL (Johnson-1978)	89.19

Gamma GOF Test

A-D Test Statistic	0.29	Anderson-Darling Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.747	5% Significance Level	
K-S Test Statistic	0.132	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.25	5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.425	k star (bias corrected MLE)	1.124
Theta hat (MLE)	42.3	Theta star (bias corrected MLE)	53.61
nu hat (MLE)	34.2	nu star (bias corrected)	26.98
MLE Mean (bias corrected)	60.27	MLE Sd (bias corrected)	56.84
		Approximate Chi Square Value (0.05)	16.14
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	14.87

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	100.8	95% Adjusted Gamma UCL (use when n<50)	109.4

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.955	Shapiro Wilk Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.859	Level	
Lilliefors Test Statistic	0.176	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.243	Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.593	Mean of logged Data	3.709
Maximum of Logged Data	5.159	SD of logged Data	0.999

Assuming Lognormal Distribution

95% H-UCL	161.4	90% Chebyshev (MVUE) UCL	122.2
95% Chebyshev (MVUE) UCL	148.8	97.5% Chebyshev (MVUE) UCL	185.7
99% Chebyshev (MVUE) UCL	258.2		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level
Nonparametric Distribution Free UCLs

95% CLT UCL	85.8	95% Jackknife UCL	88.14
95% Standard Bootstrap UCL	84.61	95% Bootstrap-t UCL	108.3
95% Hall's Bootstrap UCL	254.5	95% Percentile Bootstrap UCL	86.16
95% BCA Bootstrap UCL	91.64		
90% Chebyshev(Mean, Sd) UCL	106.8	95% Chebyshev(Mean, Sd) UCL	127.9
97.5% Chebyshev(Mean, Sd) UCL	157.2	99% Chebyshev(Mean, Sd) UCL	214.7

Suggested UCL to Use
95% Student's-t UCL 88.14
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Hg
General Statistics

Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	1
Number of Detects	6	Number of Non-Detects	6
Number of Distinct Detects	6	Number of Distinct Non-Detects	5
Minimum Detect	0.00507	Minimum Non-Detect	0.00355
Maximum Detect	0.131	Maximum Non-Detect	0.0039
Variance Detects	0.00273	Percent Non-Detects	50%
Mean Detects	0.0554	SD Detects	0.0522
Median Detects	0.038	CV Detects	0.944
Skewness Detects	0.663	Kurtosis Detects	-1.594
Mean of Logged Detects	-3.431	SD of Logged Detects	1.261

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.879	Shapiro Wilk GOF Test	
		Detected Data appear Normal at 5%	
5% Shapiro Wilk Critical Value	0.788	Significance Level	
Lilliefors Test Statistic	0.256	Lilliefors GOF Test	
		Detected Data appear Normal at 5%	
5% Lilliefors Critical Value	0.325	Significance Level	

Detected Data appear Normal at 5% Significance Level
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0295	KM Standard Error of Mean	0.0134
KM SD	0.0425	95% KM (BCA) UCL	0.0501
95% KM (t) UCL	0.0536	95% KM (Percentile Bootstrap) UCL	0.052
95% KM (z) UCL	0.0516	95% KM Bootstrap t UCL	0.079
90% KM Chebyshev UCL	0.0698	95% KM Chebyshev UCL	0.0881
97.5% KM Chebyshev UCL	0.113	99% KM Chebyshev UCL	0.163

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.29	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.714	5% Significance Level	
K-S Test Statistic	0.221	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.34	5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level
Gamma Statistics on Detected Data Only

k hat (MLE)	1.067	k star (bias corrected MLE)	0.645
Theta hat (MLE)	0.0519	Theta star (bias corrected MLE)	0.0859
nu hat (MLE)	12.8	nu star (bias corrected)	7.735
Mean (detects)	0.0554		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.00507	Mean	0.0327
Maximum	0.131	Median	0.01
SD	0.0424	CV	1.299
k hat (MLE)	0.97	k star (bias corrected MLE)	0.783
Theta hat (MLE)	0.0337	Theta star (bias corrected MLE)	0.0417
nu hat (MLE)	23.29	nu star (bias corrected)	18.8
Adjusted Level of Significance (β)	0.029		
Approximate Chi Square Value (18.80, α)	9.97	Adjusted Chi Square Value (18.80, β)	9.004
95% Gamma Approximate UCL (use when n>=50)	0.0616	95% Gamma Adjusted UCL (use when n<50)	0.0682

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.0295	SD (KM)	0.0425
Variance (KM)	0.00181	SE of Mean (KM)	0.0134
k hat (KM)	0.48	k star (KM)	0.415
nu hat (KM)	11.52	nu star (KM)	9.97
theta hat (KM)	0.0614	theta star (KM)	0.0709
80% gamma percentile (KM)	0.0477	90% gamma percentile (KM)	0.0826
95% gamma percentile (KM)	0.121	99% gamma percentile (KM)	0.216
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.97, α)	3.923	Adjusted Chi Square Value (9.97, β)	3.365
95% Gamma Approximate KM-UCL (use when n>=50)	0.0749	95% Gamma Adjusted KM-UCL (use when n<50)	0.0873
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
		Detected Data appear Lognormal at 5%	
5% Shapiro Wilk Critical Value	0.788	Significance Level	
Lilliefors Test Statistic	0.172	Lilliefors GOF Test	
		Detected Data appear Lognormal at 5%	
5% Lilliefors Critical Value	0.325	Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.0282	Mean in Log Scale	-5.236
SD in Original Scale	0.0453	SD in Log Scale	2.089
95% t UCL (assumes normality of ROS data)	0.0516	95% Percentile Bootstrap UCL	0.0507
95% BCA Bootstrap UCL	0.057	95% Bootstrap t UCL	0.0848
95% H-UCL (Log ROS)	1.212		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-4.536	KM Geo Mean	0.0107
KM SD (logged)	1.372	95% Critical H Value (KM-Log)	3.633
KM Standard Error of Mean (logged)	0.434	95% H-UCL (KM -Log)	0.124
KM SD (logged)	1.372	95% Critical H Value (KM-Log)	3.633
KM Standard Error of Mean (logged)	0.434		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0286	Mean in Log Scale	-4.857
SD in Original Scale	0.045	SD in Log Scale	1.715
95% t UCL (Assumes normality)	0.0519	95% H-Stat UCL	0.32
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.0536		
V			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	11
		Number of Missing Observations	1
Minimum	11	Mean	32.31
Maximum	48	Median	30
SD	11.37	Std. Error of Mean	3.281
Coefficient of Variation	0.352	Skewness	-0.147
Normal GOF Test			
Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.16	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	38.2	95% Adjusted-CLT UCL (Chen-1995)	37.56
		95% Modified-t UCL (Johnson-1978)	38.18
Gamma GOF Test			
A-D Test Statistic	0.376	Anderson-Darling Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.731	5% Significance Level	
K-S Test Statistic	0.158	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.246	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	7.35	k star (bias corrected MLE)	5.568
Theta hat (MLE)	4.396	Theta star (bias corrected MLE)	5.802

nu hat (MLE)	176.4	nu star (bias corrected)	133.6
MLE Mean (bias corrected)	32.31	MLE Sd (bias corrected)	13.69
		Approximate Chi Square Value (0.05)	107.9
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	104.4
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	40	95% Adjusted Gamma UCL (use when n<50)	41.35
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.859	Level	
Lilliefors Test Statistic	0.17	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.243	Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.398	Mean of logged Data	3.406
Maximum of Logged Data	3.871	SD of logged Data	0.416
Assuming Lognormal Distribution			
95% H-UCL	42.48	90% Chebyshev (MVUE) UCL	44.58
95% Chebyshev (MVUE) UCL	50	97.5% Chebyshev (MVUE) UCL	57.52
99% Chebyshev (MVUE) UCL	72.29		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	37.71	95% Jackknife UCL	38.2
95% Standard Bootstrap UCL	37.4	95% Bootstrap-t UCL	38.39
95% Hall's Bootstrap UCL	37.55	95% Percentile Bootstrap UCL	37.08
95% BCA Bootstrap UCL	37.14		
90% Chebyshev(Mean, Sd) UCL	42.15	95% Chebyshev(Mean, Sd) UCL	46.61
97.5% Chebyshev(Mean, Sd) UCL	52.8	99% Chebyshev(Mean, Sd) UCL	64.96
Suggested UCL to Use			
95% Student's-t UCL	38.2		

Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.

Zn

General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	1
Minimum	24.4	Mean	39.34
Maximum	62.5	Median	37.95
SD	11.9	Std. Error of Mean	3.435
Coefficient of Variation	0.302	Skewness	0.686
Normal GOF Test			
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.161	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	45.51	95% Adjusted-CLT UCL (Chen-1995)	45.72
		95% Modified-t UCL (Johnson-1978)	45.62
Gamma GOF Test			
A-D Test Statistic	0.253	Anderson-Darling Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.731	5% Significance Level	
K-S Test Statistic	0.123	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.245	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	12.41	k star (bias corrected MLE)	9.36
Theta hat (MLE)	3.171	Theta star (bias corrected MLE)	4.203
nu hat (MLE)	297.7	nu star (bias corrected)	224.6
MLE Mean (bias corrected)	39.34	MLE Sd (bias corrected)	12.86
		Approximate Chi Square Value (0.05)	191
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	186.2
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	46.28	95% Adjusted Gamma UCL (use when n<50)	47.46
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	

		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.859	Level	
Lilliefors Test Statistic	0.121	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.243	Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	3.195	Mean of logged Data	3.631
Maximum of Logged Data	4.135	SD of logged Data	0.298
Assuming Lognormal Distribution			
95% H-UCL	46.93	90% Chebyshev (MVUE) UCL	49.57
95% Chebyshev (MVUE) UCL	54.2	97.5% Chebyshev (MVUE) UCL	60.64
99% Chebyshev (MVUE) UCL	73.28		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	44.99	95% Jackknife UCL	45.51
95% Standard Bootstrap UCL	44.88	95% Bootstrap-t UCL	47.07
95% Hall's Bootstrap UCL	47.53	95% Percentile Bootstrap UCL	45.31
95% BCA Bootstrap UCL	45.88		
90% Chebyshev(Mean, Sd) UCL	49.65	95% Chebyshev(Mean, Sd) UCL	54.31
97.5% Chebyshev(Mean, Sd) UCL	60.79	99% Chebyshev(Mean, Sd) UCL	73.52
Suggested UCL to Use			
95% Student's-t UCL	45.51		
Benzyl Alchohol			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	1
Number of Detects	7	Number of Non-Detects	5
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	0.127	Minimum Non-Detect	0.1
Maximum Detect	1.65	Maximum Non-Detect	0.101
Variance Detects	0.304	Percent Non-Detects	41.67%
Mean Detects	0.644	SD Detects	0.552
Median Detects	0.434	CV Detects	0.856
Skewness Detects	1.097	Kurtosis Detects	0.574
Mean of Logged Detects	-0.794	SD of Logged Detects	0.952
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk GOF Test	
		Detected Data appear Normal at 5%	
5% Shapiro Wilk Critical Value	0.803	Significance Level	
Lilliefors Test Statistic	0.22	Lilliefors GOF Test	
		Detected Data appear Normal at 5%	
5% Lilliefors Critical Value	0.304	Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.418	KM Standard Error of Mean	0.148
KM SD	0.473	95% KM (BCA) UCL	0.669
95% KM (t) UCL	0.683	95% KM (Percentile Bootstrap) UCL	0.674
95% KM (z) UCL	0.66	95% KM Bootstrap t UCL	0.863
90% KM Chebyshev UCL	0.86	95% KM Chebyshev UCL	1.061
97.5% KM Chebyshev UCL	1.339	99% KM Chebyshev UCL	1.886
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.212	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.721	5% Significance Level	
K-S Test Statistic	0.155	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.317	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.557	k star (bias corrected MLE)	0.985
Theta hat (MLE)	0.414	Theta star (bias corrected MLE)	0.654
nu hat (MLE)	21.8	nu star (bias corrected)	13.79
Mean (detects)	0.644		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.38
Maximum	1.65	Median	0.144
SD	0.522	CV	1.374
k hat (MLE)	0.456	k star (bias corrected MLE)	0.397
Theta hat (MLE)	0.834	Theta star (bias corrected MLE)	0.956
nu hat (MLE)	10.94	nu star (bias corrected)	9.536
Adjusted Level of Significance (β)	0.029		
Approximate Chi Square Value (9.54, α)	3.654	Adjusted Chi Square Value (9.54, β)	3.119
95% Gamma Approximate UCL (use when n>=50)	0.992	95% Gamma Adjusted UCL (use when n<50)	1.162
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.418	SD (KM)	0.473
Variance (KM)	0.224	SE of Mean (KM)	0.148
k hat (KM)	0.778	k star (KM)	0.639
nu hat (KM)	18.66	nu star (KM)	15.33
theta hat (KM)	0.537	theta star (KM)	0.654
80% gamma percentile (KM)	0.688	90% gamma percentile (KM)	1.071
95% gamma percentile (KM)	1.469	99% gamma percentile (KM)	2.427
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (15.33, α)	7.491	Adjusted Chi Square Value (15.33, β)	6.671
95% Gamma Approximate KM-UCL (use when n>=50)	0.854	95% Gamma Adjusted KM-UCL (use when n<50)	0.959
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.148	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.391	Mean in Log Scale	-1.889
SD in Original Scale	0.514	SD in Log Scale	1.565
95% t UCL (assumes normality of ROS data)	0.658	95% Percentile Bootstrap UCL	0.628
95% BCA Bootstrap UCL	0.702	95% Bootstrap t UCL	0.909
95% H-UCL (Log ROS)	3.447		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.422	KM Geo Mean	0.241
KM SD (logged)	1.003	95% Critical H Value (KM-Log)	2.921
KM Standard Error of Mean (logged)	0.313	95% H-UCL (KM -Log)	0.964
KM SD (logged)	1.003	95% Critical H Value (KM-Log)	2.921
KM Standard Error of Mean (logged)	0.313		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.397	Mean in Log Scale	-1.709
SD in Original Scale	0.509	SD in Log Scale	1.331
95% t UCL (Assumes normality)	0.661	95% H-Stat UCL	1.827
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.683		
HMX			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	9
		Number of Missing Observations	1
Number of Detects	7	Number of Non-Detects	5
Number of Distinct Detects	7	Number of Distinct Non-Detects	2
Minimum Detect	0.172	Minimum Non-Detect	0.149
Maximum Detect	6.66	Maximum Non-Detect	0.15
Variance Detects	5.265	Percent Non-Detects	41.67%
Mean Detects	1.683	SD Detects	2.295
Median Detects	1.14	CV Detects	1.363
Skewness Detects	2.198	Kurtosis Detects	5.159
Mean of Logged Detects	-0.217	SD of Logged Detects	1.34
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.704	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Level	

Lilliefors Test Statistic	0.314	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.044	KM Standard Error of Mean	0.558
KM SD	1.79	95% KM (BCA) UCL	2.103
95% KM (t) UCL	2.046	95% KM (Percentile Bootstrap) UCL	1.964
95% KM (z) UCL	1.962	95% KM Bootstrap t UCL	3.731
90% KM Chebyshev UCL	2.718	95% KM Chebyshev UCL	3.477
97.5% KM Chebyshev UCL	4.53	99% KM Chebyshev UCL	6.598
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.394	Anderson-Darling GOF Test	
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.22	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.322	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.804	k star (bias corrected MLE)	0.555
Theta hat (MLE)	2.093	Theta star (bias corrected MLE)	3.034
nu hat (MLE)	11.26	nu star (bias corrected)	7.766
Mean (detects)	1.683		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.986
Maximum	6.66	Median	0.194
SD	1.901	CV	1.928
k hat (MLE)	0.334	k star (bias corrected MLE)	0.306
Theta hat (MLE)	2.955	Theta star (bias corrected MLE)	3.225
nu hat (MLE)	8.007	nu star (bias corrected)	7.339
Adjusted Level of Significance (β)	0.029		
Approximate Chi Square Value (7.34, α)	2.358	Adjusted Chi Square Value (7.34, β)	1.951
95% Gamma Approximate UCL (use when n>=50)	3.068	95% Gamma Adjusted UCL (use when n<50)	3.709
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.044	SD (KM)	1.79
Variance (KM)	3.204	SE of Mean (KM)	0.558
k hat (KM)	0.34	k star (KM)	0.311
nu hat (KM)	8.162	nu star (KM)	7.455
theta hat (KM)	3.07	theta star (KM)	3.361
80% gamma percentile (KM)	1.614	90% gamma percentile (KM)	3.066
95% gamma percentile (KM)	4.722	99% gamma percentile (KM)	9.009
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (7.45, α)	2.423	Adjusted Chi Square Value (7.45, β)	2.009
95% Gamma Approximate KM-UCL (use when n>=50)	3.211	95% Gamma Adjusted KM-UCL (use when n<50)	3.874
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.202	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.993	Mean in Log Scale	-1.753
SD in Original Scale	1.897	SD in Log Scale	2.196
95% t UCL (assumes normality of ROS data)	1.976	95% Percentile Bootstrap UCL	1.953
95% BCA Bootstrap UCL	2.558	95% Bootstrap t UCL	3.902
95% H-UCL (Log ROS)	68.69		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.92	KM Geo Mean	0.399
KM SD (logged)	1.26	95% Critical H Value (KM-Log)	3.41
KM Standard Error of Mean (logged)	0.393	95% H-UCL (KM -Log)	3.223
KM SD (logged)	1.26	95% Critical H Value (KM-Log)	3.41
KM Standard Error of Mean (logged)	0.393		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.013	Mean in Log Scale	-1.207
SD in Original Scale	1.886	SD in Log Scale	1.573
95% t UCL (Assumes normality)	1.991	95% H-Stat UCL	7.039
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM Bootstrap t UCL	3.731	Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but k<=1)	3.874
TATB			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	8
		Number of Missing Observations	1
Number of Detects	5	Number of Non-Detects	7
Number of Distinct Detects	5	Number of Distinct Non-Detects	3
Minimum Detect	0.791	Minimum Non-Detect	0.296
Maximum Detect	5.535	Maximum Non-Detect	0.3
Variance Detects	3.981	Percent Non-Detects	58.33%
Mean Detects	2.042	SD Detects	1.995
Median Detects	1.06	CV Detects	0.977
Skewness Detects	2.017	Kurtosis Detects	4.113
Mean of Logged Detects	0.424	SD of Logged Detects	0.786
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.713	Shapiro Wilk GOF Test	
		Detected Data Not Normal at 5% Significance	
5% Shapiro Wilk Critical Value	0.762	Level	
Lilliefors Test Statistic	0.336	Lilliefors GOF Test	
		Detected Data appear Normal at 5%	
5% Lilliefors Critical Value	0.343	Significance Level	
Detected Data appear Approximate Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.024	KM Standard Error of Mean	0.464
KM SD	1.438	95% KM (BCA) UCL	1.863
95% KM (t) UCL	1.857	95% KM (Percentile Bootstrap) UCL	1.789
95% KM (z) UCL	1.787	95% KM Bootstrap t UCL	2.976
90% KM Chebyshev UCL	2.416	95% KM Chebyshev UCL	3.047
97.5% KM Chebyshev UCL	3.922	99% KM Chebyshev UCL	5.642
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.595	Anderson-Darling GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.685	5% Significance Level	
K-S Test Statistic	0.31	Kolmogorov-Smirnov GOF	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.361	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.873	k star (bias corrected MLE)	0.883
Theta hat (MLE)	1.09	Theta star (bias corrected MLE)	2.314
nu hat (MLE)	18.73	nu star (bias corrected)	8.826
Mean (detects)	2.042		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.857
Maximum	5.535	Median	0.01
SD	1.595	CV	1.861
k hat (MLE)	0.294	k star (bias corrected MLE)	0.276
Theta hat (MLE)	2.916	Theta star (bias corrected MLE)	3.105
nu hat (MLE)	7.051	nu star (bias corrected)	6.622
Adjusted Level of Significance (β)	0.029		
Approximate Chi Square Value (6.62, α)	1.965	Adjusted Chi Square Value (6.62, β)	1.603
95% Gamma Approximate UCL (use when n>=50)	2.887	95% Gamma Adjusted UCL (use when n<50)	3.539
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.024	SD (KM)	1.438
Variance (KM)	2.068	SE of Mean (KM)	0.464
k hat (KM)	0.507	k star (KM)	0.436
nu hat (KM)	12.16	nu star (KM)	10.45

theta hat (KM)	2.02	theta star (KM)	2.35
80% gamma percentile (KM)	1.666	90% gamma percentile (KM)	2.846
95% gamma percentile (KM)	4.129	99% gamma percentile (KM)	7.325
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.45, α)	4.226	Adjusted Chi Square Value (10.45, β)	3.642
95% Gamma Approximate KM-UCL (use when n>=50)	2.531	95% Gamma Adjusted KM-UCL (use when n<50)	2.938
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.279	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.93	Mean in Log Scale	-1.077
SD in Original Scale	1.554	SD in Log Scale	1.48
95% t UCL (assumes normality of ROS data)	1.736	95% Percentile Bootstrap UCL	1.733
95% BCA Bootstrap UCL	2.079	95% Bootstrap t UCL	3.229
95% H-UCL (Log ROS)	5.697		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.533	KM Geo Mean	0.587
KM SD (logged)	0.928	95% Critical H Value (KM-Log)	2.786
KM Standard Error of Mean (logged)	0.299	95% H-UCL (KM -Log)	1.967
KM SD (logged)	0.928	95% Critical H Value (KM-Log)	2.786
KM Standard Error of Mean (logged)	0.299		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.938	Mean in Log Scale	-0.933
SD in Original Scale	1.548	SD in Log Scale	1.288
95% t UCL (Assumes normality)	1.741	95% H-Stat UCL	3.464
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	1.857		
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			

UCL Statistics for Uncensored Full Data Sets	**Dioxin/Furan TEQ**		
User Selected Options			
	ProUCL 5.15/12/2022		
Date/Time of Computation	4:38:07 PM		
From File	WorkSheet.xls		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Bird TEQ			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	1.54E-06	Mean	1.71E-06
Maximum	2.02E-06	Median	1.65E-06
SD	1.70E-07	Std. Error of Mean	4.90E-08
Coefficient of Variation	N/A	Skewness	0.964
Normal GOF Test			
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.207	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.80E-06	95% Adjusted-CLT UCL (Chen-1995)	1.80E-06
		95% Modified-t UCL (Johnson-1978)	1.80E-06
Gamma GOF Test			
A-D Test Statistic	0.714	Anderson-Darling Gamma GOF Test	

		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.731	5% Significance Level	
K-S Test Statistic	0.205	Kolmogorov-Smirnov Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.245	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.16E+02	k star (bias corrected MLE)	8.69E+01
Theta hat (MLE)	1.47E-08	Theta star (bias corrected MLE)	1.96E-08
nu hat (MLE)	2.78E+03	nu star (bias corrected)	2.09E+03
MLE Mean (bias corrected)	1.71E-06	MLE Sd (bias corrected)	1.83E-07
		Approximate Chi Square Value (0.05)	1981
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	1965
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	1.80E-06	95% Adjusted Gamma UCL (use when n<50)	1.81E-06
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.859	Level	
Lilliefors Test Statistic	0.196	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.243	Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-13.38	Mean of logged Data	-13.28
Maximum of Logged Data	-13.11	SD of logged Data	0.096
Assuming Lognormal Distribution			
95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	1.85E-06
95% Chebyshev (MVUE) UCL	1.91E-06	97.5% Chebyshev (MVUE) UCL	2.00E-06
99% Chebyshev (MVUE) UCL	2.18E-06		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1.79E-06	95% Jackknife UCL	1.80E-06
95% Standard Bootstrap UCL	1.78E-06	95% Bootstrap-t UCL	1.82E-06
95% Hall's Bootstrap UCL	1.81E-06	95% Percentile Bootstrap UCL	1.79E-06
95% BCA Bootstrap UCL	1.80E-06		
90% Chebyshev(Mean, Sd) UCL	1.86E-06	95% Chebyshev(Mean, Sd) UCL	1.92E-06
97.5% Chebyshev(Mean, Sd) UCL	2.01E-06	99% Chebyshev(Mean, Sd) UCL	2.20E-06
Suggested UCL to Use			
95% Student's-t UCL	1.80E-06		
When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test			
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
Mammal TEQ			
General Statistics			
Total Number of Observations	12	Number of Distinct Observations	12
		Number of Missing Observations	0
Minimum	1.14E-06	Mean	1.21E-06
Maximum	1.33E-06	Median	1.20E-06
SD	6.23E-08	Std. Error of Mean	1.80E-08
Coefficient of Variation	N/A	Skewness	0.579
Normal GOF Test			
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.165	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.24E-06	95% Adjusted-CLT UCL (Chen-1995)	1.24E-06
		95% Modified-t UCL (Johnson-1978)	1.24E-06
Gamma GOF Test			
A-D Test Statistic	0.358	Anderson-Darling Gamma GOF Test	
		Detected data appear Gamma Distributed at	
5% A-D Critical Value	0.731	5% Significance Level	
K-S Test Statistic	0.177	Kolmogorov-Smirnov Gamma GOF Test	

		Detected data appear Gamma Distributed at	
5% K-S Critical Value	0.245	5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	417.5	k star (bias corrected MLE)	313.1
Theta hat (MLE)	2.90E-09	Theta star (bias corrected MLE)	3.87E-09
nu hat (MLE)	10019	nu star (bias corrected)	7516
MLE Mean (bias corrected)	1.21E-06	MLE Sd (bias corrected)	6.84E-08
		Approximate Chi Square Value (0.05)	7315
Adjusted Level of Significance	0.029	Adjusted Chi Square Value	7285
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	1.24E-06	95% Adjusted Gamma UCL (use when n<50)	1.25E-06
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Shapiro Wilk Critical Value	0.859	Level	
Lilliefors Test Statistic	0.168	Lilliefors Lognormal GOF Test	
		Data appear Lognormal at 5% Significance	
5% Lilliefors Critical Value	0.243	Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-13.69	Mean of logged Data	-13.63
Maximum of Logged Data	-13.53	SD of logged Data	0.051
Assuming Lognormal Distribution			
95% H-UCL	N/A	90% Chebyshev (MVUE) UCL	1.26E-06
95% Chebyshev (MVUE) UCL	1.29E-06	97.5% Chebyshev (MVUE) UCL	1.32E-06
99% Chebyshev (MVUE) UCL	1.39E-06		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1.24E-06	95% Jackknife UCL	1.24E-06
95% Standard Bootstrap UCL	1.24E-06	95% Bootstrap-t UCL	1.24E-06
95% Hall's Bootstrap UCL	1.25E-06	95% Percentile Bootstrap UCL	1.24E-06
95% BCA Bootstrap UCL	1.24E-06		
90% Chebyshev(Mean, Sd) UCL	1.26E-06	95% Chebyshev(Mean, Sd) UCL	1.29E-06
97.5% Chebyshev(Mean, Sd) UCL	1.32E-06	99% Chebyshev(Mean, Sd) UCL	1.39E-06
Suggested UCL to Use			
95% Student's-t UCL	1.24E-06		

ATTACHMENT B. LANL ECORISK 4.2 DATABASE (MG/KG) FOR ORGANICS AND INORGANICS ABOVE BACKGROUND- SOIL

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	Deer mouse (Mammalian omnivore)	0.00000058	0.0000038		SOIL_DM(ip)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	Earthworm (Soil-dwelling invertebrate)	5	10		SOIL_EW_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	Gray fox (Mammalian top carnivore)	0.0001	0.00068		SOIL_RF(f)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	Montane shrew (Mammalian insectivore)	0.00000029	0.0000019		SOIL_MS(i)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	Mountain cottontail (Mammalian herbivore)	0.00004	0.00027		SOIL_DC(p)_1746-01-6
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	American kestrel (Avian top carnivore)	4.10E-06			
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	American kestrel (insectivore / carnivore)	4.10E-06			
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	American robin (Avian herbivore)	4.10E-06			
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	American robin (Avian insectivore)	4.10E-06			
Dioxin/ Furan	Tetrachlorodibenzodioxin [2,3,7,8-]	1746-01-6	American robin (Avian omnivore)	4.10E-06			
HE	3,5-Dinitroaniline	618-87-1	Deer mouse (Mammalian omnivore)	23	230	Use amino-2,6-dinitrotoluene [4-	SOIL_DM(ip)_19406-51-0
HE	3,5-Dinitroaniline	618-87-1	Earthworm (Soil-dwelling invertebrate)	18	180	Use amino-2,6-dinitrotoluene [4-	SOIL_EW_19406-51-0
HE	3,5-Dinitroaniline	618-87-1	Generic plant (Terrestrial autotroph - producer)	33	330	Use amino-2,6-dinitrotoluene [4-	SOIL_GP_19406-51-0
HE	3,5-Dinitroaniline	618-87-1	Gray fox (Mammalian top carnivore)	6700	67000	Use amino-2,6-dinitrotoluene [4-	SOIL_RF(f)_19406-51-0
HE	3,5-Dinitroaniline	618-87-1	Montane shrew (Mammalian insectivore)	12	120	Use amino-2,6-dinitrotoluene [4-	SOIL_MS(i)_19406-51-0
HE	3,5-Dinitroaniline	618-87-1	Mountain cottontail (Mammalian herbivore)	320	3200	Use amino-2,6-dinitrotoluene [4-	SOIL_DC(p)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Deer mouse (Mammalian omnivore)	23	230		SOIL_DM(ip)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Earthworm (Soil-dwelling invertebrate)	18	180		SOIL_EW_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Generic plant (Terrestrial autotroph - producer)	33	330		SOIL_GP_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Gray fox (Mammalian top carnivore)	6700	67000		SOIL_RF(f)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Montane shrew (Mammalian insectivore)	12	120		SOIL_MS(i)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	Mountain cottontail (Mammalian herbivore)	320	3200		SOIL_DC(p)_19406-51-0

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Deer mouse (Mammalian omnivore)	23	230		SOIL_DM(ip)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Earthworm (Soil-dwelling invertebrate)	43	430		SOIL_EW_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Generic plant (Terrestrial autotroph - producer)	14	140		SOIL_GP_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Gray fox (Mammalian top carnivore)	9700	97000		SOIL_RF(f)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Montane shrew (Mammalian insectivore)	16	160		SOIL_MS(i)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	Mountain cottontail (Mammalian herbivore)	110	1100		SOIL_DC(p)_35572-78-2
HE	Dinitrobenzene[1,3-]	99-65-0	American kestrel (Avian top carnivore)	120	1200		SOIL_AK(f)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	American kestrel (insectivore / carnivore)	9.3	93		SOIL_AK(fi)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian herbivore)	0.079	0.79		SOIL_AR(p)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian insectivore)	1.6	16		SOIL_AR(i)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	American robin (Avian omnivore)	0.15	1.5		SOIL_AR(ip)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	Deer mouse (Mammalian omnivore)	0.072	0.16		SOIL_DM(ip)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	Gray fox (Mammalian top carnivore)	82	190		SOIL_RF(f)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	Montane shrew (Mammalian insectivore)	0.95	2.2		SOIL_MS(i)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	Mountain cottontail (Mammalian herbivore)	0.091	0.21		SOIL_DC(p)_99-65-0
HE	Dinitrotoluene[2,4-]	121-14-2	Deer mouse (Mammalian omnivore)	20	200		SOIL_DM(ip)_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	Earthworm (Soil-dwelling invertebrate)	18	180		SOIL_EW_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	Generic plant (Terrestrial autotroph - producer)	6	60		SOIL_GP_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	Gray fox (Mammalian top carnivore)	2000	20000		SOIL_RF(f)_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	Montane shrew (Mammalian insectivore)	14	140		SOIL_MS(i)_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	Mountain cottontail (Mammalian herbivore)	74	740		SOIL_DC(p)_121-14-2
HE	Dinitrotoluene[2,6-]	606-20-2	American kestrel (Avian top carnivore)	18000	180000		SOIL_AK(f)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	American kestrel (insectivore / carnivore)	680	6800		SOIL_AK(fi)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian herbivore)	52	520		SOIL_AR(p)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian insectivore)	130	1300		SOIL_AR(i)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	American robin (Avian omnivore)	74	740		SOIL_AR(ip)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	Deer mouse (Mammalian omnivore)	4	40		SOIL_DM(ip)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	Earthworm (Soil-dwelling invertebrate)	30	44		SOIL_EW_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	Gray fox (Mammalian top carnivore)	1300	13000		SOIL_RF(f)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	Montane shrew (Mammalian insectivore)	7.6	76		SOIL_MS(i)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	Mountain cottontail (Mammalian herbivore)	6.7	67		SOIL_DC(p)_606-20-2
HE	HMX	2691-41-0	Deer mouse (Mammalian omnivore)	290	790		SOIL_DM(ip)_2691-41-0
HE	HMX	2691-41-0	Earthworm (Soil-dwelling invertebrate)	16	160		SOIL_EW_2691-41-0
HE	HMX	2691-41-0	Generic plant (Terrestrial autotroph - producer)	2700	3500		SOIL_GP_2691-41-0
HE	HMX	2691-41-0	Gray fox (Mammalian top carnivore)	59000	150000		SOIL_RF(f)_2691-41-0
HE	HMX	2691-41-0	Montane shrew (Mammalian insectivore)	1100	2900		SOIL_MS(i)_2691-41-0
HE	HMX	2691-41-0	Mountain cottontail (Mammalian herbivore)	410	1100		SOIL_DC(p)_2691-41-0
HE	Nitroglycerine	55-63-0	Deer mouse (Mammalian omnivore)	70	740		SOIL_DM(ip)_55-63-0
HE	Nitroglycerine	55-63-0	Earthworm (Soil-dwelling invertebrate)	13	130		SOIL_EW_55-63-0
HE	Nitroglycerine	55-63-0	Generic plant (Terrestrial autotroph - producer)	21	210		SOIL_GP_55-63-0
HE	Nitroglycerine	55-63-0	Gray fox (Mammalian top carnivore)	69000	730000		SOIL_RF(f)_55-63-0
HE	Nitroglycerine	55-63-0	Montane shrew (Mammalian insectivore)	1200	13000		SOIL_MS(i)_55-63-0
HE	Nitroglycerine	55-63-0	Mountain cottontail (Mammalian herbivore)	88	930		SOIL_DC(p)_55-63-0
HE	Nitrotoluene[2-]	88-72-2	Deer mouse (Mammalian omnivore)	9.8	98		SOIL_DM(ip)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	Gray fox (Mammalian top carnivore)	6000	60000		SOIL_RF(f)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	Montane shrew (Mammalian insectivore)	22	220		SOIL_MS(i)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	Mountain cottontail (Mammalian herbivore)	15	150		SOIL_DC(p)_88-72-2
HE	Nitrotoluene[3-]	99-08-1	Deer mouse (Mammalian omnivore)	12	120		SOIL_DM(ip)_99-08-1
HE	Nitrotoluene[3-]	99-08-1	Gray fox (Mammalian top carnivore)	7000	70000		SOIL_RF(f)_99-08-1
HE	Nitrotoluene[3-]	99-08-1	Montane shrew (Mammalian insectivore)	19	190		SOIL_MS(i)_99-08-1

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
HE	Nitrotoluene[3-]	99-08-1	Mountain cottontail (Mammalian herbivore)	21	210		SOIL_DC(p)_99-08-1
HE	Nitrotoluene[4-]	99-99-0	Deer mouse (Mammalian omnivore)	21	210		SOIL_DM(ip)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	Gray fox (Mammalian top carnivore)	13000	130000		SOIL_RF(f)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	Montane shrew (Mammalian insectivore)	41	410		SOIL_MS(i)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	Mountain cottontail (Mammalian herbivore)	36	360		SOIL_DC(p)_99-99-0
HE	PETN	78-11-5	Deer mouse (Mammalian omnivore)	100	1000		SOIL_DM(ip)_78-11-5
HE	PETN	78-11-5	Gray fox (Mammalian top carnivore)	47000	470000		SOIL_RF(f)_78-11-5
HE	PETN	78-11-5	Montane shrew (Mammalian insectivore)	1000	10000		SOIL_MS(i)_78-11-5
HE	PETN	78-11-5	Mountain cottontail (Mammalian herbivore)	120	1200		SOIL_DC(p)_78-11-5
HE	RDX	121-82-4	American kestrel (Avian top carnivore)	780	1400		SOIL_AK(f)_121-82-4
HE	RDX	121-82-4	American kestrel (insectivore / carnivore)	11	22		SOIL_AK(fi)_121-82-4
HE	RDX	121-82-4	American robin (Avian herbivore)	2.3	4.3		SOIL_AR(p)_121-82-4
HE	RDX	121-82-4	American robin (Avian insectivore)	2.4	4.5		SOIL_AR(i)_121-82-4
HE	RDX	121-82-4	American robin (Avian omnivore)	2.3	4.4		SOIL_AR(ip)_121-82-4
HE	RDX	121-82-4	Deer mouse (Mammalian omnivore)	16	51		SOIL_DM(ip)_121-82-4
HE	RDX	121-82-4	Earthworm (Soil-dwelling invertebrate)	8.4	15		SOIL_EW_121-82-4
HE	RDX	121-82-4	Gray fox (Mammalian top carnivore)	7000	22000		SOIL_RF(f)_121-82-4
HE	RDX	121-82-4	Montane shrew (Mammalian insectivore)	16	53		SOIL_MS(i)_121-82-4
HE	RDX	121-82-4	Mountain cottontail (Mammalian herbivore)	38	120		SOIL_DC(p)_121-82-4
HE	Tetryl	479-45-8	Deer mouse (Mammalian omnivore)	1.5	7.2		SOIL_DM(ip)_479-45-8
HE	Tetryl	479-45-8	Gray fox (Mammalian top carnivore)	960	4600		SOIL_RF(f)_479-45-8
HE	Tetryl	479-45-8	Montane shrew (Mammalian insectivore)	60	280		SOIL_MS(i)_479-45-8
HE	Tetryl	479-45-8	Mountain cottontail (Mammalian herbivore)	1.8	8.9		SOIL_DC(p)_479-45-8
HE	TATB	3058-38-6	Deer mouse (Mammalian omnivore)	110	1100	Use 1,3,5-TNB for all	SOIL_DM(ip)_99-35-4
HE	TATB	3058-38-6	Earthworm (Soil-dwelling invertebrate)	10	28	Use 1,3,5-TNB for all	SOIL_EW_99-35-4
HE	TATB	3058-38-6	Gray fox (Mammalian top carnivore)	10000	100000	Use 1,3,5-TNB for all	SOIL_RF(f)_99-35-4
HE	TATB	3058-38-6	Montane shrew (Mammalian insectivore)	720	7200	Use 1,3,5-TNB for all	SOIL_MS(i)_99-35-4
HE	TATB	3058-38-6	Mountain cottontail (Mammalian herbivore)	150	1500	Use 1,3,5-TNB for all	SOIL_DC(p)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	Deer mouse (Mammalian omnivore)	110	1100		SOIL_DM(ip)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	Earthworm (Soil-dwelling invertebrate)	10	28		SOIL_EW_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	Gray fox (Mammalian top carnivore)	10000	100000		SOIL_RF(f)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	Montane shrew (Mammalian insectivore)	720	7200		SOIL_MS(i)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	Mountain cottontail (Mammalian herbivore)	150	1500		SOIL_DC(p)_99-35-4
HE	Trinitrotoluene[2,4,6-]	118-96-7	American kestrel (Avian top carnivore)	3100	5700		SOIL_AK(f)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	American kestrel (insectivore / carnivore)	1300	2400		SOIL_AK(fi)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian herbivore)	7.5	13		SOIL_AR(p)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian insectivore)	120	220		SOIL_AR(i)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	American robin (Avian omnivore)	14	26		SOIL_AR(ip)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Deer mouse (Mammalian omnivore)	95	440		SOIL_DM(ip)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Earthworm (Soil-dwelling invertebrate)	32	58		SOIL_EW_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Generic plant (Terrestrial autotroph - producer)	62	120		SOIL_GP_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Gray fox (Mammalian top carnivore)	26000	120000		SOIL_RF(f)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Montane shrew (Mammalian insectivore)	1900	9100		SOIL_MS(i)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	Mountain cottontail (Mammalian herbivore)	110	540		SOIL_DC(p)_118-96-7

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
Inorganic	Chromium (total)	16065-83-1	American kestrel (Avian top carnivore)	860	2700		SOIL_AK(f)_CR
Inorganic	Chromium (total)	16065-83-1	American kestrel (insectivore / carnivore)	170	560		SOIL_AK(fi)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian herbivore)	51	160		SOIL_AR(p)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian insectivore)	23	73		SOIL_AR(i)_CR
Inorganic	Chromium (total)	16065-83-1	American robin (Avian omnivore)	32	100		SOIL_AR(ip)_CR
Inorganic	Chromium (total)	16065-83-1	Deer mouse (Mammalian omnivore)	110	11000		SOIL_DM(ip)_CR
Inorganic	Chromium (total)	16065-83-1	Gray fox (Mammalian top carnivore)	1800	180000		SOIL_RF(f)_CR
Inorganic	Chromium (total)	16065-83-1	Montane shrew (Mammalian insectivore)	63	6300		SOIL_MS(i)_CR
Inorganic	Chromium (total)	16065-83-1	Mountain cottontail (Mammalian herbivore)	410	41000		SOIL_DC(p)_CR
Inorganic	Copper	7440-50-8	American kestrel (Avian top carnivore)	1100	3500		SOIL_AK(f)_CU
Inorganic	Copper	7440-50-8	American kestrel (insectivore / carnivore)	80	240		SOIL_AK(fi)_CU
Inorganic	Copper	7440-50-8	American robin (Avian herbivore)	34	100		SOIL_AR(p)_CU
Inorganic	Copper	7440-50-8	American robin (Avian insectivore)	14	43		SOIL_AR(i)_CU
Inorganic	Copper	7440-50-8	American robin (Avian omnivore)	20	60		SOIL_AR(ip)_CU
Inorganic	Copper	7440-50-8	Deer mouse (Mammalian omnivore)	63	100		SOIL_DM(ip)_CU
Inorganic	Copper	7440-50-8	Earthworm (Soil-dwelling invertebrate)	80	530		SOIL_EW_CU
Inorganic	Copper	7440-50-8	Generic plant (Terrestrial autotroph - producer)	70	490		SOIL_GP_CU
Inorganic	Copper	7440-50-8	Gray fox (Mammalian top carnivore)	4000	6700		SOIL_RF(f)_CU
Inorganic	Copper	7440-50-8	Montane shrew (Mammalian insectivore)	42	70		SOIL_MS(i)_CU
Inorganic	Copper	7440-50-8	Mountain cottontail (Mammalian herbivore)	260	430		SOIL_DC(p)_CU
Inorganic	Mercury (inorganic)	7487-94-7	American kestrel (Avian top carnivore)	0.32	3.2		SOIL_AK(f)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American kestrel (insectivore / carnivore)	0.058	0.58		SOIL_AK(fi)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian herbivore)	0.067	0.67		SOIL_AR(p)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian insectivore)	0.013	0.13		SOIL_AR(i)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	American robin (Avian omnivore)	0.022	0.22		SOIL_AR(ip)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Deer mouse (Mammalian omnivore)	3	30		SOIL_DM(ip)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Earthworm (Soil-dwelling invertebrate)	0.05	0.5		SOIL_EW_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Generic plant (Terrestrial autotroph - producer)	34	64		SOIL_GP_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Gray fox (Mammalian top carnivore)	76	760		SOIL_RF(f)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Montane shrew (Mammalian insectivore)	1.7	17		SOIL_MS(i)_HGI
Inorganic	Mercury (inorganic)	7487-94-7	Mountain cottontail (Mammalian herbivore)	23	230		SOIL_DC(p)_HGI
Inorganic	Perchlorate	14797-73-0	American kestrel (Avian top carnivore)	2	4		SOIL_AK(f)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American kestrel (insectivore / carnivore)	3.9	8		SOIL_AK(fi)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian herbivore)	0.12	0.24		SOIL_AR(p)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian insectivore)	31	64		SOIL_AR(i)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	American robin (Avian omnivore)	0.24	0.49		SOIL_AR(ip)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Deer mouse (Mammalian omnivore)	0.21	1		SOIL_DM(ip)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Earthworm (Soil-dwelling invertebrate)	3.5	35		SOIL_EW_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Generic plant (Terrestrial autotroph - producer)	40	80		SOIL_GP_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Gray fox (Mammalian top carnivore)	3.3	16		SOIL_RF(f)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Montane shrew (Mammalian insectivore)	31	150		SOIL_MS(i)_ClO4(-1)
Inorganic	Perchlorate	14797-73-0	Mountain cottontail (Mammalian herbivore)	0.26	1.3		SOIL_DC(p)_ClO4(-1)
Inorganic	Vanadium	7440-62-2	American kestrel (Avian top carnivore)	110	230		SOIL_AK(f)_V
Inorganic	Vanadium	7440-62-2	American kestrel (insectivore / carnivore)	56	110		SOIL_AK(fi)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian herbivore)	6.8	13		SOIL_AR(p)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian insectivore)	4.7	9.5		SOIL_AR(i)_V
Inorganic	Vanadium	7440-62-2	American robin (Avian omnivore)	5.5	11		SOIL_AR(ip)_V
Inorganic	Vanadium	7440-62-2	Deer mouse (Mammalian omnivore)	470	1000		SOIL_DM(ip)_V
Inorganic	Vanadium	7440-62-2	Generic plant (Terrestrial autotroph - producer)	60	80		SOIL_GP_V
Inorganic	Vanadium	7440-62-2	Gray fox (Mammalian top carnivore)	3200	6900		SOIL_RF(f)_V
Inorganic	Vanadium	7440-62-2	Montane shrew (Mammalian insectivore)	290	610		SOIL_MS(i)_V
Inorganic	Vanadium	7440-62-2	Mountain cottontail (Mammalian herbivore)	740	1500		SOIL_DC(p)_V
Inorganic	Zinc	7440-66-6	American kestrel (Avian top carnivore)	2600	7000		SOIL_AK(f)_ZN
Inorganic	Zinc	7440-66-6	American kestrel (insectivore / carnivore)	220	590		SOIL_AK(fi)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian herbivore)	330	120		SOIL_AR(p)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian insectivore)	47	120		SOIL_AR(i)_ZN
Inorganic	Zinc	7440-66-6	American robin (Avian omnivore)	83	220		SOIL_AR(ip)_ZN

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
Inorganic	Zinc	7440-66-6	Deer mouse (Mammalian omnivore)	170	1700		SOIL_DM(ip)_ZN
Inorganic	Zinc	7440-66-6	Earthworm (Soil-dwelling invertebrate)	120	930		SOIL_EW_ZN
Inorganic	Zinc	7440-66-6	Generic plant (Terrestrial autotroph - producer)	160	810		SOIL_GP_ZN
Inorganic	Zinc	7440-66-6	Gray fox (Mammalian top carnivore)	9600	94000		SOIL_RF(f)_ZN
Inorganic	Zinc	7440-66-6	Montane shrew (Mammalian insectivore)	99	980		SOIL_MS(i)_ZN
Inorganic	Zinc	7440-66-6	Mountain cottontail (Mammalian herbivore)	1800	18000		SOIL_DC(p)_ZN
Organic	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	Earthworm (Soil-dwelling invertebrate)	1.8	81.5		SOIL_EW_1763-23-1
Organic	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	Generic plant (Terrestrial autotroph - producer)	62.2	80.8		SOIL_GP_1763-23-1
Organic	Perfluorooctanoic acid (PFOA)	335-67-1	Earthworm (Soil-dwelling invertebrate)	12.2	101.1		SOIL_EW_335-67-1
Organic	Perfluorooctanoic acid (PFOA)	335-67-1	Generic plant (Terrestrial autotroph - producer)	41.1	62.1		SOIL_GP_335-67-1
Organic	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	Earthworm (Soil-dwelling invertebrate)	198	1977		SOIL_EW_TPH F2F3
Organic	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	Generic plant (Terrestrial autotroph - producer)	81.2	419		SOIL_GP_TPH F2F3
Organic	Total Petroleum Hydrocarbon DRO	TPH-DRO	Earthworm (Soil-dwelling invertebrate)	198	1977		SOIL_EW_TPH F2F3
Organic	Total Petroleum Hydrocarbon DRO	TPH-DRO	Generic plant (Terrestrial autotroph - producer)	81.2	419		SOIL_GP_TPH F2F3
PAH	Acenaphthene	83-32-9	Deer mouse (Mammalian omnivore)	160	1600		SOIL_DM(ip)_83-32-9
PAH	Acenaphthene	83-32-9	Generic plant (Terrestrial autotroph - producer)	0.25	2		SOIL_GP_83-32-9
PAH	Acenaphthene	83-32-9	Gray fox (Mammalian top carnivore)	29000	290000		SOIL_RF(f)_83-32-9
PAH	Acenaphthene	83-32-9	Montane shrew (Mammalian insectivore)	130	1300		SOIL_MS(i)_83-32-9
PAH	Acenaphthene	83-32-9	Mountain cottontail (Mammalian herbivore)	530	5300		SOIL_DC(p)_83-32-9
PAH	Acenaphthylene	208-96-8	Deer mouse (Mammalian omnivore)	160	1600		SOIL_DM(ip)_208-96-8
PAH	Acenaphthylene	208-96-8	Gray fox (Mammalian top carnivore)	28000	280000		SOIL_RF(f)_208-96-8
PAH	Acenaphthylene	208-96-8	Montane shrew (Mammalian insectivore)	120	1200		SOIL_MS(i)_208-96-8
PAH	Acenaphthylene	208-96-8	Mountain cottontail (Mammalian herbivore)	540	5400		SOIL_DC(p)_208-96-8
PAH	Anthracene	120-12-7	Deer mouse (Mammalian omnivore)	300	3000		SOIL_DM(ip)_120-12-7
PAH	Anthracene	120-12-7	Generic plant (Terrestrial autotroph - producer)	6.8	9		SOIL_GP_120-12-7
PAH	Anthracene	120-12-7	Gray fox (Mammalian top carnivore)	38000	380000		SOIL_RF(f)_120-12-7
PAH	Anthracene	120-12-7	Montane shrew (Mammalian insectivore)	210	2100		SOIL_MS(i)_120-12-7
PAH	Anthracene	120-12-7	Mountain cottontail (Mammalian herbivore)	1200	12000		SOIL_DC(p)_120-12-7
PAH	Benzo(a)anthracene	56-55-3	American kestrel (Avian top carnivore)	28	280		SOIL_AK(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American kestrel (insectivore / carnivore)	6.4	64		SOIL_AK(fi)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian herbivore)	0.73	7.3		SOIL_AR(p)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian insectivore)	0.88	8.8		SOIL_AR(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	American robin (Avian omnivore)	0.8	8		SOIL_AR(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Deer mouse (Mammalian omnivore)	3.4	34		SOIL_DM(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Generic plant (Terrestrial autotroph - producer)	18	180		SOIL_GP_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Gray fox (Mammalian top carnivore)	110	1100		SOIL_RF(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Montane shrew (Mammalian insectivore)	4	40		SOIL_MS(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	Mountain cottontail (Mammalian herbivore)	6.1	61		SOIL_DC(p)_56-55-3
PAH	Benzo(a)pyrene	50-32-8	Deer mouse (Mammalian omnivore)	84	260		SOIL_DM(ip)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Gray fox (Mammalian top carnivore)	3400	11000		SOIL_RF(f)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Montane shrew (Mammalian insectivore)	62	190		SOIL_MS(i)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	Mountain cottontail (Mammalian herbivore)	260	830		SOIL_DC(p)_50-32-8
PAH	Benzo(b)fluoranthene	205-99-2	Deer mouse (Mammalian omnivore)	51	510		SOIL_DM(ip)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Generic plant (Terrestrial autotroph - producer)	18	180		SOIL_GP_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Gray fox (Mammalian top carnivore)	2400	24000		SOIL_RF(f)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	Montane shrew (Mammalian insectivore)	44	440		SOIL_MS(i)_205-99-2

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
PAH	Benzo(b)fluoranthene	205-99-2	Mountain cottontail (Mammalian herbivore)	130	1300		SOIL_DC(p)_205-99-2
PAH	Benzo(g,h,i)perylene	191-24-2	Deer mouse (Mammalian omnivore)	46	460		SOIL_DM(ip)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Gray fox (Mammalian top carnivore)	3600	36000		SOIL_RF(f)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Montane shrew (Mammalian insectivore)	25	250		SOIL_MS(i)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	Mountain cottontail (Mammalian herbivore)	470	4700		SOIL_DC(p)_191-24-2
PAH	Benzo(k)fluoranthene	207-08-9	Deer mouse (Mammalian omnivore)	99	990		SOIL_DM(ip)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Gray fox (Mammalian top carnivore)	4300	43000		SOIL_RF(f)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Montane shrew (Mammalian insectivore)	71	710		SOIL_MS(i)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	Mountain cottontail (Mammalian herbivore)	330	3300		SOIL_DC(p)_207-08-9
PAH	Chrysene	218-01-9	Deer mouse (Mammalian omnivore)	3.1	31		SOIL_DM(ip)_218-01-9
PAH	Chrysene	218-01-9	Gray fox (Mammalian top carnivore)	110	1100		SOIL_RF(f)_218-01-9
PAH	Chrysene	218-01-9	Montane shrew (Mammalian insectivore)	3.1	31		SOIL_MS(i)_218-01-9
PAH	Chrysene	218-01-9	Mountain cottontail (Mammalian herbivore)	6.3	63		SOIL_DC(p)_218-01-9
PAH	Dibenzo(a,h)anthracene	53-70-3	Deer mouse (Mammalian omnivore)	22	220		SOIL_DM(ip)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Gray fox (Mammalian top carnivore)	850	8500		SOIL_RF(f)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Montane shrew (Mammalian insectivore)	14	140		SOIL_MS(i)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	Mountain cottontail (Mammalian herbivore)	84	840		SOIL_DC(p)_53-70-3
PAH	Fluoranthene	206-44-0	Deer mouse (Mammalian omnivore)	38	380		SOIL_DM(ip)_206-44-0
PAH	Fluoranthene	206-44-0	Earthworm (Soil-dwelling invertebrate)	10	23		SOIL_EW_206-44-0
PAH	Fluoranthene	206-44-0	Gray fox (Mammalian top carnivore)	3900	39000		SOIL_RF(f)_206-44-0
PAH	Fluoranthene	206-44-0	Montane shrew (Mammalian insectivore)	22	220		SOIL_MS(i)_206-44-0
PAH	Fluoranthene	206-44-0	Mountain cottontail (Mammalian herbivore)	270	2700		SOIL_DC(p)_206-44-0
PAH	Fluorene	86-73-7	Deer mouse (Mammalian omnivore)	340	680		SOIL_DM(ip)_86-73-7
PAH	Fluorene	86-73-7	Earthworm (Soil-dwelling invertebrate)	3.7	19		SOIL_EW_86-73-7
PAH	Fluorene	86-73-7	Gray fox (Mammalian top carnivore)	50000	100000		SOIL_RF(f)_86-73-7
PAH	Fluorene	86-73-7	Montane shrew (Mammalian insectivore)	250	510		SOIL_MS(i)_86-73-7
PAH	Fluorene	86-73-7	Mountain cottontail (Mammalian herbivore)	1100	2300		SOIL_DC(p)_86-73-7
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Deer mouse (Mammalian omnivore)	110	1100		SOIL_DM(ip)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Gray fox (Mammalian top carnivore)	4600	46000		SOIL_RF(f)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Montane shrew (Mammalian insectivore)	71	710		SOIL_MS(i)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	Mountain cottontail (Mammalian herbivore)	510	5100		SOIL_DC(p)_193-39-5
PAH	Methylnaphthalene[2-]	91-57-6	Deer mouse (Mammalian omnivore)	24	240		SOIL_DM(ip)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Gray fox (Mammalian top carnivore)	4900	49000		SOIL_RF(f)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Montane shrew (Mammalian insectivore)	16	160		SOIL_MS(i)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	Mountain cottontail (Mammalian herbivore)	110	1100		SOIL_DC(p)_91-57-6
PAH	Naphthalene	91-20-3	American kestrel (Avian top carnivore)	2100	21000		SOIL_AK(f)_91-20-3
PAH	Naphthalene	91-20-3	American kestrel (insectivore / carnivore)	78	780		SOIL_AK(fi)_91-20-3
PAH	Naphthalene	91-20-3	American robin (Avian herbivore)	3.4	34		SOIL_AR(p)_91-20-3
PAH	Naphthalene	91-20-3	American robin (Avian insectivore)	15	150		SOIL_AR(i)_91-20-3
PAH	Naphthalene	91-20-3	American robin (Avian omnivore)	5.7	57		SOIL_AR(ip)_91-20-3
PAH	Naphthalene	91-20-3	Deer mouse (Mammalian omnivore)	9.6	27		SOIL_DM(ip)_91-20-3
PAH	Naphthalene	91-20-3	Generic plant (Terrestrial autotroph - producer)	1	10		SOIL_GP_91-20-3
PAH	Naphthalene	91-20-3	Gray fox (Mammalian top carnivore)	5800	16000		SOIL_RF(f)_91-20-3
PAH	Naphthalene	91-20-3	Montane shrew (Mammalian insectivore)	28	79		SOIL_MS(i)_91-20-3
PAH	Naphthalene	91-20-3	Mountain cottontail (Mammalian herbivore)	14	40		SOIL_DC(p)_91-20-3
PAH	Phenanthrene	85-01-8	Deer mouse (Mammalian omnivore)	15	150		SOIL_DM(ip)_85-01-8
PAH	Phenanthrene	85-01-8	Earthworm (Soil-dwelling invertebrate)	5.5	12		SOIL_EW_85-01-8
PAH	Phenanthrene	85-01-8	Gray fox (Mammalian top carnivore)	1900	19000		SOIL_RF(f)_85-01-8
PAH	Phenanthrene	85-01-8	Montane shrew (Mammalian insectivore)	11	110		SOIL_MS(i)_85-01-8
PAH	Phenanthrene	85-01-8	Mountain cottontail (Mammalian herbivore)	62	620		SOIL_DC(p)_85-01-8
PAH	Pyrene	129-00-0	American kestrel (Avian top carnivore)	3000	30000		SOIL_AK(f)_129-00-0
PAH	Pyrene	129-00-0	American kestrel (insectivore / carnivore)	160	1600		SOIL_AK(fi)_129-00-0
PAH	Pyrene	129-00-0	American robin (Avian herbivore)	68	680		SOIL_AR(p)_129-00-0
PAH	Pyrene	129-00-0	American robin (Avian insectivore)	33	330		SOIL_AR(i)_129-00-0

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
PAH	Pyrene	129-00-0	American robin (Avian omnivore)	44	440		SOIL_AR(ip)_129-00-0
PAH	Pyrene	129-00-0	Deer mouse (Mammalian omnivore)	31	310		SOIL_DM(ip)_129-00-0
PAH	Pyrene	129-00-0	Earthworm (Soil-dwelling invertebrate)	10	20		SOIL_EW_129-00-0
PAH	Pyrene	129-00-0	Gray fox (Mammalian top carnivore)	3100	31000		SOIL_RF(f)_129-00-0
PAH	Pyrene	129-00-0	Montane shrew (Mammalian insectivore)	23	230		SOIL_MS(i)_129-00-0
PAH	Pyrene	129-00-0	Mountain cottontail (Mammalian herbivore)	110	1100		SOIL_DC(p)_129-00-0
SVOC	Benzoic Acid	65-85-0	Deer mouse (Mammalian omnivore)	1.3	13		SOIL_DM(ip)_65-85-0
SVOC	Benzoic Acid	65-85-0	Gray fox (Mammalian top carnivore)	2000	20000		SOIL_RF(f)_65-85-0
SVOC	Benzoic Acid	65-85-0	Montane shrew (Mammalian insectivore)	1	10		SOIL_MS(i)_65-85-0
SVOC	Benzoic Acid	65-85-0	Mountain cottontail (Mammalian herbivore)	4.6	46		SOIL_DC(p)_65-85-0
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American kestrel (Avian top carnivore)	9.3	93		SOIL_AK(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American kestrel (insectivore / carnivore)	0.096	0.96		SOIL_AK(fi)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian herbivore)	16	160		SOIL_AR(p)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian insectivore)	0.02	0.2		SOIL_AR(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	American robin (Avian omnivore)	0.04	0.4		SOIL_AR(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Deer mouse (Mammalian omnivore)	1.1	11		SOIL_DM(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Gray fox (Mammalian top carnivore)	500	5000		SOIL_RF(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Montane shrew (Mammalian insectivore)	0.6	6		SOIL_MS(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	Mountain cottontail (Mammalian herbivore)	1900	19000		SOIL_DC(p)_117-81-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Deer mouse (Mammalian omnivore)	160	1600		SOIL_DM(ip)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Gray fox (Mammalian top carnivore)	23000	230000		SOIL_RF(f)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Montane shrew (Mammalian insectivore)	90	900		SOIL_MS(i)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	Mountain cottontail (Mammalian herbivore)	2400	24000		SOIL_DC(p)_85-68-7
SVOC	Carbazole	86-74-8	Deer mouse (Mammalian omnivore)	79	790		SOIL_DM(ip)_86-74-8
SVOC	Carbazole	86-74-8	Gray fox (Mammalian top carnivore)	13000	130000		SOIL_RF(f)_86-74-8
SVOC	Carbazole	86-74-8	Montane shrew (Mammalian insectivore)	110	1100		SOIL_MS(i)_86-74-8
SVOC	Carbazole	86-74-8	Mountain cottontail (Mammalian herbivore)	140	1400		SOIL_DC(p)_86-74-8
SVOC	Chlorobenzene	108-90-7	Deer mouse (Mammalian omnivore)	53	530		SOIL_DM(ip)_108-90-7
SVOC	Chlorobenzene	108-90-7	Earthworm (Soil-dwelling invertebrate)	2.4	24		SOIL_EW_108-90-7
SVOC	Chlorobenzene	108-90-7	Gray fox (Mammalian top carnivore)	25000	250000		SOIL_RF(f)_108-90-7
SVOC	Chlorobenzene	108-90-7	Montane shrew (Mammalian insectivore)	43	430		SOIL_MS(i)_108-90-7
SVOC	Chlorobenzene	108-90-7	Mountain cottontail (Mammalian herbivore)	170	1700		SOIL_DC(p)_108-90-7
SVOC	Chlorophenol[2-]	95-57-8	American kestrel (Avian top carnivore)	310	3100		SOIL_AK(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American kestrel (insectivore / carnivore)	14	140		SOIL_AK(fi)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian herbivore)	0.39	3.9		SOIL_AR(p)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian insectivore)	2.6	26		SOIL_AR(i)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	American robin (Avian omnivore)	0.68	6.8		SOIL_AR(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Deer mouse (Mammalian omnivore)	0.54	5.4		SOIL_DM(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Gray fox (Mammalian top carnivore)	340	3400		SOIL_RF(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Montane shrew (Mammalian insectivore)	2.3	23		SOIL_MS(i)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	Mountain cottontail (Mammalian herbivore)	0.74	7.4		SOIL_DC(p)_95-57-8
SVOC	Dibenzofuran	132-64-9	Generic plant (Terrestrial autotroph - producer)	6.1	61		SOIL_GP_132-64-9
SVOC	Diethyl Phthalate	84-66-2	Deer mouse (Mammalian omnivore)	3600	36000		SOIL_DM(ip)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Generic plant (Terrestrial autotroph - producer)	100	1000		SOIL_GP_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Gray fox (Mammalian top carnivore)	2500000	25000000		SOIL_RF(f)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Montane shrew (Mammalian insectivore)	3600	36000		SOIL_MS(i)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	Mountain cottontail (Mammalian herbivore)	8800	88000		SOIL_DC(p)_84-66-2
SVOC	Dimethyl Phthalate	131-11-3	Deer mouse (Mammalian omnivore)	38	460		SOIL_DM(ip)_131-11-3

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
SVOC	Dimethyl Phthalate	131-11-3	Earthworm (Soil-dwelling invertebrate)	10	100		SOIL_EW_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Gray fox (Mammalian top carnivore)	48000	590000		SOIL_RF(f)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Montane shrew (Mammalian insectivore)	80	980		SOIL_MS(i)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	Mountain cottontail (Mammalian herbivore)	60	740		SOIL_DC(p)_131-11-3
SVOC	Di-n-Butyl Phthalate	84-74-2	American kestrel (Avian top carnivore)	2	20		SOIL_AK(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American kestrel (insectivore / carnivore)	0.052	0.52		SOIL_AK(fi)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian herbivore)	0.38	3.8		SOIL_AR(p)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian insectivore)	0.011	0.11		SOIL_AR(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	American robin (Avian omnivore)	0.021	0.21		SOIL_AR(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Deer mouse (Mammalian omnivore)	360	860		SOIL_DM(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Generic plant (Terrestrial autotroph - producer)	160	600		SOIL_GP_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Gray fox (Mammalian top carnivore)	62000	140000		SOIL_RF(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Montane shrew (Mammalian insectivore)	180	450		SOIL_MS(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	Mountain cottontail (Mammalian herbivore)	17000	40000		SOIL_DC(p)_84-74-2
SVOC	Di-n-octylphthalate	117-84-0	Deer mouse (Mammalian omnivore)	1.8	18		SOIL_DM(ip)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Gray fox (Mammalian top carnivore)	1300	13000		SOIL_RF(f)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Montane shrew (Mammalian insectivore)	0.91	9.1		SOIL_MS(i)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	Mountain cottontail (Mammalian herbivore)	8400	84000		SOIL_DC(p)_117-84-0
SVOC	Methylphenol[2-]	95-48-7	Deer mouse (Mammalian omnivore)	580	5800		SOIL_DM(ip)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Generic plant (Terrestrial autotroph - producer)	0.67	7		SOIL_GP_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Gray fox (Mammalian top carnivore)	160000	1600000		SOIL_RF(f)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Montane shrew (Mammalian insectivore)	1500	15000		SOIL_MS(i)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	Mountain cottontail (Mammalian herbivore)	880	8800		SOIL_DC(p)_95-48-7
SVOC	Methylphenol[3-]	108-39-4	Generic plant (Terrestrial autotroph - producer)	0.69	7		SOIL_GP_108-39-4
SVOC	Nitroaniline[2-]	88-74-4	Deer mouse (Mammalian omnivore)	5.3	10		SOIL_DM(ip)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Gray fox (Mammalian top carnivore)	2200	4400		SOIL_RF(f)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Montane shrew (Mammalian insectivore)	6.5	13		SOIL_MS(i)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	Mountain cottontail (Mammalian herbivore)	11	22		SOIL_DC(p)_88-74-4
SVOC	Nitrobenzene	98-95-3	Deer mouse (Mammalian omnivore)	4.8	48		SOIL_DM(ip)_98-95-3
SVOC	Nitrobenzene	98-95-3	Earthworm (Soil-dwelling invertebrate)	2.2	22		SOIL_EW_98-95-3
SVOC	Nitrobenzene	98-95-3	Gray fox (Mammalian top carnivore)	4100	41000		SOIL_RF(f)_98-95-3
SVOC	Nitrobenzene	98-95-3	Montane shrew (Mammalian insectivore)	21	210		SOIL_MS(i)_98-95-3
SVOC	Nitrobenzene	98-95-3	Mountain cottontail (Mammalian herbivore)	6.7	67		SOIL_DC(p)_98-95-3
SVOC	Pentachloronitrobenzene	82-68-8	American kestrel (Avian top carnivore)	110	1100		SOIL_AK(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American kestrel (insectivore / carnivore)	3.3	33		SOIL_AK(fi)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian herbivore)	21	210		SOIL_AR(p)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian insectivore)	0.7	7		SOIL_AR(i)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	American robin (Avian omnivore)	1.3	13		SOIL_AR(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Deer mouse (Mammalian omnivore)	22	220		SOIL_DM(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Gray fox (Mammalian top carnivore)	3500	35000		SOIL_RF(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Montane shrew (Mammalian insectivore)	11	110		SOIL_MS(i)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	Mountain cottontail (Mammalian herbivore)	930	9300		SOIL_DC(p)_82-68-8
SVOC	Pentachlorophenol	87-86-5	American kestrel (Avian top carnivore)	57	570		SOIL_AK(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American kestrel (insectivore / carnivore)	1.7	17		SOIL_AK(fi)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian herbivore)	29	290		SOIL_AR(p)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian insectivore)	0.36	3.6		SOIL_AR(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	American robin (Avian omnivore)	0.72	7.2		SOIL_AR(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Deer mouse (Mammalian omnivore)	1.5	15		SOIL_DM(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Earthworm (Soil-dwelling invertebrate)	31	150		SOIL_EW_87-86-5
SVOC	Pentachlorophenol	87-86-5	Generic plant (Terrestrial autotroph - producer)	5	50		SOIL_GP_87-86-5
SVOC	Pentachlorophenol	87-86-5	Gray fox (Mammalian top carnivore)	230	2300		SOIL_RF(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Montane shrew (Mammalian insectivore)	0.81	8.1		SOIL_MS(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	Mountain cottontail (Mammalian herbivore)	180	1800		SOIL_DC(p)_87-86-5

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
SVOC	Phenol	108-95-2	Deer mouse (Mammalian omnivore)	37	370		SOIL_DM(ip)_108-95-2
SVOC	Phenol	108-95-2	Earthworm (Soil-dwelling invertebrate)	1.8	18		SOIL_EW_108-95-2
SVOC	Phenol	108-95-2	Generic plant (Terrestrial autotroph - producer)	0.79	8		SOIL_GP_108-95-2
SVOC	Phenol	108-95-2	Gray fox (Mammalian top carnivore)	43000	430000		SOIL_RF(f)_108-95-2
SVOC	Phenol	108-95-2	Montane shrew (Mammalian insectivore)	640	6400		SOIL_MS(i)_108-95-2
SVOC	Phenol	108-95-2	Mountain cottontail (Mammalian herbivore)	47	470		SOIL_DC(p)_108-95-2
VOC	Acetone	67-64-1	American kestrel (Avian top carnivore)	66000	660000		SOIL_AK(f)_67-64-1
VOC	Acetone	67-64-1	American kestrel (insectivore / carnivore)	840	8400		SOIL_AK(fi)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian herbivore)	7.5	75		SOIL_AR(p)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian insectivore)	170	1700		SOIL_AR(i)_67-64-1
VOC	Acetone	67-64-1	American robin (Avian omnivore)	14	140		SOIL_AR(ip)_67-64-1
VOC	Acetone	67-64-1	Deer mouse (Mammalian omnivore)	1.2	6.3		SOIL_DM(ip)_67-64-1
VOC	Acetone	67-64-1	Gray fox (Mammalian top carnivore)	7800	39000		SOIL_RF(f)_67-64-1
VOC	Acetone	67-64-1	Montane shrew (Mammalian insectivore)	15	79		SOIL_MS(i)_67-64-1
VOC	Acetone	67-64-1	Mountain cottontail (Mammalian herbivore)	1.6	8		SOIL_DC(p)_67-64-1
VOC	Benzene	71-43-2	Deer mouse (Mammalian omnivore)	24	240		SOIL_DM(ip)_71-43-2
VOC	Benzene	71-43-2	Gray fox (Mammalian top carnivore)	18000	180000		SOIL_RF(f)_71-43-2
VOC	Benzene	71-43-2	Montane shrew (Mammalian insectivore)	49	490		SOIL_MS(i)_71-43-2
VOC	Benzene	71-43-2	Mountain cottontail (Mammalian herbivore)	38	380		SOIL_DC(p)_71-43-2
VOC	Benzyl Alcohol	100-51-6	Deer mouse (Mammalian omnivore)	120	1200		SOIL_DM(ip)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Gray fox (Mammalian top carnivore)	110000	1100000		SOIL_RF(f)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Montane shrew (Mammalian insectivore)	270	2700		SOIL_MS(i)_100-51-6
VOC	Benzyl Alcohol	100-51-6	Mountain cottontail (Mammalian herbivore)	190	1900		SOIL_DC(p)_100-51-6
VOC	Butanone[2-]	78-93-3	Deer mouse (Mammalian omnivore)	350	920		SOIL_DM(ip)_78-93-3
VOC	Butanone[2-]	78-93-3	Gray fox (Mammalian top carnivore)	1300000	3500000		SOIL_RF(f)_78-93-3
VOC	Butanone[2-]	78-93-3	Montane shrew (Mammalian insectivore)	2700	6900		SOIL_MS(i)_78-93-3
VOC	Butanone[2-]	78-93-3	Mountain cottontail (Mammalian herbivore)	470	1200		SOIL_DC(p)_78-93-3
VOC	Carbon Disulfide	75-15-0	Deer mouse (Mammalian omnivore)	0.81	8.1		SOIL_DM(ip)_75-15-0
VOC	Carbon Disulfide	75-15-0	Gray fox (Mammalian top carnivore)	190	1900		SOIL_RF(f)_75-15-0
VOC	Carbon Disulfide	75-15-0	Montane shrew (Mammalian insectivore)	1.2	12		SOIL_MS(i)_75-15-0
VOC	Carbon Disulfide	75-15-0	Mountain cottontail (Mammalian herbivore)	1.4	14		SOIL_DC(p)_75-15-0
VOC	Chloroaniline[4-]	106-47-8	Earthworm (Soil-dwelling invertebrate)	1.8	18		SOIL_EW_106-47-8
VOC	Chloroaniline[4-]	106-47-8	Generic plant (Terrestrial autotroph - producer)	1	10		SOIL_GP_106-47-8
VOC	Chloroform	67-66-3	Deer mouse (Mammalian omnivore)	8	21		SOIL_DM(ip)_67-66-3
VOC	Chloroform	67-66-3	Gray fox (Mammalian top carnivore)	8900	24000		SOIL_RF(f)_67-66-3
VOC	Chloroform	67-66-3	Montane shrew (Mammalian insectivore)	8.2	22		SOIL_MS(i)_67-66-3
VOC	Chloroform	67-66-3	Mountain cottontail (Mammalian herbivore)	19	52		SOIL_DC(p)_67-66-3
VOC	Dichlorobenzene[1,2-]	95-50-1	Deer mouse (Mammalian omnivore)	1.5	15		SOIL_DM(ip)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Gray fox (Mammalian top carnivore)	480	4800		SOIL_RF(f)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Montane shrew (Mammalian insectivore)	0.92	9.2		SOIL_MS(i)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	Mountain cottontail (Mammalian herbivore)	12	120		SOIL_DC(p)_95-50-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Deer mouse (Mammalian omnivore)	1.2	12		SOIL_DM(ip)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Gray fox (Mammalian top carnivore)	380	3800		SOIL_RF(f)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Montane shrew (Mammalian insectivore)	0.74	7.4		SOIL_MS(i)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	Mountain cottontail (Mammalian herbivore)	13	130		SOIL_DC(p)_541-73-1
VOC	Dichlorobenzene[1,4-]	106-46-7	Deer mouse (Mammalian omnivore)	1.5	6		SOIL_DM(ip)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Earthworm (Soil-dwelling invertebrate)	1.2	12		SOIL_EW_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Gray fox (Mammalian top carnivore)	470	1800		SOIL_RF(f)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Montane shrew (Mammalian insectivore)	0.89	3.5		SOIL_MS(i)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	Mountain cottontail (Mammalian herbivore)	12	49		SOIL_DC(p)_106-46-7
VOC	Dichloroethane[1,1-]	75-34-3	Deer mouse (Mammalian omnivore)	210	2100		SOIL_DM(ip)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	Gray fox (Mammalian top carnivore)	250000	2500000		SOIL_RF(f)_75-34-3

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
VOC	Dichloroethane[1,1-]	75-34-3	Montane shrew (Mammalian insectivore)	290	2900		SOIL_MS(i)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	Mountain cottontail (Mammalian herbivore)	410	4100		SOIL_DC(p)_75-34-3
VOC	Dichloroethane[1,2-]	107-06-2	American kestrel (Avian top carnivore)	1300	2700		SOIL_AK(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American kestrel (insectivore / carnivore)	22	44		SOIL_AK(fi)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian herbivore)	0.85	1.6		SOIL_AR(p)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian insectivore)	4.5	9		SOIL_AR(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	American robin (Avian omnivore)	1.4	2.8		SOIL_AR(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Deer mouse (Mammalian omnivore)	27	270		SOIL_DM(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Gray fox (Mammalian top carnivore)	36000	360000		SOIL_RF(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Montane shrew (Mammalian insectivore)	91	910		SOIL_MS(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	Mountain cottontail (Mammalian herbivore)	39	390		SOIL_DC(p)_107-06-2
VOC	Dichloroethene[1,1-]	75-35-4	Deer mouse (Mammalian omnivore)	14	140		SOIL_DM(ip)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Gray fox (Mammalian top carnivore)	14000	140000		SOIL_RF(f)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Montane shrew (Mammalian insectivore)	11	110		SOIL_MS(i)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	Mountain cottontail (Mammalian herbivore)	44	440		SOIL_DC(p)_75-35-4
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Deer mouse (Mammalian omnivore)	25	250		SOIL_DM(ip)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Gray fox (Mammalian top carnivore)	25000	250000		SOIL_RF(f)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Montane shrew (Mammalian insectivore)	24	240		SOIL_MS(i)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	Mountain cottontail (Mammalian herbivore)	64	640		SOIL_DC(p)_540-59-0
VOC	Diphenylamine	122-39-4	American kestrel (Avian top carnivore)	3900	6500		SOIL_AK(f)_122-39-4
VOC	Diphenylamine	122-39-4	American kestrel (insectivore / carnivore)	49	81		SOIL_AK(fi)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian herbivore)	78	130		SOIL_AR(p)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian insectivore)	10	16		SOIL_AR(i)_122-39-4
VOC	Diphenylamine	122-39-4	American robin (Avian omnivore)	17	29		SOIL_AR(ip)_122-39-4
VOC	Hexachlorobenzene	118-74-1	American kestrel (Avian top carnivore)	12	120		SOIL_AK(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American kestrel (insectivore / carnivore)	0.37	3.7		SOIL_AK(fi)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian herbivore)	83	830		SOIL_AR(p)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian insectivore)	0.079	0.79		SOIL_AR(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	American robin (Avian omnivore)	0.15	1.5		SOIL_AR(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Deer mouse (Mammalian omnivore)	0.39	3.9		SOIL_DM(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Earthworm (Soil-dwelling invertebrate)	10	100		SOIL_EW_118-74-1
VOC	Hexachlorobenzene	118-74-1	Generic plant (Terrestrial autotroph - producer)	10	100		SOIL_GP_118-74-1
VOC	Hexachlorobenzene	118-74-1	Gray fox (Mammalian top carnivore)	59	590		SOIL_RF(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Montane shrew (Mammalian insectivore)	0.2	2		SOIL_MS(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	Mountain cottontail (Mammalian herbivore)	910	9100		SOIL_DC(p)_118-74-1
VOC	Hexanone[2-]	591-78-6	American kestrel (Avian top carnivore)	290	2900		SOIL_AK(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	American kestrel (insectivore / carnivore)	1.7	17		SOIL_AK(fi)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian herbivore)	0.47	4.7		SOIL_AR(p)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian insectivore)	0.36	3.6		SOIL_AR(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	American robin (Avian omnivore)	0.41	4.1		SOIL_AR(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	Deer mouse (Mammalian omnivore)	6.1	23		SOIL_DM(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	Gray fox (Mammalian top carnivore)	5900	22000		SOIL_RF(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	Montane shrew (Mammalian insectivore)	5.4	20		SOIL_MS(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	Mountain cottontail (Mammalian herbivore)	17	65		SOIL_DC(p)_591-78-6
VOC	Iodomethane	74-88-4	American kestrel (Avian top carnivore)	46	92		SOIL_AK(f)_74-88-4
VOC	Iodomethane	74-88-4	American kestrel (insectivore / carnivore)	0.29	0.59		SOIL_AK(fi)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian herbivore)	0.038	0.076		SOIL_AR(p)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian insectivore)	0.062	0.12		SOIL_AR(i)_74-88-4
VOC	Iodomethane	74-88-4	American robin (Avian omnivore)	0.047	0.095		SOIL_AR(ip)_74-88-4
VOC	Methyl-2-pentanone[4-]	108-10-1	Deer mouse (Mammalian omnivore)	9.7	97		SOIL_DM(ip)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Gray fox (Mammalian top carnivore)	18000	180000		SOIL_RF(f)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Montane shrew (Mammalian insectivore)	15	150		SOIL_MS(i)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	Mountain cottontail (Mammalian herbivore)	17	170		SOIL_DC(p)_108-10-1
VOC	Methylene Chloride	75-09-2	Deer mouse (Mammalian omnivore)	2.6	22		SOIL_DM(ip)_75-09-2

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
VOC	Methylene Chloride	75-09-2	Generic plant (Terrestrial autotroph - producer)	1600	16000		SOIL_GP_75-09-2
VOC	Methylene Chloride	75-09-2	Gray fox (Mammalian top carnivore)	4300	36000		SOIL_RF(f)_75-09-2
VOC	Methylene Chloride	75-09-2	Montane shrew (Mammalian insectivore)	9.2	79		SOIL_MS(i)_75-09-2
VOC	Methylene Chloride	75-09-2	Mountain cottontail (Mammalian herbivore)	3.8	32		SOIL_DC(p)_75-09-2
VOC	Styrene	100-42-5	Earthworm (Soil-dwelling invertebrate)	1.2	12		SOIL_EW_100-42-5
VOC	Styrene	100-42-5	Generic plant (Terrestrial autotroph - producer)	3.2	32		SOIL_GP_100-42-5
VOC	Tetrachloroethene	127-18-4	Deer mouse (Mammalian omnivore)	0.35	1.7		SOIL_DM(ip)_127-18-4
VOC	Tetrachloroethene	127-18-4	Generic plant (Terrestrial autotroph - producer)	10	100		SOIL_GP_127-18-4
VOC	Tetrachloroethene	127-18-4	Gray fox (Mammalian top carnivore)	120	630		SOIL_RF(f)_127-18-4
VOC	Tetrachloroethene	127-18-4	Montane shrew (Mammalian insectivore)	0.18	0.94		SOIL_MS(i)_127-18-4
VOC	Tetrachloroethene	127-18-4	Mountain cottontail (Mammalian herbivore)	9.5	47		SOIL_DC(p)_127-18-4
VOC	Isopropyltoluene[4-]	99-87-6	Deer mouse (Mammalian omnivore)	25	250	Use toluene	SOIL_DM(ip)_108-88-3
VOC	Isopropyltoluene[4-]	99-87-6	Generic plant (Terrestrial autotroph - producer)	200	2000	Use toluene	SOIL_GP_108-88-3
VOC	Isopropyltoluene[4-]	99-87-6	Gray fox (Mammalian top carnivore)	12000	120000	Use toluene	SOIL_RF(f)_108-88-3
VOC	Isopropyltoluene[4-]	99-87-6	Montane shrew (Mammalian insectivore)	23	230	Use toluene	SOIL_MS(i)_108-88-3
VOC	Isopropyltoluene[4-]	99-87-6	Mountain cottontail (Mammalian herbivore)	66	660	Use toluene	SOIL_DC(p)_108-88-3
VOC	Toluene	108-88-3	Deer mouse (Mammalian omnivore)	25	250		SOIL_DM(ip)_108-88-3
VOC	Toluene	108-88-3	Generic plant (Terrestrial autotroph - producer)	200	2000		SOIL_GP_108-88-3
VOC	Toluene	108-88-3	Gray fox (Mammalian top carnivore)	12000	120000		SOIL_RF(f)_108-88-3
VOC	Toluene	108-88-3	Montane shrew (Mammalian insectivore)	23	230		SOIL_MS(i)_108-88-3
VOC	Toluene	108-88-3	Mountain cottontail (Mammalian herbivore)	66	660		SOIL_DC(p)_108-88-3
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Deer mouse (Mammalian omnivore)	0.51	5.1		SOIL_DM(ip)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Earthworm (Soil-dwelling invertebrate)	1.2	12		SOIL_EW_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Gray fox (Mammalian top carnivore)	110	1100		SOIL_RF(f)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Montane shrew (Mammalian insectivore)	0.27	2.7		SOIL_MS(i)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	Mountain cottontail (Mammalian herbivore)	12	120		SOIL_DC(p)_120-82-1
VOC	Trichloroethane[1,1,1-]	71-55-6	Deer mouse (Mammalian omnivore)	400	4000		SOIL_DM(ip)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Gray fox (Mammalian top carnivore)	310000	3100000		SOIL_RF(f)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Montane shrew (Mammalian insectivore)	260	2600		SOIL_MS(i)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	Mountain cottontail (Mammalian herbivore)	2000	20000		SOIL_DC(p)_71-55-6
VOC	Trichloroethene	79-01-6	Deer mouse (Mammalian omnivore)	54	540		SOIL_DM(ip)_79-01-6
VOC	Trichloroethene	79-01-6	Gray fox (Mammalian top carnivore)	42000	420000		SOIL_RF(f)_79-01-6
VOC	Trichloroethene	79-01-6	Montane shrew (Mammalian insectivore)	42	420		SOIL_MS(i)_79-01-6
VOC	Trichloroethene	79-01-6	Mountain cottontail (Mammalian herbivore)	190	1900		SOIL_DC(p)_79-01-6
VOC	Trichlorofluoromethane	75-69-4	Deer mouse (Mammalian omnivore)	97	650		SOIL_DM(ip)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Gray fox (Mammalian top carnivore)	62000	420000		SOIL_RF(f)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Montane shrew (Mammalian insectivore)	52	350		SOIL_MS(i)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	Mountain cottontail (Mammalian herbivore)	1800	12000		SOIL_DC(p)_75-69-4
VOC	Vinyl Chloride	75-01-4	Deer mouse (Mammalian omnivore)	0.13	1.3		SOIL_DM(ip)_75-01-4
VOC	Vinyl Chloride	75-01-4	Gray fox (Mammalian top carnivore)	110	1100		SOIL_RF(f)_75-01-4
VOC	Vinyl Chloride	75-01-4	Montane shrew (Mammalian insectivore)	0.12	1.2		SOIL_MS(i)_75-01-4
VOC	Vinyl Chloride	75-01-4	Mountain cottontail (Mammalian herbivore)	0.34	3.4		SOIL_DC(p)_75-01-4

Analyte Group	Analyte Name	Analyte Code	ESL Receptor	No Effect ESL	Low Effect ESL	Note	ESL ID
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	American kestrel (Avian top carnivore)	13000	130000	Use Xylene total	SOIL_AK(f)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	American kestrel (insectivore / carnivore)	190	1900	Use Xylene total	SOIL_AK(fi)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	American robin (Avian herbivore)	89	890	Use Xylene total	SOIL_AR(p)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	American robin (Avian insectivore)	41	410	Use Xylene total	SOIL_AR(i)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	American robin (Avian omnivore)	56	560	Use Xylene total	SOIL_AR(ip)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	Deer mouse (Mammalian omnivore)	1.9	2.4	Use Xylene total	SOIL_DM(ip)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	Generic plant (Terrestrial autotroph - producer)	100	1000	Use Xylene total	SOIL_GP_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	Gray fox (Mammalian top carnivore)	750	930	Use Xylene total	SOIL_RF(f)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	Montane shrew (Mammalian insectivore)	1.4	1.8	Use Xylene total	SOIL_MS(i)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	Mountain cottontail (Mammalian herbivore)	7.6	9.5	Use Xylene total	SOIL_DC(p)_1330-20-7

Supplement 4-9

Revision of 2011 Open Detonation Risk Assessment

EXECUTIVE SUMMARY

The areas around two open detonation (OD) units operating at the Los Alamos National Laboratory at Technical Area 36 (TA-36) and TA-39 were sampled. Surface soil samples (0–1 ft) were collected from 19 and 10 locations, respectively, and analyzed for inorganic chemicals, organic chemicals, and isotopic uranium. Data from these samples were used to conduct human health and ecological risk-screening assessments at the two sites.

For the human health risk-screening assessment, both the industrial and residential scenarios were evaluated. The exposure point concentrations for the chemicals of potential concern were less than their respective industrial and residential soil screening levels and screening action levels. The potential risks/doses for the industrial and residential scenarios were below the New Mexico Environment Department and U.S. Department of Energy target levels.

Ecological receptors were evaluated using several lines of evidence, including minimum ecological screening level comparisons, hazard index analyses, potential effects to populations (individuals for threatened and endangered species), and lowest observed adverse effect level analyses. The ecological risk screening assessments indicated potential risks to the robin, deer mouse, and shrew at both OD units and to the earthworm and plant at the TA-39-6 OD unit. However, field studies found no adverse impacts to the small mammal population at either site, and field observations made during the site visit revealed the plant communities, which are kept sparse to non-existent to minimize fire danger, appear healthy at both sites. In addition, nest boxes have been added to the areas around each OD unit and are being monitored for occupancy, hatching success, and fledgling success. Avian surveys at the two open detonation sites were also initiated to monitor patterns of bird abundance and diversity, and population trends at both sites. This information will supplement or replace the nest box results, particularly if the drought continues to effect nest box occupancy. Results for 2013 indicated that avian abundance and diversity at the OD units were comparable to or greater than that of the control sites.

1.0 INTRODUCTION

Two open detonation (OD) units operate at the Los Alamos National Laboratory (LANL or Laboratory). The two units are located at Technical Area 36 (TA-36) and TA-39, and are referred to as TA-36-8 OD unit or "Minie" and TA-39-6 OD unit or "Point 6," respectively. The OD hazardous waste treatment operations require a permit under the Resource Conservation and Recovery Act (RCRA). Each of these locations is also used for high explosives (HE) testing operations that do not require a RCRA permit. Soil sampling was conducted for the purpose of characterizing the sites as a baseline condition for continued treatment operations at the hazardous waste treatment units.

The TA-36-8 OD unit consists of an irregularly shaped sand- and grass-covered area. Solid and liquid hazardous explosive waste and explosive-contaminated waste may be treated (i.e., open detonated) at the unit. The TA-39-6 OD unit consists of a relatively flat, sand-covered area that measures approximately 40 feet by 40 feet in a canyon bottom. Solid and liquid hazardous explosive waste may be treated at the unit. The units are used primarily for non-treatment-related experimental test detonations and are occasionally also used for treatment of hazardous explosive waste.

Human health and ecological risk-screening assessments for the OD units were conducted using surface soil data collected in 2011. The results of the risk-screening assessments are presented in the following sections.

1.1 Conceptual Site Model

Only authorized Laboratory workers currently have access to the area around the OD units so the primary land use is industrial. Therefore, Laboratory workers are the primary receptors and the industrial scenario is the defining scenario for the human health risk-screening assessment (i.e., the scenario on which site decisions are based). Because the sites are located within the boundaries of operational facilities, the reasonably foreseeable future land use will continue to be industrial. Residential exposure is also assessed and provided for comparison purposes.

The release of contaminants from the OD operations has occurred over more than 50 yr. Releases are transported primarily by atmospheric winds, which rapidly disperse the material in ambient air. Most material is deposited close to the source(s) and decreases with distance from the source.

The regional water table is approximately 1000 ft below the TA-36-8 OD unit and approximately 560 ft below the TA-39-6 OD unit. Municipal supply well PM-4 is the operating supply well nearest to the TA-36-8 OD unit and is 9300 ft north-northeast of the OD unit. The regional groundwater flow direction in the vicinity of the TA-36-8 OD unit is expected to flow from east-northeast to east-southeast. No municipal supply wells are located in the vicinity of or downgradient of the TA-39-6 OD unit. The regional groundwater flow in the vicinity of the TA-39-6 OD unit is expected to be towards the southeast. Therefore, there are no potential uses of groundwater beneath the OD units. Furthermore, the hydrologic conditions yield little contaminant migration and are characterized by very slow unsaturated water flow from the surface to the regional aquifer. Because surface-water flow is infrequent and shallow alluvial groundwater is not common, contaminants largely remain near their original sources, predominantly in soil and sediment. As a result, no complete groundwater pathway exists at either of these sites.

Potential exposure pathways for a site worker (as well as a hypothetical resident) include incidental ingestion of soil, inhalation of fugitive dust or vapors, and dermal contact with soil. Other potential pathways from subsurface releases to potential receptors would be complete only if soil were to be

excavated and brought to the surface. In such a case, the potential contaminant migration pathways and potential exposure pathways would be the same as those of a surface soil release.

The primary ecological exposure pathways include root uptake, ingestion of soil, and food-web transport. Exposure of plants and soil invertebrates is not related to dietary pathways, but is the result of direct contact to, and uptake from, the surrounding medium. For terrestrial wildlife, most exposure is through the oral pathway from the diet and incidental ingestion of soil (Sample et al. 1997). The dermal contact and inhalation pathways are not typically assessed quantitatively in ecological risk assessments, based on guidance indicating the ingestion route is most important to terrestrial animals (EPA 1997; EPA 2003). Dermal exposure to wildlife is mitigated by the fur or feathers covering the bodies of most vertebrates, and the incidental consumption of soil during grooming is included in the direct soil ingestion estimates. Respirable dust particles are most likely ingested rather than inhaled and is a negligible pathway (EPA 1997; EPA 2003), while nonrespirable dust is ingested and accounted for in incidental soil ingestion values for wildlife species (EPA 1993; EPA 2003). Therefore, the exposure pathways considered in the development of the ecological screening levels (ESLs) used in the risk-screening assessment capture the primary exposure for wildlife receptors.

1.2 Identification of Chemicals of Potential Concern

1.2.1 Sampling

Nineteen surface samples (0−1 ft) were collected from 19 locations across the TA-36-8 OD unit (Figure 1.2-1) and 10 surface samples (0−1 ft) were collected from 10 locations across the TA-39-6 OD unit (Figure 1.2-2). Samples were marked by XY (U.S. Survey Feet) coordinates, preserved according to U.S. Environmental Protection Agency (EPA) guideline methodology, recorded on chain-of-custody forms, and analyzed for the following constituents using the methods in the parentheses:

- high explosives (SW-846-8321A-MOD)
- metals (SW-846-6010B and SW-846-6020)
- dioxins and furans (EPA Method 1618 and SW-846-8290)
- semivolatile organic compounds (SVOCs) (SW-846-8270C)
- volatile organic compounds (VOCs) (SW-846-8260B)
- polychlorinated biphenyls (PCBs) (SW-846-8082)
- perchlorate (SW-846-6850)
- isotopic uranium (HASL-300-ISOU)

The soil data reflect the deposition of contaminants over more than 50 yr of operation. The data for each OD unit are provided on CD as Attachment 1.

1.2.2 Evaluation of Inorganic Chemicals

TA-36-8

Nineteen surface samples were collected from 19 locations and analyzed for metals and perchlorate. Cadmium, calcium, copper, lead, nickel, and zinc were detected above soil background values (BVs) (LANL 1998) in at least one soil sample (Table 1.2-1). Perchlorate was detected in nine samples but does not have any background data.

Statistical comparisons of the six inorganic chemicals with background data were conducted using the Gehan, quantile, and slippage tests to determine whether the site data are statistically different from

background data. If a p-value is less than a specified probability (0.05), then there is some reason to suspect a difference exists between the distributions. If the p-value is greater than 0.05, no difference is indicated.

The statistical comparisons found cadmium and nickel were not statistically different from background ($p>0.05$), while copper and lead were statistically different from background ($p<0.05$). Although the statistical comparisons for calcium and zinc indicated the site data were statistically different from the background data sets (Gehan $p<0.05$), the box plots show the site data are entirely within the range of background concentrations and the site data do not exceed the maximum background concentrations for these inorganic chemicals. Furthermore, calcium had only one concentration (6210 mg/kg) slightly above the soil BV (6120 mg/kg), and both calcium and zinc passed the quantile and slippage tests ($p>0.05$). Therefore, calcium and zinc are not retained as chemicals of potential concern (COPCs) at the TA-36-8 OD unit. The results of the statistical comparisons and the box plots are provided as Attachment 2 on CD. Copper, lead, and perchlorate were retained as COPCs at the TA-36-8 OD unit (Figure 1.2-3).

TA-39-6

Ten surface samples were collected from 10 locations and analyzed for metals and perchlorate. Antimony, barium, cadmium, copper, lead, mercury, silver, and zinc were detected above soil BVs (LANL 1998) in at least one soil sample (Table 1.2-2). Perchlorate was detected in five samples but does not have any background data.

Statistical comparisons with background data were conducted for antimony, barium, cadmium, and zinc. Copper, lead, and mercury were interpreted to be substantially above background and no statistical comparisons were conducted. The statistical comparisons found barium and cadmium were not statistically different from background ($p>0.05$), while antimony and zinc were statistically different from background ($p<0.05$). The results of the statistical comparisons and the box plots are provided as Attachment 2 on CD. Antimony, copper, lead, mercury, perchlorate, silver, and zinc were retained as COPCs at TA-39-6 OD unit (Figure 1.2-4).

1.2.3 Evaluation of Organic Chemicals

TA-36-8

Nineteen surface samples were collected from 19 locations and analyzed for HE, SVOCs, VOCs, PCBs, and dioxins/furans. Thirty-four organic chemicals plus 15 dioxin and furan congeners were detected in 1 or more samples and were retained as COPCs (Tables 1.2-3 and 1.2-4 and Figures 1.2-5 and 1.2-6).

TA-39-6

Ten surface samples were collected from 10 locations and analyzed for HE, SVOCs, VOCs, PCBs, and dioxins/furans. Nineteen organic chemicals plus15 dioxin and furan congeners were detected in 1 or more samples and were retained as COPCs (Tables 1.2-5 and 1.2-6 and Figures 1.2-7 and 1.2-8).

1.2.4 Evaluation of Radionuclides

TA-36-8

Nineteen surface samples were collected from 19 locations and analyzed for isotopic uranium. Uranium-234, uranium-235/236, and uranium-238 were detected above BVs and were retained as COPCs (Table 1.2-7) (Figure 1.2-9).

TA-39-6

Ten surface samples were collected from 10 locations and analyzed for isotopic uranium. Uranium-234, uranium-235/236, and uranium-238 were not detected above BVs and were not retained as COPCs.

2.0 HUMAN HEALTH RISK SCREENING ASSESSMENT

2.1 Screening Evaluation

The exposure point concentrations (EPCs) are the 95% upper confidence limit (UCL) of the arithmetic mean or the maximum detected concentration if too few detected concentrations were reported. All the data were used to calculate the 95% UCLs for the risk-screening assessments, if appropriate.

The EPCs for the dioxin and furan congeners are the sums of the detected congeners weighted by the Toxic Equivalency Factors (TEFs) for mammals (humans and wildlife) (NMED 2012) and by the Van den Berg et al. (1998) TEFs for birds; the sum is expressed as the 2,3,7,8-tetrachlorodibenzodioxin (TCDD[2,3,7,8-]) equivalent concentration. The TEFs used are presented in Table 2.1-1. The results of the TEF calculations and the TCDD[2,3,7,8-] equivalent concentrations for the TA-36-8 OD unit samples are presented in Tables 2.1-2 and 2.1-3. The results of the TEF calculations and the TCDD[2,3,7,8-] equivalent concentrations for the TA-39-6 OD unit samples are presented in Tables 2.1-4 and 2.1-5.

The 95% UCLs were calculated as described in EPA guidance (EPA 2002). Tests for distributions were performed using ProUCL 5.0.00 (http://www.epa.gov/osp/hstl/tsc/software.htm) to determine the appropriate method for UCL calculations and the recommended UCLs were used. The ProUCL inputs and outputs are presented as Attachment 3 on CD. The EPCs (95% UCL or maximum detected concentration) for each COPC at each site are presented in Tables 2.1-6 and 2.1-7.

The EPC for each COPC was compared with the industrial and residential soil screening levels (SSLs) or screening action levels (SALs). The chemical SSLs used in the evaluations were obtained from New Mexico Environment Department (NMED) guidance (NMED 2012) or EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm). The SSLs for carcinogens are equivalent to a 1×10^{-5} cancer risk and for noncarcinogens represent a hazard quotient (HQ) of 1. The comparisons with SSLs are conducted separately for carcinogens and noncarcinogens for industrial and residential receptors. Radionuclide SALs are used for comparison with radionuclide EPCs and were derived using the residual radioactive (RESRAD) model, Version 6.5 (LANL 2012a). The SALs are based on a total dose of 25-mrem/yr as authorized by DOE Order 458.1.

TA-36-8

The EPCs for noncarcinogenic COPCs were less than their respective industrial and residential SSLs. The hazard indexes (HIs) for the noncarcinogenic COPCs are approximately 0.04 and 0.2, respectively (Tables 2.1-8 and 2.1-9), which are less than the NMED target HI of 1 (NMED 2012).

The EPCs for carcinogenic COPCs were less than their respective industrial and residential SSLs. The total excess cancer risks from exposure to carcinogenic COPCs are approximately 9×10^{-7} and 9×10^{-6}, respectively (Tables 2.1-10 and 2.1-11), which are less than the NMED target risk level of 1×10^{-5} (NMED 2012).

The EPCs for radionuclide COPCs were less than their respective industrial and residential SALs. The total doses from exposure to radionuclide COPCs are 1 mrem/yr and 5.4 mrem/yr, respectively (Tables 2.1-12 and 2.1-13), which are below the U.S. Department of Energy (DOE) target dose limit of 25 mrem/yr as authorized by DOE Order 458.1.

The EPCs for noncarcinogenic COPCs were less than their respective industrial and residential SSLs. The HIs for the noncarcinogenic COPCs are approximately 0.3 and 1.2, respectively (Tables 2.1-14 and 2.1-15), which are less than or equivalent to the NMED target HI of 1 (NMED 2012). The residential HI is in part from lead, which has an SSL based on the soil lead level that limits exposure of a child for a resident to no more than a 5% chance of exceeding a 10 µg/dL blood lead level. The HQ for lead is an indication of whether the blood lead level criterion is exceeded. The residential HI is approximately 1 with the lead HQ contributing approximately 0.4. Without lead, the residential HI is 0.8. Therefore, the lead EPC does not exceed the residential SSL (blood lead level criterion is not exceeded), and the noncarcinogenic HI without lead is below the NMED target level of 1.

The EPCs for carcinogenic COPCs were less than their respective industrial and residential SSLs. The total excess cancer risks from exposure to carcinogenic COPCs are approximately 1×10^{-6} and 5×10^{-6}, respectively (Tables 2.1-16 and 2.1-17), which are less than the NMED target risk level of 1×10^{-5} (NMED 2012).

No radionuclide COPCs were identified at this site.

2.2 Uncertainty Analysis

The analysis for human health is subject to uncertainties associated with data evaluation, exposure assessment, and toxicity values. Each or all of these uncertainties may affect the assessment results.

2.2.1 Data Evaluation

Data evaluation uncertainties may include errors in sampling, laboratory analysis, and data analysis. Although concentrations used in this risk assessment were less than the estimated quantitation limits for some COPCs, data evaluation uncertainties are expected to have little effect on the assessment results. The J (estimated) qualification of detected concentrations of some organic COPCs does not affect the assessment.

Another data evaluation uncertainty relates to the use of the UCL as the EPC for each COPC. Use of the UCL may result in an overestimation of risk for analytes with elevated detection limits. Use of the maximum concentration also overestimates the exposure to contamination because receptors are not exposed to these concentrations across the site.

2.2.2 Exposure Assessment

The receptors evaluated by the assessments are subject to exposures in a different manner than the exposure assumptions used to derive the SSLs. Assumptions for the industrial SSLs are that the potentially exposed individual is a worker who is outside for 8 h/d for 225 d/yr (NMED 2012) and spends the entire work day on-site within the contaminated area. Assumptions for the residential SSLs are that the potentially exposed individual is a resident who is present 24 h/d for 350 d/yr (NMED 2012) and spends the entire 24 h on-site within the contaminated area. Because it is unlikely the worker or resident is within the contaminated area for the entire time, the screening assessments overestimate the exposure. As a result, risks/doses may be overestimated.

The data represent deposition from more than 50 yr of operation into 2011. Therefore, the data and subsequently the screening assessment results represent baseline conditions.

Assumptions underlying the exposure parameters, routes of exposure, amount of contaminated media available for exposure, and intake rates for routes of exposure are consistent with NMED parameters and default values (NMED 2012). In the absence of site-specific data, several upper-bound values for the assumptions may be combined to estimate exposure for any one pathway, and the resulting risk estimate can exceed the upper percentile. Therefore, uncertainties in the assumptions underlying the exposure pathways may contribute to risk assessments that exceed the reasonably expected range.

2.2.3 Toxicity Values

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (slope factors [SFs] and reference doses [RfDs]) were used to derive the risk-based screening values used in the screening evaluation (NMED 2012). Uncertainties were identified in four areas with respect to the toxicity values: (1) extrapolation from other animals to humans, (2) interindividual variability in the human population, (3) the derivation of RfDs and SFs, and (4) the chemical form of the COPC.

The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because differences exist between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in each of these steps, resulting in the overestimation of potential risk.

For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no observed adverse effect level (NOAEL). The NOAEL uncertainty factor approach incorporates a 10-fold factor to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment. This factor of 10 is generally considered to result in a conservative estimate of risk to noncarcinogenic COPCs.

The RfDs and SFs for different chemicals are derived from experiments conducted by different laboratories that may have different accuracy and precision that could lead to an over- or underestimation of risk. The uncertainty associated with the toxicity factors for noncarcinogens is measured by the uncertainty factor, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood a contaminant is a human carcinogen.

The COPCs may be bound to the environmental matrix and not available for absorption into the human body. This is true of the COPCs evaluated in this risk-screening assessment. Metals and organic chemicals are typically tightly bound to soil particles and are not readily available for uptake by a receptor. However, the exposure scenarios default to the assumption that the COPCs are 100% bioavailable. This assumption can lead to an overestimation of the total risk.

2.2.4 Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown and possible interactions could be synergistic or antagonistic, resulting in either an overestimation or underestimation of the potential risk. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated for individual COPCs that act by different mechanisms and on different target organs but are addressed additively.

2.3 Interpretation

Based on an industrial scenario, the HIs (0.04 and 0.3) are less than the NMED target level of 1 and the cancer risks (9×10^{-7} and 1×10^{-6}) are less than the NMED target level of 1×10^{-5}. For the residential scenario, the HIs (0.2 and 0.8) are less than the NMED target level of 1 and the cancer risks (9×10^{-6} and 5×10^{-6}) are less than the NMED target level of 1×10^{-5}. The lead EPC at TA-39-6 is less than the residential SSL (400 mg/kg). The total doses at the TA-36-8 OD unit are 1 mrem/yr and 5 mrem/yr for the industrial and residential scenarios, respectively, which are below the DOE target dose limit of 25 mrem/yr as authorized by DOE Order 458.1. No radionuclide COPCs were identified at the TA-39-6 OD unit. The results indicate there are no potential unacceptable risks or doses to human health at the OD units under both scenarios.

3.0 ECOLOGICAL RISK SCREENING ASSESSMENT

3.1 Screening Evaluation

The ecological risk-screening evaluation identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs with ESLs in accordance with Laboratory guidance (LANL 2012b). The EPCs used in the assessment are presented in Tables 2.1-6 and 2.1-7, and the calculation is described in section 2.1. The ESLs obtained from the ECORISK Database, Version 3.1 (LANL 2012c) are presented in Table 3.1-1. The avian ESLs for TCDD[2,3,7,8-], which are also presented in Table 3.1-1, are from ECORISK Database, Version 2.0 (LANL 2003). The ESLs are based on similar species and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined to be lethal to 50% of the test population. Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values are presented in the ECORISK Database, Versions 2.0 and 3.1 (LANL 2003; LANL 2012c).

The HQs calculated for each COPEC and screening receptor are the ratios of the EPC to the ESLs for each ecological receptor. The higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors; conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. The analysis begins with a comparison of the minimum ESL for each COPC with the EPC. HQs greater than 0.3 are used to identify COPECs requiring additional evaluation (LANL 2012b). Individual HQs for a receptor are summed to derive an HI; an HI greater than 1 is an indication further assessment may be needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

The HQs using the minimum ESLs exceeded 0.3 for bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, 2,4-dinitrotoluene, 1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX), lead, triaminotrinitrobenzene (TATB), TCDD[2,3,7,8-], and uranium-238 at the TA-36-8 OD unit (Table 3.1-2). The HQs using the minimum ESLs exceeded 0.3 for antimony, Aroclor-1254, bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, 2,4-dinitrotoluene, di-n-octyl phthalate, lead, mercury, silver, TATB, TCDD[2,3,7,8-], and zinc at the TA-39-6 OD unit (Table 3.1-3). These COPCs were retained as COPECs. In addition, perchlorate was detected at both sites, but has no ESLs, and was retained as a COPEC. The HQ for each COPEC/receptor combination was calculated and summed to obtain an HI for each receptor at each site (Tables 3.1-4 and 3.1-5). The HI is the sum of HQs for chemicals with common toxicological endpoints for a given receptor. It is assumed for the purposes of ecological screening, nonradionuclides have common

toxicological effects and HQs may be added. The calculations indicate all receptors at both sites have HIs greater than 1. The results are discussed further in the uncertainty section.

3.2 Uncertainty Analysis

3.2.1 Chemical Form

The assumptions used in the ESL derivations are conservative and are not necessarily representative of actual conditions. These assumptions include maximum chemical bioavailability, maximum receptor ingestion rates, minimum body weight, and additive effects of multiple COPECs. These factors tend to result in conservative ESL estimates, which may lead to an overestimation of the potential risk. The assumption of additive effects for multiple COPECs may result in an over- or underestimation of the potential risk to receptors.

The chemical form of the individual COPCs was not determined as part of the investigation. Toxicological data are typically based on the most toxic and bioavailable chemical species, which are not typically found in the environment. Inorganic, organic, and radionuclide COPECs are generally not 100% bioavailable to receptors in the natural environment because of interference from other natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil), rapid oxidation, or reduction changes that render harmful chemical forms unavailable to biotic processes. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2012b), and the values are biased toward overestimating the potential risk to receptors.

Antimony, copper, lead, mercury, silver, and zinc are naturally occurring and dependent on soil conditions for bioavailability. Lead concentrations at the TA-36-8 OD unit and the silver concentrations at the TA-39-6 OD unit are similar to naturally occurring levels found in uncontaminated soil (i.e., background). Lead concentrations slightly exceed the BV in four samples and the maximum background concentration in two samples, and silver concentrations are less than the BV, except for one elevated concentration (1.36 mg/kg), which is also the EPC. The metals adsorb to the soil particles and are comparatively unavailable for uptake. In addition, because most concentrations are similar to naturally occurring levels, plants and animals regulate uptake and elimination of these metals making them less toxic.

The presence of dioxins and furans in soil also does not determine exposure and risk to receptors. Dioxins and furans are relatively unavailable for uptake by plants and animals because these compounds are tightly bound to soil particles, are immobile, and insoluble (Umbreit et al. 1986). EPA reported the relative bioavailability of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofuran congeners in soil is less than 100% as compared with a lipid or organic solvent vehicle as the reference material (EPA 2010). Abiotic constituents, compound aging, and other associated soil factors may influence soil bioavailability (e.g., bioavailability appears to decrease with aging based on comparisons of laboratory spiked soil and soil contaminated in situ [Umbreit et al. 1986]). The difference between the toxicity represented by the ESL and the lack of adverse effects in the canyons may be related to the low bioavailability of dioxins and furans in soil.

Similarly, bis(2-ethylhexyl)phthalate and di-n-butyl phthalate are tightly bound to soil particles, are immobile, and are insoluble. Both undergo biodegradation over time. The bioavailability of these compounds is much less than the 100% assumed for the screening assessment. This relationship is supported by the lack of impacts to biota in the canyons around the Laboratory where bis(2-ethylhexyl)phthalate and di-n-butyl phthalate have been detected above ESLs during other investigations (LANL 2004; LANL 2006; LANL 2007; LANL 2009a; LANL 2009b). The difference between the toxicity

represented by the ESLs and the lack of adverse effects in the canyons may be related to the low bioavailability of the phthalates from soil.

3.2.2 Exposure Assumptions

The EPCs used in the calculations of HQs are the 95% UCLs or maximum detected concentrations. These EPCs are conservative estimates of exposure to each COPEC. The sampling efforts focused on areas of known contamination, and the receptors were assumed to ingest 100% of their food and spend 100% of their time at the site. These assumptions related to the exposure for terrestrial receptors are likely to result in an overestimation of potential ecological exposure and risk.

The areas sampled include both OD units and the vicinity around each unit. The data and subsequently the screening assessment results represent baseline conditions for the sites, which are the result of more than 50 yr of operation.

3.2.3 Toxicity Values

The HQs were calculated using ESLs, which are based on NOAELs as threshold effect levels; actual risk for a given COPEC/receptor combination occurs at a higher level, possibly somewhere between the NOAEL-based threshold and the threshold based on the LOAEL. The use of NOAELs leads to an overestimation of potential risk to ecological receptors. ESLs are based on laboratory studies requiring extrapolation to wildlife receptors. Laboratory studies are typically based on “artificial” and maintained populations with genetically similar individuals and are limited to single chemical exposures in isolated and controlled conditions using a single-exposure pathway. Wild species are concomitantly exposed to a variety of chemical and environmental stressors, potentially rendering them more susceptible to chemical stress. On the other hand, wild populations are likely more genetically diverse than laboratory populations, making wild populations, as a whole, less sensitive to chemical exposure than laboratory populations. The uncertainties associated with the ESLs tend to lead to an overestimation of potential risk.

The avian ESLs for TCDD[2,3,7,8-] obtained from ECORISK Database, Version 2.0 (LANL 2003) are based on a toxicity value using intraperitoneal injections. This route of exposure does not occur naturally and assumes TCDD[2,3,7,8-] bioavailability and absorption from the gastrointestinal tract and the abdominal cavity are not significantly different. However, exposure by this route likely overestimates the potential absorption of TCDD[2,3,7,8-] by the receptor and thereby overestimates the potential effect on the receptor.

3.2.4 Area Use Factors

In addition to the direct comparison of the EPC with the ESLs, area use factors (AUFs) are used to account for the amount of time a receptor is likely to spend within the contaminated areas based on the size of the receptor’s home range (HR). The AUF for an individual organism is calculated by dividing the size of the site by the HR for that receptor. Because threatened and endangered species must be assessed on an individual basis (EPA 1999), the AUF is applicable for the Mexican spotted owl. The kestrel (top carnivore) is used as the surrogate receptor for the Mexican spotted owl. The site areas are approximately 8.3 hectares (ha) for the TA-36-8 OD unit and 0.8 ha for the TA-39-6 OD unit, and the HR for the Mexican spotted owl is 366 ha. Therefore, the AUFs for the Mexican spotted owl are 0.02 and 0.002, respectively (Table 3.2-1). Application of the AUFs for the Mexican spotted owl to the HQs for the kestrel (top carnivore) results in adjusted HIs of 2 and 0.1, respectively. The adjusted HI above 1 at the TA-36-8 OD unit is due primarily to bis(2-ethylhexyl)phthalate and to a lesser extent di-n-butyl phthalate. The EPCs for both COPECs are from one elevated detected concentration for each. Comparison of the

LOAEL-based ESLs for the kestrel (top carnivore) for these two COPECs (Table 3.2-2) results in a HI of 10 and an adjusted HI of 0.2 using the AUF (0.02). Therefore, no potential exists for adverse impacts to the Mexican spotted owl at both OD units.

3.2.5 Population Area Use Factors

EPA guidance is to manage the ecological risk to populations rather than to individuals, with the exception of threatened and endangered species (EPA 1999). One approach to addressing the potential effects on populations is to estimate the spatial extent of the area inhabited by the local population that overlaps with the contaminated area. The population area for each receptor is based on the individual receptor HR and its dispersal distance (Bowman et al. 2002). Bowman et al. (2002) estimate the median dispersal distance for mammals is 7 times the linear dimension of the HR (i.e., the square root of the HR area). If only the dispersal distances for the mammals with HRs within the range of the screening receptors are used, the median dispersal distance becomes 3.6 times the square root of the HR (R^2 = 0.91) (Bowman et al. 2002). If it is assumed the receptors can disperse over the same distance in any direction, the population area is circular and the dispersal distance is the radius of the circle. Therefore, the population area for each receptor can be derived by $\pi(3.6\sqrt{HR})^2$ or approximately 40HR.

The population area use factor (PAUF) is calculated by dividing the site area (approximately 8.3 ha and 0.8 ha for the OD units) by the population area of the receptor (Table 3.2-1). The HIs for each site are adjusted by multiplying by the respective PAUFs. The HQs and HIs for the earthworm and plant are not adjusted by a PAUF because these receptors do not have HRs.

The adjusted HIs are less than 1 for the kestrel, cottontail, and red fox at both sites (Tables 3.2-3 and 3.2-4). The adjusted HIs for the other receptors ranged from 7 to 96 at the TA-36-8 OD unit and 4 to 72 at the TA-39-6 OD unit (Tables 3.2-3 and 3.2-4). The elevated HIs at the TA-36-8 OD unit are from bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, and lead for the robin; bis(2-ethylhexyl)phthalate, copper, 2,4-dinitrotoluene, HMX, TATB, and TCDD[2,3,7,8-] for the deer mouse; and bis(2-ethylhexyl)phthalate, copper, and TCDD[2,3,7,8-] for the shrew. The HIs for the plant and earthworm are due to copper. The elevated HIs at the TA-39-6 OD unit are from bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, lead, and mercury for the robin; antimony, copper, 2,4-dinitrotoluene, di-n-octyl phthalate, lead, and TCDD[2,3,7,8-] for the deer mouse; and antimony, copper, and TCDD[2,3,7,8-] for the shrew. The HI for the plant is from antimony, copper, lead, and zinc, and the HI for the earthworm is from copper, mercury, and zinc.

3.2.6 LOAEL Analysis

The PAUF-adjusted HIs were greater than 1 for several receptors at both sites. To address these HIs, a LOAEL analysis was conducted using ESLs calculated based on a LOAEL rather than a NOAEL. The analysis addresses some of the uncertainties and conservativeness of the ESLs used in the initial screening assessments. The LOAEL-based ESLs were calculated based on toxicity information in the ECORISK Database, Version 3.1 (LANL 2012c), and are presented in Table 3.2-2. The LOAEL-based 2,3,7,8-TCDD ESLs for the robin were calculated by multiplying the NOAEL-based ESLs from ECORISK Database, Version 2.0 (LANL 2003) by an uncertainty factor of 10.

The LOAEL analysis resulted in HIs equivalent to 1 for the earthworm and plant, respectively, and HIs greater than 1 for the robin (all feeding guilds), deer mouse, and shrew at the TA-36-8 OD unit (Table 3.2-5). The LOAEL analysis resulted in HIs greater than 1 for the robin (all feeding guilds), deer mouse, shrew, earthworm, and plant at the TA-39-6 OD unit (Table 3.2-6). The PAUF-adjusted LOAEL HIs ranged from 2 to 13 at the TA-36-8 OD unit for the robin (all feeding guilds), deer mouse, and shrew (Table 3.2-7). The PAUF-adjusted LOAEL HIs ranged from 2 to 9 at the TA-39-6 OD unit for the robin

(insectivore and omnivore), deer mouse, shrew, earthworm, and plant, but equivalent to 1 for the robin (herbivore) (Table 3.2-8). The elevated adjusted HIs at the TA-36-8 OD unit are from bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, and lead for the robin; copper, HMX, TATB, and TCDD[2,3,7,8-] for the deer mouse; and copper and TCDD[2,3,7,8-] for the shrew. The elevated adjusted HIs at the TA-39-6 OD unit are from copper and di-n-butyl phthalate for the robin, and copper for the deer mouse and shrew. The HI for the plant is from antimony and copper and the HI for the earthworm is from copper and mercury.

3.2.7 Field and Laboratory Investigations and Observations

Because the risk-screening assessments resulted in HIs above 1 for several receptors at both sites, field and laboratory studies have been or will be implemented to determine whether the screening results are reflected by impacts to biota. The studies include small mammal trapping and analysis of whole organisms as well as population measurements, monitoring of cavity-nesting birds in nest boxes, earthworm bioaccumulation tests (measures of growth and survival), and seedling-germination tests.

Small mammal trapping and analysis of whole organisms was conducted around both OD units in 2011. Field mice were collected around each OD site and analyzed for dioxins and furans, metals, HE, PCBs, and perchlorate (Fresquez 2011a). Small-mammal community and population parameters were also estimated across each site (Bennett and Robinson 2011).

Dioxin and furan congeners were not detected above the detection limit in any of the whole body field mice samples; 1 to 3 congeners were detected in each field mouse sample at TA-36-8 and 1 to 5 congeners were detected in each field mouse sample at TA-39-6 (Fresquez 2011a). Concentrations in whole body samples were well below the concentrations detected in the soil, had fewer congeners detected than in 40% to 70% of the soil samples, and were below the deer mouse ESL for TCDD (LANL 2012c). The dioxin and furan data are similar to other dioxin/furan field-mouse uptake studies at the Laboratory (Fresquez et al. 2013) and nationally (Krouskop et al. 1991) As noted above in section 3.2.1, dioxins and furans are relatively unavailable for uptake by plants and animals because these compounds are tightly bound to soil particles, are immobile, and are insoluble (Umbreit et al. 1986). The results of the whole animal analyses support this condition in that dioxins and furans at the concentrations detected in soil under natural field conditions are not significantly assimilated by field mice either by ingestion and/or by surface contact possibly because of the adsorption of the chemical to soil surfaces or because of oxidation/reduction changes. In addition, the samples analyzed included the pelt and carcass so it is unclear whether the congeners detected represent uptake or adherence of soil particles to the pelt. The difference between the potential toxicity represented by the ESLs and the lack of adverse effects in the field is likely related to the low bioavailability of dioxins and furans in the soil and sediment.

Based on the small-mammal data collected, the OD unit operations do not appear to be adversely affecting local small mammal populations (Bennett and Robinson 2011). The small-mammal population investigation revealed slight differences in the species composition, diversity, evenness, and capture rates between sites. It is likely differences in habitat quality and normal population variations were the reasons for the differences found. Sex ratios were either not statistically different from the assumption of equal proportions or were not found to be different from the expected ratio of equal proportions (sample sizes prevented statistical evaluation of all species). Reproductive status also appeared to be similar among species, but the sample size was too small to statistically evaluate this parameter. In addition, the reproductive structure of the animals captured may be an indication of the time of year (late summer) the study took place. Body weights showed no statistical difference between sites for the deer mouse and harvest mouse populations and measured were within the range of weights published for the species.

Other biota investigations conducted in Los Alamos/Pueblo Canyons (LANL 2004) and Pajarito Canyon (LANL 2009a) included small mammal trapping and analysis of whole organisms. The TCDD equivalent concentrations reported as part of these investigations were similar to the soil concentrations at the OD units. The TCDD equivalent concentrations reported in Kraig et al. (2002, Tables 5 and A-6) ranged from 4.7×10^{-7} mg/kg to 3.5×10^{-6} mg/kg in lower Los Alamos Canyon. These levels are similar to the TCDD equivalent concentrations in Los Alamos and Pueblo Canyons (LANL 2005), where the range of concentrations was 1.71×10^{-10} mg/kg to 4.96×10^{-6} mg/kg. In addition, TCDD equivalent concentrations ranged from 3.14×10^{-7} mg/kg to 3.09×10^{-6} mg/kg in Pajarito Canyon (LANL 2009a). In comparison, the TCDD[2,3,7,8-] equivalent concentrations across the TA-36-8 OD unit ranged from 1.05×10^{-7} mg/kg to 1.61×10^{-5} mg/kg, and across the TA-39-6 OD unit ranged from 7.4×10^{-8} mg/kg to 5.65×10^{-6} mg/kg. The concentrations at TA-36-8 exceed the upper end of the ranges of concentrations detected in Los Alamos, Pueblo, and Pajarito Canyons in one sample (next highest concentration at TA-36-8 is 4.38×10^{-6} mg/kg), while the concentrations at TA-39-6 are within the range of concentrations or comparable to those in the canyons. The studies conducted in the canyons found no effects on small mammal populations from exposure to TCDD.

Barium and lead were detected in two to three animals at each site above the regional statistical reference levels (RSRLs), which are the upper-bounds of concentrations (mean plus three standard deviations) calculated from field mice collected at regional locations away from the influence of the Laboratory (over 9 miles away) (Fresquez 2009 and 2011b). The barium concentrations were slightly above the RSRL, while lead concentrations were 6 times the RSRL. However, all barium and lead whole body concentrations were below the Laboratory soil BVs (LANL 1998) and the deer mouse ESLs (LANL 2012c). Barium was not detected above the soil BV at either site, while lead was detected above the soil BV at both sites. Lead soil concentrations and the lead EPC were below the deer mouse ESL at TA-36-8, while lead soil concentrations were above the deer mouse ESL in four samples and the lead EPC was only slightly above the deer mouse ESL at TA-39-6. Barium was not retained as a COPC at both sites (section 1.2.2) and lead was not found to be a significant contributor to the deer mouse HI at either site (Tables 3.2-7 and 3.2-8). Copper, which is a significant contributor to potential risk at both sites based on the risk-screening assessments, was not detected above the RSRL in any whole body samples at either site. Copper whole body concentrations were also below the deer mouse and shrew ESLs (LANL 2012c). No HE compounds were detected in any of the animals collected, and perchlorate concentrations were 1 or 2 orders of magnitude below the RSRL. The whole body samples analyzed for PCBs had detected concentrations. At TA-36-8, three samples had a total PCB concentration above the RSRL for nonurban sites, while the other two samples had a total PCB concentration below the RSRL for nonurban sites. All total PCB concentrations were below the RSRL for urban sites. At TA-39-6, two samples had total PCB concentrations above either of the RSRLs, while three other samples had a total PCB concentration similar to or below the RSRL for nonurban sites and below the RSRL for urban sites. In addition, the total PCB concentrations were well below the deer mouse ESLs for all Aroclors and the maximum soil concentrations of Aroclor-1254 and Aroclor-1260 detected at both sites were below the deer mouse ESLs (LANL 2012c). According to Fresquez et al. (2013) the concentrations are also below the average whole body concentration that resulted in population alterations and changes in organ function in field mice (Battey et al. 1990).

In addition to the elevated HIs for the small mammals, the risk screening resulted in elevated HIs for the robin from bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, and lead at TA-36-8, and copper and di-n-butyl phthalate at TA-39-6. As a result, nest boxes were added to the areas around each site in 2011 to measure potential effects of operations on avian populations. However, because of the extreme drought and the Las Conchas fire, no birds nested in the boxes at TA-36-8 and TA-39-6 in 2011. No birds nested in the boxes at TA-39-6 in 2012. Because TA-39 is at a lower elevation than TA-36 and other nest boxes in the LANL-wide network, this area has been much more affected by the drought, thus affecting

nest occupancy. TA-36-8 had two nest boxes occupied in 2012; one ash-throated flycatcher nest did not hatch any eggs and one western bluebird nest hatched five eggs and successfully fledged the young. It should be noted there has been a substantial overall decrease in occupancy of the nest boxes within the Laboratory due to the drought to where only higher elevation sites are maintaining populations. In addition, the nest boxes at TA-36-8 were removed in 2012 while tree removal occurred as a fire precaution related to the drought. The nest boxes around TA-36-8 will be replaced for the 2013 breeding season and both areas will continue to be monitored.

In addition, avian surveys at the two open detonation sites were initiated to monitor patterns of bird abundance and diversity, and population trends at both sites (LANL 2013). This information will supplement or replace the nest box results, particularly if the drought continues to effect nest box occupancy. The monitoring will be conducted annually to establish trends over time. In 2013, a total of 590 birds representing 55 species were recorded. Of the 55 species detected, 54 are protected under the Migratory Bird Treaty Act. Results indicated that the avian abundance and diversity were comparable to or greater than that of the control sites (LANL 2013).

The earthworm and plant HIs for TA-39-6 were primarily driven by copper (87% and 52%, respectively). The copper 95% UCL was substantially biased by the maximum detected concentration (3410 mg/kg), which is the only concentration that exceeded the UCL. Without the maximum detected concentration the 95% UCL is reduced by 50% to 1047 mg/kg and the earthworm and plant HIs are reduced by 25% to 50% (3 and 6, respectively). The maximum detected concentration is approximately 40 ft to the west of the open detonation unit and the next highest concentration (1910 mg/kg) is located atop the control building approximately 15 ft to the east of the open detonation unit (Figure 1.2-4). Also the mean copper concentration for the site is 720 mg/kg versus a 95% UCL three times the mean. The distribution of copper indicates the highest concentrations are isolated and not indicative of a large area of contamination.

The TA-39-6 Open Detonation Unit is a relatively flat, sand-covered area and measures approximately 40 ft by 40 ft, and is located near the canyon bottom. Steep canyon walls rise to heights of 100 ft or more in the immediate vicinity of the TA-39-6 OD Unit, roughly forming a semicircle around the unit. Building TA-39-6 (the control building) is a reinforced concrete structure extending partially beneath the detonation area. Part of the unit lies above building TA-39-6 and sand has been placed above the control building, over the unit area, and over the semicircle surrounding the unit. The entire area in and around the OD unit consists of sand and does not contain soil native to the area and vegetation is kept sparse to non-existent to minimize fire danger. The type of vegetation further from the unit consists of native plants and grasses. The topography and aerial extent of the unit is shown on Figure 3.2-1.

Field observations made during the site visits revealed the plant community at each site is limited because of active maintenance related safety and fire prevention and the nature of the plant communities at the sites. In both cases, the areas around the open detonation units currently are vegetation free up to 150-200 ft from the units and the soil conditions are not conducive to plant growth and proliferation. The soil/fill at both sites is very sandy with little organic matter and the soil/fill within and around the open detonation units is not native soil and is not intended to promote plant growth. The soil/fill is also not conducive to earthworm growth and survival. In addition, the native plant communities that are present 150-200 ft from the units are naturally sparse as illustrated in the aerial photographs of each unit (Figures 3.2-1 and 3.2-2). However, the plant communities in the surrounding areas appear healthy; no evidence was found of any adverse impacts of contamination to the plant community. These observations support the conclusions that COPECs are not impacting soil invertebrates (as represented by the earthworm) and plants.

3.2.8 COPECs without ESLs

Several COPECs do not have ESLs for any receptor in the ECORISK Database, Version 3.1 (LANL 2012c). In an effort to address this uncertainty and provide a quantitative assessment of potential ecological risk, several online toxicity databases have been searched to determine if any relevant toxicity information is available. The online databases searched were EPA Ecotox Database, EPA Office of Pesticide Programs Aquatic Life Benchmarks, U.S. Army Corps of Engineers/EPA Environmental Residue-Effects, California Cal/Ecotox Database, Pesticide Action Network Pesticide Database, U.S. Army Wildlife Toxicity Assessment Program, U.S. Department of Agriculture Integrated Pesticide Management Database, American Bird Conservancy Pesticide Toxicity Database, and Oak Ridge National Laboratory Risk Assessment Information System. However, these COPECs did not have any relevant toxicity data in the online databases listed above.

In the absence of a chemical-specific ESL, COPEC concentrations were compared with the ESLs for a surrogate chemical. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood ecological receptors are potentially impacted.

Some COPECs without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk. These COPECs are often infrequently detected across the site. In these cases, comparisons to residential human health SSLs are presented as part of a qualitative assessment. The comparison of COPEC concentrations to residential human health SSLs is a viable alternative for several reasons. Animal studies are used to infer effects on humans and is the basic premise of modern toxicology (EPA 1989). In addition, toxicity values derived for the calculation of human health SSLs are often based on potential effects that are more sensitive than the ones used to derive ESLs (e.g., cellular effects for humans versus survival or reproductive effects for terrestrial animals). The EPA also applies uncertainty factors or modifying factors to ensure the toxicity values are protective (i.e., they are adjusted by uncertainty factors to values much lower than the study results). COPEC concentrations compared with these values are an order of magnitude or more below the SSLs, which corresponds to uncertainty factors of 10 or more. Therefore, it is assumed the differences in toxicity would not be more than an order of magnitude for any given chemical. The relative difference between values provides a weight of evidence that the potential toxicity of the COPC is likely to be low or very low to the receptor(s).

No ESLs are available in the ECORISK Database, Version 3.1 (LANL 2012c) for perchlorate, 2-chloronaphthalene, ethylbenzene, 4-isopropyltoluene, TATB, 1,2-xylene, and 1,3-xylene+1,4-xylene. In addition, no toxicity data were found as a result of the online database searches.

Perchlorate was detected in nine samples at the TA-36-8 OD Unit and five samples at the TA-39-6 OD Unit, with maximum detected concentrations of 0.00905 mg/kg and 0.00574 mg/kg, respectively. No background data are available for perchlorate. The NMED residential SSL for perchlorate is 54.8 mg/kg, indicating that potential toxicity is low. Because of the potential low toxicity, perchlorate is eliminated as a COPEC.

Surrogate ESLs based on structural similarity of chemicals were used to evaluate the potential ecological risks from 2-chloronaphthalene, ethylbenzene, 4-isopropyltoluene, TATB, 1,2-xylene, and 1,3-xylene+1,4-xylene. The ESLs used are presented in Table 3.1-1. TATB was identified as a COPEC at both sites using the surrogate ESLs.

4.0 CONCLUSIONS

The human health risk-screening assessment found potential risks and doses were below the NMED and DOE target levels for the industrial and residential scenarios. Therefore, no potential unacceptable risks and doses to human receptors exist under the industrial and residential scenarios at both OD units.

Literature-derived ESLs are conservative and overestimate the potential risk to receptors. The screening assessments resulted in adjusted HIs less than 1 for the kestrel, cottontail, and fox at both sites. Adjusted LOAEL-based HIs were above 1 for the robin, deer mouse, and shrew at both sites, and for the earthworm and plant at the TA-39-6 OD unit. The elevated adjusted LOAEL-based HIs were primarily from bis(2-ethylhexyl)phthalate, copper, di-n-butyl phthalate, and lead for the robin at the TA-36-8 OD unit; copper and di-n-butyl phthalate for the robin at the TA-39-6 OD unit; copper, HMX, TATB, and TCDD[2,3,7,8-] for the deer mouse at the TA-36-8 OD unit; copper for the deer mouse at the TA-39-6 OD unit; copper and TCDD[2,3,7,8-] for the shrew at the TA-36-8 OD unit; copper for the shrew at the TA-39-6 OD unit; antimony and copper for the plant at the TA-39-6 OD unit; and copper and mercury for the earthworm at the TA-39-6 OD unit.

The HIs exceed 1 for the robin, deer mouse, and shrew at both sites and for the earthworm and plant at the TA-39-6 OD unit. Recent field studies found no adverse impacts to the small-mammal population at either site. However, the available nest box data are limited. The drought has substantially affected the occupancy of all of the nest boxes on the Pajarito Plateau to where only higher elevation sites are maintaining populations. Despite this apparent change, the nest boxes around TA-36-8 and TA-39-6 will continue to be monitored. In addition, avian monitoring at the two open detonation sites was initiated to monitor patterns of bird abundance and diversity, and population trends at both sites. This information will supplement or replace the nest box results, particularly if the drought continues to effect nest box occupancy. Results for 2013 indicated that the avian abundance and diversity were comparable to or greater than that of the control sites.

The earthworm and plant HIs were also above 1 at TA-39-6. Field observations made during the site visit revealed the plant communities at each site are sparse because of active maintenance related safety and fire prevention and the type of non-native soil/fill present at the sites. However, the plant communities in the surrounding areas appear healthy. This line of evidence indicates there are no adverse ecological impacts to the soil invertebrate and plant communities.

5.0 REFERENCES

Battey, J., R.A. Leavitt, N. Biondao, and D. Polin, 1990. “An Ecotoxicological Study of a Population of the White-Footed Mouse (*Peromyscus leucopus*) Inhabiting a Polychlorinated Biphenyls-Contaminated Area,” *Archives of Environmental Contamination and Toxicology*, 19:283-290. (Battey et al. 1990)

Bennett, K., and R. Robinson, September 2008. “Small Mammal Sampling in Sandia Canyon, 2007,” Los Alamos National Laboratory report LA-14373, Los Alamos, New Mexico. (Bennett and Robinson 2008)

Bowman, J., J.A.G. Jaeger, and L. Fahrig, 2002. “Dispersal Distance of Mammals is Proportional to Home Range Size,” *Ecology,* Vol. 83, No. 7, pp. 2049–2055. (Bowman et al. 2002)

EPA (U.S. Environmental Protection Agency), 1993. “Wildlife Exposure Factors Handbook,” U.S. Environmental Protection Agency document EPA/600/P93/187A, Office of Research and Development, Washington, D.C. (EPA 1993)

EPA (U.S. Environmental Protection Agency), June 5, 1997. “Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final,” U.S. Environmental Protection Agency, Environmental Response Team, Edison NJ. (EPA 1997)

EPA (U.S. Environmental Protection Agency), October 7, 1999. “Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites,” OSWER Directive No. 9285.7-28 P, Office of Solid Waste and Emergency Response, Washington, D.C. (EPA 1999)

EPA (U.S. Environmental Protection Agency), July 2002. “Calculating Exposure Point Concentrations at Hazardous Waste Sites,” draft, U.S. Environmental Protection Agency document OSWER 9285.6-10, Office of Emergency and Remedial Response, Washington, D.C. (EPA 2002)

EPA (U.S. Environmental Protection Agency), November 2003. “Guidance for Developing Ecological Soil Screening Levels, Evaluation of Dermal Contact and Inhalation Exposure Pathways for the Purpose of Setting Eco-SSLs, Attachment 1-3, U.S. Environmental Protection Agency document OSWER Directive 92857-55, Office of Solid Waste and Emergency Response. (EPA 2003)

EPA (U.S. Environmental Protection Agency), December 2010. “Final Report Bioavailability of Dioxins and Dioxin-Like Compounds in Soil,” Office of Superfund Remediation and Technology Innovation, Environmental Response Team, West Las Vegas, Nevada (http://epa.gov/superfund/health/contaminants/dioxin/pdfs/Final_dioxin_RBA_Report_12_20_10.pdf). (EPA 2010)

Fresquez, P.R., 2009. “The Concentration of Radionuclides, Heavy Metals, and Polychlorinated Biphenyls in Field Mice collected from Regional Background Areas” Los Alamos National Laboratory document LA-UR-09-07580, Los Alamos, New Mexico. (Fresquez 2009)

Fresquez, P.R., 2011. “The Concentration of Radionuclides, Heavy Metals, and Polychlorinated Biphenyls in Field Mice collected from Regional Background Areas: Revision 1” Los Alamos National Laboratory document LA-UR-11-11687, Los Alamos, New Mexico. (Fresquez 2011a)

Fresquez, P.R., 2011. “Chemical Concentrations in Field Mice Collected from Open-Detonation Firing Sites TA-36 Minie and TA-39 Point 6 at Los Alamos National Laboratory,” Los Alamos National Laboratory document LA-UR-11-10614, Los Alamos, New Mexico. (Fresquez 2011b)

Fresquez, P.R., L. Hansen, and C. Hathcock, 2013. “Chemical Concentrations in Field Mice/Voles Collected from an Open-Burn Site at Technical Area 16 at Los Alamos National Laboratory, Revision 1,” Los Alamos National Laboratory document LA-UR-13-200040, Los Alamos, New Mexico. (Fresquez et al. 2013)

Kraig, D., Ryti, R., Katzman, D., Buhl, T., Gallaher, B., and Fresquez, P., March 2002. "Radiological and Nonradiological Effects after the Cerro Grande Fire," Los Alamos National Laboratory document LA-13914, Los Alamos, New Mexico. (Kraig et al. 2002)

Krouskop, K.J., K.C. Ayers, and J.L. Proctor. 1991. “Multimedia Sampling for Dioxin at a Strip Mine Reclaimed with Sludge from Bleached Kraft Wastewater Treatment,” *Tappi Journal*, 74(4):235–240. (Krouskop et al. 1991)

LANL (Los Alamos National Laboratory), September 1998. “Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory,” Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998)

LANL (Los Alamos National Laboratory), November 2003. “ECORISK Database (Version 2.0),” on CD, Los Alamos, New Mexico. (LANL 2003)

LANL (Los Alamos National Laboratory), April 2004. “Los Alamos and Pueblo Canyons Investigation Report,” Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004)

LANL (Los Alamos National Laboratory), December 2005. “Los Alamos and Pueblo Canyons Supplemental Investigation Report,” Los Alamos National Laboratory document LA-UR-05-9230, Los Alamos, New Mexico. (LANL 2005)

LANL (Los Alamos National Laboratory), October 2006. “Mortandad Canyon Investigation Report,” Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006)

LANL (Los Alamos National Laboratory), June 2007. “Revised Risk Assessments for Mortandad Canyon,” Los Alamos National Laboratory document LA-UR-07-4010, Los Alamos, New Mexico. (LANL 2007)

LANL (Los Alamos National Laboratory), August 2009. “Pajarito Canyon Investigation Report, Revision 1,” Los Alamos National Laboratory document LA-UR-09-4670, Los Alamos, New Mexico. (LANL 2009a)

LANL (Los Alamos National Laboratory), October 2009. “Investigation Report for Sandia Canyon,” Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009b)

LANL (Los Alamos National Laboratory), October 2012. “Derivation and Use of Radionuclide Screening Action Levels, Revision 2,” Los Alamos National Laboratory document LA-UR-12-23292, Los Alamos, New Mexico. (LANL 2012a)

LANL (Los Alamos National Laboratory), November 2012. “Screening-Level Ecological Risk Assessment Methods, Revision 3,” Los Alamos National Laboratory document LA-UR-12-24152, Los Alamos, New Mexico. (LANL 2012b)

LANL (Los Alamos National Laboratory), October 2012. “ECORISK Database (Release 3.1),” on CD, LA-UR-12-24548, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2012c)

LANL (Los Alamos National Laboratory), 2013. “Avian Monitoring at the TA-36 Minie Site, TA-39 Point 6, and TA-16 Burn Grounds,” Los Alamos National Laboratory document LA-UR-13-27825, Los Alamos, New Mexico. (LANL 2013)

NMED (New Mexico Environment Department), February 2012 (updated June 2012). “Risk Assessment Guidance for Site Investigations and Remediation,” New Mexico Environment Department, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, Santa Fe, New Mexico. (NMED 2012)

Sample, B.E., Suter III, G.W., Efroymson, R.A., and Jones, D.A., May 1998. “A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application,” Oak Ridge National Laboratory, Environmental Sciences Division, Publication No. 4783, ORNL/TM13615, Oak Ridge, TN. (Sample et al. 1997)

Umbreit, T.H., Hesse, E.J., and Gallo, M.A., 1986. “Bioavailability of dioxin in soil from a 2,4,5-T manufacturing site,” Science 232:497–499. (Umbreit et al. 1986)

Van den Berg, M., Birnbaum, L., Bosveld, A.T., Brunström, B., Cook, P., Feeley, M., Giesy, J.P., Hanberg, A., Hasegawa, R., Kennedy, S.W., Kubiak, T., Larsen, J.C., van Leeuwen, F.X., Liem, A.K., Nolt, C., Peterson, R.E., Poellinger, L., Safe, S., Schrenk, D., Tillitt, D., Tysklind, M., Younes, M., Waern, F., and Zacharewski, T., 1998. “Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife,” Environ Health Perspect. 106(12):775–792. (Van den Berg et al. 1998)

Table 1.2-1
Inorganic Chemicals Detected or Detected above Background at the TA-36-8 OD Unit

Sample ID	Depth (ft)	Media	Cadmium (mg/kg)	Calcium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Perchlorate (mg/kg)	Zinc (mg/kg)
Soil BV[a] (mg/kg)			**0.4**	**6120**	**14.7**	**22.3**	**15.4**	**na[b]**	**48.8**
Industrial SSLs[c] (mg/kg)			**897**	**na**	**45400**	**800**	**22500**	**795**	**341000**
Residential SSLs[c] (mg/kg)			**70.3**	**na**	**3130**	**400**	**1560**	**54.8**	**23500**
RE36-11-4953	0-1	Soil	2.71	—[d]	49.1(J+)	—	—	—	66.7
RE36-11-4954	0-1	Soil	—	—	32(J+)	—	—	0.000717(J)	42.2
RE36-11-4955	0-1	Soil	3.17	—	99.2(J+)	22.4	—	—	50.1
RE36-11-4956	0-1	Soil	—	—	349(J+)	—	—	0.00905	45.1
RE36-11-4957	0-1	Soil	2.33	—	212(J+)	—	—	0.000669(J)	32.9
RE36-11-4958	0-1	Soil	—	—	88.7(J+)	30.7	—	—	55.4
RE36-11-4959	0-1	Soil	—	—	83.2(J+)	32.9	—	—	43
RE36-11-4960	0-1	Soil	—	—	55.9(J+)	23.8	—	0.000912(J)	42.8
RE36-11-4961	0-1	Soil	0.835	6210	32.5(J+)	—	—	0.000594(J)	37.2
RE36-11-4962	0-1	Soil	—	—	—	—	—	0.00166(J)	40.6
RE36-11-4963	0-1	Soil	1.19	—	1470(J+)	—	—	—	29.4
RE36-11-4964	0-1	Soil	1.11	—	49.9(J+)	—	—	—	40.6
RE36-11-4965	0-1	Soil	0.487(J)	—	34.1(J+)	—	—	—	50.1
RE36-11-4967	0-1	Soil	0.895	—	61.1(J+)	—	32.2(J-)	0.00272	46.5
RE36-11-4968	0-1	Soil	—	—	27.5(J+)	—	—	—	49.9
RE36-11-4969	0-1	Soil	0.645	—	31.9(J+)	—	—	0.000854(J)	46.6
RE36-11-4970	0-1	Soil	—	—	—	—	—	0.000585(J)	34.5
RE36-11-4971	0-1	Soil	—	—	22(J+)	—	—	—	35
RE36-11-4972	0-1	Soil	—	—	29.6(J+)	—	—	—	54.4

[a] Source of BVs Is LANL (1998).
[b] na = Not available.
[c] SSLs from NMED (2012).
[d] — = Not detected or not detected above BV.

Table 1.2-2
Inorganic Chemicals Detected or Detected above Background at the TA-39-6 OD Unit

Sample ID	Depth (ft)	Media	Antimony (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Perchlorate (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
Soil BV[a] (mg/kg)			**0.83**	**295**	**0.4**	**14.7**	**22.3**	**0.1**	**na[b]**	**1**	**48.8**
Industrial SSLs[c] (mg/kg)			**454**	**223000**	**897**	**45400**	**800**	**341**	**795**	**5680**	**341000**
Residential SSLs[c] (mg/kg)			**31.3**	**15600**	**70.3**	**3130**	**400**	**23.5**	**54.8**	**391**	**23500**
RE39-11-4973	0-1	Soil	—[d]	298	—	312(J)	217	0.488	0.000948(J)	—	194
RE39-11-4974	0-1	Soil	3.36	—	0.739	1910(J)	50.5	—	—	—	—
RE39-11-4975	0-1	Soil	2.5	—	—	52.4(J)	53.8	—	0.00168(J)	—	—
RE39-11-4976	0-1	Soil	—	—	—	79.8(J)	51.2	—	0.00135(J)	—	56.8
RE39-11-4977	0-1	Soil	2.18	—	—	3410(J)	98	—	0.00574	—	91
RE39-11-4978	0-1	Soil	0.996(J)	—	0.463(J)	196(J)	91.9	—	—	—	49.4
RE36-11-4979	0-1	Soil	—	—	—	225(J)	139	—	—	—	—
RE39-11-4980	0-1	Soil	—	—	—	323(J)	259	—	0.00059(J)	—	60.2
RE39-11-4981	0-1	Soil	—	—	—	229(J)	83.1	—	—	—	—
RE39-11-4982	0-1	Soil	1.05	—	—	463(J)	150	—	—	1.36	50.5

[a] Source of BVs Is LANL (1998).
[b] na = Not available.
[c] SSLs from NMED (2012).
[d] — = Not detected or not detected above BV.

Table 1.2-3
Organic Chemicals Other than Dioxins/Furans Detected at the TA-36-8 OD Unit

Sample ID	Depth (ft)	Media	Acetone	Amino-2,6-dinitrotoluene[4-]	Anthracene	Aroclor-1254	Aroclor-1260	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Bis(2-ethylhexyl)phthalate	Butanone[2-]
Industrial SSLs[a]			**868000**	**1900[b]**	**183000**	**8.26**	**8.26**	**23.4**	**2.34**	**23.4**	**18300[c]**	**234**	**1370**	**375000**
Residential SSLs[a]			**66600**	**150[b]**	**17200**	**1.12**	**2.22**	**1.48**	**0.148**	**1.48**	**1720[c]**	**14.8**	**347**	**37100**
RE36-11-4953	0-1	Soil	—[d]	—	—	—	0.0017(J)	—	—	0.0238(J)	—	—	—	—
RE36-11-4954	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.132(J)	—
RE36-11-4955	0-1	Soil	—	—	—	—	0.0016(J)	—	—	0.0257(J)	0.0151(J)	—	—	—
RE36-11-4956	0-1	Soil	0.00331(J)	0.285(J)	0.016(J)	—	—	0.0259(J)	0.0505	0.0396	0.0559		0.128(J)	0.00161(J)
RE36-11-4957	0-1	Soil	—	—	—	—	—	—	—	—	—	—	8.4	—
RE36-11-4958	0-1	Soil	—	—	—	0.0018(J)	0.0027(J)	—	—	—	—	—	—	—
RE36-11-4959	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.289(J)	—
RE36-11-4960	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.247(J)	—
RE36-11-4961	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4962	0-1	Soil	—	—	—	—	0.0013(J)	—	—	—	—	—	—	—
RE36-11-4963	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.0833(J)	—
RE36-11-4964	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4965	0-1	Soil	—	—	—	—	—	—	—	0.0183(J)	—	—	—	—
RE36-11-4967	0-1	Soil	—	—	—	—	0.0207	—	—	—	—	—	—	—
RE36-11-4968	0-1	Soil	—	—	0.0134(J)	—	—	0.0723	0.0836	0.0915	0.0476	0.0343	—	—
RE36-11-4969	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.108(J)	—
RE36-11-4970	0-1	Soil	—	—	—	—	—	—	—	0.0157(J)	—	—	—	—
RE36-11-4971	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4972	0-1	Soil	—	—	—	—	—	—	—	—	—	—	0.0889(J)	—

Table 1.2-3 (continued)

Sample ID	Depth (ft)	Media	Chloronaphthalene[2-]	Chrysene	Di-n-butyl phthalate	Dinitrotoluene[2,4-]	Dinitrotoluene[2,6-]	Diphenylamine	Fluoranthene	Fluorene	HMX	Indeno(1,2,3-cd)pyrene	Methylene chloride
Industrial SSLs[a]			**90800**	**2340**	**68400**	**61.8**	**684**	**15000[b]**	**24400**	**24400**	**56800**	**23.4**	**4700**
Residential SSLs[a]			**6260**	**148**	**6110**	**15.7**	**61.1**	**1500[b]**	**2290**	**2290**	**3910**	**1.48**	**409**
RE36-11-4953	0-1	Soil	—	—	0.147(J)	—	—	—	0.0162(J)	—	—	—	—
RE36-11-4954	0-1	Soil	—	—	0.31(J)	0.282(J)	—	—	—	—	0.974	—	—
RE36-11-4955	0-1	Soil	—	—	—	—	—	—	0.0106(J)	—	0.267(J)	—	—
RE36-11-4956	0-1	Soil	—	0.0242(J)	—	0.116(J)	—	—	0.0651	0.0194(J)	7.69	0.0232(J)	—
RE36-11-4957	0-1	Soil	—	—	—	—	—	—	—	—	2.41	—	—
RE36-11-4958	0-1	Soil	—	—	1.2	1.58	0.0696(J)	0.146(J)	—	—	0.222(J)	—	—
RE36-11-4959	0-1	Soil	—	—	—	—	—	—	—	—	2.27	—	—
RE36-11-4960	0-1	Soil	—	—	0.0884(J)	—	—	—	—	—	0.151(J)	—	—
RE36-11-4961	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4962	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4963	0-1	Soil	—	—	—	—	—	—	—	—	24.5	—	—
RE36-11-4964	0-1	Soil	—	—	—	—	—	—	—	—	67.4	—	—
RE36-11-4965	0-1	Soil	—	0.0109(J)	0.146(J)	—	—	—	0.0242(J)	—	—	—	—
RE36-11-4967	0-1	Soil	0.108	—	—	—	—	—	—	—	1.18	—	—
RE36-11-4968	0-1	Soil	—	0.0771	0.133(J)	—	—	—	0.142	—	0.419(J)	0.0452	0.00217(J)
RE36-11-4969	0-1	Soil	—	—	0.0827(J)	—	—	—	—	—	0.516	—	—
RE36-11-4970	0-1	Soil	—	—	—	—	—	—	0.0202(J)	—	—	—	—
RE36-11-4971	0-1	Soil	—	—	—	—	—	—	—	—	—	—	—
RE36-11-4972	0-1	Soil	—	—	0.176(J)	—	—	—	—	—	—	—	—

Table 1.2-3 (continued)

Sample ID	Depth (ft)	Media	Methylnaphthalene[2-]	Naphthalene	PETN	Phenanthrene	Pyrene	RDX	TATB	Toluene	Trinitrotoluene[2,4,6-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSLs[a]			**2200[b]**	**241**	**4300[b]**	**20500**	**18300**	**3410**	**27000[b,e]**	**57700**	**568**	**4410**	**3980[f]**
Residential SSLs[a]			**230[b]**	**43**	**1200[b]**	**1830**	**1720**	**58.2**	**2200[b,e]**	**5270**	**39.1**	**898**	**814[f]**
RE36-11-4953	0-1	Soil	—	—	—	—	0.0121(J)	1.16	7.98(J)	—	—	0.000448(J)	0.00105(J)
RE36-11-4954	0-1	Soil	—	—	—	—	—	—	37.3(J)	—	—	—	0.00039(J)
RE36-11-4955	0-1	Soil	—	—	—	—	—	—	30.5(J)	—	—	—	—
RE36-11-4956	0-1	Soil	0.00784(J)	0.0136(J)	—	0.058	0.122	2.61	30.8(J)	0.000853(J)	0.701	—	0.000823(J)
RE36-11-4957	0-1	Soil	—	—	—	0.013(J)	—	0.189(J)	29.1(J)	—	0.111(J)	—	—
RE36-11-4958	0-1	Soil	—	—	—	—	—	0.105(J)	24.4(J)	—	—	—	—
RE36-11-4959	0-1	Soil	—	—	—	—	—	0.138(J)	34.9(J)	—	—	—	—
RE36-11-4960	0-1	Soil	—	—	—	—	—	0.144(J)	31.1(J)	—	—	—	—
RE36-11-4961	0-1	Soil	—	—	—	—	—	—	11.4(J)	—	—	—	—
RE36-11-4962	0-1	Soil	—	—	—	—	—	—	1.35	—	—	—	—
RE36-11-4963	0-1	Soil	—	—	12.8	—	—	—	23.7(J)	—	—	—	—
RE36-11-4964	0-1	Soil	—	—	—	—	—	—	27.9(J)	—	—	—	—
RE36-11-4965	0-1	Soil	—	—	—	—	0.0211(J)	—	33.8(J)	—	—	—	—
RE36-11-4967	0-1	Soil	—	—	—	—	—	—	16.9	0.000535(J)	—	—	0.000565(J)
RE36-11-4968	0-1	Soil	—	—	—	0.0774	0.137	0.608	3.52(J)	0.000897(J)	—	—	0.00101(J)
RE36-11-4969	0-1	Soil	—	—	—	—	—	—	7.73(J)	—	—	—	—
RE36-11-4970	0-1	Soil	—	—	—	—	0.0285(J)	—	1.14(J)	—	—	—	—
RE36-11-4971	0-1	Soil	—	—	—	—	—	—	1.74	—	—	—	—
RE36-11-4972	0-1	Soil	—	—	—	—	—	—	19.8	—	—	—	—

Note: units are mg/kg.
[a] SSLs from NMED (2012), unless otherwise noted.
[b] SSLs from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[c] Pyrene used a surrogate based on structural similarity.
[d] — = Not detected.
[e] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[f] Xylenes used as a surrogate based on structural similarity.

Table 1.2-4
Dioxin and Furan Congener Concentrations in Samples Collected at the TA-36-8 OD Unit

Congener	RE-11-4953 (mg/kg)	RE-11-4954 (mg/kg)	RE-11-4955 (mg/kg)	RE-11-4956 (mg/kg)	RE-11-4957 (mg/kg)	RE-11-4958 (mg/kg)	RE-11-4959 (mg/kg)	RE-11-4960 (mg/kg)	RE-11-4961 (mg/kg)	RE-11-4962 (mg/kg)
2,3,7,8-TCDD	1.27E-07	Not detected	1.25E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	6.51E-07	Not detected	7.07E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	1.34E-06	Not detected	1.63E-06	Not detected	5.92E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	2.62E-06	5.77E-07	3.05E-06	Not detected	1.22E-06	Not detected	Not detected	7.86E-07	7.58E-07	Not detected
1,2,3,7,8,9-HxCDD	2.79E-06	6.45E-07	2.84E-06	Not detected	1.15E-06	Not detected	Not detected	6.65E-07	7.13E-07	Not detected
1,2,3,4,6,7,8-HpCDD	1.27E-04	1.87E-05	1.34E-04	7.34E-06	4.88E-05	1.69E-05	9.02E-06	2.60E-05	2.35E-05	9.01E-06
OCDD	1.07E-03	1.51E-04	1.01E-03	6.44E-05	3.28E-04	1.44E-04	7.28E-05	2.60E-04	1.56E-04	5.95E-05
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDF	6.70E-07	Not detected	6.40E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HXCDF	5.62E-07	Not detected	6.38E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	8.01E-07	Not detected	8.57E-07	Not detected	5.54E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.09E-05	2.51E-06	9.35E-06	1.10E-06	4.04E-06	2.67E-06	1.18E-06	3.49E-06	2.05E-06	1.10E-06
1,2,3,4,7,8,9-HpCDF	6.84E-07	Not detected	6.79E-07	Not detected	5.73E-07	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	3.20E-05	6.65E-06	2.93E-05	2.76E-06	1.03E-05	8.33E-06	3.49E-06	1.23E-05	4.40E-06	2.19E-06

Table 1.2-4 (continued)

Congener	RE-11-4963 (mg/kg)	RE-11-4964 (mg/kg)	RE-11-4965 (mg/kg)	RE-11-4967 (mg/kg)	RE-11-4968 (mg/kg)	RE-11-4969 (mg/kg)	RE-11-4970 (mg/kg)	RE-11-4971 (mg/kg)	RE-11-4972 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	1.63E-07	1.84E-07	1.68E-07	Not detected	Not detected	Not detected	3.79E-07
1,2,3,7,8-PeCDD	Not detected	Not detected	9.47E-07	8.58E-07	7.46E-07	Not detected	Not detected	Not detected	3.04E-06
1,2,3,4,7,8-HxCDD	6.14E-07	5.93E-07	2.25E-06	1.82E-06	1.98E-06	1.05E-06	Not detected	Not detected	7.20E-06
1,2,3,6,7,8-HxCDD	1.05E-06	1.20E-06	4.29E-06	3.65E-06	2.96E-06	2.00E-06	7.37E-07	Not detected	1.50E-05
1,2,3,7,8,9-HxCDD	9.10E-07	1.16E-06	3.95E-06	3.59E-06	3.13E-06	2.11E-06	6.89E-07	Not detected	1.51E-05
1,2,3,4,6,7,8-HpCDD	3.52E-05	4.41E-05	1.55E-04	1.38E-04	1.37E-04	6.78E-05	2.62E-05	1.38E-05	6.02E-04
OCDD	2.25E-04	2.97E-04	9.93E-04	9.88E-04	1.05E-03	4.07E-04	1.97E-04	1.03E-04	4.75E-03
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	8.94E-07
1,2,3,4,7,8-HxCDF	Not detected	Not detected	5.21E-07	7.11E-07	6.82E-07	Not detected	Not detected	Not detected	2.34E-06
1,2,3,6,7,8-HXCDF	Not detected	Not detected	6.22E-07	6.36E-07	5.92E-07	Not detected	Not detected	Not detected	1.87E-06
2,3,4,6,7,8-HxCDF	Not detected	Not detected	9.10E-07	1.04E-06	8.62E-07	Not detected	Not detected	Not detected	3.14E-06
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	6.41E-07
1,2,3,4,6,7,8-HpCDF	3.11E-06	3.44E-06	1.42E-05	1.25E-05	1.05E-05	4.59E-06	2.52E-06	1.42E-06	4.17E-05
1,2,3,4,7,8,9-HpCDF	Not detected	Not detected	1.06E-06	9.20E-07	7.05E-07	Not detected	Not detected	Not detected	2.85E-06
OCDF	6.75E-06	8.39E-06	4.56E-05	3.64E-05	3.10E-05	1.22E-05	8.18E-06	3.40E-06	1.07E-04

Table 1.2-5
Organic Chemicals Detected Other than Dioxins/Furans at the TA-39-6 OD Unit

Sample ID	Depth (ft)	Media	Aroclor-1254	Aroclor-1260	Bis(2-ethylhexyl)phthalate	Butylbenzylphthalate	Di-n-butyl phthalate	Dinitrotoluene[2,4-]	Di-n-octyl phthalate	Diphenylamine	Ethylbenzene	HMX	Isopropyltoluene[4-]	Naphthalene
Industrial SSLs[a]			**8.26**	**8.26**	**1370**	**9100[b]**	**68400**	**61.8**	**68400[c]**	**15000[b]**	**378**	**56800**	**14500[d]**	**241**
Residential SSLs[a]			**1.12**	**2.22**	**347**	**2600[b]**	**6110**	**15.7**	**6110[c]**	**1500[b]**	**68.4**	**3910**	**2430[d]**	**43**
RE39-11-4973	0-1	Soil	0.0381	0.0177	0.101(J)	—[e]	0.414	—	—	—	0.000336(J)	—	0.00133	0.0234(J)
RE39-11-4974	0-1	Soil	0.002(J)	0.0016(J)	0.403	—	—	—	—	—	—	—	—	—
RE39-11-4975	0-1	Soil	0.0031(J)	0.0028(J)	—	—	—	—	—	—	—	—	—	—
RE39-11-4976	0-1	Soil	0.0084	0.0052	—	—	—	—	—	—	—	—	—	—
RE39-11-4977	0-1	Soil	0.007	0.0054	2.42	—	6.76(J)	15.7(J)	3.81	1.3	—	0.458(J)	—	—
RE39-11-4978	0-1	Soil	0.005	0.0026(J)	0.144(J)	—	3.68	4.52(J)	—	0.309(J)	—	—	—	—
RE39-11-4979	0-1	Soil	0.0108	0.0063	—	—	1.12	2.79	—	0.182(J)	—	—	—	—
RE39-11-4980	0-1	Soil	0.0113	0.0135	0.291(J)	0.09(J)	0.527(J)	5.18	—	—	—	—	—	—
RE39-11-4981	0-1	Soil	0.0028(J)	—	0.915	—	1.6	3.69(J)	—	0.0717(J)	—	—	—	—
RE39-11-4982	0-1	Soil	0.0058	0.0026(J)	0.437	0.137(J)	1.47	3.54	—	0.143(J)	—	—	—	—

Table 1.2-5 (continued)

Sample ID	Depth (ft)	Media	RDX	Styrene	TATB	Toluene	Trinitrotoluene[2,4,6-]	Xylene[1,2-]	Xylene[1,3-]+Xylene[1,4-]
Industrial SSLs[a]			**3410**	**50000**	**27000[b,f]**	**57700**	**568**	**4410**	**3980[g]**
Residential SSLs[a]			**58.2**	**7280**	**2200[b,f]**	**5270**	**39.1**	**898**	**814[g]**
RE39-11-4973	0-1	Soil	—	0.000388(J)	5.19	0.00124	—	0.000336(J)	0.00165(J)
RE39-11-4974	0-1	Soil	—	—	0.435(J)	—	—	—	—
RE39-11-4975	0-1	Soil	—	—	—	—	—	—	—
RE39-11-4976	0-1	Soil	—	—	—	—	—	—	—
RE39-11-4977	0-1	Soil	—	—	0.592(J)	—	—	—	—
RE39-11-4978	0-1	Soil	—	—	9.71	—	—	—	—
RE39-11-4979	0-1	Soil	—	—	—	—	—	—	—
RE39-11-4980	0-1	Soil	—	—	2.07	—	—	—	—
RE39-11-4981	0-1	Soil	0.116(J)	—	3.69	—	0.312(J)	—	—
RE39-11-4982	0-1	Soil	—	—	1.98	—	—	—	—

Note: units are mg/kg.

[a] SSLs from NMED (2012), unless otherwise noted.

[b] SSLs from EPA regional screening tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

[c] Di-n-butyl phthalate used as a surrogate based on structural similarity.

[d] Isopropylbenzene used as a surrogate based on structural similarity.

[e] — = Not detected.

[f] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[g] Xylenes used as a surrogate based on structural similarity.

Table 1.2-6
Dioxin and Furan Congener Concentrations in Samples Collected at the TA-39-6 OD Unit

Congener	RE-11-4973 (mg/kg)	RE-11-4974 (mg/kg)	RE-11-4975 (mg/kg)	RE-11-4976 (mg/kg)	RE-11-4977 (mg/kg)	RE-11-4978 (mg/kg)	RE-11-4979 (mg/kg)	RE-11-4980 (mg/kg)	RE-11-4981 (mg/kg)	RE-11-4982 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	Not detected	Not detected	2.16E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	5.63E-07	Not detected	Not detected	Not detected	1.04E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	9.81E-07	Not detected	Not detected	Not detected	2.12E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	3.00E-06	Not detected	Not detected	Not detected	4.57E-06	5.35E-07	Not detected	1.11E-06	Not detected	5.34E-07
1,2,3,7,8,9-HxCDD	2.45E-06	Not detected	5.69E-07	Not detected	4.89E-06	Not detected	Not detected	1.03E-06	Not detected	Not detected
1,2,3,4,6,7,8-HpCDD	1.21E-04	1.78E-05	1.74E-05	1.04E-05	1.81E-04	1.71E-05	9.84E-06	4.30E-05	5.28E-06	1.50E-05
OCDD	8.72E-04	1.63E-04	1.38E-04	7.58E-05	1.47E-03	1.31E-04	6.36E-05	3.52E-04	3.79E-05	1.27E-04
2,3,7,8-TCDF	3.11E-06	Not detected	Not detected	Not detected	2.03E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	7.87E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	4.75E-07	Not detected	Not detected
2,3,4,7,8-PeCDF	1.30E-06	Not detected	Not detected	5.16E-07	8.38E-07	Not detected	4.76E-07	8.60E-07	Not detected	5.26E-07
1,2,3,4,7,8-HxCDF	1.33E-06	Not detected	Not detected	Not detected	1.26E-06	Not detected	Not detected	7.27E-07	Not detected	Not detected
1,2,3,6,7,8-HXCDF	8.16E-07	Not detected	Not detected	Not detected	9.91E-07	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	1.02E-06	Not detected	Not detected	Not detected	1.48E-06	Not detected	Not detected	5.85E-07	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.01E-05	2.06E-06	1.70E-06	1.31E-06	1.44E-05	1.86E-06	1.12E-06	4.06E-06	9.43E-07	1.89E-06
1,2,3,4,7,8,9-HpCDF	7.93E-07	Not detected	Not detected	Not detected	7.16E-07	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	2.48E-05	4.99E-06	2.16E-06	1.52E-06	2.44E-05	2.99E-06	1.61E-06	6.81E-06	1.48E-06	3.78E-06

Table 1.2-7
Radionuclides Detected above Background at the TA-36-8 OD Unit

Sample ID	Depth (ft)	Media	Uranium-234 (pCi/g)	Uranium-235 (pCi/g)	Uranium-238 (pCi/g)
Soil BV[a] (pCi/g)			**2.59**	**0.2**	**2.29**
Industrial SALs[b] (pCi/g)			**1500**	**87**	**430**
Residential SALs[b] (pCi/g)			**170**	**17**	**87**
RE36-11-4953	0-1	Soil	3.62	0.515	19.4
RE36-11-4954	0-1	Soil	—[c]	—	—
RE36-11-4955	0-1	Soil	13.8(J+)	1.83(J+)	105(J+)
RE36-11-4956	0-1	Soil	—	—	—
RE36-11-4957	0-1	Soil	3.02	0.446	18.6
RE36-11-4958	0-1	Soil	—	—	4.09
RE36-11-4959	0-1	Soil	—	—	—
RE36-11-4960	0-1	Soil	—	—	—
RE36-11-4961	0-1	Soil	4.09	0.558	26.4
RE36-11-4962	0-1	Soil	—	—	5.29
RE36-11-4963	0-1	Soil	—	0.274	15.6
RE36-11-4964	0-1	Soil	3.04	0.418	19.8
RE36-11-4965	0-1	Soil	—	0.259	10.6
RE36-11-4967	0-1	Soil	5.11	0.648	31.7
RE36-11-4968	0-1	Soil	—	—	9.21
RE36-11-4969	0-1	Soil	—	0.32	12.1
RE36-11-4970	0-1	Soil	—	—	5.81
RE36-11-4971	0-1	Soil	—	—	3.9
RE36-11-4972	0-1	Soil	2.87	0.314	16.3

[a] Source of BVs Is LANL (1998).
[b] SALs from LANL (2012a).
[c] — = Not detected or not detected above BV.

Table 2.1-1
TEFs Used for Calculating TCDD Equivalent Concentrations

Dioxin and Furan Congeners	Mammalian TEF[a]	Avian TEF[b]
Tetrachlorodibenzodioxin[2,3,7,8-]	1	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	0.05
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	0.01
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	0.1
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	0.001
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	0.0001
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	0.1
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	1
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	0.1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	0.1
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	0.1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	0.01
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	0.01
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	0.0001

[a] NMED (2012).
[b] Van den Berg et al. (1998).

Table 2.1-2
Dioxin and Furan Congener Concentrations Converted Using Mammalian TEFs at the TA-36-8 OD Unit

Congener	RE-11-4953 (mg/kg)	RE-11-4954 (mg/kg)	RE-11-4955 (mg/kg)	RE-11-4956 (mg/kg)	RE-11-4957 (mg/kg)	RE-11-4958 (mg/kg)	RE-11-4959 (mg/kg)	RE-11-4960 (mg/kg)	RE-11-4961 (mg/kg)	RE-11-4962 (mg/kg)
2,3,7,8-TCDD	1.27E-07	Not detected	1.25E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	6.51E-07	Not detected	7.07E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	1.34E-07	Not detected	1.63E-07	Not detected	5.92E-08	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	2.62E-07	5.77E-08	3.05E-07	Not detected	1.22E-07	Not detected	Not detected	7.86E-08	7.58E-08	Not detected
1,2,3,7,8,9-HxCDD	2.79E-07	6.45E-08	2.84E-07	Not detected	1.15E-07	Not detected	Not detected	6.65E-08	7.13E-08	Not detected
1,2,3,4,6,7,8-HpCDD	1.27E-06	1.87E-07	1.34E-06	7.34E-08	4.88E-07	1.69E-07	9.02E-08	2.60E-07	2.35E-07	9.01E-08
OCDD	3.21E-07	4.53E-08	3.03E-07	1.93E-08	9.84E-08	4.32E-08	2.18E-08	7.80E-08	4.68E-08	1.79E-08
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDF	6.70E-08	Not detected	6.40E-08	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HXCDF	5.62E-08	Not detected	6.38E-08	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	8.01E-08	Not detected	8.57E-08	Not detected	5.54E-08	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.09E-07	2.51E-08	9.35E-08	1.10E-08	4.04E-08	2.67E-08	1.18E-08	3.49E-08	2.05E-08	1.10E-08
1,2,3,4,7,8,9-HpCDF	6.84E-09	Not detected	6.79E-09	Not detected	5.73E-09	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	9.60E-09	2.00E-09	8.79E-09	8.28E-10	3.09E-09	2.50E-09	1.05E-09	3.69E-09	1.32E-09	6.57E-10
TCDD[2,3,7,8-] equivalent concentration	3.37E-06	3.82E-07	3.55E-06	1.05E-07	1.04E-06	2.41E-07	1.25E-07	5.22E-07	4.51E-07	1.20E-07

Table 2.1-2 (continued)

Congener	RE-11-4963 (mg/kg)	RE-11-4964 (mg/kg)	RE-11-4965 (mg/kg)	RE-11-4967 (mg/kg)	RE-11-4968 (mg/kg)	RE-11-4969 (mg/kg)	RE-11-4970 (mg/kg)	RE-11-4971 (mg/kg)	RE-11-4972 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	1.63E-07	1.84E-07	1.68E-07	Not detected	Not detected	Not detected	3.79E-07
1,2,3,7,8-PeCDD	Not detected	Not detected	9.47E-07	8.58E-07	7.46E-07	Not detected	Not detected	Not detected	3.04E-06
1,2,3,4,7,8-HxCDD	6.14E-08	5.93E-08	2.25E-07	1.82E-07	1.98E-07	1.05E-07	Not detected	Not detected	7.20E-07
1,2,3,6,7,8-HxCDD	1.05E-07	1.20E-07	4.29E-07	3.65E-07	2.96E-07	2.00E-07	7.37E-08	Not detected	1.50E-06
1,2,3,7,8,9-HxCDD	9.10E-08	1.16E-07	3.95E-07	3.59E-07	3.13E-07	2.11E-07	6.89E-08	Not detected	1.51E-06
1,2,3,4,6,7,8-HpCDD	3.52E-07	4.41E-07	1.55E-06	1.38E-06	1.37E-06	6.78E-07	2.62E-07	1.38E-07	6.02E-06
OCDD	6.75E-08	8.91E-08	2.98E-07	2.96E-07	3.15E-07	1.22E-07	5.91E-08	3.09E-08	1.43E-06
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	2.68E-07
1,2,3,4,7,8-HxCDF	Not detected	Not detected	5.21E-08	7.11E-08	6.82E-08	Not detected	Not detected	Not detected	2.34E-07
1,2,3,6,7,8-HXCDF	Not detected	Not detected	6.22E-08	6.36E-08	5.92E-08	Not detected	Not detected	Not detected	1.87E-07
2,3,4,6,7,8-HxCDF	Not detected	Not detected	9.10E-08	1.04E-07	8.62E-08	Not detected	Not detected	Not detected	3.14E-07
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	6.41E-08
1,2,3,4,6,7,8-HpCDF	3.11E-08	3.44E-08	1.42E-07	1.25E-07	1.05E-07	4.59E-08	2.52E-08	1.42E-08	4.17E-07
1,2,3,4,7,8,9-HpCDF	Not detected	Not detected	1.06E-08	9.20E-09	7.05E-09	Not detected	Not detected	Not detected	2.85E-08
OCDF	2.03E-09	2.52E-09	1.37E-08	1.09E-08	9.30E-09	3.66E-09	2.45E-09	1.02E-09	3.21E-08
TCDD[2,3,7,8-] equivalent concentration	7.10E-07	8.62E-07	4.38E-06	4.01E-06	3.74E-06	1.37E-06	4.91E-07	1.84E-07	1.61E-05

Table 2.1-3
Dioxin and Furan Congener Concentrations Converted Using Avian TEFs at the TA-36-8 OD Unit

Congener	RE-11-4953 (mg/kg)	RE-11-4954 (mg/kg)	RE-11-4955 (mg/kg)	RE-11-4956 (mg/kg)	RE-11-4957 (mg/kg)	RE-11-4958 (mg/kg)	RE-11-4959 (mg/kg)	RE-11-4960 (mg/kg)	RE-11-4961 (mg/kg)	RE-11-4962 (mg/kg)
2,3,7,8-TCDD	1.27E-07	Not detected	1.25E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	6.51E-07	Not detected	7.07E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	6.70E-08	Not detected	8.15E-08	Not detected	2.96E-08	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	2.62E-08	5.77E-09	3.05E-08	Not detected	1.22E-08	Not detected	Not detected	7.86E-09	7.58E-09	Not detected
1,2,3,7,8,9-HxCDD	2.79E-07	6.45E-08	2.84E-07	Not detected	1.15E-07	Not detected	Not detected	6.65E-08	7.13E-08	Not detected
1,2,3,4,6,7,8-HpCDD	1.27E-07	1.87E-08	1.34E-07	7.34E-09	4.88E-08	1.69E-08	9.02E-08	2.60E-08	2.35E-08	9.01E-09
OCDD	1.07E-07	1.51E-08	1.01E-07	6.44E-09	3.28E-08	1.44E-08	7.28E-09	2.60E-08	1.56E-08	5.95E-09
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDF	6.70E-07	Not detected	6.40E-07	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HXCDF	5.62E-08	Not detected	6.38E-08	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	8.01E-08	Not detected	8.57E-08	Not detected	5.54E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.09E-07	2.51E-08	9.35E-08	1.10E-08	4.04E-08	2.67E-08	1.18E-08	3.49E-08	2.05E-08	1.10E-08
1,2,3,4,7,8,9-HpCDF	6.84E-09	Not detected	6.79E-09	Not detected	5.73E-09	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	3.20E-09	6.65E-10	2.93E-09	2.76E-10	1.03E-09	8.33E-10	3.49E-10	1.23E-09	4.40E-10	2.19E-10
TCDD[2,3,7,8-] equivalent concentration	2.31E-06	1.30E-07	2.36E-06	2.51E-08	8.94E-07	5.88E-08	2.84E-08	1.62E-07	1.39E-07	2.62E-08

Table 2.1-3 (continued)

Congener	RE-11-4963 (mg/kg)	RE-11-4964 (mg/kg)	RE-11-4965 (mg/kg)	RE-11-4967 (mg/kg)	RE-11-4968 (mg/kg)	RE-11-4969 (mg/kg)	RE-11-4970 (mg/kg)	RE-11-4971 (mg/kg)	RE-11-4972 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	1.63E-07	1.84E-07	1.68E-07	Not detected	Not detected	Not detected	3.79E-07
1,2,3,7,8-PeCDD	Not detected	Not detected	9.47E-07	8.58E-07	7.46E-07	Not detected	Not detected	Not detected	3.04E-06
1,2,3,4,7,8-HxCDD	3.07E-08	2.97E-08	1.13E-07	9.10E-08	9.90E-08	5.25E-08	Not detected	Not detected	3.60E-07
1,2,3,6,7,8-HxCDD	1.05E-08	1.20E-08	4.29E-08	3.65E-08	2.96E-08	2.00E-08	7.37E-09	Not detected	1.50E-07
1,2,3,7,8,9-HxCDD	9.10E-08	1.16E-07	3.95E-07	3.59E-07	3.13E-07	2.11E-07	6.89E-08	Not detected	1.51E-07
1,2,3,4,6,7,8-HpCDD	3.52E-08	4.41E-08	1.55E-07	1.38E-07	1.37E-07	6.78E-08	2.62E-08	1.38E-08	6.02E-07
OCDD	2.25E-08	2.97E-08	9.93E-08	9.88E-08	1.05E-07	4.07E-08	1.97E-08	1.03E-08	4.75E-07
2,3,7,8-TCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,7,8-PeCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	8.94E-07
1,2,3,4,7,8-HxCDF	Not detected	Not detected	5.21E-07	7.11E-07	6.82E-07	Not detected	Not detected	Not detected	2.34E-06
1,2,3,6,7,8-HXCDF	Not detected	Not detected	6.22E-08	6.36E-08	5.92E-08	Not detected	Not detected	Not detected	1.87E-07
2,3,4,6,7,8-HxCDF	Not detected	Not detected	9.10E-08	1.04E-07	8.62E-08	Not detected	Not detected	Not detected	3.14E-07
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	6.41E-08
1,2,3,4,6,7,8-HpCDF	3.11E-08	3.44E-08	1.42E-07	1.25E-07	1.05E-07	4.59E-08	2.52E-08	1.42E-08	4.17E-07
1,2,3,4,7,8,9-HpCDF	Not detected	Not detected	1.06E-08	9.20E-09	7.05E-09	Not detected	Not detected	Not detected	2.85E-08
OCDF	6.75E-10	8.39E-10	4.56E-09	3.64E-09	3.10E-09	1.22E-09	8.18E-10	3.40E-10	1.07E-08
TCDD[2,3,7,8-] equivalent concentration	2.22E-07	2.67E-07	2.75E-06	2.78E-06	2.54E-06	4.39E-07	1.48E-07	3.86E-08	1.08E-05

Table 2.1-4
Dioxin and Furan Congener Concentrations Converted Using Mammalian TEFs at the TA-39-6 OD Unit

Congener	RE-11-4973 (mg/kg)	RE-11-4974 (mg/kg)	RE-11-4975 (mg/kg)	RE-11-4976 (mg/kg)	RE-11-4977 (mg/kg)	RE-11-4978 (mg/kg)	RE-11-4979 (mg/kg)	RE-11-4980 (mg/kg)	RE-11-4981 (mg/kg)	RE-11-4982 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	Not detected	Not detected	2.16E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	5.63E-07	Not detected	Not detected	Not detected	1.04E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	9.81E-08	Not detected	Not detected	Not detected	2.12E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	3.00E-07	Not detected	Not detected	Not detected	4.57E-07	5.35E-08	Not detected	1.11E-07	Not detected	5.34E-08
1,2,3,7,8,9-HxCDD	2.45E-07	Not detected	5.69E-08	Not detected	4.89E-07	Not detected	Not detected	1.03E-07	Not detected	Not detected
1,2,3,4,6,7,8-HpCDD	1.21E-06	1.78E-07	1.74E-07	1.04E-07	1.81E-06	1.71E-07	9.84E-08	4.30E-07	5.28E-08	1.50E-07
OCDD	2.62E-07	4.89E-08	4.14E-08	2.27E-08	4.41E-07	3.93E-08	1.91E-08	1.06E-07	1.14E-08	3.81E-08
2,3,7,8-TCDF	3.11E-07	Not detected	Not detected	Not detected	2.03E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	2.36E-08	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	1.43E-08	Not detected	Not detected
2,3,4,7,8-PeCDF	3.90E-07	Not detected	Not detected	1.55E-07	2.51E-07	Not detected	1.43E-07	2.58E-07	Not detected	1.58E-07
1,2,3,4,7,8-HxCDF	1.33E-07	Not detected	Not detected	Not detected	1.26E-07	Not detected	Not detected	7.27E-08	Not detected	Not detected
1,2,3,6,7,8-HXCDF	8.16E-08	Not detected	Not detected	Not detected	9.91E-08	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	1.02E-07	Not detected	Not detected	Not detected	1.48E-07	Not detected	Not detected	5.85E-08	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.01E-07	2.06E-08	1.70E-08	1.31E-08	1.44E-07	1.86E-08	1.12E-08	4.06E-08	9.43E-09	1.89E-08
1,2,3,4,7,8,9-HpCDF	7.93E-09	Not detected	Not detected	Not detected	7.16E-09	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	7.44E-09	1.50E-09	6.48E-10	4.56E-10	7.32E-09	8.97E-10	4.83E-10	2.04E-09	4.44E-10	1.13E-09
TCDD[2,3,7,8-] equivalent concentration	3.84E-06	2.49E-07	2.90E-07	2.95E-07	5.65E-06	2.83E-07	2.72E-07	1.20E-06	7.40E-08	4.19E-07

Table 2.1-5
Dioxin and Furan Congener Concentrations Converted Using Avian TEFs at the TA-39-6 OD Unit

Congener	RE-11-4973 (mg/kg)	RE-11-4974 (mg/kg)	RE-11-4975 (mg/kg)	RE-11-4976 (mg/kg)	RE-11-4977 (mg/kg)	RE-11-4978 (mg/kg)	RE-11-4979 (mg/kg)	RE-11-4980 (mg/kg)	RE-11-4981 (mg/kg)	RE-11-4982 (mg/kg)
2,3,7,8-TCDD	Not detected	Not detected	Not detected	Not detected	2.16E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDD	5.63E-07	Not detected	Not detected	Not detected	1.04E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,7,8-HxCDD	4.91E-08	Not detected	Not detected	Not detected	1.06E-07	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,6,7,8-HxCDD	3.00E-08	Not detected	Not detected	Not detected	4.57E-08	5.35E-09	Not detected	1.11E-08	Not detected	5.34E-09
1,2,3,7,8,9-HxCDD	2.45E-07	Not detected	5.69E-08	Not detected	4.89E-07	Not detected	Not detected	1.03E-07	Not detected	Not detected
1,2,3,4,6,7,8-HpCDD	1.21E-07	1.78E-08	1.74E-08	1.04E-08	1.81E-07	1.71E-08	9.84E-09	4.30E-08	5.28E-09	1.50E-08
OCDD	8.72E-08	1.63E-08	1.38E-08	7.58E-09	1.47E-07	1.31E-08	6.36E-09	3.52E-08	3.79E-09	1.27E-08
2,3,7,8-TCDF	3.11E-06	Not detected	Not detected	Not detected	2.03E-06	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,7,8-PeCDF	7.87E-08	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	4.75E-08	Not detected	Not detected
2,3,4,7,8-PeCDF	1.30E-06	Not detected	Not detected	5.16E-07	8.38E-07	Not detected	4.76E-07	8.60E-07	Not detected	5.26E-07
1,2,3,4,7,8-HxCDF	1.33E-06	Not detected	Not detected	Not detected	1.26E-06	Not detected	Not detected	7.27E-07	Not detected	Not detected
1,2,3,6,7,8-HXCDF	8.16E-08	Not detected	Not detected	Not detected	9.91E-08	Not detected	Not detected	Not detected	Not detected	Not detected
2,3,4,6,7,8-HxCDF	1.02E-07	Not detected	Not detected	Not detected	1.48E-07	Not detected	Not detected	5.85E-08	Not detected	Not detected
1,2,3,7,8,9-HxCDF	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected	Not detected
1,2,3,4,6,7,8-HpCDF	1.01E-07	2.06E-08	1.70E-08	1.31E-08	1.44E-07	1.86E-08	1.12E-08	4.06E-08	9.43E-09	1.89E-08
1,2,3,4,7,8,9-HpCDF	7.93E-09	Not detected	Not detected	Not detected	7.16E-09	Not detected	Not detected	Not detected	Not detected	Not detected
OCDF	2.48E-09	4.99E-10	2.16E-10	1.52E-10	2.44E-09	2.99E-10	1.61E-10	6.81E-10	1.48E-10	3.78E-10
TCDD[2,3,7,8-] equivalent concentration	7.21E-06	5.52E-08	1.05E-07	5.47E-07	6.75E-06	5.44E-08	5.04E-07	1.93E-06	1.86E-08	5.78E-07

Table 2.1-6
EPCs for the Industrial and Residential Scenarios and Ecological Receptors at the TA-36-8 OD Unit

COPC	Number of Detects	Distribution	EPC (mg/kg)	EPC Method
Acetone	1	n/a*	0.00331	Maximum detected concentration
Amino-2,6-dinitrotoluene[4-]	1	n/a	0.285	Maximum detected concentration
Anthracene	2	n/a	0.016	Maximum detected concentration
Aroclor-1254	1	n/a	0.0018	Maximum detected concentration
Aroclor-1260	5	Nonparametric	0.0055	95% KM (BCA)
Benzo(a)anthracene	2	n/a	0.0723	Maximum detected concentration
Benzo(a)pyrene	2	n/a	0.0836	Maximum detected concentration
Benzo(b)fluoranthene	6	Nonparametric	0.0347	95% KM (t)
Benzo(g,h,i)perylene	3	n/a	0.0559	Maximum detected concentration
Benzo(k)fluoranthene	1	n/a	0.0343	Maximum detected concentration
Bis(2-ethylhexyl)phthalate	8	Nonparametric	2.56	95% KM (Chebyshev)
Butanone[2-]	1	n/a	0.00161	Maximum detected concentration
Chloronaphthalene[2-]	1	n/a	0.108	Maximum detected concentration
Chrysene	3	n/a	0.0771	Maximum detected concentration
Copper	19	Nonparametric	475.7	95% Chebyshev (Mean, Sd)
Di-n-butyl phthalate	8	Nonparametric	0.319	95% KM (t)
Dinitrotoluene[2,4-]	1	n/a	1.58	Maximum detected concentration
Dinitrotoluene[2,6-]	1	n/a	0.0696	Maximum detected concentration
Diphenylamine	1	n/a	0.146	Maximum detected concentration
Fluoranthene	6	Nonparametric	0.0402	95% KM (t)
Fluorene	1	n/a	0.0194	Maximum detected concentration
HMX	12	Nonparametric	22	95% KM (Chebyshev)
Indeno(1,2,3-cd)pyrene	2	n/a	0.0452	Maximum detected concentration
Lead	19	Normal	20.9	95% Student's-t
Methylene chloride	1	n/a	0.00217	Maximum detected concentration
Methylnaphthalene[2-]	1	n/a	0.00784	Maximum detected concentration

Table 2.1-6 (continued)

COPC	Number of Detects	Distribution	EPC (mg/kg)	EPC Method
Naphthalene	1	n/a	0.0136	Maximum detected concentration
Perchlorate	9	Nonparametric	0.0022	95% KM (t)
PETN	1	n/a	12.8	Maximum detected concentration
Phenanthrene	3	n/a	0.0774	Maximum detected concentration
Pyrene	5	Nonparametric	0.0484	95% KM (t)
RDX	7	Nonparametric	0.604	95% KM (t)
TATB	19	Normal	24.8	95% Student's-t
TCDD[2,3,7,8-] (mammalian)	n/a	n/a	0.00000415	95% Adjusted Gamma
TCDD[2,3,7,8-] (avian)	n/a	n/a	0.00000298	95% Adjusted Gamma
Toluene	3	n/a	0.000897	Maximum detected concentration
Trinitrotoluene[2,4,6-]	2	n/a	0.701	Maximum detected concentration
Xylene[1,2-]	1	n/a	0.000448	Maximum detected concentration
Xylene+1,4-Xylene[1,3-]	5	Nonparametric	0.000989	95% KM (t)
Uranium-234 (pCi/g)	19	Gamma	4.01	95% Adjusted Gamma
Uranium-235 (pCi/g)	16	Nonparametric	0.514	95% KM (BCA)
Uranium-238 (pCi/g)	19	Gamma	28	95% Adjusted Gamma

* n/a = Not applicable.

Table 2.1-7
EPCs for the Industrial and Residential Scenarios and Ecological Receptors at the TA-39-6 OD Unit

COPC	Number of Detects	Distribution	EPC (mg/kg)	EPC Method
Antimony	9	Nonparametric	1.9	95% KM (t)
Aroclor-1254	10	Gamma	0.019	95% Adjusted Gamma
Aroclor-1260	9	Nonparametric	0.0092	95% KM (t)
Bis(2-ethylhexyl)phthalate	7	Nonparametric	0.948	95% KM (t)
Butylbenzylphthalate	2	n/a*	0.137	Maximum detected concentration
Copper	10	Nonparametric	2220	95% Chebyshev (Mean, Sd)
Di-n-butyl phthalate	7	Nonparametric	2.89	95% KM (t)
Dinitrotoluene[2,4-]	6	Nonparametric	6.47	95% KM (t)
Di-n-octyl phthalate	1	n/a	3.81	Maximum detected concentration
Diphenylamine	5	Nonparametric	0.521	95% KM (t)
Ethylbenzene	1	n/a	0.000336	Maximum detected concentration
HMX	1	n/a	0.458	Maximum detected concentration
Isopropyltoluene4-	1	n/a	0.00133	Maximum detected concentration
Lead	10	Normal	161	95% Student's-t
Mercury	7	Nonparametric	0.271	95% KM (Chebyshev)
Naphthalene	1	n/a	0.0234	Maximum detected concentration
Perchlorate	5	Nonparametric	0.00257	95% KM (t)
RDX	1	n/a	0.116	Maximum detected concentration
Silver	4	n/a	1.36	Maximum detected concentration
Styrene	1	n/a	0.000388	Maximum detected concentration
TATB	7	Nonparametric	4.3	95% KM (t)
TCDD[2,3,7,8-] (mammalian)	n/a	n/a	0.00000389	95% Chebyshev (Mean,Sd)
TCDD[2,3,7,8-] (avian)	n/a	n/a	0.00000684	95% Adjusted Gamma
Toluene	1	n/a	0.00124	Maximum detected concentration
Trinitrotoluene[2,4,6-]	1	n/a	0.312	Maximum detected concentration
Xylene[1,2-]	1	n/a	0.000336	Maximum detected concentration
Xylene+1,4-Xylene[1,3-]	1	n/a	0.00165	Maximum detected concentration
Zinc	10	Normal	95.2	95% Student's-t

* n/a = Not applicable.

Table 2.1-8
Industrial Screening Evaluation of Noncarcinogenic COPCs at the TA-36-8 OD Unit

COPC	EPC (mg/kg)	Industrial SSL (mg/kg)[a]	HQ
Acetone	0.00331	868000	0.0000000038
Amino-2,6-dinitrotoluene[4-]	0.285	1900[b]	0.00015
Anthracene	0.016	183000	0.000000087
Benzo(g,h,i)perylene	0.0559	18300[c]	0.0000031
Butanone[2-]	0.00161	375000	0.0000000043
Chloronaphthalene[2-]	0.108	90800	0.0000012
Copper	475.7	45400	0.01
Di-n-butylphthalate	0.319	68400	0.0000047
Dinitrotoluene[2,6-]	0.0696	684	0.0001
Diphenylamine	0.146	15000[b]	0.0000097
Fluoranthene	0.0402	24400	0.0000016
Fluorene	0.0194	24400	0.0000008
HMX	22	56800	0.00039
Lead	20.9	800	0.026
Methylnaphthalene[2-]	0.00784	2200[b]	0.0000036
Perchlorate	0.0022	795	0.0000028
Phenanthrene	0.0774	20500	0.0000038
Pyrene	0.0484	18300	0.0000026
TATB	24.8	27000[b,d]	0.00092
Toluene	0.000897	57700	0.000000016
Trinitrotoluene[2,4,6-]	0.701	568	0.0012
Xylene1,2-	0.000448	4410	0.0000001
Xylene+1,4-Xylene[1,3-]	0.000989	3980[e]	0.00000025
		HI	**0.04**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[c] Pyrene used as a surrogate based on structural similarity.
[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[e] Xylenes used as a surrogate based on structural similarity.

Table 2.1-9
Residential Screening Evaluation of Noncarcinogenic COPCs at the TA-36-8 OD Unit

COPC	EPC (mg/kg)	Residential SSL (mg/kg)[a]	HQ
Acetone	0.00331	66600	0.00000005
Amino-2,6-dinitrotoluene[4-]	0.285	150[b]	0.0019
Anthracene	0.016	17200	0.00000093
Aroclor-1254	0.0018	1.12	0.0016
Benzo(g,h,i)perylene	0.0559	1720[c]	0.000033
Butanone[2-]	0.00161	37100	0.000000043
Chloronaphthalene[2-]	0.108	6260	0.000017
Copper	475.7	3130	0.15
Di-n-butylphthalate	0.319	6110	0.000052
Dinitrotoluene[2,6-]	0.0696	61.1	0.0011
Diphenylamine	0.146	1500[b]	0.000097
Fluoranthene	0.0402	2290	0.000018
Fluorene	0.0194	2290	0.0000085
HMX	22	3910	0.0056
Lead	20.9	400	0.052
Methylene chloride	0.00217	409	0.000000000053
Methylnaphthalene[2-]	0.00784	230[b]	0.000034
Perchlorate	0.0022	54.8	0.00004
Phenanthrene	0.0774	1830	0.000042
Pyrene	0.0484	1720	0.000028
TATB	24.8	2200[b,d]	0.011
Toluene	0.000897	5270	0.00000017
Trinitrotoluene[2,4,6-]	0.701	39.1	0.018
Xylene[1,2-]	0.000448	898	0.00000005
Xylene+1,4-Xylene[1,3-]	0.000989	814[e]	0.0000012
		HI	**0.2**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[c] Pyrene used as a surrogate based on structural similarity.
[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[e] Xylenes used as a surrogate based on structural similarity.

Table 2.1-10
Industrial Screening Evaluation of Carcinogenic COPCs at the TA-36-8 OD Unit

COPC	EPC (mg/kg)	Industrial SSL (mg/kg)[a]	Cancer Risk
Aroclor-1254	0.0018	8.26	2.2E-09
Aroclor-1260	0.0055	8.26	6.7E-09
Benzo(a)anthracene	0.0723	23.4	3.1E-08
Benzo(a)pyrene	0.0836	2.34	3.6E-07
Benzo(b)fluoranthene	0.0347	23.4	1.5E-08
Benzo(k)fluoranthene	0.0343	234	1.5E-09
Bis(2-ethylhexyl)phthalate	2.56	1370	1.9E-08
Chrysene	0.0771	2340	3.3E-10
Dinitrotoluene[2,4-]	1.58	61.8	2.6E-07
Indeno(1,2,3-cd)pyrene	0.0452	23.4	1.9E-08
Methylene chloride	0.00217	4700	4.6E-12
Naphthalene	0.0136	241	5.6E-10
PETN	12.8	4300[b]	3.0E-08
RDX	0.604	3410	1.8E-09
TCDD[2,3,7,8-]	0.00000415	0.000204	2.0E-07
		Total Excess Cancer Risk	**9E-07**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 2.1-11
Residential Screening Evaluation of Carcinogenic COPCs at the TA-36-8 OD Unit

COPC	EPC (mg/kg)	Residential SSL (mg/kg)[a]	Cancer Risk
Aroclor-1260	0.0052	2.22	2.5E-08
Benzo(a)anthracene	0.0723	1.48	4.9E-07
Benzo(a)pyrene	0.0836	0.148	5.6E-06
Benzo(b)fluoranthene	0.0347	1.48	2.3E-07
Benzo(k)fluoranthene	0.0343	14.8	2.3E-08
Bis(2-ethylhexyl)phthalate	2.56	347	7.4E-08
Chrysene	0.0771	148	5.2E-09
Dinitrotoluene[2,4-]	1.58	15.7	1.0E-06
Indeno(1,2,3-cd)pyrene	0.0452	1.48	3.1E-07
Naphthalene	0.0136	43	3.2E-09
PETN	12.8	1200[b]	1.1E-07
RDX	0.604	58.2	1.0E-07
TCDD[2,3,7,8-]	0.00000415	0.000045	9.2E-07
		Total Excess Cancer Risk	**9E-06**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 2.1-12
Industrial Screening Evaluation of Radionuclide COPCs at the TA-36-8 OD Unit

COPC	EPC (pCi/g)	Industrial SAL (pCi/g)*	Dose (mrem/yr)
Uranium-234	4.01	3000	0.03
Uranium-235	0.514	150	0.09
Uranium-238	28	750	0.9
		Total Dose	**1**

* SALs are from LANL (2012a).

Table 2.1-13
Residential Screening Evaluation of Radionuclide COPCs at the TA-36-8 OD Unit

COPC	EPC (pCi/g)	Residential SAL (pCi/g)*	Dose (mrem/yr)
Uranium-234	4.01	270	0.4
Uranium-235	0.514	39	0.3
Uranium-238	28	150	4.7
		Total Dose	**5.4**

* SALs are from LANL (2012a).

Table 2.1-14
Industrial Screening Evaluation of Noncarcinogenic COPCs at the TA-39-6 OD Unit

COPC	EPC (mg/kg)	Industrial SSL (mg/kg)[a]	HQ
Antimony	1.9	454	0.0042
Copper	2220	45400	0.049
Di-n-butyl phthalate	2.89	68400	0.000042
Di-n-octyl phthalate	3.81	6200[b]	0.00061
Diphenylamine	0.521	15000[b]	0.000035
HMX	0.458	56800	0.0000081
Isopropyltoluene[4-]	0.00133	14500[c]	0.000000092
Lead	161	800	0.2
Mercury	0.271	341	0.00079
Perchlorate	0.00257	795	0.0000032
Silver	1.36	5680	0.00024
Styrene	0.000388	50000	0.0000000078
TATB	4.3	27000[b,d]	0.00016
Toluene	0.00124	57700	0.000000021
Trinitrotoluene[2,4,6-]	0.312	568	0.00055
Xylene[1,2-]	0.000336	4410	0.000000076
Xylene+1,4-Xylene[1,3-]	0.00165	3980[e]	0.00000041
Zinc	95.2	341000	0.00028
		HI	**0.3**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[c] Isopropylbenzene used as a surrogate based on structural similarity.
[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[e] Xylenes used as a surrogate based on structural similarity.

Table 2.1-15
Residential Screening Evaluation of Noncarcinogenic COPCs at the TA-39-6 OD Unit

COPC	EPC (mg/kg)	Residential SSL (mg/kg)[a]	HQ
Antimony	1.9	31.3	0.061
Aroclor-1254	0.019	1.12	0.017
Copper	2220	3130	0.71
Di-n-butyl phthalate	2.89	6110	0.00047
Di-n-octyl phthalate	3.81	610[b]	0.0062
Diphenylamine	0.521	1500[b]	0.00035
HMX	0.458	3910	0.00012
Isopropyltoluene[4-]	0.00133	2430[c]	0.00000055
Lead	161	400	0.4
Mercury	0.271	23.5	0.011
Perchlorate	0.00257	54.8	0.000047
Silver	1.36	391	0.0035
Styrene	0.000388	7280	0.000000053
TATB	4.3	2200[b,d]	0.002
Toluene	0.00124	5270	0.00000024
Trinitrotoluene[2,4,6-]	0.312	39.1	0.008
Xylene[1,2-]	0.000336	898	0.00000037
Xylene+1,4-Xylene[1,3-]	0.00165	814[e]	0.000002
Zinc	95.2	23500	0.0041
		HI	**1**

[a] SSLs are from NMED (2012) unless otherwise noted.
[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).
[c] Isopropylbenzene used as a surrogate based on structural similarity.
[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[e] Xylenes used as a surrogate based on structural similarity.

Table 2.1-16
Industrial Screening Evaluation of Carcinogenic COPCs at the TA-39-6 OD Unit

COPC	EPC (mg/kg)	Industrial SSL (mg/kg)[a]	Cancer Risk
Aroclor-1254	0.019	8.26	2.3E-08
Aroclor-1260	0.0092	8.26	1.1E-08
Bis(2-ethylhexyl)phthalate	0.948	1370	6.9E-09
Butylbenzylphthalate	0.137	9100[b]	1.5E-10
Dinitrotoluene[2,4-]	6.47	61.8	1.1E-06
Ethylbenzene	0.000336	378	8.9E-12
Naphthalene	0.0234	241	9.7E-10
RDX	0.116	3410	3.4E-10
TCDD[2,3,7,8-]	0.00000389	0.000204	1.9E-07
		Total Excess Cancer Risk	**1E-06**

[a] SSLs are from NMED (2012) unless otherwise noted.

[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 2.1-17
Residential Screening Evaluation of Carcinogenic COPCs at the TA-39-6 OD Unit

COPC	EPC (mg/kg)	Residential SSL (mg/kg)[a]	Cancer Risk
Aroclor-1260	0.0092	2.22	4.1E-08
Bis(2-ethylhexyl)phthalate	0.948	347	2.7E-08
Butylbenzylphthalate	0.137	2600[b]	5.3E-10
Dinitrotoluene[2,4-]	6.47	15.7	4.1E-06
Ethylbenzene	0.000336	68.4	4.9E-12
Naphthalene	0.0234	43	5.4E-09
RDX	0.116	58.2	2.0E-08
TCDD[2,3,7,8-]	0.00000389	0.000045	8.6E-07
		Total Excess Cancer Risk	**5E-06**

[a] SSLs are from NMED (2012) unless otherwise noted.

[b] SSL from EPA regional tables (http://www.epa.gov/region06/6pd/rcra_c/pd-n/screen.htm).

Table 3.1-1
ESLs for Terrestrial Receptors

Chemical	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Acetone	1200	30000	7.5	170	14	1.2	1.4	na[a]	na	15	2900
4-Amino-2,6-dinitrotoluene	na	na	na	na	na	3.6	5.2	na	80	7.6	1600
Anthracene	na	na	na	na	na	310	1100	na	6.8	210	5800
Antimony	na	na	na	na	na	0.48	2.9	78	0.05	0.26	45
Aroclor-1254	0.17	0.22	1.3	0.041	0.08	0.88	52	na	160	0.44	0.15
Aroclor-1260	3.7	4.6	46	0.88	1.7	20	3000	na	na	10	0.14
Benzo(a)anthracene	6.9	9.8	0.8	1	0.91	3.4	6.2	na	18	3	32
Benzo(a)pyrene	na	na	na	na	na	85	280	na	na	53	380
Benzo(b)fluoranthene	na	na	na	na	na	52	130	na	18	38	250
Benzo(g,h,i)perylene	na	na	na	na	na	47	540	na	na	24	94
Benzo(k)fluoranthene	na	na	na	na	na	100	350	na	na	62	400
Bis(2-ethylhexyl)phthalate	0.045	0.033	20	0.02	0.04	1.1	2700	na	na	0.59	1.2
2-Butanone	na	na	na	na	na	360	420	na	na	2600	420000
Butylbenzylphthalate	na	na	na	na	na	160	2300	na	na	90	1900
2-Chloronaphthalene[b]	100	590	3.4	16	5.7	9.7	12	na	1	27	1200
Chrysene	na	na	na	na	na	3.1	6.5	na	na	2.4	25
Copper	110	1600	38	15	22	64	270	80	70	38	3800
Di-n-butyl phthalate	0.068	0.24	0.39	0.011	0.021	370	16000	na	160	180	5000
Dinitrotoluene[2,4-]	na	na	na	na	na	2.5	3.1	na	na	13	760
Dinitrotoluene[2,6-]	na	na	na	na	na	1.8	2.3	na	na	7.1	580
Di-n-octyl phthalate	na	na	na	na	na	1.8	13000	na	na	0.91	13
Diphenylamine	73	6700	84	10	18	na	na	na	na	na	na

Table 3.1-1 (continued)

Chemical	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Ethylbenzene[c]	na	na	na	na	na	24	35	na	na	47	7600
Fluoranthene	na	na	na	na	na	38	260	10	na	22	360
Fluorene	na	na	na	na	na	340	1100	3.7	na	250	9300
HMX	na	na	na	na	na	27	29	140	2700	3100	29000
Indeno(1,2,3-cd)pyrene	na	na	na	na	na	110	590	na	na	62	270
Isopropyltoluene[4-][d]	na	na	na	na	na	25	61	na	200	23	3100
Lead	120	810	21	14	16	120	370	1700	120	72	3700
Mercury	0.082	0.28	0.07	0.013	0.022	3	22	0.05	34	1.7	46
Methylene chloride	na	na	na	na	na	2.6	3.4	na	1600	9	1700
Methylnaphthalene[2-]	na	na	na	na	na	24	100	na	na	16	850
Naphthalene	100	590	3.4	16	5.7	9.7	12	na	1	27	1200
PETN	na	na	na	na	na	100	110	na	na	870	7600
Phenanthrene	na	na	na	na	na	15	59	5.5	na	10	290
Pyrene	190	460	71	34	46	32	110	10	na	22	360
RDX	200	1100	12	22	16	130	210	7.5	na	150	6800
Silver	19	840	11	2.6	4.3	24	150	na	560	14	4100
Styrene	na	na	na	na	na	na	na	1.2	3.2	na	na
TATB[e]	na	na	na	na	na	6.6	7.3	na	na	400	3900
TCDD[2,3,7,8-]	0.000014[f]	0.000014[f]	0.00024[f]	0.0000041[f]	0.0000081[f]	0.00000058	0.000048	5	na	0.00000029	0.0000012
Toluene	na	na	na	na	na	25	61	na	200	23	3100
Trinitrotoluene[2,4,6-]	1400	2700	6.4	140	12	80	90	32	62	920	17000
Uranium-234	120000	190000	48000	14000	14000	91000	96000	51	14000	94000	45000
Uranium-235	10000	10000	9000	6400	6400	5100	5100	55	4000	5100	4800

Table 3.1-1 (continued)

Chemical	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Uranium-238	4100	4200	3900	3400	3400	2100	2100	55	1800	2100	2000
Xylene[1,2-][g]	280	3200	90	41	56	2	7	na	100	1.4	130
Xylene+1,4-Xylene[1,3-][g]	280	3200	90	41	56	2	7	na	100	1.4	130
Zinc	320	2400	350	48	85	170	1800	120	160	98	6000

Note: ESLs from ECORISK Database, Version 3.1 (LANL 2012c), unless otherwise noted. Units are mg/kg for chemicals and pCi/g for radionuclides.

[a] na = Not available.

[b] Naphthalene used as a surrogate based on structural similarity.

[c] Benzene used as a surrogate based on structural similarity.

[d] Toluene used as a surrogate based on structural similarity.

[e] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[f] Avian ESLs for TCDD from ECORISK Database, Version 2.0 (LANL 2003).

[g] Xylene used as a surrogate based on structural similarity.

Table 3.1-2
Comparison of EPCs with the Minimum ESLs at the TA-36-8 OD Unit

COPC	EPC (mg/kg)	Minimum ESL[a] (mg/kg)	Receptor	Hazard Quotient
Acetone	0.00331	1.2	Deer mouse	0.0028
Amino-2,6-dinitrotoluene[4-]	0.285	3.6	Deer mouse	0.079
Anthracene	0.016	6.8	Plant	0.0024
Aroclor-1254	0.0018	0.041	Robin insectivore	0.044
Aroclor-1260	0.0055	0.14	Red fox	0.039
Benzo(a)anthracene	0.0723	0.8	Robin herbivore	0.09
Benzo(a)pyrene	0.0836	53	Montane shrew	0.0016
Benzo(b)fluoranthene	0.0347	18	Plant	0.0019
Benzo(g,h,i)perylene	0.0559	24	Montane shrew	0.0023
Benzo(k)fluoranthene	0.0343	62	Montane shrew	0.00055
Bis(2-ethylhexyl)phthalate	2.56	0.02	Robin insectivore	**128**
Butanone[2-]	0.00161	360	Deer mouse	0.0000045
Chloronaphthalene[2-]	0.108	1[b]	Plant	0.11
Chrysene	0.0771	2.4	Montane shrew	0.032
Copper	475.7	15	Robin insectivore	**31.7**
Di-n-butyl phthalate	0.319	0.011	Robin insectivore	**29**
Dinitrotoluene[2,4-]	1.58	2.5	Deer mouse	**0.63**
Dinitrotoluene[2,6-]	0.0696	1.8	Deer mouse	0.039
Diphenylamine	0.146	10	Robin insectivore	0.015
Fluoranthene	0.0402	10	Earthworm	0.004
Fluorene	0.0194	3.7	Earthworm	0.0052
HMX	22	27	Deer mouse	**0.81**
Indeno(1,2,3-cd)pyrene	0.0452	62	Montane shrew	0.00073
Lead	20.9	14	Robin insectivore	**1.5**
Methylene chloride	0.00217	2.6	Deer mouse	0.00083
Methylnaphthalene[2-]	0.00784	16	Montane shrew	0.00049
Naphthalene	0.0136	1	Plant	0.014
PETN	12.8	100	Deer mouse	0.13
Phenanthrene	0.0774	5.5	Earthworm	0.014
Pyrene	0.0484	10	Earthworm	0.0048
RDX	0.604	7.5	Earthworm	0.081
TATB	24.8	6.6[c]	Deer mouse	**3.8**
TCDD[2,3,7,8-] (mammalian)	0.00000415	0.00000029	Montane shrew	**14.3**
TCDD[2,3,7,8-] (avian)	0.00000298	0.0000041[d]	Robin insectivore	**0.73**
Toluene	0.000897	23	Montane shrew	0.000039
Trinitrotoluene[2,4,6-]	0.701	6.4	Robin herbivore	0.11
Xylene[1,2-]	0.000448	1.4[e]	Montane shrew	0.00032
Xylene+1,4-Xylene[1,3-]	0.000989	1.4[e]	Montane shrew	0.00071
Uranium-234 (pCi/g)	4.01	51	Earthworm	0.079
Uranium-235 (pCi/g)	0.514	55	Earthworm	0.0093
Uranium-238 (pCi/g)	28	55	Earthworm	**0.51**

Note: Bolded values indicate HQs greater than 0.3.
[a] ESLs from ECORISK Database, Version 3.1 (LANL 2012c).
[b] Naphthalene used as a surrogate based on structural similarity.
[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[d] ESL from ECORISK Database, Version 2.0 (LANL 2003).
[e] Xylene used as a surrogate based on structural similarity.

Table 3.1-3
Comparison of EPCs with the Minimum ESLs at the TA-39-6 OD Unit

COPC	EPC (mg/kg)	Minimum ESL[a] (mg/kg)	Receptor	Hazard Quotient
Antimony	1.9	0.05	Plant	**38**
Aroclor-1254	0.019	0.041	Robin insectivore	**0.46**
Aroclor-1260	0.0092	0.14	Red fox	0.066
Bis(2-ethylhexyl)phthalate	0.948	0.02	Robin insectivore	**47.4**
Butylbenzylphthalate	0.137	90	Montane shrew	0.0015
Copper	2220	15	Robin insectivore	**148**
Di-n-butyl phthalate	2.89	0.011	Robin insectivore	**263**
Dinitrotoluene[2,4-]	6.47	2.5	Deer mouse	**2.6**
Di-n-octyl phthalate	3.81	0.91	Montane shrew	**4.2**
Diphenylamine	0.521	10	Robin insectivore	0.052
Ethylbenzene	0.000336	24[b]	Deer mouse	0.000014
HMX	0.458	27	Deer mouse	0.017
Isopropyltoluene[4-]	0.00133	23[c]	Montane shrew	0.000058
Lead	161	14	Robin insectivore	**11.5**
Mercury	0.271	0.013	Robin insectivore	**20.8**
Naphthalene	0.0234	1	Plant	0.023
RDX	0.116	7.5	Earthworm	0.015
Silver	1.36	2.6	Robin insectivore	**0.52**
Styrene	0.000388	1.2	Earthworm	0.00032
TATB	4.3	6.6[d]	Deer mouse	**0.65**
TCDD[2,3,7,8-] (mammalian)	0.00000389	0.00000029	Montane shrew	**13.4**
TCDD[2,3,7,8-] (avian)	0.00000684	0.0000041[e]	Robin insectivore	**1.7**
Toluene	0.00124	23	Montane shrew	0.000054
Trinitrotoluene[2,4,6-]	0.312	6.4	Robin herbivore	0.049
Xylene[1,2-]	0.000336	1.4[f]	Montane shrew	0.00024
Xylene+1,4-Xylene[1,3-]	0.00165	1.4[f]	Montane shrew	0.0012
Zinc	95.2	48	Robin insectivore	**1.98**

Note: Bolded values indicate HQs greater than 0.3.

[a] ESLs from ECORISK Database, Version 3.1 (LANL 2012c).

[b] Benzene used as a surrogate based on structural similarity.

[c] Toluene used as a surrogate based on structural similarity.

[d] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[e] ESL from ECORISK Database, Version 2.0 (LANL 2003).

[f] Xylene used as a surrogate based on structural similarity.

Table 3.1-4
HI Analysis at the TA-36-8 OD Unit

COPEC	EPC (mg/kg)	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Bis(2-ethylhexyl)phthalate	2.56	**56.9**	**77.6**	0.13	**128**	**64**	**2.33**	0.0009	na	na	**4.34**	**2.13**
Copper	475.7	**4.32**	0.3	**12.5**	**31.7**	**21.6**	**7.43**	**1.76**	**5.95**	**6.8**	**12.5**	0.13
Di-n-butyl phthalate	0.319	**4.69**	**1.33**	**0.82**	**29**	**15.2**	0.00086	0.00002	na	0.002	0.0018	0.000064
Dinitrotoluene[2,4-]	1.58	na	na	na	na	na	**0.63**	**0.51**	na	na	0.12	0.0021
HMX	22	na	na	na	na	na	**0.81**	**0.76**	0.16	0.008	0.007	0.0008
Lead	20.9	0.17	0.026	**1**	**1.49**	**1.31**	0.17	0.056	0.012	0.17	0.29	0.0056
TATB[b]	24.8	na	na	na	na	na	**3.76**	**3.4**	na	na	0.062	0.0064
TCDD[2,3,7,8-] (mammalian)	0.00000415	n/a[c]	n/a	n/a	n/a	n/a	**7.16**	0.086	0.00000083	na	**14.3**	**3.46**
TCDD[2,3,7,8-] (avian)	0.00000298	0.21	0.21	0.012	**0.73**	**0.37**	n/a	n/a	n/a	na	n/a	n/a
Uranium-238	28 pCi/g	0.0068	0.0067	0.0072	0.0082	0.0082	0.013	0.013	**0.51**	0.016	0.013	0.014
HI		**66**	**79**	**14**	**191**	**102**	**22**	**7**	**7**	**7**	**32**	**6**

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.
[a] na = Not available.
[b] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[c] n/a = Not applicable.

Table 3.1-5
HI Analysis at the TA-39-6 OD Unit

COPEC	EPC (mg/kg)	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Antimony	1.9	na[a]	na	na	na	na	**3.96**	**0.66**	0.024	**38**	**7.31**	0.042
Aroclor-1254	0.019	0.11	0.086	0.015	**0.46**	0.24	0.022	0.00037	na	0.00012	0.043	0.13
Bis(2-ethylhexyl)phthalate	0.948	**21.1**	**28.7**	0.047	**47.4**	**23.7**	**0.86**	0.00035	na	na	**1.61**	**0.79**
Copper	2220	**20.2**	**1.39**	**58.4**	**148**	**101**	**34.7**	**8.22**	**27.8**	**31.7**	**58.4**	**0.58**
Di-n-butyl phthalate	2.89	**42.5**	**12**	**7.41**	**263**	**138**	0.0078	0.00018	na	0.018	0.016	0.00058
Dinitrotoluene[2,4-]	6.47	na	na	na	na	na	**2.59**	**2.09**	na	na	**0.5**	0.0085
Di-n-octyl phthalate	3.81	na	na	na	na	na	**2.12**	0.00029	na	na	**4.19**	0.29
Lead	161	**1.34**	0.2	**7.67**	**11.5**	**10.1**	**1.34**	**0.44**	0.095	**1.34**	**2.24**	0.044
Mercury	0.271	**3.3**	**0.97**	**3.87**	**20.8**	**12.3**	0.09	0.012	**5.42**	0.008	0.16	0.0059
Silver	1.36	0.072	0.0016	0.12	**0.52**	**0.32**	0.057	0.0091	na	0.0024	0.097	0.00033
TATB[b]	4.3	na	na	na	na	na	**0.65**	**0.59**	na	na	0.011	0.0011
TCDD[2,3,7,8-] (mammalian)	0.00000389	n/a[c]	n/a	n/a	n/a	n/a	**6.71**	0.081	0.00000079	na	**13.4**	**3.24**
TCDD[2,3,7,8-] (avian)	0.00000684	**0.49**	**0.49**	0.029	**1.67**	**0.84**	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	95.2	0.3	0.04	0.27	**1.98**	**1.12**	**0.56**	0.053	**0.79**	**0.6**	**0.97**	0.016
HI		**89**	**44**	**78**	**495**	**288**	**53**	**12**	**34**	**72**	**89**	**5**

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

[a] na = Not available.

[b] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[c] n/a = Not applicable.

Table 3.2-1
PAUFs for Ecological Receptors

Receptor	Home Range[a] (ha)	Population Area[b] (ha)	PAUF at TA-36-8 OD Unit[c]	PAUF at TA-39-6 OD Unit[d]
Robin	0.42	16.8	0.5	0.05
Kestrel	106	4240	0.002	0.0002
Deer mouse	0.077	3.0	1	0.3
Desert cottontail	3.1	124	0.07	0.006
Montane shrew	0.39	15.6	0.5	0.05
Red fox	1038	41,520	0.0002	0.00002
Mexican spotted owl	366	n/a[e]	0.02	0.002

[a] Values from EPA 1993.

[b] Derived by 40HR.

[c] PAUF is calculated as the area of the site (8.3 ha) divided by the population area.

[d] PAUF is calculated as the area of the site (0.8 ha) divided by the population area.

[e] n/a = Not applicable.

Table 3.2-2
LOAEL-Based ESLs for Terrestrial Receptors

COPEC	Receptor	LOAEL–Based ESL (mg/kg)
Antimony	Deer mouse	4.8
	Montane shrew	2.6
	Plant	0.5
Bis(2-ethylhexyl)phthalate	Robin insectivore	0.2
	Robin omnivore	0.4
	Deer mouse	11
	Montane shrew	5.9
Copper	Robin herbivore	110
	Robin insectivore	46
	Robin omnivore	66
	Deer mouse	100
	Montane shrew	63
	Earthworm	530
	Plant	490
Di-n-butyl phthalate	Robin herbivore	3.9
	Robin insectivore	0.11
	Robin omnivore	0.21
Dinitrotoluene[2,4-]	Deer mouse	25
Di-n-octyl phthalate	Deer mouse	18
HMX	Deer mouse	72
Lead	Robin herbivore	42
	Robin insectivore	28
	Robin omnivore	33
	Deer mouse	230
	Plant	570

Table 3.2-2 (continued)

COPEC	Receptor	LOAEL–Based ESL (mg/kg)
Mercury	Robin insectivore	0.13
	Robin omnivore	0.22
	Earthworm	0.5
TATB[b]	Deer mouse	66
TCDD[2,3,7,8-]	Deer mouse	0.0000039
	Montane shrew	0.0000019
	Robin insectivore	0.000041[c]
Zinc	Earthworm	930
	Plant	810
Uranium-238	Earthworm	550 pCi/g

[a] ESLs from ECORISK Database, Version 3.1 (LANL 2012c).
[b] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.
[c] ESL from ECORISK Database, Version 2.0 (LANL 2003).

Table 3.2-3
Adjusted HI Analysis at the TA-36-8 OD Unit

COPEC	EPC (mg/kg)	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Bis(2-ethylhexyl)phthalate	2.56	0.11	0.16	0.065	**64**	**32**	**3.1**	0.000063	na[a]	na	**2.17**	0.00043
Copper	475.7	0.0086	0.00059	**6.26**	**15.9**	**10.8**	**7.43**	0.12	**5.95**	**6.8**	**6.26**	0.000025
Di-n-butyl phthalate	0.319	0.0094	0.0027	**0.41**	**14.5**	**7.6**	0.00086	0.0000014	na	0.002	0.00089	0.000000013
Dinitrotoluene[2,4-]	1.58	na	na	na	na	na	**0.63**	0.036	na	na	0.061	0.00000042
HMX	22	na	na	na	na	na	**0.81**	0.029	0.16	0.008	0.0035	0.00000016
Lead	20.9	0.00034	0.000052	**0.5**	**0.75**	**0.66**	0.17	0.0039	0.012	0.17	0.15	0.0000011
TATB[b]	24.8	na	na	na	na	na	**3.76**	0.24	na	na	0.031	0.0000013
TCDD[2,3,7,8-] (mammalian)	0.00000415	n/a[c]	n/a	n/a	n/a	n/a	**7.16**	0.006	0.00000083	na	**7.15**	0.00065
TCDD[2,3,7,8-] (avian)	0.00000298	0.00042	0.00042	0.006	**0.37**	0.19	n/a	n/a	n/a	na	n/a	n/a
Uranium-238	28 pCi/g	0.000014	0.000014	0.0036	0.0041	0.0041	0.013	0.00091	**0.51**	0.016	0.0065	0.0000028
Adjusted HI		0.1	0.2	**7**	**96**	**51**	**23**	0.4	**7**	**7**	**16**	0.001

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

[a] na = Not available.

[b] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[c] n/a = Not applicable.

Table 3.2-4
Adjusted HI Analysis at the TA-39-6 OD Unit

COPEC	EPC (mg/kg)	Kestrel (insectivore)	Kestrel (carnivore)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer mouse	Desert cottontail	Earthworm	Plant	Montane shrew	Red fox
Antimony	1.9	na[a]	na	na	na	na	**1.19**	0.004	0.024	**38**	**0.37**	0.00000084
Aroclor-1254	0.019	0.000022	0.000017	0.00073	0.023	0.012	0.0064	0.0000022	na	0.00011	0.0025	0.0000022
Bis(2-ethylhexyl)phthalate	0.948	0.0042	0.0057	0.0024	**2.37**	**1.19**	0.26	0.0000021	na	na	0.08	0.000016
Copper	2220	0.004	0.00028	**2.92**	**7.4**	**5.05**	**10.4**	0.049	**27.8**	**31.7**	**2.92**	0.000012
Di-n-butyl phthalate	2.89	0.0085	0.0024	**0.37**	**13.1**	**6.88**	0.0023	0.0000011	na	0.018	0.0008	0.000000012
Dinitrotoluene[2,4-]	6.47	na	na	na	na	na	**0.78**	0.013	na	na	0.025	0.00000017
Di-n-octyl phthalate	3.81	na	na	na	na	na	**0.64**	0.0000017	na	na	0.21	0.00000058
Lead	161	0.00027	0.00004	**0.38**	**0.58**	**0.5**	**0.4**	0.0026	0.095	**1.34**	0.11	0.00000088
Mercury	0.271	0.00066	0.00019	0.19	**1.04**	**0.62**	0.027	0.000072	**5.42**	0.008	0.008	0.00000088
Silver	1.36	0.000014	0.00000032	0.0062	0.026	0.016	0.017	0.000055	na	0.0024	0.0049	0.0000000066
TATB[b]	4.3	na	na	na	na	na	0.2	0.0035	na	na	0.00055	0.000000022
TCDD[2,3,7,8-] (mammalian)	0.00000389	n/a[c]	n/a	n/a	n/a	n/a	**2.01**	0.00049	0.00000096	na	**0.67**	0.000065
TCDD[2,3,7,8-] (avian)	0.00000684	0.000098	0.000098	0.0015	0.084	0.042	n/a	n/a	n/a	na	n/a	n/a
Zinc	95.2	0.00006	0.0000079	0.014	0.099	0.056	0.17	0.00032	**0.79**	**0.6**	0.05	0.00000032
Adjusted HI		0.02	0.009	**4**	**25**	**14**	**16**	0.07	**34**	**72**	**4**	0.00009

Note: Bolded values indicate HQs greater than 0.3 or HIs greater than 1.

[a] na = Not available.

[b] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

[c] n/a = Not applicable.

Table 3.2-5
HI Analysis Using LOAEL-Based ESLs at the TA-36-8 OD Unit

COPEC	EPC (mg/kg)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Montane Shrew	Earthworm	Plant
Bis(2-ethylhexyl)phthalate	2.56	n/a[a]	**12.8**	**6.4**	0.23	**0.43**	na[b]	na
Copper	475.7	**4.32**	**10.3**	**7.21**	**4.76**	**7.55**	**0.9**	**0.97**
Di-n-butyl phthalate	0.319	0.082	**2.9**	**1.52**	n/a	n/a	na	n/a
Dinitrotoluene[2,4-]	1.58	na	na	na	0.063	n/a	na	na
HMX	22	na	na	na	**0.31**	n/a	n/a	n/a
Lead	20.9	**0.5**	**0.75**	**0.63**	n/a	n/a	n/a	n/a
TATB[c]	24.8	na	na	na	**0.38**	n/a	na	na
TCDD[2,3,7,8-] (mammalian)	0.00000415	n/a	n/a	n/a	**1.06**	**2.18**	n/a	na
TCDD[2,3,7,8-] (avian)	0.00000298	n/a	0.073	n/a	n/a	n/a	n/a	na
Uranium-238	28 pCi/g	n/a	n/a	n/a	n/a	n/a	0.051	n/a
HI		**5**	**27**	**16**	**7**	**10**	1	1

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] n/a = Not applicable.

[b] na = Not available.

[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

Table 3.2-6
HI Analysis Using LOAEL-Based ESLs at the TA-39-6 OD Unit

COPEC	EPC (mg/kg)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Montane Shrew	Earthworm	Plant
Antimony	1.9	na[a]	na	na	**0.4**	**0.73**	n/a[b]	**3.8**
Bis(2-ethylhexyl)phthalate	0.948	n/a	**4.74**	**2.37**	n/a	n/a	na	na
Copper	2220	**20.2**	**48.3**	**33.6**	**22.2**	**35.2**	**4.19**	**4.53**
Di-n-butyl phthalate	2.89	**0.74**	**26.3**	**13.8**	n/a	n/a	na	n/a
Dinitrotoluene[2,4-]	6.47	na	na	na	0.26	n/a	na	na
Di-n-octyl phthalate	3.81	na	na	na	0.21	n/a	na	na
Lead	161	**3.83**	**5.75**	**4.88**	**0.7**	n/a	n/a	0.28
Mercury	0.271	n/a	**2.08**	**1.23**	n/a	n/a	**0.54**	n/a
TCDD[2,3,7,8-] (mammalian)	0.00000389	n/a	n/a	n/a	**1**	**2.05**	n/a	na
Zinc	95.2	n/a	n/a	n/a	n/a	n/a	0.1	0.12
HI		**25**	**87**	**56**	**25**	**38**	**5**	**9**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] na = Not available.
[b] n/a = Not applicable.

Table 3.2-7
Adjusted HI Analysis Using LOAEL-Based ESLs at the TA-36-8 OD Unit

COPEC	EPC (mg/kg)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Montane Shrew
Bis(2-ethylhexyl)phthalate	2.56	n/a[a]	**6.4**	**3.2**	0.23	0.22
Copper	475.7	**2.16**	**5.15**	**3.61**	**4.76**	**3.78**
Di-n-butyl phthalate	0.319	0.041	**1.45**	**0.76**	n/a	n/a
Dinitrotoluene[2,4-]	1.58	na[b]	na	na	0.063	n/a
HMX	22	na	na	na	**0.31**	n/a
Lead	20.9	0.25	**0.38**	**0.32**	n/a	n/a
TATB[c]	24.8	na	na	na	**0.38**	n/a
TCDD[2,3,7,8-] (mammalian)	0.00000415	n/a	n/a	n/a	**1.06**	**1.09**
Adjusted HI		**2**	**13**	**8**	**7**	**5**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.

[a] na = Not available.

[b] n/a = Not applicable.

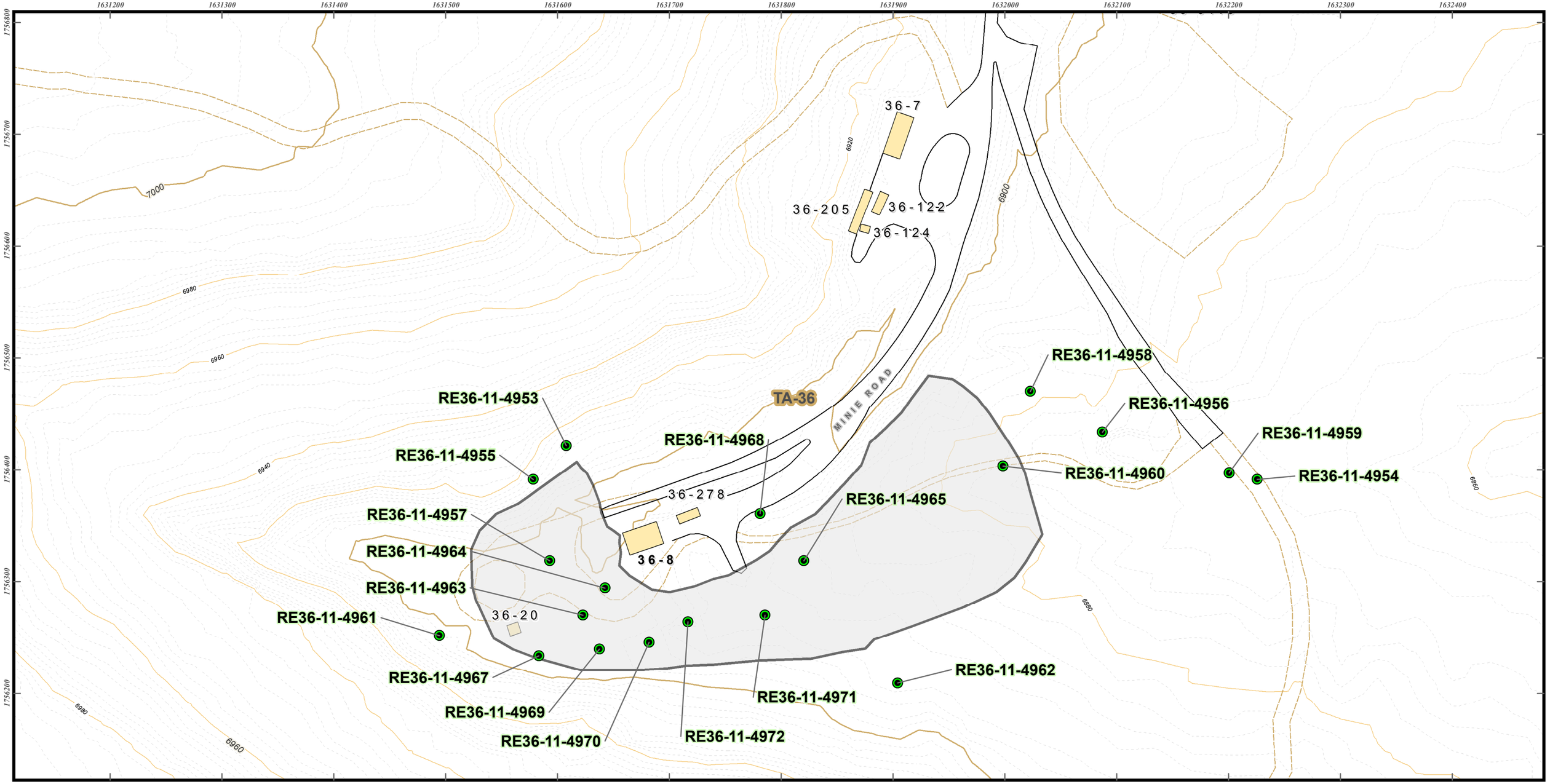
[c] Trinitrobenzene[1,3,5-] used as a surrogate based on structural similarity.

Table 3.2-8
Adjusted HI Analysis Using LOAEL-Based ESLs at the TA-39-6 OD Unit

COPEC	EPC (mg/kg)	Robin (herbivore)	Robin (insectivore)	Robin (omnivore)	Deer Mouse	Montane Shrew	Earthworm	Plant
Antimony	1.9	na[a]	na	na	0.12	0.037	n/a[b]	**3.8**
Bis(2-ethylhexyl)phthalate	0.948	n/a	0.24	0.12	n/a	n/a	na	na
Copper	2220	**1.01**	**2.42**	**1.68**	**6.66**	**1.76**	**4.19**	**4.53**
Di-n-butyl phthalate	2.89	0.04	**1.32**	**0.69**	n/a	n/a	na	n/a
Dinitrotoluene[2,4-]	6.47	na	na	na	0.08	n/a	na	na
Di-n-octyl phthalate	3.81	na	na	na	0.064	n/a	na	na
Lead	161	0.19	0.29	0.24	0.21	n/a	n/a	0.28
Mercury	0.271	n/a	0.1	0.062	n/a	n/a	**0.54**	n/a
TCDD[2,3,7,8-] (mammalian)	0.00000389	n/a	n/a	n/a	0.3	0.1	n/a	na
Zinc	95.2	n/a	n/a	n/a	n/a	n/a	0.1	0.12
Adjusted HI		1	**4**	**3**	**7**	**2**	**5**	**9**

Note: Bolded values indicate HQ greater than 0.3 or HI greater than 1.
[a] na = Not available.
[b] n/a = Not applicable.

This page intentionally left blank.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-1. TA-36-8 Open Detonation Unit Soil Sample Locations

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012

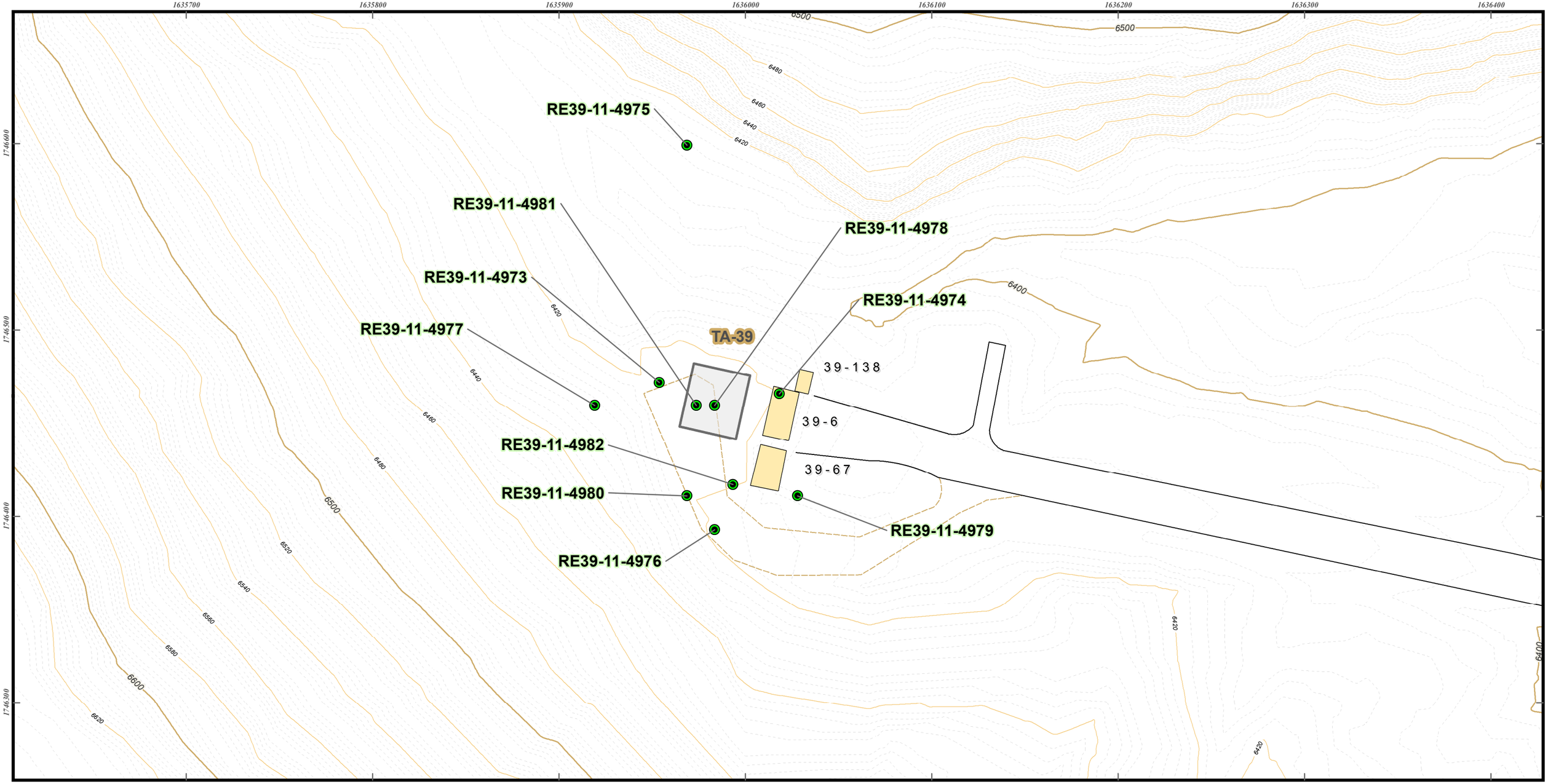
N

0 50 100 200 Feet

0 15 30 60 Meters

1:1,000

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-2. TA-39-6 Open Detonation Unit Soil Sample Locations

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-01

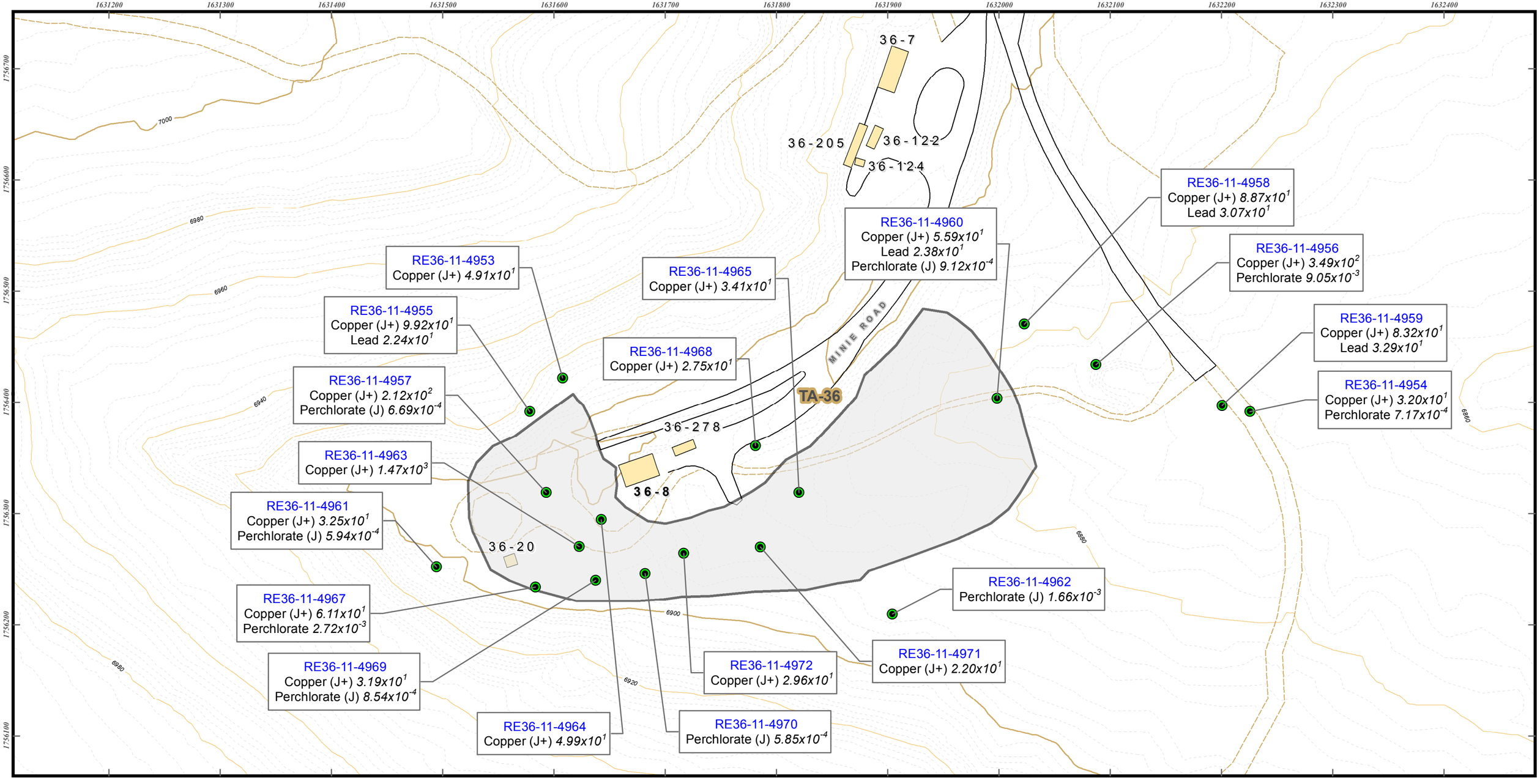
N

0 30 60 120 Feet

0 10 20 40 Meters

1:600

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-3. TA-36-8 Open Detonation Unit Soil Concentrations for Metals above Background Values and Perchlorate (No Background Value)

Notes: All concentration values are in milligrams per kilogram (mg/kg) and concentrations indicated with "J" or "J+" are estimated concentrations.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-02

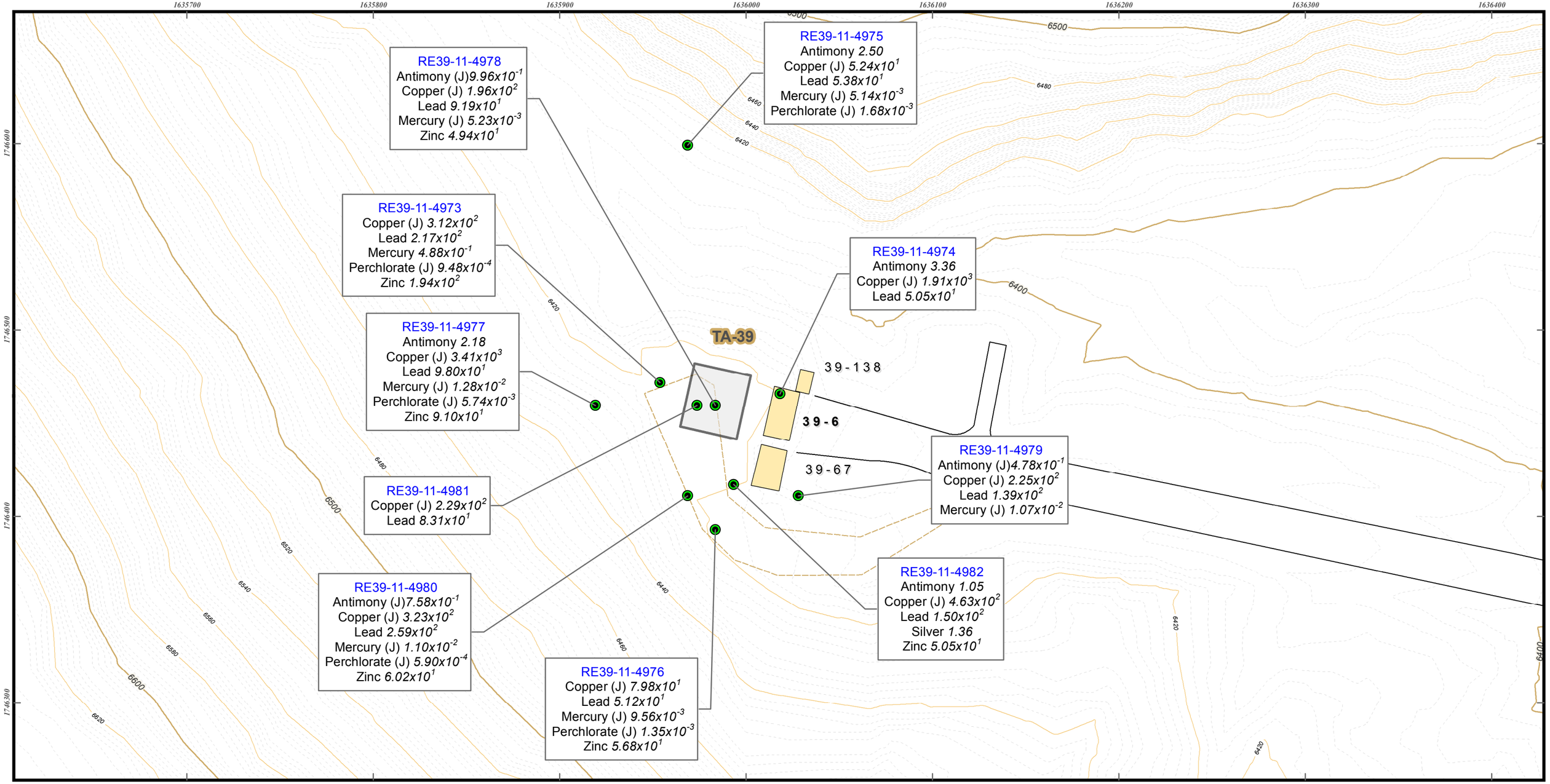
N

0 50 100 200 Feet

0 15 30 60 Meters

1:1,000

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-4. TA-39-6 Open Detonation Unit Soil Concentrations for Metals above Background Values and Perchlorate (No Background Value)

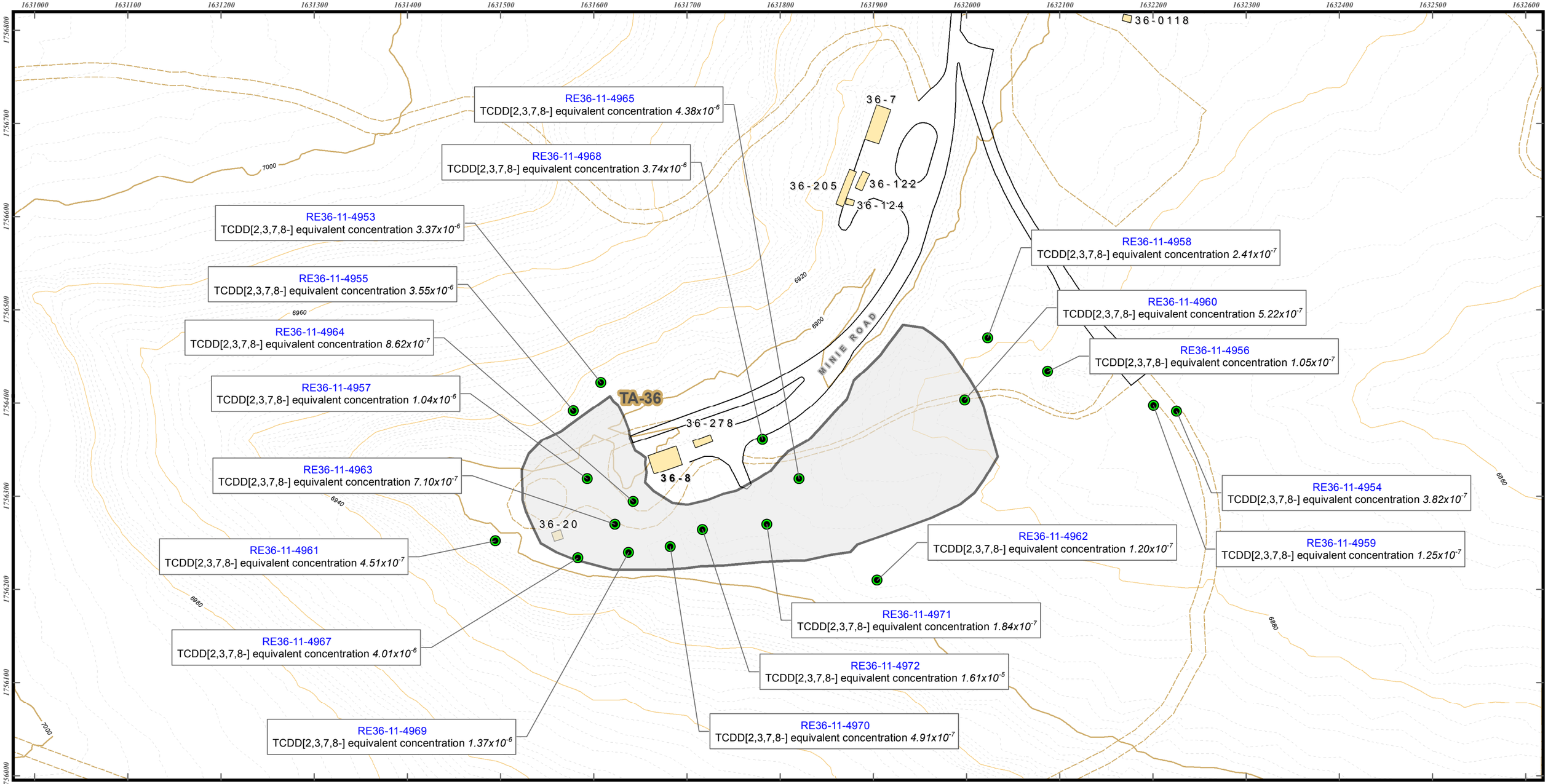
Notes: All concentration values are in milligrams per kilogram (mg/kg) and concentrations indicated with "J" or "J+" are estimated concentrations.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-03

N

0 30 60 120 Feet
0 10 20 40 Meters
1:600

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-5. TA-36-8 Open Detonation Unit Soil Concentrations for Dioxins/Furans

Notes: Concentration values are in milligrams per kilogram (mg/kg) and represent the TCDD toxicity equivalent concentrations for all dioxin/furan congeners detected at the sample location.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-06

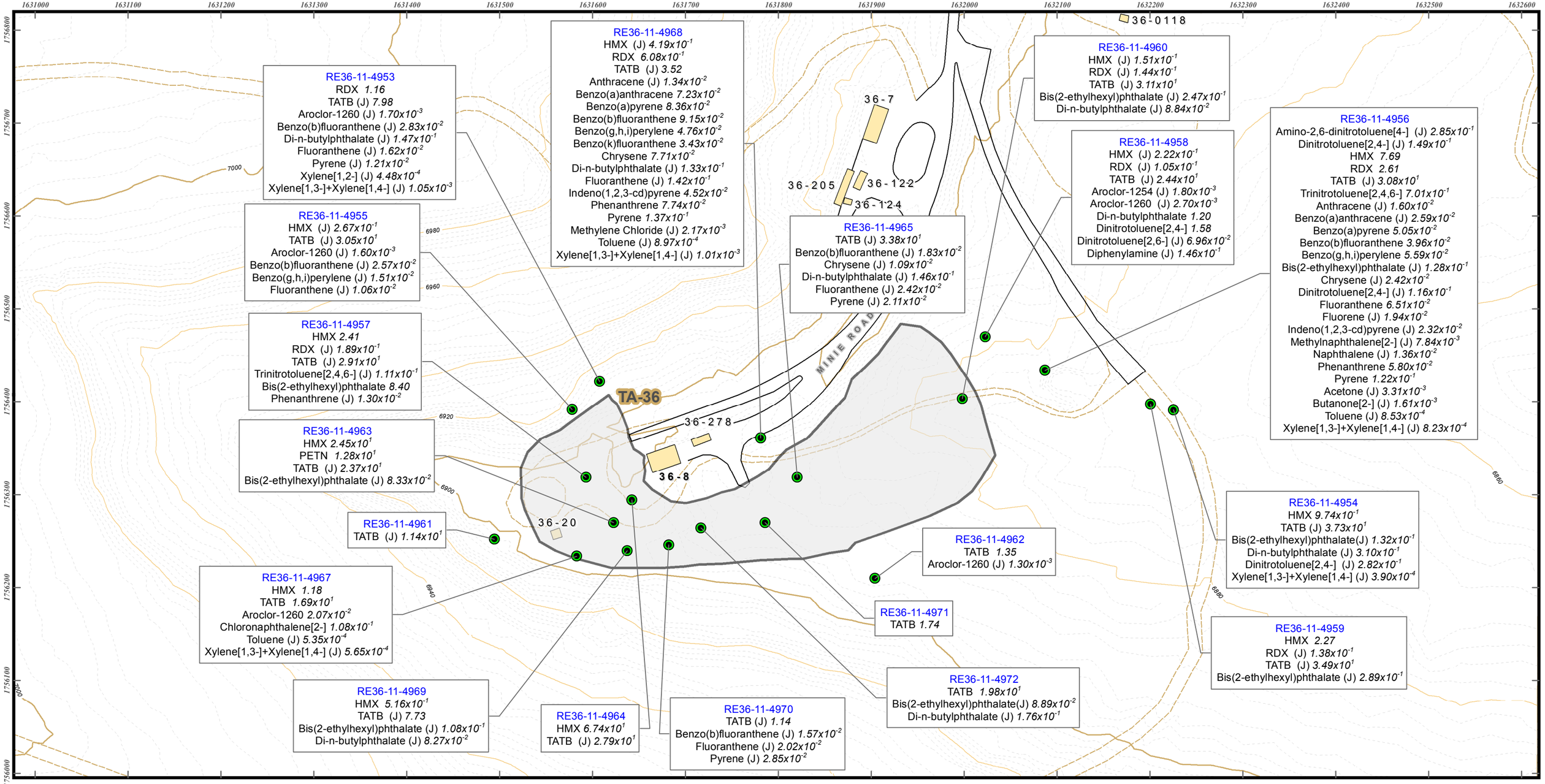
N

0 50 100 200 Feet

0 20 40 80 Meters

1:1,200

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-6. TA-36-8 Open Detonation Unit Soil Concentrations for Organic Chemicals Other than Dioxins/Furans

Notes: All concentration values are in milligrams per kilogram (mg/kg) and concentrations indicated with "J" or "J+" are estimated concentrations.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-04

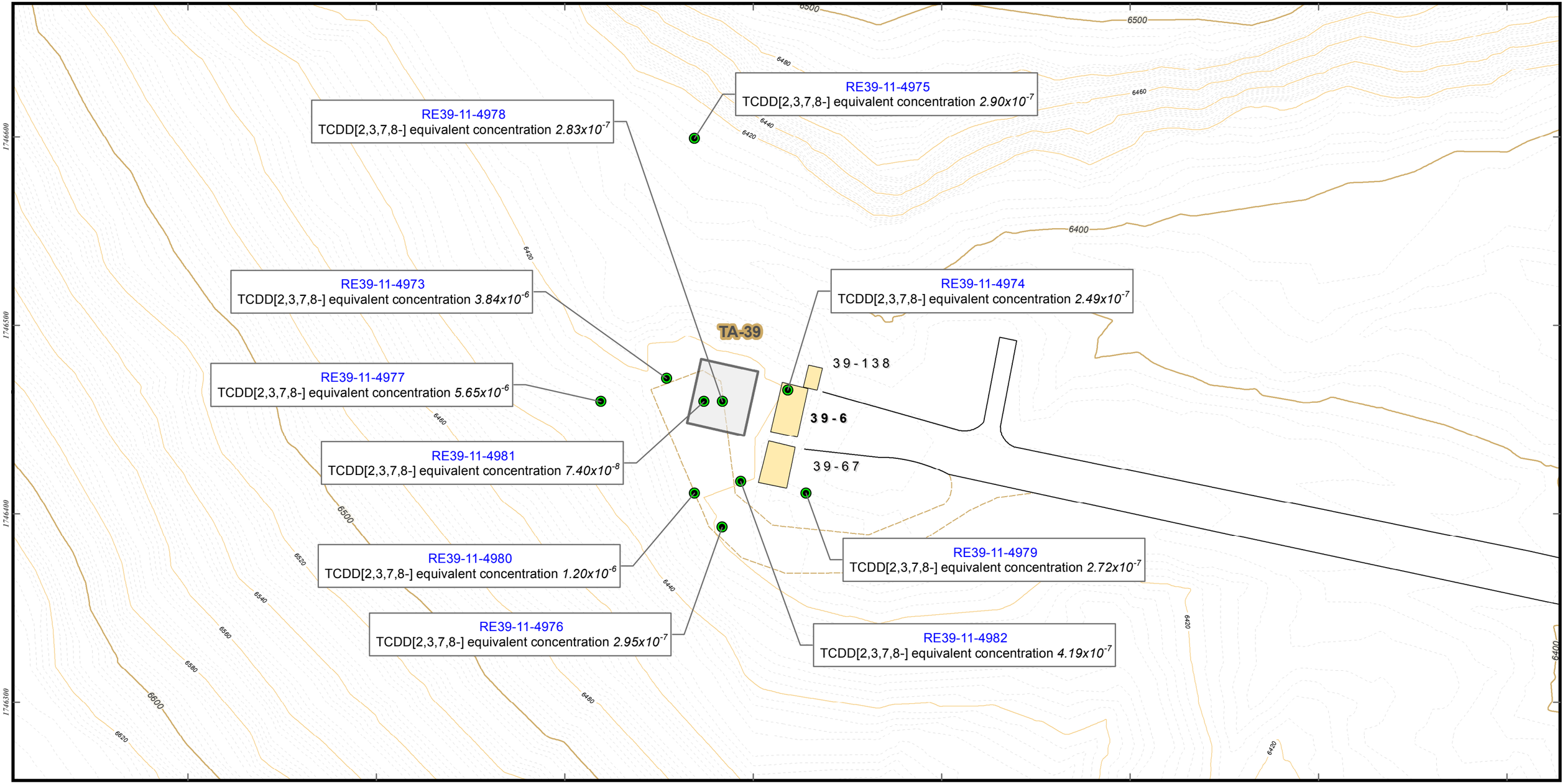
N

0 60 120 240 Feet

0 20 40 80 Meters

1:1,200

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-7. TA-39-6 Open Detonation Unit Soil Concentrations for Dioxins/Furans

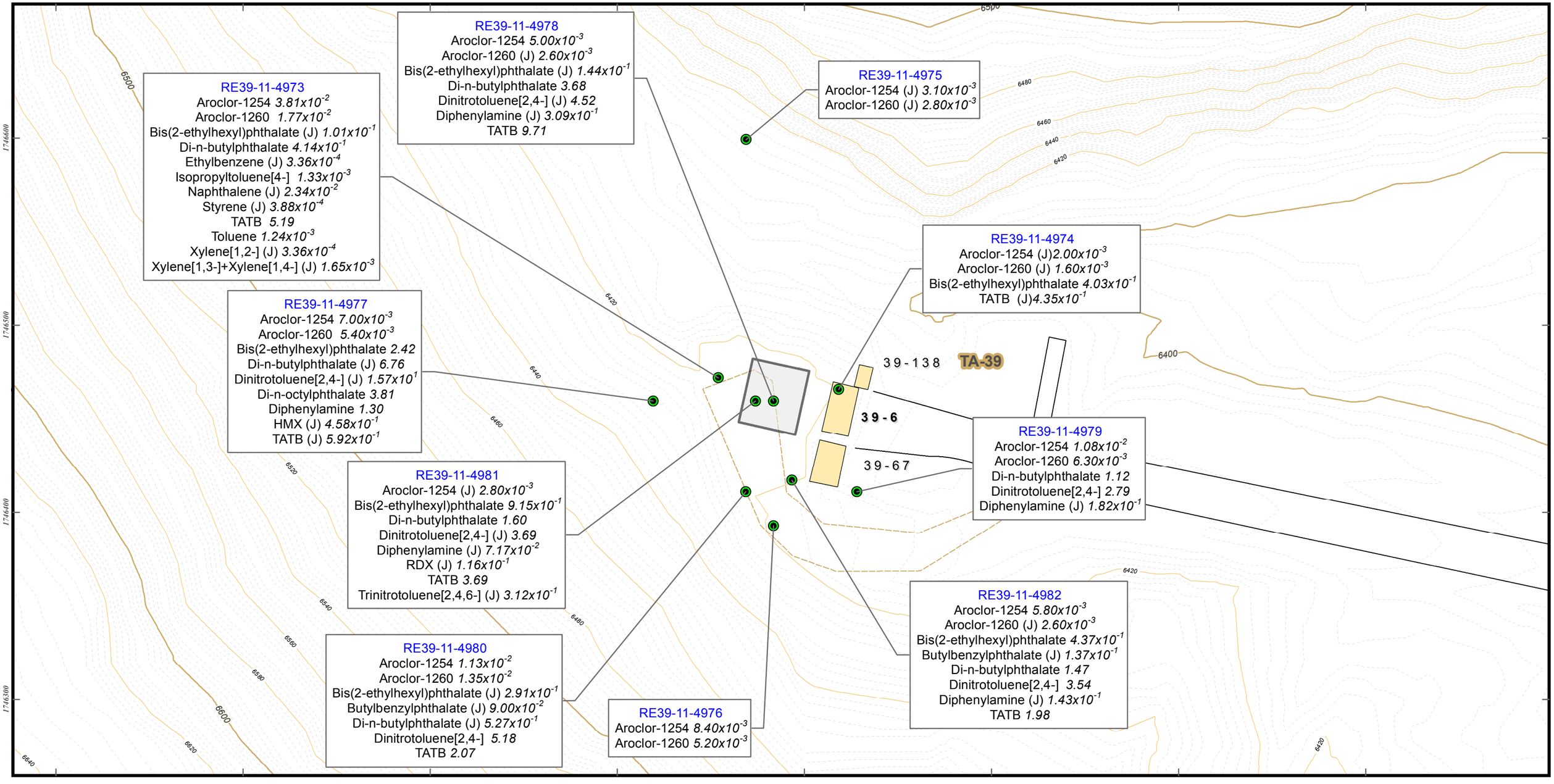
Notes: Concentration values are in milligrams per kilogram (mg/kg) and represent the TCDD toxicity equivalent concentrations for all dioxin/furan congeners detected at the sample location.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-07

N

0 30 60 120 Feet
0 10 20 40 Meters
1:600

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-8. TA-39-6 Open Detonation Unit Soil Concentrations for Organic Chemicals Other than Dioxins/Furans

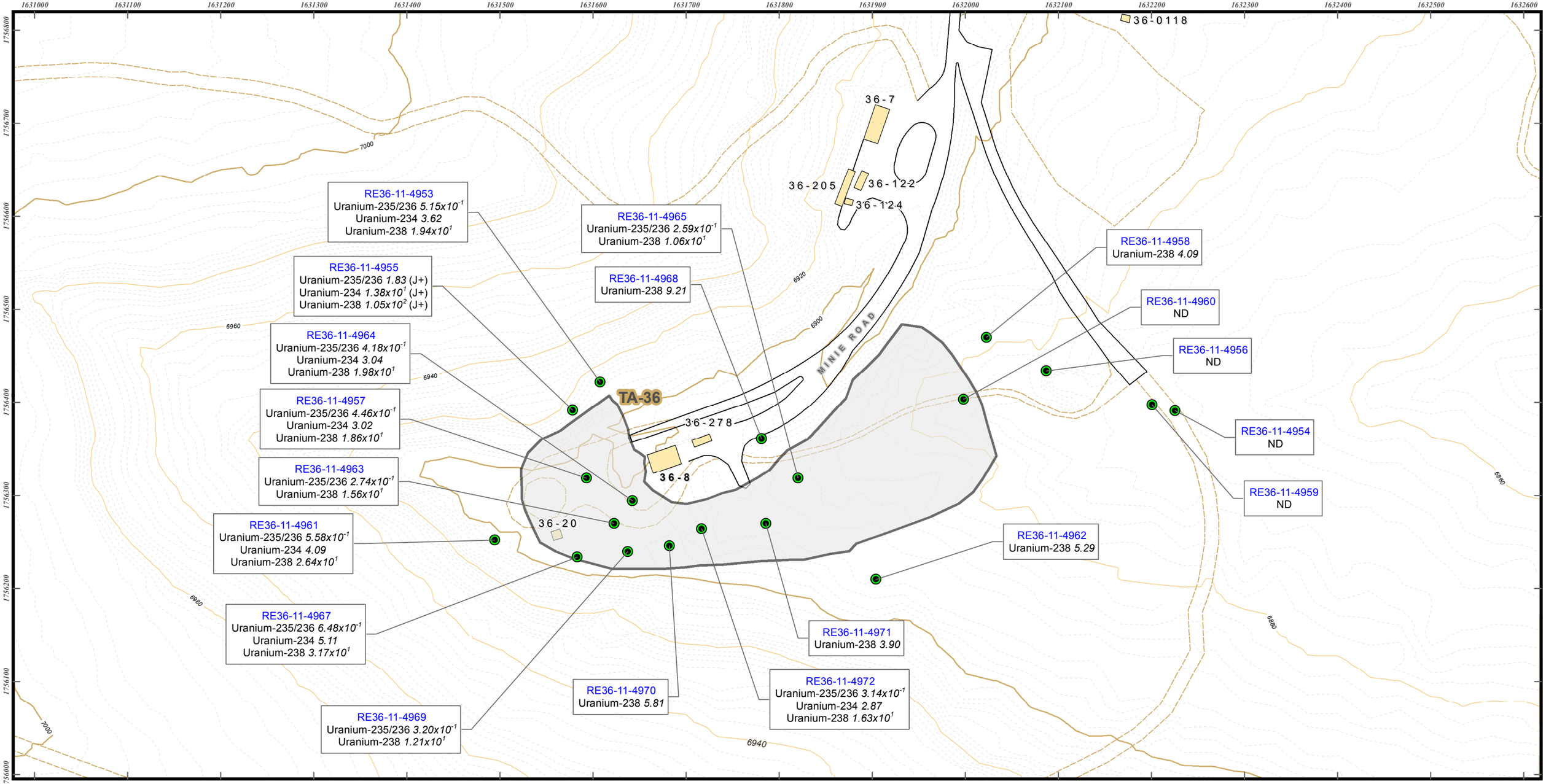
Notes: All concentration values are in milligrams per kilogram (mg/kg) and concentrations indicated with "J" or "J+" are estimated concentrations.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-05

N

0 30 60 120 Feet
0 10 20 40 Meters
1:600

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.



Unit boundary
Structures
2011 Grab Samples
Roads, paved
Roads, dirt
Contours, 2 ft
Contours, 20 ft
Contours, 100 ft

Supplement 4-9

Figure 1.2-9. TA-36-8 Open Detonation Unit Soil Concentrations for Uranium Isotopes above Background Values

Notes: All concentration values are in picoCuries per gram (piCu/g). Concentrations indicated with "J+" are estimated concentrations.
"ND" indicates that uranium isotopes were not detected at the sample location.

New Mexico State Plane Coordinate System Central Zone US Ft
North American Datum 1983 National Geodetic Vertical Datum 1929
Created by W. Red Star, OIO-DO. 22 JANUARY 2014 Map #14-0012-08

N

0 50 100 200 Feet

0 20 40 80 Meters

1:1,200

DISCLAIMER: This map was created for work processes associated with Open Detonation Risk Assessment. All other uses for this map should be confirmed with Environmental Compliance Program staff.

1	**UCL Statistics for Data Sets with Non-Detects**											
2												
3			User Selected Options									
4			Date/Time of Computation	3/12/2014 9:58:53 AM								
5			From File	UCL 36-8 OD Input Data_030514.xls								
6			Full Precision	OFF								
7			Confidence Coefficient	95%								
8			Number of Bootstrap Operations	2000								
9												
10	**Aroclor-1260**											
11												
12	**General Statistics**											
13					Total Number of Observations	19			Number of Distinct Observations	17		
14					Number of Detects	5			Number of Non-Detects	14		
15					Number of Distinct Detects	5			Number of Distinct Non-Detects	12		
16					Minimum Detect	0.0013			Minimum Non-Detect	0.0167		
17					Maximum Detect	0.0207			Maximum Non-Detect	0.0351		
18					Variance Detects	7.1530E-5			Percent Non-Detects	73.68%		
19					Mean Detects	0.0056			SD Detects	0.00846		
20					Median Detects	0.0017			CV Detects	1.51		
21					Skewness Detects	2.215			Kurtosis Detects	4.921		
22					Mean of Logged Detects	-5.85			SD of Logged Detects	1.135		
23												
24	**Normal GOF Test on Detects Only**											
25					Shapiro Wilk Test Statistic	0.605			**Shapiro Wilk GOF Test**			
26					5% Shapiro Wilk Critical Value	0.762			Detected Data Not Normal at 5% Significance Level			
27					Lilliefors Test Statistic	0.434			**Lilliefors GOF Test**			
28					5% Lilliefors Critical Value	0.396			Detected Data Not Normal at 5% Significance Level			
29	**Detected Data Not Normal at 5% Significance Level**											
30												
31	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
32					Mean	0.00294			Standard Error of Mean	0.00124		
33					SD	0.00447			95% KM (BCA) UCL	0.00553		
34					95% KM (t) UCL	0.00508			95% KM (Percentile Bootstrap) UCL	0.00523		
35					95% KM (z) UCL	0.00497			95% KM Bootstrap t UCL	0.022		
36					90% KM Chebyshev UCL	0.00664			95% KM Chebyshev UCL	0.00832		
37					97.5% KM Chebyshev UCL	0.0107			99% KM Chebyshev UCL	0.0152		
38												
39	**Gamma GOF Tests on Detected Observations Only**											
40					A-D Test Statistic	0.907			**Anderson-Darling GOF Test**			
41					5% A-D Critical Value	0.695			Detected Data Not Gamma Distributed at 5% Significance Level			
42					K-S Test Statistic	0.393			**Kolmogrov-Smirnoff GOF**			
43					5% K-S Critical Value	0.365			Detected Data Not Gamma Distributed at 5% Significance Level			
44	**Detected Data Not Gamma Distributed at 5% Significance Level**											
45												
46	**Gamma Statistics on Detected Data Only**											
47					k hat (MLE)	0.881			k star (bias corrected MLE)	0.486		
48					Theta hat (MLE)	0.00636			Theta star (bias corrected MLE)	0.0115		
49					nu hat (MLE)	8.808			nu star (bias corrected)	4.857		
50					MLE Mean (bias corrected)	0.0056			MLE Sd (bias corrected)	0.00804		
51												
52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	0.431			nu hat (KM)	16.38		
54					Approximate Chi Square Value (16.38, α)	8.233			Adjusted Chi Square Value (16.38, β)	7.731		
55					95% Gamma Approximate KM-UCL (use when n>=50)	0.00584			95% Gamma Adjusted KM-UCL (use when n<50)	0.00622		
56												
57	**Gamma ROS Statistics using Imputed Non-Detects**											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62					Minimum	0.0013			Mean	0.00884		
63					Maximum	0.0207			Median	0.01		
64					SD	0.00446			CV	0.504		
65					k hat (MLE)	2.598			k star (bias corrected MLE)	2.223		
66					Theta hat (MLE)	0.0034			Theta star (bias corrected MLE)	0.00398		
67					nu hat (MLE)	98.71			nu star (bias corrected)	84.46		
68					MLE Mean (bias corrected)	0.00884			MLE Sd (bias corrected)	0.00593		
69									Adjusted Level of Significance (β)	0.0369		
70					Approximate Chi Square Value (84.46, α)	64.28			Adjusted Chi Square Value (84.46, β)	62.74		
71					95% Gamma Approximate UCL (use when n>=50)	0.0116			95% Gamma Adjusted UCL (use when n<50)	0.0119		
72												
73	**Lognormal GOF Test on Detected Observations Only**											
74					Shapiro Wilk Test Statistic	0.75			**Shapiro Wilk GOF Test**			
75					5% Shapiro Wilk Critical Value	0.762			Detected Data Not Lognormal at 5% Significance Level			
76					Lilliefors Test Statistic	0.322			**Lilliefors GOF Test**			
77					5% Lilliefors Critical Value	0.396			Detected Data appear Lognormal at 5% Significance Level			
78	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
79												
80	**Lognormal ROS Statistics Using Imputed Non-Detects**											
81					Mean in Original Scale	0.00297			Mean in Log Scale	-6.126		
82					SD in Original Scale	0.00432			SD in Log Scale	0.593		
83					95% t UCL (assumes normality of ROS data)	0.00469			95% Percentile Bootstrap UCL	0.00493		
84					95% BCA Bootstrap UCL	0.00595			95% Bootstrap t UCL	0.0152		
85					95% H-UCL (Log ROS)	0.0035						

	A	B	C	D	E	F	G	H	I	J	K	L
86												
87	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
88					KM Mean (logged)	-6.199			95% H-UCL (KM -Log)			0.00343
89					KM SD (logged)	0.635			95% Critical H Value (KM-Log)			2.148
90					KM Standard Error of Mean (logged)	0.211						
91												
92	**DL/2 Statistics**											
93	**DL/2 Normal**						**DL/2 Log-Transformed**					
94					Mean in Original Scale	0.00883			Mean in Log Scale			-4.959
95					SD in Original Scale	0.00519			SD in Log Scale			0.795
96					95% t UCL (Assumes normality)	0.0109			95% H-Stat UCL			0.0149
97	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
98												
99	**Nonparametric Distribution Free UCL Statistics**											
100	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
101												
102	**Suggested UCL to Use**											
103					95% KM (BCA) UCL	0.00553						
104	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
105	Recommendations are based upon data size, data distribution, and skewness.											
106	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
107	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
108												

Benzo(b)fluoranthene											
General Statistics											
Total Number of Observations					19	Number of Distinct Observations					17
Number of Detects					6	Number of Non-Detects					13
Number of Distinct Detects					6	Number of Distinct Non-Detects					11
Minimum Detect					0.0157	Minimum Non-Detect					0.0334
Maximum Detect					0.0915	Maximum Non-Detect					0.038
Variance Detects					7.9647E-4	Percent Non-Detects					68.42%
Mean Detects					0.0365	SD Detects					0.0282
Median Detects					0.027	CV Detects					0.773
Skewness Detects					1.994	Kurtosis Detects					4.184
Mean of Logged Detects					-3.5	SD of Logged Detects					0.634
Normal GOF Test on Detects Only											
Shapiro Wilk Test Statistic					0.758	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.788	Detected Data Not Normal at 5% Significance Level					
Lilliefors Test Statistic					0.29	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.362	Detected Data appear Normal at 5% Significance Level					
Detected Data appear Approximate Normal at 5% Significance Level											
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
Mean					0.0266	Standard Error of Mean					0.00471
SD					0.0165	95% KM (BCA) UCL					0.0348
95% KM (t) UCL					0.0347	95% KM (Percentile Bootstrap) UCL					0.035
95% KM (z) UCL					0.0343	95% KM Bootstrap t UCL					0.0392
90% KM Chebyshev UCL					0.0407	95% KM Chebyshev UCL					0.0471
97.5% KM Chebyshev UCL					0.056	99% KM Chebyshev UCL					0.0734
Gamma GOF Tests on Detected Observations Only											
A-D Test Statistic					0.449	**Anderson-Darling GOF Test**					
5% A-D Critical Value					0.702	Detected data appear Gamma Distributed at 5% Significance Level					
K-S Test Statistic					0.247	**Kolmogrov-Smirnoff GOF**					
5% K-S Critical Value					0.335	Detected data appear Gamma Distributed at 5% Significance Level					
Detected data appear Gamma Distributed at 5% Significance Level											
Gamma Statistics on Detected Data Only											
k hat (MLE)					2.783	k star (bias corrected MLE)					1.503
Theta hat (MLE)					0.0131	Theta star (bias corrected MLE)					0.0243
nu hat (MLE)					33.4	nu star (bias corrected)					18.03
MLE Mean (bias corrected)					0.0365	MLE Sd (bias corrected)					0.0298
Gamma Kaplan-Meier (KM) Statistics											
k hat (KM)					2.585	nu hat (KM)					98.23
Approximate Chi Square Value (98.23, α)					76.37	Adjusted Chi Square Value (98.23, β)					74.68
95% Gamma Approximate KM-UCL (use when n>=50)					0.0342	95% Gamma Adjusted KM-UCL (use when n<50)					0.035
Gamma ROS Statistics using Imputed Non-Detects											
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
GROS may not be used when kstar of detected data is small such as < 0.1											
For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
Minimum					0.0145	Mean					0.026
Maximum					0.0915	Median					0.021
SD					0.0169	CV					0.651
k hat (MLE)					4.877	k star (bias corrected MLE)					4.142
Theta hat (MLE)					0.00532	Theta star (bias corrected MLE)					0.00627
nu hat (MLE)					185.3	nu star (bias corrected)					157.4
MLE Mean (bias corrected)					0.026	MLE Sd (bias corrected)					0.0128
						Adjusted Level of Significance (β)					0.0369
Approximate Chi Square Value (157.38, α)					129.4	Adjusted Chi Square Value (157.38, β)					127.2
95% Gamma Approximate UCL (use when n>=50)					0.0316	95% Gamma Adjusted UCL (use when n<50)					0.0321
Lognormal GOF Test on Detected Observations Only											
Shapiro Wilk Test Statistic					0.918	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.788	Detected Data appear Lognormal at 5% Significance Level					
Lilliefors Test Statistic					0.207	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.362	Detected Data appear Lognormal at 5% Significance Level					
Detected Data appear Lognormal at 5% Significance Level											
Lognormal ROS Statistics Using Imputed Non-Detects											
Mean in Original Scale					0.0265	Mean in Log Scale					-3.723
SD in Original Scale					0.0166	SD in Log Scale					0.383
95% t UCL (assumes normality of ROS data)					0.0331	95% Percentile Bootstrap UCL					0.0336
95% BCA Bootstrap UCL					0.0373	95% Bootstrap t UCL					0.0508
95% H-UCL (Log ROS)					0.0309						
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
KM Mean (logged)					-3.736	95% H-UCL (KM -Log)					0.0314
KM SD (logged)					0.414	95% Critical H Value (KM-Log)					1.932
KM Standard Error of Mean (logged)					0.147						
DL/2 Statistics											
DL/2 Normal						**DL/2 Log-Transformed**					
Mean in Original Scale					0.0235	Mean in Log Scale					-3.875

	A	B	C	D	E	F	G	H	I	J	K	L
194					SD in Original Scale	0.0174					SD in Log Scale	0.426
195					95% t UCL (Assumes normality)	0.0304					95% H-Stat UCL	0.0276
196	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
197												
198	**Nonparametric Distribution Free UCL Statistics**											
199	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
200												
201	**Suggested UCL to Use**											
202					95% KM (t) UCL	0.0347					95% KM (Percentile Bootstrap) UCL	0.035
203												
204	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
205	Recommendations are based upon data size, data distribution, and skewness.											
206	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
207	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
208												

209	**Bis(2-ethylhexyl)phthalate**										
210											
211	**General Statistics**										
212					Total Number of Observations	19			Number of Distinct Observations	19	
213					Number of Detects	8			Number of Non-Detects	11	
214					Number of Distinct Detects	8			Number of Distinct Non-Detects	11	
215					Minimum Detect	0.0833			Minimum Non-Detect	0.334	
216					Maximum Detect	8.4			Maximum Non-Detect	0.38	
217					Variance Detects	8.506			Percent Non-Detects	57.89%	
218					Mean Detects	1.185			SD Detects	2.916	
219					Median Detects	0.13			CV Detects	2.462	
220					Skewness Detects	2.825			Kurtosis Detects	7.984	
221					Mean of Logged Detects	-1.465			SD of Logged Detects	1.519	
222											
223	**Normal GOF Test on Detects Only**										
224					Shapiro Wilk Test Statistic	0.44			**Shapiro Wilk GOF Test**		
225					5% Shapiro Wilk Critical Value	0.818			Detected Data Not Normal at 5% Significance Level		
226					Lilliefors Test Statistic	0.496			**Lilliefors GOF Test**		
227					5% Lilliefors Critical Value	0.313			Detected Data Not Normal at 5% Significance Level		
228	**Detected Data Not Normal at 5% Significance Level**										
229											
230	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
231					Mean	0.588			Standard Error of Mean	0.453	
232					SD	1.843			95% KM (BCA) UCL	1.465	
233					95% KM (t) UCL	1.372			95% KM (Percentile Bootstrap) UCL	1.444	
234					95% KM (z) UCL	1.332			95% KM Bootstrap t UCL	11.47	
235					90% KM Chebyshev UCL	1.945			95% KM Chebyshev UCL	2.56	
236					97.5% KM Chebyshev UCL	3.414			99% KM Chebyshev UCL	5.09	
237											
238	**Gamma GOF Tests on Detected Observations Only**										
239					A-D Test Statistic	1.772			**Anderson-Darling GOF Test**		
240					5% A-D Critical Value	0.779			Detected Data Not Gamma Distributed at 5% Significance Level		
241					K-S Test Statistic	0.444			**Kolmogrov-Smirnoff GOF**		
242					5% K-S Critical Value	0.313			Detected Data Not Gamma Distributed at 5% Significance Level		
243	**Detected Data Not Gamma Distributed at 5% Significance Level**										
244											
245	**Gamma Statistics on Detected Data Only**										
246					k hat (MLE)	0.402			k star (bias corrected MLE)	0.335	
247					Theta hat (MLE)	2.945			Theta star (bias corrected MLE)	3.539	
248					nu hat (MLE)	6.435			nu star (bias corrected)	5.355	
249					MLE Mean (bias corrected)	1.185			MLE Sd (bias corrected)	2.047	
250											
251	**Gamma Kaplan-Meier (KM) Statistics**										
252					k hat (KM)	0.102			nu hat (KM)	3.866	
253					Approximate Chi Square Value (3.87, α)	0.669			Adjusted Chi Square Value (3.87, β)	0.567	
254					95% Gamma Approximate KM-UCL (use when n>=50)	3.395			95% Gamma Adjusted KM-UCL (use when n<50)	4.01	
255											
256	**Gamma ROS Statistics using Imputed Non-Detects**										
257	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
258	GROS may not be used when kstar of detected data is small such as < 0.1										
259	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
260	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
261					Minimum	0.01			Mean	0.505	
262					Maximum	8.4			Median	0.01	
263					SD	1.914			CV	3.793	
264					k hat (MLE)	0.27			k star (bias corrected MLE)	0.262	
265					Theta hat (MLE)	1.869			Theta star (bias corrected MLE)	1.923	
266					nu hat (MLE)	10.26			nu star (bias corrected)	9.971	
267					MLE Mean (bias corrected)	0.505			MLE Sd (bias corrected)	0.985	
268									Adjusted Level of Significance (β)	0.0369	
269					Approximate Chi Square Value (9.97, α)	3.923			Adjusted Chi Square Value (9.97, β)	3.597	
270					95% Gamma Approximate UCL (use when n>=50)	1.282			95% Gamma Adjusted UCL (use when n<50)	1.398	
271											
272	**Lognormal GOF Test on Detected Observations Only**										
273					Shapiro Wilk Test Statistic	0.678			**Shapiro Wilk GOF Test**		
274					5% Shapiro Wilk Critical Value	0.818			Detected Data Not Lognormal at 5% Significance Level		
275					Lilliefors Test Statistic	0.316			**Lilliefors GOF Test**		
276					5% Lilliefors Critical Value	0.313			Detected Data Not Lognormal at 5% Significance Level		
277	**Detected Data Not Lognormal at 5% Significance Level**										
278											
279	**Lognormal ROS Statistics Using Imputed Non-Detects**										
280					Mean in Original Scale	0.596			Mean in Log Scale	-1.649	
281					SD in Original Scale	1.89			SD in Log Scale	0.961	
282					95% t UCL (assumes normality of ROS data)	1.348			95% Percentile Bootstrap UCL	1.461	
283					95% BCA Bootstrap UCL	1.903			95% Bootstrap t UCL	24.27	
284					95% H-UCL (Log ROS)	0.544					
285											
286	**DL/2 Statistics**										
287	**DL/2 Normal**								**DL/2 Log-Transformed**		
288					Mean in Original Scale	0.601			Mean in Log Scale	-1.62	
289					SD in Original Scale	1.889			SD in Log Scale	0.958	
290					95% t UCL (Assumes normality)	1.353			95% H-Stat UCL	0.557	
291	**DL/2 is not a recommended method, provided for comparisons and historical reasons**										
292											
293	**Nonparametric Distribution Free UCL Statistics**										

	A	B	C	D	E	F	G	H	I	J	K	L
294	**Data do not follow a Discernible Distribution at 5% Significance Level**											
295												
296	**Suggested UCL to Use**											
297					97.5% KM (Chebyshev) UCL	3.414						
298												
299	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
300	Recommendations are based upon data size, data distribution, and skewness.											
301	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
302	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
303												
304												

305	**Copper**											
306												
307	**General Statistics**											
308					Total Number of Observations	19				Number of Distinct Observations	19	
309										Number of Missing Observations	0	
310					Minimum	7.09				Mean	144.6	
311					Maximum	1470				Median	49.1	
312					SD	331.1				Std. Error of Mean	75.96	
313					Coefficient of Variation	2.289				Skewness	3.966	
314												
315	**Normal GOF Test**											
316					Shapiro Wilk Test Statistic	0.407	**Shapiro Wilk GOF Test**					
317					5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level					
318					Lilliefors Test Statistic	0.397	**Lilliefors GOF Test**					
319					5% Lilliefors Critical Value	0.203	Data Not Normal at 5% Significance Level					
320	**Data Not Normal at 5% Significance Level**											
321												
322	**Assuming Normal Distribution**											
323					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
324					95% Student's-t UCL	276.4				95% Adjusted-CLT UCL (Chen-1995)	343.4	
325										95% Modified-t UCL (Johnson-1978)	287.9	
326												
327	**Gamma GOF Test**											
328					A-D Test Statistic	1.932	**Anderson-Darling Gamma GOF Test**					
329					5% A-D Critical Value	0.79	Data Not Gamma Distributed at 5% Significance Level					
330					K-S Test Statistic	0.283	**Kolmogrov-Smirnoff Gamma GOF Test**					
331					5% K-S Critical Value	0.208	Data Not Gamma Distributed at 5% Significance Level					
332	**Data Not Gamma Distributed at 5% Significance Level**											
333												
334	**Gamma Statistics**											
335					k hat (MLE)	0.637				k star (bias corrected MLE)	0.571	
336					Theta hat (MLE)	227.1				Theta star (bias corrected MLE)	253.2	
337					nu hat (MLE)	24.2				nu star (bias corrected)	21.71	
338					MLE Mean (bias corrected)	144.6				MLE Sd (bias corrected)	191.4	
339										Approximate Chi Square Value (0.05)	12.12	
340					Adjusted Level of Significance	0.0369				Adjusted Chi Square Value	11.5	
341												
342	**Assuming Gamma Distribution**											
343					95% Approximate Gamma UCL (use when n>=50))	259.1				95% Adjusted Gamma UCL (use when n<50)	273.1	
344												
345	**Lognormal GOF Test**											
346					Shapiro Wilk Test Statistic	0.919	**Shapiro Wilk Lognormal GOF Test**					
347					5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level					
348					Lilliefors Test Statistic	0.155	**Lilliefors Lognormal GOF Test**					
349					5% Lilliefors Critical Value	0.203	Data appear Lognormal at 5% Significance Level					
350	**Data appear Lognormal at 5% Significance Level**											
351												
352	**Lognormal Statistics**											
353					Minimum of Logged Data	1.959				Mean of logged Data	4.012	
354					Maximum of Logged Data	7.293				SD of logged Data	1.197	
355												
356	**Assuming Lognormal Distribution**											
357					95% H-UCL	256.7				90% Chebyshev (MVUE) UCL	207.5	
358					95% Chebyshev (MVUE) UCL	253.1				97.5% Chebyshev (MVUE) UCL	316.4	
359					99% Chebyshev (MVUE) UCL	440.9						
360												
361	**Nonparametric Distribution Free UCL Statistics**											
362	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
363												
364	**Nonparametric Distribution Free UCLs**											
365					95% CLT UCL	269.6				95% Jackknife UCL	276.4	
366					95% Standard Bootstrap UCL	265.6				95% Bootstrap-t UCL	811.7	
367					95% Hall's Bootstrap UCL	692.3				95% Percentile Bootstrap UCL	286	
368					95% BCA Bootstrap UCL	358						
369					90% Chebyshev(Mean, Sd) UCL	372.5				95% Chebyshev(Mean, Sd) UCL	475.7	
370					97.5% Chebyshev(Mean, Sd) UCL	619				99% Chebyshev(Mean, Sd) UCL	900.4	
371												
372	**Suggested UCL to Use**											
373					95% Chebyshev (Mean, Sd) UCL	475.7						
374												
375	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
376	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
377	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
378	For additional insight the user may want to consult a statistician.											
379												

Di-n-butylphthalate											
General Statistics											
Total Number of Observations					19	Number of Distinct Observations					17
Number of Detects					8	Number of Non-Detects					11
Number of Distinct Detects					8	Number of Distinct Non-Detects					9
Minimum Detect					0.0827	Minimum Non-Detect					0.334
Maximum Detect					1.2	Maximum Non-Detect					0.38
Variance Detects					0.142	Percent Non-Detects					57.89%
Mean Detects					0.285	SD Detects					0.376
Median Detects					0.147	CV Detects					1.318
Skewness Detects					2.643	Kurtosis Detects					7.155
Mean of Logged Detects					-1.688	SD of Logged Detects					0.86
Normal GOF Test on Detects Only											
Shapiro Wilk Test Statistic					0.574	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.818	Detected Data Not Normal at 5% Significance Level					
Lilliefors Test Statistic					0.364	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.313	Detected Data Not Normal at 5% Significance Level					
Detected Data Not Normal at 5% Significance Level											
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
Mean					0.21	Standard Error of Mean					0.0633
SD					0.243	95% KM (BCA) UCL					0.332
95% KM (t) UCL					0.319	95% KM (Percentile Bootstrap) UCL					0.32
95% KM (z) UCL					0.314	95% KM Bootstrap t UCL					0.642
90% KM Chebyshev UCL					0.4	95% KM Chebyshev UCL					0.486
97.5% KM Chebyshev UCL					0.605	99% KM Chebyshev UCL					0.839
Gamma GOF Tests on Detected Observations Only											
A-D Test Statistic					1.014	**Anderson-Darling GOF Test**					
5% A-D Critical Value					0.731	Detected Data Not Gamma Distributed at 5% Significance Level					
K-S Test Statistic					0.33	**Kolmogrov-Smirnoff GOF**					
5% K-S Critical Value					0.3	Detected Data Not Gamma Distributed at 5% Significance Level					
Detected Data Not Gamma Distributed at 5% Significance Level											
Gamma Statistics on Detected Data Only											
k hat (MLE)					1.293	k star (bias corrected MLE)					0.892
Theta hat (MLE)					0.221	Theta star (bias corrected MLE)					0.32
nu hat (MLE)					20.69	nu star (bias corrected)					14.27
MLE Mean (bias corrected)					0.285	MLE Sd (bias corrected)					0.302
Gamma Kaplan-Meier (KM) Statistics											
k hat (KM)					0.743	nu hat (KM)					28.25
Approximate Chi Square Value (28.25, α)					17.12	Adjusted Chi Square Value (28.25, β)					16.36
95% Gamma Approximate KM-UCL (use when n>=50)					0.346	95% Gamma Adjusted KM-UCL (use when n<50)					0.362
Gamma ROS Statistics using Imputed Non-Detects											
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
GROS may not be used when kstar of detected data is small such as < 0.1											
For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
Minimum					0.0523	Mean					0.205
Maximum					1.2	Median					0.142
SD					0.25	CV					1.218
k hat (MLE)					1.821	k star (bias corrected MLE)					1.568
Theta hat (MLE)					0.113	Theta star (bias corrected MLE)					0.131
nu hat (MLE)					69.19	nu star (bias corrected)					59.6
MLE Mean (bias corrected)					0.205	MLE Sd (bias corrected)					0.164
						Adjusted Level of Significance (β)					0.0369
Approximate Chi Square Value (59.60, α)					42.85	Adjusted Chi Square Value (59.60, β)					41.61
95% Gamma Approximate UCL (use when n>=50)					0.285	95% Gamma Adjusted UCL (use when n<50)					0.294
Lognormal GOF Test on Detected Observations Only											
Shapiro Wilk Test Statistic					0.824	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.818	Detected Data appear Lognormal at 5% Significance Level					
Lilliefors Test Statistic					0.273	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.313	Detected Data appear Lognormal at 5% Significance Level					
Detected Data appear Lognormal at 5% Significance Level											
Lognormal ROS Statistics Using Imputed Non-Detects											
Mean in Original Scale					0.21	Mean in Log Scale					-1.8
SD in Original Scale					0.245	SD in Log Scale					0.568
95% t UCL (assumes normality of ROS data)					0.308	95% Percentile Bootstrap UCL					0.318
95% BCA Bootstrap UCL					0.381	95% Bootstrap t UCL					0.692
95% H-UCL (Log ROS)					0.256						
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
KM Mean (logged)					-1.843	95% H-UCL (KM -Log)					0.263
KM SD (logged)					0.622	95% Critical H Value (KM-Log)					2.134
KM Standard Error of Mean (logged)					0.196						
DL/2 Statistics											
DL/2 Normal						**DL/2 Log-Transformed**					
Mean in Original Scale					0.222	Mean in Log Scale					-1.719

	A	B	C	D	E	F	G	H	I	J	K	L
465					SD in Original Scale	0.241					SD in Log Scale	0.538
466					95% t UCL (Assumes normality)	0.318					95% H-Stat UCL	0.269
467	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
468												
469	**Nonparametric Distribution Free UCL Statistics**											
470	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
471												
472	**Suggested UCL to Use**											
473					95% KM (t) UCL	0.319					95% KM (% Bootstrap) UCL	0.32
474												
475	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
476	Recommendations are based upon data size, data distribution, and skewness.											
477	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
478	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
479												

480	**Fluoranthene**											
481												
482	**General Statistics**											
483						Total Number of Observations	19			Number of Distinct Observations	17	
484						Number of Detects	6			Number of Non-Detects	13	
485						Number of Distinct Detects	6			Number of Distinct Non-Detects	11	
486						Minimum Detect	0.0106			Minimum Non-Detect	0.0334	
487						Maximum Detect	0.142			Maximum Non-Detect	0.038	
488						Variance Detects	0.00257			Percent Non-Detects	68.42%	
489						Mean Detects	0.0464			SD Detects	0.0507	
490						Median Detects	0.0222			CV Detects	1.093	
491						Skewness Detects	1.79			Kurtosis Detects	2.942	
492						Mean of Logged Detects	-3.496			SD of Logged Detects	0.968	
493												
494	**Normal GOF Test on Detects Only**											
495						Shapiro Wilk Test Statistic	0.755			**Shapiro Wilk GOF Test**		
496						5% Shapiro Wilk Critical Value	0.788			Detected Data Not Normal at 5% Significance Level		
497						Lilliefors Test Statistic	0.336			**Lilliefors GOF Test**		
498						5% Lilliefors Critical Value	0.362			Detected Data appear Normal at 5% Significance Level		
499	**Detected Data appear Approximate Normal at 5% Significance Level**											
500												
501	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
502						Mean	0.0268			Standard Error of Mean	0.00772	
503						SD	0.0295			95% KM (BCA) UCL	0.0403	
504						95% KM (t) UCL	0.0402			95% KM (Percentile Bootstrap) UCL	0.0408	
505						95% KM (z) UCL	0.0395			95% KM Bootstrap t UCL	0.0601	
506						90% KM Chebyshev UCL	0.05			95% KM Chebyshev UCL	0.0605	
507						97.5% KM Chebyshev UCL	0.0751			99% KM Chebyshev UCL	0.104	
508												
509	**Gamma GOF Tests on Detected Observations Only**											
510						A-D Test Statistic	0.485			**Anderson-Darling GOF Test**		
511						5% A-D Critical Value	0.71			Detected data appear Gamma Distributed at 5% Significance Level		
512						K-S Test Statistic	0.31			**Kolmogrov-Smirnoff GOF**		
513						5% K-S Critical Value	0.339			Detected data appear Gamma Distributed at 5% Significance Level		
514	**Detected data appear Gamma Distributed at 5% Significance Level**											
515												
516	**Gamma Statistics on Detected Data Only**											
517						k hat (MLE)	1.317			k star (bias corrected MLE)	0.77	
518						Theta hat (MLE)	0.0352			Theta star (bias corrected MLE)	0.0603	
519						nu hat (MLE)	15.81			nu star (bias corrected)	9.237	
520						MLE Mean (bias corrected)	0.0464			MLE Sd (bias corrected)	0.0529	
521												
522	**Gamma Kaplan-Meier (KM) Statistics**											
523						k hat (KM)	0.826			nu hat (KM)	31.41	
524						Approximate Chi Square Value (31.41, α)	19.6			Adjusted Chi Square Value (31.41, β)	18.79	
525						95% Gamma Approximate KM-UCL (use when n>=50)	0.043			95% Gamma Adjusted KM-UCL (use when n<50)	0.0448	
526												
527	**Gamma ROS Statistics using Imputed Non-Detects**											
528	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
529	GROS may not be used when kstar of detected data is small such as < 0.1											
530	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
531	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
532						Minimum	0.01			Mean	0.026	
533						Maximum	0.142			Median	0.0156	
534						SD	0.0306			CV	1.176	
535						k hat (MLE)	1.888			k star (bias corrected MLE)	1.625	
536						Theta hat (MLE)	0.0138			Theta star (bias corrected MLE)	0.016	
537						nu hat (MLE)	71.73			nu star (bias corrected)	61.74	
538						MLE Mean (bias corrected)	0.026			MLE Sd (bias corrected)	0.0204	
539										Adjusted Level of Significance (β)	0.0369	
540						Approximate Chi Square Value (61.74, α)	44.66			Adjusted Chi Square Value (61.74, β)	43.4	
541						95% Gamma Approximate UCL (use when n>=50)	0.036			95% Gamma Adjusted UCL (use when n<50)	0.037	
542												
543	**Lognormal GOF Test on Detected Observations Only**											
544						Shapiro Wilk Test Statistic	0.92			**Shapiro Wilk GOF Test**		
545						5% Shapiro Wilk Critical Value	0.788			Detected Data appear Lognormal at 5% Significance Level		
546						Lilliefors Test Statistic	0.259			**Lilliefors GOF Test**		
547						5% Lilliefors Critical Value	0.362			Detected Data appear Lognormal at 5% Significance Level		
548	**Detected Data appear Lognormal at 5% Significance Level**											
549												
550	**Lognormal ROS Statistics Using Imputed Non-Detects**											
551						Mean in Original Scale	0.0273			Mean in Log Scale	-3.848	
552						SD in Original Scale	0.03			SD in Log Scale	0.589	
553						95% t UCL (assumes normality of ROS data)	0.0392			95% Percentile Bootstrap UCL	0.0396	
554						95% BCA Bootstrap UCL	0.0472			95% Bootstrap t UCL	0.0965	
555						95% H-UCL (Log ROS)	0.0339					
556												
557	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
558						KM Mean (logged)	-3.891			95% H-UCL (KM -Log)	0.0338	
559						KM SD (logged)	0.619			95% Critical H Value (KM-Log)	2.13	
560						KM Standard Error of Mean (logged)	0.204					
561												
562	**DL/2 Statistics**											
563						**DL/2 Normal**				**DL/2 Log-Transformed**		
564						Mean in Original Scale	0.0266			Mean in Log Scale	-3.873	

	A	B	C	D	E	F	G	H	I	J	K	L
565					SD in Original Scale	0.0301					SD in Log Scale	0.575
566					95% t UCL (Assumes normality)	0.0386					95% H-Stat UCL	0.0325
567	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
568												
569	**Nonparametric Distribution Free UCL Statistics**											
570	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
571												
572	**Suggested UCL to Use**											
573					95% KM (t) UCL	0.0402					95% KM (Percentile Bootstrap) UCL	0.0408
574												
575	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
576	Recommendations are based upon data size, data distribution, and skewness.											
577	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
578	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
579												

HMX											
General Statistics											
Total Number of Observations					19	Number of Distinct Observations					14
Number of Detects					12	Number of Non-Detects					7
Number of Distinct Detects					12	Number of Distinct Non-Detects					2
Minimum Detect					0.151	Minimum Non-Detect					0.0346
Maximum Detect					67.4	Maximum Non-Detect					0.5
Variance Detects					385.8	Percent Non-Detects					36.84%
Mean Detects					9	SD Detects					19.64
Median Detects					1.077	CV Detects					2.183
Skewness Detects					2.851	Kurtosis Detects					8.384
Mean of Logged Detects					0.42	SD of Logged Detects					1.913
Normal GOF Test on Detects Only											
Shapiro Wilk Test Statistic					0.523	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.859	Detected Data Not Normal at 5% Significance Level					
Lilliefors Test Statistic					0.381	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.256	Detected Data Not Normal at 5% Significance Level					
Detected Data Not Normal at 5% Significance Level											
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
Mean					5.755	Standard Error of Mean					3.723
SD					15.54	95% KM (BCA) UCL					13.41
95% KM (t) UCL					12.21	95% KM (Percentile Bootstrap) UCL					12.38
95% KM (z) UCL					11.88	95% KM Bootstrap t UCL					49.32
90% KM Chebyshev UCL					16.92	95% KM Chebyshev UCL					21.98
97.5% KM Chebyshev UCL					29.01	99% KM Chebyshev UCL					42.8
Gamma GOF Tests on Detected Observations Only											
A-D Test Statistic					1.01	**Anderson-Darling GOF Test**					
5% A-D Critical Value					0.809	Detected Data Not Gamma Distributed at 5% Significance Level					
K-S Test Statistic					0.287	**Kolmogrov-Smirnoff GOF**					
5% K-S Critical Value					0.263	Detected Data Not Gamma Distributed at 5% Significance Level					
Detected Data Not Gamma Distributed at 5% Significance Level											
Gamma Statistics on Detected Data Only											
k hat (MLE)					0.374	k star (bias corrected MLE)					0.336
Theta hat (MLE)					24.05	Theta star (bias corrected MLE)					26.76
nu hat (MLE)					8.982	nu star (bias corrected)					8.07
MLE Mean (bias corrected)					9	MLE Sd (bias corrected)					15.52
Gamma Kaplan-Meier (KM) Statistics											
k hat (KM)					0.137	nu hat (KM)					5.213
Approximate Chi Square Value (5.21, α)					1.252	Adjusted Chi Square Value (5.21, β)					1.093
95% Gamma Approximate KM-UCL (use when n>=50)					23.97	95% Gamma Adjusted KM-UCL (use when n<50)					27.46
Gamma ROS Statistics using Imputed Non-Detects											
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
GROS may not be used when kstar of detected data is small such as < 0.1											
For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
Minimum					0.01	Mean					5.688
Maximum					67.4	Median					0.267
SD					15.99	CV					2.811
k hat (MLE)					0.228	k star (bias corrected MLE)					0.227
Theta hat (MLE)					25	Theta star (bias corrected MLE)					25.09
nu hat (MLE)					8.645	nu star (bias corrected)					8.613
MLE Mean (bias corrected)					5.688	MLE Sd (bias corrected)					11.95
						Adjusted Level of Significance (β)					0.0369
Approximate Chi Square Value (8.61, α)					3.095	Adjusted Chi Square Value (8.61, β)					2.812
95% Gamma Approximate UCL (use when n>=50)					15.83	95% Gamma Adjusted UCL (use when n<50)					17.42
Lognormal GOF Test on Detected Observations Only											
Shapiro Wilk Test Statistic					0.928	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.859	Detected Data appear Lognormal at 5% Significance Level					
Lilliefors Test Statistic					0.155	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.256	Detected Data appear Lognormal at 5% Significance Level					
Detected Data appear Lognormal at 5% Significance Level											
Lognormal ROS Statistics Using Imputed Non-Detects											
Mean in Original Scale					5.745	Mean in Log Scale					-0.657
SD in Original Scale					15.97	SD in Log Scale					2.239
95% t UCL (assumes normality of ROS data)					12.1	95% Percentile Bootstrap UCL					12.3
95% BCA Bootstrap UCL					16.18	95% Bootstrap t UCL					49.4
95% H-UCL (Log ROS)					74.99						
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
KM Mean (logged)					-0.477	95% H-UCL (KM -Log)					29.16
KM SD (logged)					1.959	95% Critical H Value (KM-Log)					4.179
KM Standard Error of Mean (logged)					0.499						
DL/2 Statistics											
DL/2 Normal						**DL/2 Log-Transformed**					
Mean in Original Scale					5.764	Mean in Log Scale					-0.386

	A	B	C	D	E	F	G	H	I	J	K	L
665				SD in Original Scale		15.96					SD in Log Scale	1.937
666				95% t UCL (Assumes normality)		12.11					95% H-Stat UCL	29.36
667	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
668												
669	**Nonparametric Distribution Free UCL Statistics**											
670	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
671												
672	**Suggested UCL to Use**											
673				99% KM (Chebyshev) UCL		42.8						
674												
675	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
676	Recommendations are based upon data size, data distribution, and skewness.											
677	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
678	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
679												
680												

681	**Lead**											
682												
683	**General Statistics**											
684					Total Number of Observations	19			Number of Distinct Observations	18		
685									Number of Missing Observations	0		
686					Minimum	10.6			Mean	18.34		
687					Maximum	32.9			Median	18.9		
688					SD	6.357			Std. Error of Mean	1.458		
689					Coefficient of Variation	0.347			Skewness	0.766		
690												
691	**Normal GOF Test**											
692					Shapiro Wilk Test Statistic	0.911			**Shapiro Wilk GOF Test**			
693					5% Shapiro Wilk Critical Value	0.901			Data appear Normal at 5% Significance Level			
694					Lilliefors Test Statistic	0.139			**Lilliefors GOF Test**			
695					5% Lilliefors Critical Value	0.203			Data appear Normal at 5% Significance Level			
696	**Data appear Normal at 5% Significance Level**											
697												
698	**Assuming Normal Distribution**											
699					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
700					95% Student's-t UCL	20.87			95% Adjusted-CLT UCL (Chen-1995)	21.01		
701									95% Modified-t UCL (Johnson-1978)	20.91		
702												
703	**Gamma GOF Test**											
704					A-D Test Statistic	0.489			**Anderson-Darling Gamma GOF Test**			
705					5% A-D Critical Value	0.741			Detected data appear Gamma Distributed at 5% Significance Level			
706					K-S Test Statistic	0.129			**Kolmogrov-Smirnoff Gamma GOF Test**			
707					5% K-S Critical Value	0.199			Detected data appear Gamma Distributed at 5% Significance Level			
708	**Detected data appear Gamma Distributed at 5% Significance Level**											
709												
710	**Gamma Statistics**											
711					k hat (MLE)	9.16			k star (bias corrected MLE)	7.749		
712					Theta hat (MLE)	2.002			Theta star (bias corrected MLE)	2.366		
713					nu hat (MLE)	348.1			nu star (bias corrected)	294.5		
714					MLE Mean (bias corrected)	18.34			MLE Sd (bias corrected)	6.587		
715									Approximate Chi Square Value (0.05)	255.7		
716					Adjusted Level of Significance	0.0369			Adjusted Chi Square Value	252.6		
717												
718	**Assuming Gamma Distribution**											
719					95% Approximate Gamma UCL (use when n>=50))	21.12			95% Adjusted Gamma UCL (use when n<50)	21.38		
720												
721	**Lognormal GOF Test**											
722					Shapiro Wilk Test Statistic	0.932			**Shapiro Wilk Lognormal GOF Test**			
723					5% Shapiro Wilk Critical Value	0.901			Data appear Lognormal at 5% Significance Level			
724					Lilliefors Test Statistic	0.149			**Lilliefors Lognormal GOF Test**			
725					5% Lilliefors Critical Value	0.203			Data appear Lognormal at 5% Significance Level			
726	**Data appear Lognormal at 5% Significance Level**											
727												
728	**Lognormal Statistics**											
729					Minimum of Logged Data	2.361			Mean of logged Data	2.853		
730					Maximum of Logged Data	3.493			SD of logged Data	0.343		
731												
732	**Assuming Lognormal Distribution**											
733					95% H-UCL	21.41			90% Chebyshev (MVUE) UCL	22.74		
734					95% Chebyshev (MVUE) UCL	24.73			97.5% Chebyshev (MVUE) UCL	27.5		
735					99% Chebyshev (MVUE) UCL	32.94						
736												
737	**Nonparametric Distribution Free UCL Statistics**											
738	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
739												
740	**Nonparametric Distribution Free UCLs**											
741					95% CLT UCL	20.74			95% Jackknife UCL	20.87		
742					95% Standard Bootstrap UCL	20.55			95% Bootstrap-t UCL	21.16		
743					95% Hall's Bootstrap UCL	21.39			95% Percentile Bootstrap UCL	20.75		
744					95% BCA Bootstrap UCL	20.86						
745					90% Chebyshev(Mean, Sd) UCL	22.71			95% Chebyshev(Mean, Sd) UCL	24.69		
746					97.5% Chebyshev(Mean, Sd) UCL	27.45			99% Chebyshev(Mean, Sd) UCL	32.85		
747												
748	**Suggested UCL to Use**											
749					95% Student's-t UCL	20.87						
750												
751	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
752	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
753	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
754	For additional insight the user may want to consult a statistician.											
755												

Perchlorate											
General Statistics											
Total Number of Observations					19	Number of Distinct Observations					16
Number of Detects					9	Number of Non-Detects					10
Number of Distinct Detects					9	Number of Distinct Non-Detects					7
Minimum Detect					5.8500E-4	Minimum Non-Detect					0.00202
Maximum Detect					0.00905	Maximum Non-Detect					0.00219
Variance Detects					7.5280E-6	Percent Non-Detects					52.63%
Mean Detects					0.00197	SD Detects					0.00274
Median Detects					8.5400E-4	CV Detects					1.39
Skewness Detects					2.666	Kurtosis Detects					7.357
Mean of Logged Detects					-6.722	SD of Logged Detects					0.913
Normal GOF Test on Detects Only											
Shapiro Wilk Test Statistic					0.576	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.829	Detected Data Not Normal at 5% Significance Level					
Lilliefors Test Statistic					0.323	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.295	Detected Data Not Normal at 5% Significance Level					
Detected Data Not Normal at 5% Significance Level											
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
Mean					0.00139	Standard Error of Mean					4.6800E-4
SD					0.00188	95% KM (BCA) UCL					0.00225
95% KM (t) UCL					0.0022	95% KM (Percentile Bootstrap) UCL					0.00219
95% KM (z) UCL					0.00216	95% KM Bootstrap t UCL					0.00379
90% KM Chebyshev UCL					0.00279	95% KM Chebyshev UCL					0.00343
97.5% KM Chebyshev UCL					0.00431	99% KM Chebyshev UCL					0.00604
Gamma GOF Tests on Detected Observations Only											
A-D Test Statistic					1.115	**Anderson-Darling GOF Test**					
5% A-D Critical Value					0.741	Detected Data Not Gamma Distributed at 5% Significance Level					
K-S Test Statistic					0.324	**Kolmogrov-Smirnoff GOF**					
5% K-S Critical Value					0.286	Detected Data Not Gamma Distributed at 5% Significance Level					
Detected Data Not Gamma Distributed at 5% Significance Level											
Gamma Statistics on Detected Data Only											
k hat (MLE)					1.149	k star (bias corrected MLE)					0.84
Theta hat (MLE)					0.00172	Theta star (bias corrected MLE)					0.00235
nu hat (MLE)					20.69	nu star (bias corrected)					15.13
MLE Mean (bias corrected)					0.00197	MLE Sd (bias corrected)					0.00215
Gamma Kaplan-Meier (KM) Statistics											
k hat (KM)					0.541	nu hat (KM)					20.57
Approximate Chi Square Value (20.57, α)					11.27	Adjusted Chi Square Value (20.57, β)					10.67
95% Gamma Approximate KM-UCL (use when n>=50)					0.00253	95% Gamma Adjusted KM-UCL (use when n<50)					0.00267
Gamma ROS Statistics using Imputed Non-Detects											
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
GROS may not be used when kstar of detected data is small such as < 0.1											
For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
Minimum					5.8500E-4	Mean					0.0062
Maximum					0.01	Median					0.01
SD					0.00451	CV					0.727
k hat (MLE)					1.09	k star (bias corrected MLE)					0.953
Theta hat (MLE)					0.00569	Theta star (bias corrected MLE)					0.00651
nu hat (MLE)					41.41	nu star (bias corrected)					36.2
MLE Mean (bias corrected)					0.0062	MLE Sd (bias corrected)					0.00635
						Adjusted Level of Significance (β)					0.0369
Approximate Chi Square Value (36.20, α)					23.43	Adjusted Chi Square Value (36.20, β)					22.54
95% Gamma Approximate UCL (use when n>=50)					0.00958	95% Gamma Adjusted UCL (use when n<50)					0.00996
Lognormal GOF Test on Detected Observations Only											
Shapiro Wilk Test Statistic					0.8	**Shapiro Wilk GOF Test**					
5% Shapiro Wilk Critical Value					0.829	Detected Data Not Lognormal at 5% Significance Level					
Lilliefors Test Statistic					0.286	**Lilliefors GOF Test**					
5% Lilliefors Critical Value					0.295	Detected Data appear Lognormal at 5% Significance Level					
Detected Data appear Approximate Lognormal at 5% Significance Level											
Lognormal ROS Statistics Using Imputed Non-Detects											
Mean in Original Scale					0.00142	Mean in Log Scale					-6.886
SD in Original Scale					0.00192	SD in Log Scale					0.66
95% t UCL (assumes normality of ROS data)					0.00218	95% Percentile Bootstrap UCL					0.00226
95% BCA Bootstrap UCL					0.00276	95% Bootstrap t UCL					0.00517
95% H-UCL (Log ROS)					0.00178						
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
KM Mean (logged)					-6.935	95% H-UCL (KM -Log)					0.00172
KM SD (logged)					0.671	95% Critical H Value (KM-Log)					2.188
KM Standard Error of Mean (logged)					0.188						
DL/2 Statistics											
DL/2 Normal						**DL/2 Log-Transformed**					
Mean in Original Scale					0.00148	Mean in Log Scale					-6.797

	A	B	C	D	E	F	G	H	I	J	K	L
841					SD in Original Scale	0.00189					SD in Log Scale	0.613
842					95% t UCL (Assumes normality)	0.00224					95% H-Stat UCL	0.00183
843	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
844												
845	**Nonparametric Distribution Free UCL Statistics**											
846	**Detected Data appear Approximate Lognormal Distributed at 5% Significance Level**											
847												
848	**Suggested UCL to Use**											
849					95% KM (t) UCL	0.0022					95% KM (% Bootstrap) UCL	0.00219
850												
851	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
852	Recommendations are based upon data size, data distribution, and skewness.											
853	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
854	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
855												

856	**Pyrene**											
857												
858	**General Statistics**											
859						Total Number of Observations	19			Number of Distinct Observations	16	
860						Number of Detects	5			Number of Non-Detects	14	
861						Number of Distinct Detects	5			Number of Distinct Non-Detects	11	
862						Minimum Detect	0.0121			Minimum Non-Detect	0.0334	
863						Maximum Detect	0.137			Maximum Non-Detect	0.038	
864						Variance Detects	0.00362			Percent Non-Detects	73.68%	
865						Mean Detects	0.0641			SD Detects	0.0602	
866						Median Detects	0.0285			CV Detects	0.938	
867						Skewness Detects	0.601			Kurtosis Detects	-3.067	
868						Mean of Logged Detects	-3.184			SD of Logged Detects	1.085	
869												
870	**Normal GOF Test on Detects Only**											
871						Shapiro Wilk Test Statistic	0.796			**Shapiro Wilk GOF Test**		
872						5% Shapiro Wilk Critical Value	0.762			Detected Data appear Normal at 5% Significance Level		
873						Lilliefors Test Statistic	0.323			**Lilliefors GOF Test**		
874						5% Lilliefors Critical Value	0.396			Detected Data appear Normal at 5% Significance Level		
875	**Detected Data appear Normal at 5% Significance Level**											
876												
877	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
878						Mean	0.032			Standard Error of Mean	0.00943	
879						SD	0.0341			95% KM (BCA) UCL	0.0478	
880						95% KM (t) UCL	0.0484			95% KM (Percentile Bootstrap) UCL	0.0482	
881						95% KM (z) UCL	0.0475			95% KM Bootstrap t UCL	0.0624	
882						90% KM Chebyshev UCL	0.0603			95% KM Chebyshev UCL	0.0731	
883						97.5% KM Chebyshev UCL	0.0909			99% KM Chebyshev UCL	0.126	
884												
885	**Gamma GOF Tests on Detected Observations Only**											
886						A-D Test Statistic	0.5			**Anderson-Darling GOF Test**		
887						5% A-D Critical Value	0.689			Detected data appear Gamma Distributed at 5% Significance Level		
888						K-S Test Statistic	0.291			**Kolmogrov-Smirnoff GOF**		
889						5% K-S Critical Value	0.363			Detected data appear Gamma Distributed at 5% Significance Level		
890	**Detected data appear Gamma Distributed at 5% Significance Level**											
891												
892	**Gamma Statistics on Detected Data Only**											
893						k hat (MLE)	1.283			k star (bias corrected MLE)	0.647	
894						Theta hat (MLE)	0.05			Theta star (bias corrected MLE)	0.0992	
895						nu hat (MLE)	12.83			nu star (bias corrected)	6.466	
896						MLE Mean (bias corrected)	0.0641			MLE Sd (bias corrected)	0.0798	
897												
898	**Gamma Kaplan-Meier (KM) Statistics**											
899						k hat (KM)	0.882			nu hat (KM)	33.51	
900						Approximate Chi Square Value (33.51, α)	21.27			Adjusted Chi Square Value (33.51, β)	20.42	
901						95% Gamma Approximate KM-UCL (use when n>=50)	0.0505			95% Gamma Adjusted KM-UCL (use when n<50)	0.0526	
902												
903	**Gamma ROS Statistics using Imputed Non-Detects**											
904	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
905	GROS may not be used when kstar of detected data is small such as < 0.1											
906	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
907	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
908						Minimum	0.01			Mean	0.0327	
909						Maximum	0.137			Median	0.0206	
910						SD	0.0351			CV	1.074	
911						k hat (MLE)	1.773			k star (bias corrected MLE)	1.528	
912						Theta hat (MLE)	0.0184			Theta star (bias corrected MLE)	0.0214	
913						nu hat (MLE)	67.37			nu star (bias corrected)	58.06	
914						MLE Mean (bias corrected)	0.0327			MLE Sd (bias corrected)	0.0264	
915										Adjusted Level of Significance (β)	0.0369	
916						Approximate Chi Square Value (58.06, α)	41.55			Adjusted Chi Square Value (58.06, β)	40.33	
917						95% Gamma Approximate UCL (use when n>=50)	0.0457			95% Gamma Adjusted UCL (use when n<50)	0.0471	
918												
919	**Lognormal GOF Test on Detected Observations Only**											
920						Shapiro Wilk Test Statistic	0.881			**Shapiro Wilk GOF Test**		
921						5% Shapiro Wilk Critical Value	0.762			Detected Data appear Lognormal at 5% Significance Level		
922						Lilliefors Test Statistic	0.24			**Lilliefors GOF Test**		
923						5% Lilliefors Critical Value	0.396			Detected Data appear Lognormal at 5% Significance Level		
924	**Detected Data appear Lognormal at 5% Significance Level**											
925												
926	**Lognormal ROS Statistics Using Imputed Non-Detects**											
927						Mean in Original Scale	0.0325			Mean in Log Scale	-3.701	
928						SD in Original Scale	0.0347			SD in Log Scale	0.642	
929						95% t UCL (assumes normality of ROS data)	0.0463			95% Percentile Bootstrap UCL	0.0459	
930						95% BCA Bootstrap UCL	0.0507			95% Bootstrap t UCL	0.107	
931						95% H-UCL (Log ROS)	0.042					
932												
933	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
934						KM Mean (logged)	-3.744			95% H-UCL (KM -Log)	0.042	
935						KM SD (logged)	0.673			95% Critical H Value (KM-Log)	2.19	
936						KM Standard Error of Mean (logged)	0.254					
937												
938	**DL/2 Statistics**											
939						**DL/2 Normal**				**DL/2 Log-Transformed**		
940						Mean in Original Scale	0.0297			Mean in Log Scale	-3.821	

	A	B	C	D	E	F	G	H	I	J	K	L
941					SD in Original Scale	0.0354					SD in Log Scale	0.645
942					95% t UCL (Assumes normality)	0.0438					95% H-Stat UCL	0.0374
943	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
944												
945	**Nonparametric Distribution Free UCL Statistics**											
946	**Detected Data appear Normal Distributed at 5% Significance Level**											
947												
948	**Suggested UCL to Use**											
949					95% KM (t) UCL	0.0484					95% KM (Percentile Bootstrap) UCL	0.0482
950												
951	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
952	Recommendations are based upon data size, data distribution, and skewness.											
953	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
954	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
955												

956	**RDX**											
957												
958	**General Statistics**											
959					Total Number of Observations	19			Number of Distinct Observations	8		
960					Number of Detects	7			Number of Non-Detects	12		
961					Number of Distinct Detects	7			Number of Distinct Non-Detects	1		
962					Minimum Detect	0.105			Minimum Non-Detect	0.5		
963					Maximum Detect	2.61			Maximum Non-Detect	0.5		
964					Variance Detects	0.851			Percent Non-Detects	63.16%		
965					Mean Detects	0.708			SD Detects	0.923		
966					Median Detects	0.189			CV Detects	1.304		
967					Skewness Detects	1.857			Kurtosis Detects	3.323		
968					Mean of Logged Detects	-1.033			SD of Logged Detects	1.242		
969												
970	**Normal GOF Test on Detects Only**											
971					Shapiro Wilk Test Statistic	0.734			**Shapiro Wilk GOF Test**			
972					5% Shapiro Wilk Critical Value	0.803			Detected Data Not Normal at 5% Significance Level			
973					Lilliefors Test Statistic	0.284			**Lilliefors GOF Test**			
974					5% Lilliefors Critical Value	0.335			Detected Data appear Normal at 5% Significance Level			
975	**Detected Data appear Approximate Normal at 5% Significance Level**											
976												
977	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
978					Mean	0.352			Standard Error of Mean	0.146		
979					SD	0.586			95% KM (BCA) UCL	0.632		
980					95% KM (t) UCL	0.604			95% KM (Percentile Bootstrap) UCL	0.598		
981					95% KM (z) UCL	0.591			95% KM Bootstrap t UCL	1.296		
982					90% KM Chebyshev UCL	0.789			95% KM Chebyshev UCL	0.987		
983					97.5% KM Chebyshev UCL	1.261			99% KM Chebyshev UCL	1.801		
984												
985	**Gamma GOF Tests on Detected Observations Only**											
986					A-D Test Statistic	0.578			**Anderson-Darling GOF Test**			
987					5% A-D Critical Value	0.732			Detected data appear Gamma Distributed at 5% Significance Level			
988					K-S Test Statistic	0.302			**Kolmogrov-Smirnoff GOF**			
989					5% K-S Critical Value	0.321			Detected data appear Gamma Distributed at 5% Significance Level			
990	**Detected data appear Gamma Distributed at 5% Significance Level**											
991												
992	**Gamma Statistics on Detected Data Only**											
993					k hat (MLE)	0.856			k star (bias corrected MLE)	0.585		
994					Theta hat (MLE)	0.826			Theta star (bias corrected MLE)	1.211		
995					nu hat (MLE)	11.99			nu star (bias corrected)	8.185		
996					MLE Mean (bias corrected)	0.708			MLE Sd (bias corrected)	0.926		
997												
998	**Gamma Kaplan-Meier (KM) Statistics**											
999					k hat (KM)	0.36			nu hat (KM)	13.69		
1000					Approximate Chi Square Value (13.69, α)	6.359			Adjusted Chi Square Value (13.69, β)	5.926		
1001					95% Gamma Approximate KM-UCL (use when n>=50)	0.757			95% Gamma Adjusted KM-UCL (use when n<50)	0.812		
1002												
1003	**Gamma ROS Statistics using Imputed Non-Detects**											
1004	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1005	GROS may not be used when kstar of detected data is small such as < 0.1											
1006	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1007	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1008					Minimum	0.01			Mean	0.377		
1009					Maximum	2.61			Median	0.144		
1010					SD	0.622			CV	1.651		
1011					k hat (MLE)	0.506			k star (bias corrected MLE)	0.461		
1012					Theta hat (MLE)	0.745			Theta star (bias corrected MLE)	0.817		
1013					nu hat (MLE)	19.21			nu star (bias corrected)	17.51		
1014					MLE Mean (bias corrected)	0.377			MLE Sd (bias corrected)	0.555		
1015									Adjusted Level of Significance (β)	0.0369		
1016					Approximate Chi Square Value (17.51, α)	9.04			Adjusted Chi Square Value (17.51, β)	8.51		
1017					95% Gamma Approximate UCL (use when n>=50)	0.73			95% Gamma Adjusted UCL (use when n<50)	0.775		
1018												
1019	**Lognormal GOF Test on Detected Observations Only**											
1020					Shapiro Wilk Test Statistic	0.877			**Shapiro Wilk GOF Test**			
1021					5% Shapiro Wilk Critical Value	0.803			Detected Data appear Lognormal at 5% Significance Level			
1022					Lilliefors Test Statistic	0.266			**Lilliefors GOF Test**			
1023					5% Lilliefors Critical Value	0.335			Detected Data appear Lognormal at 5% Significance Level			
1024	**Detected Data appear Lognormal at 5% Significance Level**											
1025												
1026	**Lognormal ROS Statistics Using Imputed Non-Detects**											
1027					Mean in Original Scale	0.385			Mean in Log Scale	-1.578		
1028					SD in Original Scale	0.6			SD in Log Scale	1.048		
1029					95% t UCL (assumes normality of ROS data)	0.623			95% Percentile Bootstrap UCL	0.637		
1030					95% BCA Bootstrap UCL	0.739			95% Bootstrap t UCL	1.144		
1031					95% H-UCL (Log ROS)	0.692						
1032												
1033	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
1034					KM Mean (logged)	-1.618			95% H-UCL (KM -Log)	0.457		
1035					KM SD (logged)	0.845			95% Critical H Value (KM-Log)	2.4		
1036					KM Standard Error of Mean (logged)	0.225						
1037												
1038	**DL/2 Statistics**											
1039					**DL/2 Normal**				**DL/2 Log-Transformed**			
1040					Mean in Original Scale	0.419			Mean in Log Scale	-1.256		

	A	B	C	D	E	F	G	H	I	J	K	L
1041					SD in Original Scale	0.579					SD in Log Scale	0.738
1042					95% t UCL (Assumes normality)	0.649					95% H-Stat UCL	0.555
1043	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1044												
1045	**Nonparametric Distribution Free UCL Statistics**											
1046	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
1047												
1048	**Suggested UCL to Use**											
1049					95% KM (t) UCL	0.604					95% KM (Percentile Bootstrap) UCL	0.598
1050												
1051	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1052	Recommendations are based upon data size, data distribution, and skewness.											
1053	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1054	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1055												
1056												

1057	**TATB**											
1058												
1059	**General Statistics**											
1060						Total Number of Observations	19			Number of Distinct Observations	19	
1061										Number of Missing Observations	0	
1062						Minimum	1.14			Mean	19.74	
1063						Maximum	37.3			Median	23.7	
1064						SD	12.75			Std. Error of Mean	2.925	
1065						Coefficient of Variation	0.646			Skewness	-0.283	
1066												
1067	**Normal GOF Test**											
1068						Shapiro Wilk Test Statistic	0.897			**Shapiro Wilk GOF Test**		
1069						5% Shapiro Wilk Critical Value	0.901			Data Not Normal at 5% Significance Level		
1070						Lilliefors Test Statistic	0.16			**Lilliefors GOF Test**		
1071						5% Lilliefors Critical Value	0.203			Data appear Normal at 5% Significance Level		
1072	**Data appear Approximate Normal at 5% Significance Level**											
1073												
1074	**Assuming Normal Distribution**											
1075						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
1076						95% Student's-t UCL	24.81			95% Adjusted-CLT UCL (Chen-1995)	24.35	
1077										95% Modified-t UCL (Johnson-1978)	24.78	
1078												
1079	**Gamma GOF Test**											
1080						A-D Test Statistic	1.203			**Anderson-Darling Gamma GOF Test**		
1081						5% A-D Critical Value	0.761			Data Not Gamma Distributed at 5% Significance Level		
1082						K-S Test Statistic	0.22			**Kolmogrov-Smirnoff Gamma GOF Test**		
1083						5% K-S Critical Value	0.203			Data Not Gamma Distributed at 5% Significance Level		
1084	**Data Not Gamma Distributed at 5% Significance Level**											
1085												
1086	**Gamma Statistics**											
1087						k hat (MLE)	1.326			k star (bias corrected MLE)	1.152	
1088						Theta hat (MLE)	14.89			Theta star (bias corrected MLE)	17.14	
1089						nu hat (MLE)	50.38			nu star (bias corrected)	43.76	
1090						MLE Mean (bias corrected)	19.74			MLE Sd (bias corrected)	18.4	
1091										Approximate Chi Square Value (0.05)	29.59	
1092						Adjusted Level of Significance	0.0369			Adjusted Chi Square Value	28.57	
1093												
1094	**Assuming Gamma Distribution**											
1095						95% Approximate Gamma UCL (use when n>=50))	29.19			95% Adjusted Gamma UCL (use when n<50)	30.23	
1096												
1097	**Lognormal GOF Test**											
1098						Shapiro Wilk Test Statistic	0.802			**Shapiro Wilk Lognormal GOF Test**		
1099						5% Shapiro Wilk Critical Value	0.901			Data Not Lognormal at 5% Significance Level		
1100						Lilliefors Test Statistic	0.223			**Lilliefors Lognormal GOF Test**		
1101						5% Lilliefors Critical Value	0.203			Data Not Lognormal at 5% Significance Level		
1102	**Data Not Lognormal at 5% Significance Level**											
1103												
1104	**Lognormal Statistics**											
1105						Minimum of Logged Data	0.131			Mean of logged Data	2.56	
1106						Maximum of Logged Data	3.619			SD of logged Data	1.174	
1107												
1108	**Assuming Lognormal Distribution**											
1109						95% H-UCL	56.94			90% Chebyshev (MVUE) UCL	46.85	
1110						95% Chebyshev (MVUE) UCL	57.03			97.5% Chebyshev (MVUE) UCL	71.17	
1111						99% Chebyshev (MVUE) UCL	98.94					
1112												
1113	**Nonparametric Distribution Free UCL Statistics**											
1114	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1115												
1116	**Nonparametric Distribution Free UCLs**											
1117						95% CLT UCL	24.55			95% Jackknife UCL	24.81	
1118						95% Standard Bootstrap UCL	24.41			95% Bootstrap-t UCL	24.65	
1119						95% Hall's Bootstrap UCL	24.24			95% Percentile Bootstrap UCL	24.6	
1120						95% BCA Bootstrap UCL	24.42					
1121						90% Chebyshev(Mean, Sd) UCL	28.51			95% Chebyshev(Mean, Sd) UCL	32.49	
1122						97.5% Chebyshev(Mean, Sd) UCL	38.01			99% Chebyshev(Mean, Sd) UCL	48.84	
1123												
1124	**Suggested UCL to Use**											
1125						95% Student's-t UCL	24.81					
1126												
1127	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1128	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1129	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1130	For additional insight the user may want to consult a statistician.											
1131												
1132	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
1133	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
1134												
1135												

1136	**Uranium-234**											
1137												
1138	**General Statistics**											
1139					Total Number of Observations	19			Number of Distinct Observations	19		
1140									Number of Missing Observations	0		
1141					Minimum	0.56			Mean	2.726		
1142					Maximum	13.8			Median	2.08		
1143					SD	2.966			Std. Error of Mean	0.68		
1144					Coefficient of Variation	1.088			Skewness	3.157		
1145												
1146	**Normal GOF Test**											
1147					Shapiro Wilk Test Statistic	0.635			**Shapiro Wilk GOF Test**			
1148					5% Shapiro Wilk Critical Value	0.901			Data Not Normal at 5% Significance Level			
1149					Lilliefors Test Statistic	0.247			**Lilliefors GOF Test**			
1150					5% Lilliefors Critical Value	0.203			Data Not Normal at 5% Significance Level			
1151	**Data Not Normal at 5% Significance Level**											
1152												
1153	**Assuming Normal Distribution**											
1154					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
1155					95% Student's-t UCL	3.906			95% Adjusted-CLT UCL (Chen-1995)	4.372		
1156									95% Modified-t UCL (Johnson-1978)	3.988		
1157												
1158	**Gamma GOF Test**											
1159					A-D Test Statistic	0.488			**Anderson-Darling Gamma GOF Test**			
1160					5% A-D Critical Value	0.756			Detected data appear Gamma Distributed at 5% Significance Level			
1161					K-S Test Statistic	0.133			**Kolmogrov-Smirnoff Gamma GOF Test**			
1162					5% K-S Critical Value	0.202			Detected data appear Gamma Distributed at 5% Significance Level			
1163	**Detected data appear Gamma Distributed at 5% Significance Level**											
1164												
1165	**Gamma Statistics**											
1166					k hat (MLE)	1.605			k star (bias corrected MLE)	1.386		
1167					Theta hat (MLE)	1.699			Theta star (bias corrected MLE)	1.967		
1168					nu hat (MLE)	60.97			nu star (bias corrected)	52.68		
1169					MLE Mean (bias corrected)	2.726			MLE Sd (bias corrected)	2.316		
1170									Approximate Chi Square Value (0.05)	37.01		
1171					Adjusted Level of Significance	0.0369			Adjusted Chi Square Value	35.86		
1172												
1173	**Assuming Gamma Distribution**											
1174					95% Approximate Gamma UCL (use when n>=50)	3.881			95% Adjusted Gamma UCL (use when n<50)	4.005		
1175												
1176	**Lognormal GOF Test**											
1177					Shapiro Wilk Test Statistic	0.968			**Shapiro Wilk Lognormal GOF Test**			
1178					5% Shapiro Wilk Critical Value	0.901			Data appear Lognormal at 5% Significance Level			
1179					Lilliefors Test Statistic	0.0769			**Lilliefors Lognormal GOF Test**			
1180					5% Lilliefors Critical Value	0.203			Data appear Lognormal at 5% Significance Level			
1181	**Data appear Lognormal at 5% Significance Level**											
1182												
1183	**Lognormal Statistics**											
1184					Minimum of Logged Data	-0.58			Mean of logged Data	0.66		
1185					Maximum of Logged Data	2.625			SD of logged Data	0.805		
1186												
1187	**Assuming Lognormal Distribution**											
1188					95% H-UCL	4.179			90% Chebyshev (MVUE) UCL	4.189		
1189					95% Chebyshev (MVUE) UCL	4.901			97.5% Chebyshev (MVUE) UCL	5.888		
1190					99% Chebyshev (MVUE) UCL	7.828						
1191												
1192	**Nonparametric Distribution Free UCL Statistics**											
1193	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1194												
1195	**Nonparametric Distribution Free UCLs**											
1196					95% CLT UCL	3.845			95% Jackknife UCL	3.906		
1197					95% Standard Bootstrap UCL	3.776			95% Bootstrap-t UCL	5.312		
1198					95% Hall's Bootstrap UCL	8.552			95% Percentile Bootstrap UCL	3.898		
1199					95% BCA Bootstrap UCL	4.468						
1200					90% Chebyshev(Mean, Sd) UCL	4.767			95% Chebyshev(Mean, Sd) UCL	5.692		
1201					97.5% Chebyshev(Mean, Sd) UCL	6.975			99% Chebyshev(Mean, Sd) UCL	9.496		
1202												
1203	**Suggested UCL to Use**											
1204					95% Adjusted Gamma UCL	4.005						
1205												
1206	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1207	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1208	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1209	For additional insight the user may want to consult a statistician.											
1210												

Uranium-235/236				
General Statistics				
Total Number of Observations	19	Number of Distinct Observations	19	
Number of Detects	16	Number of Non-Detects	3	
Number of Distinct Detects	16	Number of Distinct Non-Detects	3	
Minimum Detect	0.0749	Minimum Non-Detect	0.0396	
Maximum Detect	1.83	Maximum Non-Detect	0.0524	
Variance Detects	0.177	Percent Non-Detects	15.79%	
Mean Detects	0.397	SD Detects	0.42	
Median Detects	0.294	CV Detects	1.057	
Skewness Detects	2.904	Kurtosis Detects	9.879	
Mean of Logged Detects	-1.276	SD of Logged Detects	0.846	
Normal GOF Test on Detects Only				
Shapiro Wilk Test Statistic	0.664	**Shapiro Wilk GOF Test**		
5% Shapiro Wilk Critical Value	0.887	Detected Data Not Normal at 5% Significance Level		
Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**		
5% Lilliefors Critical Value	0.222	Detected Data Not Normal at 5% Significance Level		
Detected Data Not Normal at 5% Significance Level				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs				
Mean	0.341	Standard Error of Mean	0.0937	
SD	0.396	95% KM (BCA) UCL	0.514	
95% KM (t) UCL	0.504	95% KM (Percentile Bootstrap) UCL	0.496	
95% KM (z) UCL	0.495	95% KM Bootstrap t UCL	0.646	
90% KM Chebyshev UCL	0.622	95% KM Chebyshev UCL	0.75	
97.5% KM Chebyshev UCL	0.926	99% KM Chebyshev UCL	1.273	
Gamma GOF Tests on Detected Observations Only				
A-D Test Statistic	0.407	**Anderson-Darling GOF Test**		
5% A-D Critical Value	0.754	Detected data appear Gamma Distributed at 5% Significance Level		
K-S Test Statistic	0.12	**Kolmogrov-Smirnoff GOF**		
5% K-S Critical Value	0.219	Detected data appear Gamma Distributed at 5% Significance Level		
Detected data appear Gamma Distributed at 5% Significance Level				
Gamma Statistics on Detected Data Only				
k hat (MLE)	1.56	k star (bias corrected MLE)	1.309	
Theta hat (MLE)	0.255	Theta star (bias corrected MLE)	0.304	
nu hat (MLE)	49.93	nu star (bias corrected)	41.9	
MLE Mean (bias corrected)	0.397	MLE Sd (bias corrected)	0.347	
Gamma Kaplan-Meier (KM) Statistics				
k hat (KM)	0.743	nu hat (KM)	28.24	
Approximate Chi Square Value (28.24, α)	17.11	Adjusted Chi Square Value (28.24, β)	16.36	
95% Gamma Approximate KM-UCL (use when n>=50)	0.563	95% Gamma Adjusted KM-UCL (use when n<50)	0.589	
Gamma ROS Statistics using Imputed Non-Detects				
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs				
GROS may not be used when kstar of detected data is small such as < 0.1				
For such situations, GROS method tends to yield inflated values of UCLs and BTVs				
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates				
Minimum	0.01	Mean	0.336	
Maximum	1.83	Median	0.259	
SD	0.41	CV	1.22	
k hat (MLE)	0.83	k star (bias corrected MLE)	0.734	
Theta hat (MLE)	0.405	Theta star (bias corrected MLE)	0.458	
nu hat (MLE)	31.53	nu star (bias corrected)	27.88	
MLE Mean (bias corrected)	0.336	MLE Sd (bias corrected)	0.393	
		Adjusted Level of Significance (β)	0.0369	
Approximate Chi Square Value (27.88, α)	16.84	Adjusted Chi Square Value (27.88, β)	16.09	
95% Gamma Approximate UCL (use when n>=50)	0.557	95% Gamma Adjusted UCL (use when n<50)	0.583	
Lognormal GOF Test on Detected Observations Only				
Shapiro Wilk Test Statistic	0.962	**Shapiro Wilk GOF Test**		
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level		
Lilliefors Test Statistic	0.0973	**Lilliefors GOF Test**		
5% Lilliefors Critical Value	0.222	Detected Data appear Lognormal at 5% Significance Level		
Detected Data appear Lognormal at 5% Significance Level				
Lognormal ROS Statistics Using Imputed Non-Detects				
Mean in Original Scale	0.341	Mean in Log Scale	-1.581	
SD in Original Scale	0.406	SD in Log Scale	1.059	
95% t UCL (assumes normality of ROS data)	0.503	95% Percentile Bootstrap UCL	0.503	
95% BCA Bootstrap UCL	0.59	95% Bootstrap t UCL	0.637	
95% H-UCL (Log ROS)	0.707			
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed				
KM Mean (logged)	-1.584	95% H-UCL (KM -Log)	0.671	
KM SD (logged)	1.036	95% Critical H Value (KM-Log)	2.662	
KM Standard Error of Mean (logged)	0.245			
DL/2 Statistics				
DL/2 Normal		**DL/2 Log-Transformed**		
Mean in Original Scale	0.338	Mean in Log Scale	-1.673	

	A	B	C	D	E	F	G	H	I	J	K	L
1296					SD in Original Scale	0.409					SD in Log Scale	1.219
1297					95% t UCL (Assumes normality)	0.501					95% H-Stat UCL	0.917
1298	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1299												
1300	**Nonparametric Distribution Free UCL Statistics**											
1301	**Detected Data appear Gamma Distributed at 5% Significance Level**											
1302												
1303	**Suggested UCL to Use**											
1304					95% KM (BCA) UCL	0.514					95% GROS Adjusted Gamma UCL	0.583
1305					95% Adjusted Gamma KM-UCL	0.589						
1306												
1307	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1308	Recommendations are based upon data size, data distribution, and skewness.											
1309	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1310	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1311												
1312												

1313	**Uranium-238**											
1314												
1315	**General Statistics**											
1316					Total Number of Observations	19			Number of Distinct Observations		19	
1317									Number of Missing Observations		0	
1318					Minimum	0.788			Mean		16.25	
1319					Maximum	105			Median		10.6	
1320					SD	23.31			Std. Error of Mean		5.347	
1321					Coefficient of Variation	1.435			Skewness		3.352	
1322												
1323	**Normal GOF Test**											
1324					Shapiro Wilk Test Statistic	0.594			**Shapiro Wilk GOF Test**			
1325					5% Shapiro Wilk Critical Value	0.901			Data Not Normal at 5% Significance Level			
1326					Lilliefors Test Statistic	0.281			**Lilliefors GOF Test**			
1327					5% Lilliefors Critical Value	0.203			Data Not Normal at 5% Significance Level			
1328	**Data Not Normal at 5% Significance Level**											
1329												
1330	**Assuming Normal Distribution**											
1331					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
1332					95% Student's-t UCL	25.52			95% Adjusted-CLT UCL (Chen-1995)		29.43	
1333									95% Modified-t UCL (Johnson-1978)		26.2	
1334												
1335	**Gamma GOF Test**											
1336					A-D Test Statistic	0.384			**Anderson-Darling Gamma GOF Test**			
1337					5% A-D Critical Value	0.775			Detected data appear Gamma Distributed at 5% Significance Level			
1338					K-S Test Statistic	0.133			**Kolmogrov-Smirnoff Gamma GOF Test**			
1339					5% K-S Critical Value	0.205			Detected data appear Gamma Distributed at 5% Significance Level			
1340	**Detected data appear Gamma Distributed at 5% Significance Level**											
1341												
1342	**Gamma Statistics**											
1343					k hat (MLE)	0.845			k star (bias corrected MLE)		0.747	
1344					Theta hat (MLE)	19.22			Theta star (bias corrected MLE)		21.75	
1345					nu hat (MLE)	32.12			nu star (bias corrected)		28.38	
1346					MLE Mean (bias corrected)	16.25			MLE Sd (bias corrected)		18.8	
1347									Approximate Chi Square Value (0.05)		17.23	
1348					Adjusted Level of Significance	0.0369			Adjusted Chi Square Value		16.47	
1349												
1350	**Assuming Gamma Distribution**											
1351					95% Approximate Gamma UCL (use when n>=50)	26.77			95% Adjusted Gamma UCL (use when n<50)		28	
1352												
1353	**Lognormal GOF Test**											
1354					Shapiro Wilk Test Statistic	0.959			**Shapiro Wilk Lognormal GOF Test**			
1355					5% Shapiro Wilk Critical Value	0.901			Data appear Lognormal at 5% Significance Level			
1356					Lilliefors Test Statistic	0.119			**Lilliefors Lognormal GOF Test**			
1357					5% Lilliefors Critical Value	0.203			Data appear Lognormal at 5% Significance Level			
1358	**Data appear Lognormal at 5% Significance Level**											
1359												
1360	**Lognormal Statistics**											
1361					Minimum of Logged Data	-0.238			Mean of logged Data		2.091	
1362					Maximum of Logged Data	4.654			SD of logged Data		1.284	
1363												
1364	**Assuming Lognormal Distribution**											
1365					95% H-UCL	46.2			90% Chebyshev (MVUE) UCL		34.75	
1366					95% Chebyshev (MVUE) UCL	42.71			97.5% Chebyshev (MVUE) UCL		53.76	
1367					99% Chebyshev (MVUE) UCL	75.46						
1368												
1369	**Nonparametric Distribution Free UCL Statistics**											
1370	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1371												
1372	**Nonparametric Distribution Free UCLs**											
1373					95% CLT UCL	25.04			95% Jackknife UCL		25.52	
1374					95% Standard Bootstrap UCL	25.08			95% Bootstrap-t UCL		37.19	
1375					95% Hall's Bootstrap UCL	60.74			95% Percentile Bootstrap UCL		25.81	
1376					95% BCA Bootstrap UCL	29.91						
1377					90% Chebyshev(Mean, Sd) UCL	32.29			95% Chebyshev(Mean, Sd) UCL		39.55	
1378					97.5% Chebyshev(Mean, Sd) UCL	49.64			99% Chebyshev(Mean, Sd) UCL		69.45	
1379												
1380	**Suggested UCL to Use**											
1381					95% Adjusted Gamma UCL	28						
1382												
1383	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1384	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1385	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1386	For additional insight the user may want to consult a statistician.											
1387												

1388	1,3-Xylene+1,4-Xylene										
1389											
1390	**General Statistics**										
1391						Total Number of Observations	19			Number of Distinct Observations	15
1392						Number of Detects	5			Number of Non-Detects	14
1393						Number of Distinct Detects	5			Number of Distinct Non-Detects	10
1394						Minimum Detect	3.9000E-4			Minimum Non-Detect	0.00202
1395						Maximum Detect	0.00105			Maximum Non-Detect	0.00229
1396						Variance Detects	8.1301E-8			Percent Non-Detects	73.68%
1397						Mean Detects	7.6760E-4			SD Detects	2.8513E-4
1398						Median Detects	8.2300E-4			CV Detects	0.371
1399						Skewness Detects	-0.453			Kurtosis Detects	-1.979
1400						Mean of Logged Detects	-7.237			SD of Logged Detects	0.421
1401											
1402	**Normal GOF Test on Detects Only**										
1403						Shapiro Wilk Test Statistic	0.917	**Shapiro Wilk GOF Test**			
1404						5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level			
1405						Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**			
1406						5% Lilliefors Critical Value	0.396	Detected Data appear Normal at 5% Significance Level			
1407	**Detected Data appear Normal at 5% Significance Level**										
1408											
1409	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
1410						Mean	7.6760E-4			Standard Error of Mean	1.2752E-4
1411						SD	2.5503E-4			95% KM (BCA) UCL	9.7325E-4
1412						95% KM (t) UCL	9.8872E-4			95% KM (Percentile Bootstrap) UCL	9.8325E-4
1413						95% KM (z) UCL	9.7734E-4			95% KM Bootstrap t UCL	0.00103
1414						90% KM Chebyshev UCL	0.00115			95% KM Chebyshev UCL	0.00132
1415						97.5% KM Chebyshev UCL	0.00156			99% KM Chebyshev UCL	0.00204
1416											
1417	**Gamma GOF Tests on Detected Observations Only**										
1418						A-D Test Statistic	0.346	**Anderson-Darling GOF Test**			
1419						5% A-D Critical Value	0.68	Detected data appear Gamma Distributed at 5% Significance Level			
1420						K-S Test Statistic	0.224	**Kolmogrov-Smirnoff GOF**			
1421						5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Level			
1422	**Detected data appear Gamma Distributed at 5% Significance Level**										
1423											
1424	**Gamma Statistics on Detected Data Only**										
1425						k hat (MLE)	7.828			k star (bias corrected MLE)	3.264
1426						Theta hat (MLE)	9.8061E-5			Theta star (bias corrected MLE)	2.3514E-4
1427						nu hat (MLE)	78.28			nu star (bias corrected)	32.64
1428						MLE Mean (bias corrected)	7.6760E-4			MLE Sd (bias corrected)	4.2484E-4
1429											
1430	**Gamma Kaplan-Meier (KM) Statistics**										
1431						k hat (KM)	9.059			nu hat (KM)	344.2
1432						Approximate Chi Square Value (344.24, α)	302.3			Adjusted Chi Square Value (344.24, β)	298.8
1433						95% Gamma Approximate KM-UCL (use when n>=50)	8.7425E-4			95% Gamma Adjusted KM-UCL (use when n<50)	8.8430E-4
1434											
1435	**Gamma ROS Statistics using Imputed Non-Detects**										
1436	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
1437	GROS may not be used when kstar of detected data is small such as < 0.1										
1438	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
1439	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
1440						Minimum	3.9000E-4			Mean	0.00757
1441						Maximum	0.01			Median	0.01
1442						SD	0.00418			CV	0.552
1443						k hat (MLE)	1.349			k star (bias corrected MLE)	1.171
1444						Theta hat (MLE)	0.00561			Theta star (bias corrected MLE)	0.00646
1445						nu hat (MLE)	51.26			nu star (bias corrected)	44.5
1446						MLE Mean (bias corrected)	0.00757			MLE Sd (bias corrected)	0.007
1447										Adjusted Level of Significance (β)	0.0369
1448						Approximate Chi Square Value (44.50, α)	30.2			Adjusted Chi Square Value (44.50, β)	29.17
1449						95% Gamma Approximate UCL (use when n>=50)	0.0112			95% Gamma Adjusted UCL (use when n<50)	0.0115
1450											
1451	**Lognormal GOF Test on Detected Observations Only**										
1452						Shapiro Wilk Test Statistic	0.898	**Shapiro Wilk GOF Test**			
1453						5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level			
1454						Lilliefors Test Statistic	0.226	**Lilliefors GOF Test**			
1455						5% Lilliefors Critical Value	0.396	Detected Data appear Lognormal at 5% Significance Level			
1456	**Detected Data appear Lognormal at 5% Significance Level**										
1457											
1458	**Lognormal ROS Statistics Using Imputed Non-Detects**										
1459						Mean in Original Scale	7.4103E-4			Mean in Log Scale	-7.237
1460						SD in Original Scale	1.8105E-4			SD in Log Scale	0.257
1461						95% t UCL (assumes normality of ROS data)	8.1306E-4			95% Percentile Bootstrap UCL	8.0565E-4
1462						95% BCA Bootstrap UCL	8.1044E-4			95% Bootstrap t UCL	8.1325E-4
1463						95% H-UCL (Log ROS)	8.2970E-4				
1464											
1465	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**										
1466						KM Mean (logged)	-7.237			95% H-UCL (KM -Log)	9.1403E-4
1467						KM SD (logged)	0.377			95% Critical H Value (KM-Log)	1.902
1468						KM Standard Error of Mean (logged)	0.188				
1469											
1470	**DL/2 Statistics**										
1471						**DL/2 Normal**				**DL/2 Log-Transformed**	
1472						Mean in Original Scale	9.8358E-4			Mean in Log Scale	-6.952

	A	B	C	D	E	F	G	H	I	J	K	L
1473					SD in Original Scale	1.9259E-4					SD in Log Scale	0.267
1474					95% t UCL (Assumes normality)	0.00106					95% H-Stat UCL	0.00111
1475	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1476												
1477	**Nonparametric Distribution Free UCL Statistics**											
1478	**Detected Data appear Normal Distributed at 5% Significance Level**											
1479												
1480	**Suggested UCL to Use**											
1481					95% KM (t) UCL	9.8872E-4					95% KM (Percentile Bootstrap) UCL	9.8325E-4
1482												
1483	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1484	Recommendations are based upon data size, data distribution, and skewness.											
1485	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1486	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1487												
1488												

1489	**Dioxins Mammals**											
1490												
1491	**General Statistics**											
1492						Total Number of Observations	19			Number of Distinct Observations	19	
1493										Number of Missing Observations	0	
1494						Minimum	1.0500E-7			Mean	2.1975E-6	
1495						Maximum	1.6100E-5			Median	7.1000E-7	
1496						SD	3.6959E-6			Std. Error of Mean	8.4789E-7	
1497						Coefficient of Variation	N/A			Skewness	3.247	
1498												
1499	**Normal GOF Test**											
1500						Shapiro Wilk Test Statistic	0.571	**Shapiro Wilk GOF Test**				
1501						5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level				
1502						Lilliefors Test Statistic	0.286	**Lilliefors GOF Test**				
1503						5% Lilliefors Critical Value	0.203	Data Not Normal at 5% Significance Level				
1504	**Data Not Normal at 5% Significance Level**											
1505												
1506	**Assuming Normal Distribution**											
1507						**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**				
1508						95% Student's-t UCL	3.6678E-6	95% Adjusted-CLT UCL (Chen-1995)	4.2670E-6			
1509								95% Modified-t UCL (Johnson-1978)	3.7731E-6			
1510												
1511	**Gamma GOF Test**											
1512						A-D Test Statistic	0.761	**Anderson-Darling Gamma GOF Test**				
1513						5% A-D Critical Value	0.79	Detected data appear Gamma Distributed at 5% Significance Level				
1514						K-S Test Statistic	0.168	**Kolmogrov-Smirnoff Gamma GOF Test**				
1515						5% K-S Critical Value	0.208	Detected data appear Gamma Distributed at 5% Significance Level				
1516	**Detected data appear Gamma Distributed at 5% Significance Level**											
1517												
1518	**Gamma Statistics**											
1519						k hat (MLE)	0.635	k star (bias corrected MLE)	0.57			
1520						Theta hat (MLE)	3.4615E-6	Theta star (bias corrected MLE)	3.8573E-6			
1521						nu hat (MLE)	24.12	nu star (bias corrected)	21.65			
1522						MLE Mean (bias corrected)	2.1975E-6	MLE Sd (bias corrected)	2.9115E-6			
1523								Approximate Chi Square Value (0.05)	12.08			
1524						Adjusted Level of Significance	0.0369	Adjusted Chi Square Value	11.45			
1525												
1526	**Assuming Gamma Distribution**											
1527						95% Approximate Gamma UCL (use when n>=50)	3.9398E-6	95% Adjusted Gamma UCL (use when n<50)	4.1541E-6			
1528												
1529	**Lognormal GOF Test**											
1530						Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk Lognormal GOF Test**				
1531						5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level				
1532						Lilliefors Test Statistic	0.148	**Lilliefors Lognormal GOF Test**				
1533						5% Lilliefors Critical Value	0.203	Data appear Lognormal at 5% Significance Level				
1534	**Data appear Lognormal at 5% Significance Level**											
1535												
1536	**Lognormal Statistics**											
1537						Minimum of Logged Data	-16.07	Mean of logged Data	-13.99			
1538						Maximum of Logged Data	-11.04	SD of logged Data	1.445			
1539												
1540	**Assuming Lognormal Distribution**											
1541						95% H-UCL	7.3014E-6	90% Chebyshev (MVUE) UCL	4.6794E-6			
1542						95% Chebyshev (MVUE) UCL	5.8237E-6	97.5% Chebyshev (MVUE) UCL	7.4119E-6			
1543						99% Chebyshev (MVUE) UCL	1.0532E-5					
1544												
1545	**Nonparametric Distribution Free UCL Statistics**											
1546	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1547												
1548	**Nonparametric Distribution Free UCLs**											
1549						95% CLT UCL	3.5922E-6	95% Jackknife UCL	3.6678E-6			
1550						95% Standard Bootstrap UCL	3.5577E-6	95% Bootstrap-t UCL	5.3363E-6			
1551						95% Hall's Bootstrap UCL	8.6139E-6	95% Percentile Bootstrap UCL	3.7316E-6			
1552						95% BCA Bootstrap UCL	4.4744E-6					
1553						90% Chebyshev(Mean, Sd) UCL	4.7412E-6	95% Chebyshev(Mean, Sd) UCL	5.8934E-6			
1554						97.5% Chebyshev(Mean, Sd) UCL	7.4926E-6	99% Chebyshev(Mean, Sd) UCL	1.0634E-5			
1555												
1556	**Suggested UCL to Use**											
1557						95% Adjusted Gamma UCL	4.1541E-6					
1558												
1559	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1560	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1561	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1562	For additional insight the user may want to consult a statistician.											
1563												
1564												

1565	**Dioxins Avian**											
1566												
1567	**General Statistics**											
1568						Total Number of Observations	19			Number of Distinct Observations	19	
1569										Number of Missing Observations	0	
1570						Minimum	2.5100E-8			Mean	1.3746E-6	
1571						Maximum	1.0800E-5			Median	2.2200E-7	
1572						SD	2.5231E-6			Std. Error of Mean	5.7884E-7	
1573						Coefficient of Variation	N/A			Skewness	3.181	
1574												
1575	**Normal GOF Test**											
1576						Shapiro Wilk Test Statistic	0.563	**Shapiro Wilk GOF Test**				
1577						5% Shapiro Wilk Critical Value	0.901	Data Not Normal at 5% Significance Level				
1578						Lilliefors Test Statistic	0.296	**Lilliefors GOF Test**				
1579						5% Lilliefors Critical Value	0.203	Data Not Normal at 5% Significance Level				
1580	**Data Not Normal at 5% Significance Level**											
1581												
1582	**Assuming Normal Distribution**											
1583						**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
1584						95% Student's-t UCL	2.3784E-6			95% Adjusted-CLT UCL (Chen-1995)	2.7781E-6	
1585										95% Modified-t UCL (Johnson-1978)	2.4488E-6	
1586												
1587	**Gamma GOF Test**											
1588						A-D Test Statistic	0.919	**Anderson-Darling Gamma GOF Test**				
1589						5% A-D Critical Value	0.813	Data Not Gamma Distributed at 5% Significance Level				
1590						K-S Test Statistic	0.21	**Kolmogrov-Smirnoff Gamma GOF Test**				
1591						5% K-S Critical Value	0.211	Detected data appear Gamma Distributed at 5% Significance Level				
1592	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
1593												
1594	**Gamma Statistics**											
1595						k hat (MLE)	0.447			k star (bias corrected MLE)	0.411	
1596						Theta hat (MLE)	3.0760E-6			Theta star (bias corrected MLE)	3.3412E-6	
1597						nu hat (MLE)	16.98			nu star (bias corrected)	15.63	
1598						MLE Mean (bias corrected)	1.3746E-6			MLE Sd (bias corrected)	2.1431E-6	
1599										Approximate Chi Square Value (0.05)	7.705	
1600						Adjusted Level of Significance	0.0369			Adjusted Chi Square Value	7.221	
1601												
1602	**Assuming Gamma Distribution**											
1603						95% Approximate Gamma UCL (use when n>=50)	2.7894E-6			95% Adjusted Gamma UCL (use when n<50)	2.9761E-6	
1604												
1605	**Lognormal GOF Test**											
1606						Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk Lognormal GOF Test**				
1607						5% Shapiro Wilk Critical Value	0.901	Data appear Lognormal at 5% Significance Level				
1608						Lilliefors Test Statistic	0.168	**Lilliefors Lognormal GOF Test**				
1609						5% Lilliefors Critical Value	0.203	Data appear Lognormal at 5% Significance Level				
1610	**Data appear Lognormal at 5% Significance Level**											
1611												
1612	**Lognormal Statistics**											
1613						Minimum of Logged Data	-17.5			Mean of logged Data	-14.94	
1614						Maximum of Logged Data	-11.44			SD of logged Data	1.881	
1615												
1616	**Assuming Lognormal Distribution**											
1617						95% H-UCL	1.1395E-5			90% Chebyshev (MVUE) UCL	3.9582E-6	
1618						95% Chebyshev (MVUE) UCL	5.0545E-6			97.5% Chebyshev (MVUE) UCL	6.5763E-6	
1619						99% Chebyshev (MVUE) UCL	9.5654E-6					
1620												
1621	**Nonparametric Distribution Free UCL Statistics**											
1622	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1623												
1624	**Nonparametric Distribution Free UCLs**											
1625						95% CLT UCL	2.3267E-6			95% Jackknife UCL	2.3784E-6	
1626						95% Standard Bootstrap UCL	2.2810E-6			95% Bootstrap-t UCL	3.6504E-6	
1627						95% Hall's Bootstrap UCL	5.7409E-6			95% Percentile Bootstrap UCL	2.3718E-6	
1628						95% BCA Bootstrap UCL	2.9833E-6					
1629						90% Chebyshev(Mean, Sd) UCL	3.1112E-6			95% Chebyshev(Mean, Sd) UCL	3.8977E-6	
1630						97.5% Chebyshev(Mean, Sd) UCL	4.9895E-6			99% Chebyshev(Mean, Sd) UCL	7.1340E-6	
1631												
1632	**Suggested UCL to Use**											
1633						95% Adjusted Gamma UCL	2.9761E-6					
1634												
1635	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1636	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1637	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1638	For additional insight the user may want to consult a statistician.											
1639												

1	**UCL Statistics for Data Sets with Non-Detects**											
2												
3			User Selected Options									
4			Date/Time of Computation	3/12/2014 10:01:20 AM								
5			From File	UCL 39-6 OD Input Data_0301514.xls								
6			Full Precision	OFF								
7			Confidence Coefficient	95%								
8			Number of Bootstrap Operations	2000								
9												
10	**Antimony**											
11												
12	**General Statistics**											
13			Total Number of Observations	10			Number of Distinct Observations	10				
14			Number of Detects	9			Number of Non-Detects	1				
15			Number of Distinct Detects	9			Number of Distinct Non-Detects	1				
16			Minimum Detect	0.478			Minimum Non-Detect	1.16				
17			Maximum Detect	3.36			Maximum Non-Detect	1.16				
18			Variance Detects	1.084			Percent Non-Detects	10%				
19			Mean Detects	1.379			SD Detects	1.041				
20			Median Detects	0.996			CV Detects	0.755				
21			Skewness Detects	1.064			Kurtosis Detects	-0.19				
22			Mean of Logged Detects	0.08			SD of Logged Detects	0.727				
23												
24	**Normal GOF Test on Detects Only**											
25			Shapiro Wilk Test Statistic	0.832			**Shapiro Wilk GOF Test**					
26			5% Shapiro Wilk Critical Value	0.829			Detected Data appear Normal at 5% Significance Level					
27			Lilliefors Test Statistic	0.291			**Lilliefors GOF Test**					
28			5% Lilliefors Critical Value	0.295			Detected Data appear Normal at 5% Significance Level					
29	**Detected Data appear Normal at 5% Significance Level**											
30												
31	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**											
32			Mean	1.314			Standard Error of Mean	0.321				
33			SD	0.954			95% KM (BCA) UCL	1.813				
34			95% KM (t) UCL	1.902			95% KM (Percentile Bootstrap) UCL	1.839				
35			95% KM (z) UCL	1.842			95% KM Bootstrap t UCL	2.152				
36			90% KM Chebyshev UCL	2.277			95% KM Chebyshev UCL	2.713				
37			97.5% KM Chebyshev UCL	3.319			99% KM Chebyshev UCL	4.508				
38												
39	**Gamma GOF Tests on Detected Observations Only**											
40			A-D Test Statistic	0.521			**Anderson-Darling GOF Test**					
41			5% A-D Critical Value	0.729			Detected data appear Gamma Distributed at 5% Significance Level					
42			K-S Test Statistic	0.23			**Kolmogrov-Smirnoff GOF**					
43			5% K-S Critical Value	0.282			Detected data appear Gamma Distributed at 5% Significance Level					
44	**Detected data appear Gamma Distributed at 5% Significance Level**											
45												
46	**Gamma Statistics on Detected Data Only**											
47			k hat (MLE)	2.224			k star (bias corrected MLE)	1.557				
48			Theta hat (MLE)	0.62			Theta star (bias corrected MLE)	0.886				
49			nu hat (MLE)	40.03			nu star (bias corrected)	28.02				
50			MLE Mean (bias corrected)	1.379			MLE Sd (bias corrected)	1.105				
51												
52	**Gamma Kaplan-Meier (KM) Statistics**											
53			k hat (KM)	1.897			nu hat (KM)	37.94				
54			Approximate Chi Square Value (37.94, α)	24.84			Adjusted Chi Square Value (37.94, β)	23.01				
55			95% Gamma Approximate KM-UCL (use when n>=50)	2.007			95% Gamma Adjusted KM-UCL (use when n<50)	2.167				
56												
57	**Gamma ROS Statistics using Imputed Non-Detects**											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62			Minimum	0.478			Mean	1.317				
63			Maximum	3.36			Median	0.878				
64			SD	1.001			CV	0.76				
65			k hat (MLE)	2.318			k star (bias corrected MLE)	1.689				
66			Theta hat (MLE)	0.568			Theta star (bias corrected MLE)	0.78				
67			nu hat (MLE)	46.36			nu star (bias corrected)	33.79				
68			MLE Mean (bias corrected)	1.317			MLE Sd (bias corrected)	1.013				
69							Adjusted Level of Significance (β)	0.0267				
70			Approximate Chi Square Value (33.79, α)	21.49			Adjusted Chi Square Value (33.79, β)	19.81				
71			95% Gamma Approximate UCL (use when n>=50)	2.07			95% Gamma Adjusted UCL (use when n<50)	2.247				
72												
73	**Lognormal GOF Test on Detected Observations Only**											
74			Shapiro Wilk Test Statistic	0.903			**Shapiro Wilk GOF Test**					
75			5% Shapiro Wilk Critical Value	0.829			Detected Data appear Lognormal at 5% Significance Level					
76			Lilliefors Test Statistic	0.184			**Lilliefors GOF Test**					
77			5% Lilliefors Critical Value	0.295			Detected Data appear Lognormal at 5% Significance Level					

78	**Detected Data appear Lognormal at 5% Significance Level**											
79												
80	**Lognormal ROS Statistics Using Imputed Non-Detects**											
81					Mean in Original Scale	1.317			Mean in Log Scale	0.0442		
82					SD in Original Scale	1.001			SD in Log Scale	0.695		
83					95% t UCL (assumes normality of ROS data)	1.897			95% Percentile Bootstrap UCL	1.832		
84					95% BCA Bootstrap UCL	1.963			95% Bootstrap t UCL	2.242		
85					95% H-UCL (Log ROS)	2.386						
86												
87	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
88					KM Mean (logged)	0.0355			95% H-UCL (KM -Log)	2.26		
89					KM SD (logged)	0.671			95% Critical H Value (KM-Log)	2.482		
90					KM Standard Error of Mean (logged)	0.228						
91												
92	**DL/2 Statistics**											
93	**DL/2 Normal**						**DL/2 Log-Transformed**					
94					Mean in Original Scale	1.299			Mean in Log Scale	0.0175		
95					SD in Original Scale	1.013			SD in Log Scale	0.713		
96					95% t UCL (Assumes normality)	1.887			95% H-Stat UCL	2.409		
97	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
98												
99	**Nonparametric Distribution Free UCL Statistics**											
100	**Detected Data appear Normal Distributed at 5% Significance Level**											
101												
102	**Suggested UCL to Use**											
103					95% KM (t) UCL	1.902			95% KM (Percentile Bootstrap) UCL	1.839		
104												
105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
106	Recommendations are based upon data size, data distribution, and skewness.											
107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
109												
110												

111	**Aroclor-1254**										
112											
113	**General Statistics**										
114	Total Number of Observations				10	Number of Distinct Observations					10
115						Number of Missing Observations					0
116	Minimum				0.002	Mean					0.00943
117	Maximum				0.0381	Median					0.0064
118	SD				0.0106	Std. Error of Mean					0.00334
119	Coefficient of Variation				1.121	Skewness					2.639
120											
121	**Normal GOF Test**										
122	Shapiro Wilk Test Statistic				0.653	**Shapiro Wilk GOF Test**					
123	5% Shapiro Wilk Critical Value				0.842	Data Not Normal at 5% Significance Level					
124	Lilliefors Test Statistic				0.33	**Lilliefors GOF Test**					
125	5% Lilliefors Critical Value				0.28	Data Not Normal at 5% Significance Level					
126	**Data Not Normal at 5% Significance Level**										
127											
128	**Assuming Normal Distribution**										
129	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
130	95% Student's-t UCL				0.0156	95% Adjusted-CLT UCL (Chen-1995)					0.0179
131						95% Modified-t UCL (Johnson-1978)					0.016
132											
133	**Gamma GOF Test**										
134	A-D Test Statistic				0.496	**Anderson-Darling Gamma GOF Test**					
135	5% A-D Critical Value				0.739	Detected data appear Gamma Distributed at 5% Significance Level					
136	K-S Test Statistic				0.209	**Kolmogrov-Smirnoff Gamma GOF Test**					
137	5% K-S Critical Value				0.271	Detected data appear Gamma Distributed at 5% Significance Level					
138	**Detected data appear Gamma Distributed at 5% Significance Level**										
139											
140	**Gamma Statistics**										
141	k hat (MLE)				1.497	k star (bias corrected MLE)					1.114
142	Theta hat (MLE)				0.0063	Theta star (bias corrected MLE)					0.00846
143	nu hat (MLE)				29.93	nu star (bias corrected)					22.29
144	MLE Mean (bias corrected)				0.00943	MLE Sd (bias corrected)					0.00893
145						Approximate Chi Square Value (0.05)					12.55
146	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value					11.3
147											
148	**Assuming Gamma Distribution**										
149	95% Approximate Gamma UCL (use when n>=50)				0.0167	95% Adjusted Gamma UCL (use when n<50)					0.0186
150											
151	**Lognormal GOF Test**										
152	Shapiro Wilk Test Statistic				0.954	**Shapiro Wilk Lognormal GOF Test**					
153	5% Shapiro Wilk Critical Value				0.842	Data appear Lognormal at 5% Significance Level					
154	Lilliefors Test Statistic				0.158	**Lilliefors Lognormal GOF Test**					
155	5% Lilliefors Critical Value				0.28	Data appear Lognormal at 5% Significance Level					
156	**Data appear Lognormal at 5% Significance Level**										
157											
158	**Lognormal Statistics**										
159	Minimum of Logged Data				-6.215	Mean of logged Data					-5.034
160	Maximum of Logged Data				-3.268	SD of logged Data					0.849
161											
162	**Assuming Lognormal Distribution**										
163	95% H-UCL				0.0207	90% Chebyshev (MVUE) UCL					0.0164
164	95% Chebyshev (MVUE) UCL				0.0198	97.5% Chebyshev (MVUE) UCL					0.0245
165	99% Chebyshev (MVUE) UCL				0.0338						
166											
167	**Nonparametric Distribution Free UCL Statistics**										
168	**Data appear to follow a Discernible Distribution at 5% Significance Level**										
169											
170	**Nonparametric Distribution Free UCLs**										
171	95% CLT UCL				0.0149	95% Jackknife UCL					0.0156
172	95% Standard Bootstrap UCL				0.0146	95% Bootstrap-t UCL					0.0253
173	95% Hall's Bootstrap UCL				0.0362	95% Percentile Bootstrap UCL					0.0156
174	95% BCA Bootstrap UCL				0.0178						
175	90% Chebyshev(Mean, Sd) UCL				0.0195	95% Chebyshev(Mean, Sd) UCL					0.024
176	97.5% Chebyshev(Mean, Sd) UCL				0.0303	99% Chebyshev(Mean, Sd) UCL					0.0427
177											
178	**Suggested UCL to Use**										
179	95% Adjusted Gamma UCL				0.0186						
180											
181	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
182	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
183	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
184	For additional insight the user may want to consult a statistician.										
185											

186	**Aroclor-1260**										
187											
188	**General Statistics**										
189	Total Number of Observations				10	Number of Distinct Observations					9
190	Number of Detects				9	Number of Non-Detects					1
191	Number of Distinct Detects				8	Number of Distinct Non-Detects					1
192	Minimum Detect				0.0016	Minimum Non-Detect					0.0034
193	Maximum Detect				0.0177	Maximum Non-Detect					0.0034
194	Variance Detects				3.0679E-5	Percent Non-Detects					10%
195	Mean Detects				0.00641	SD Detects					0.00554
196	Median Detects				0.0052	CV Detects					0.864
197	Skewness Detects				1.44	Kurtosis Detects					1.091
198	Mean of Logged Detects				-5.345	SD of Logged Detects					0.8
199											
200	**Normal GOF Test on Detects Only**										
201	Shapiro Wilk Test Statistic				0.798	**Shapiro Wilk GOF Test**					
202	5% Shapiro Wilk Critical Value				0.829	Detected Data Not Normal at 5% Significance Level					
203	Lilliefors Test Statistic				0.286	**Lilliefors GOF Test**					
204	5% Lilliefors Critical Value				0.295	Detected Data appear Normal at 5% Significance Level					
205	**Detected Data appear Approximate Normal at 5% Significance Level**										
206											
207	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
208	Mean				0.00601	Standard Error of Mean					0.00171
209	SD				0.0051	95% KM (BCA) UCL					0.00893
210	95% KM (t) UCL				0.00915	95% KM (Percentile Bootstrap) UCL					0.00888
211	95% KM (z) UCL				0.00883	95% KM Bootstrap t UCL					0.0135
212	90% KM Chebyshev UCL				0.0111	95% KM Chebyshev UCL					0.0135
213	97.5% KM Chebyshev UCL				0.0167	99% KM Chebyshev UCL					0.023
214											
215	**Gamma GOF Tests on Detected Observations Only**										
216	A-D Test Statistic				0.479	**Anderson-Darling GOF Test**					
217	5% A-D Critical Value				0.731	Detected data appear Gamma Distributed at 5% Significance Level					
218	K-S Test Statistic				0.211	**Kolmogrov-Smirnoff GOF**					
219	5% K-S Critical Value				0.283	Detected data appear Gamma Distributed at 5% Significance Level					
220	**Detected data appear Gamma Distributed at 5% Significance Level**										
221											
222	**Gamma Statistics on Detected Data Only**										
223	k hat (MLE)				1.841	k star (bias corrected MLE)					1.301
224	Theta hat (MLE)				0.00348	Theta star (bias corrected MLE)					0.00493
225	nu hat (MLE)				33.14	nu star (bias corrected)					23.43
226	MLE Mean (bias corrected)				0.00641	MLE Sd (bias corrected)					0.00562
227											
228	**Gamma Kaplan-Meier (KM) Statistics**										
229	k hat (KM)				1.389	nu hat (KM)					27.77
230	Approximate Chi Square Value (27.77, α)				16.75	Adjusted Chi Square Value (27.77, β)					15.28
231	95% Gamma Approximate KM-UCL (use when n>=50)				0.00996	95% Gamma Adjusted KM-UCL (use when n<50)					0.0109
232											
233	**Gamma ROS Statistics using Imputed Non-Detects**										
234	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
235	GROS may not be used when kstar of detected data is small such as < 0.1										
236	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
237	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
238	Minimum				0.0016	Mean					0.00677
239	Maximum				0.0177	Median					0.0053
240	SD				0.00534	CV					0.789
241	k hat (MLE)				1.962	k star (bias corrected MLE)					1.44
242	Theta hat (MLE)				0.00345	Theta star (bias corrected MLE)					0.0047
243	nu hat (MLE)				39.24	nu star (bias corrected)					28.8
244	MLE Mean (bias corrected)				0.00677	MLE Sd (bias corrected)					0.00564
245						Adjusted Level of Significance (β)					0.0267
246	Approximate Chi Square Value (28.80, α)				17.55	Adjusted Chi Square Value (28.80, β)					16.04
247	95% Gamma Approximate UCL (use when n>=50)				0.0111	95% Gamma Adjusted UCL (use when n<50)					0.0122
248											
249	**Lognormal GOF Test on Detected Observations Only**										
250	Shapiro Wilk Test Statistic				0.935	**Shapiro Wilk GOF Test**					
251	5% Shapiro Wilk Critical Value				0.829	Detected Data appear Lognormal at 5% Significance Level					
252	Lilliefors Test Statistic				0.192	**Lilliefors GOF Test**					
253	5% Lilliefors Critical Value				0.295	Detected Data appear Lognormal at 5% Significance Level					
254	**Detected Data appear Lognormal at 5% Significance Level**										
255											
256	**Lognormal ROS Statistics Using Imputed Non-Detects**										
257	Mean in Original Scale				0.00601	Mean in Log Scale					-5.412
258	SD in Original Scale				0.00537	SD in Log Scale					0.783
259	95% t UCL (assumes normality of ROS data)				0.00913	95% Percentile Bootstrap UCL					0.00878
260	95% BCA Bootstrap UCL				0.00931	95% Bootstrap t UCL					0.0144
261	95% H-UCL (Log ROS)				0.0122						
262											

	A	B	C	D	E	F	G	H	I	J	K	L
263	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
264					KM Mean (logged)	-5.416				95% H-UCL (KM -Log)		0.0113
265					KM SD (logged)	0.75				95% Critical H Value (KM-Log)		2.618
266					KM Standard Error of Mean (logged)	0.253						
267												
268	**DL/2 Statistics**											
269	**DL/2 Normal**						**DL/2 Log-Transformed**					
270					Mean in Original Scale	0.00594				Mean in Log Scale		-5.448
271					SD in Original Scale	0.00543				SD in Log Scale		0.821
272					95% t UCL (Assumes normality)	0.00909				95% H-Stat UCL		0.0128
273	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
274												
275	**Nonparametric Distribution Free UCL Statistics**											
276	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
277												
278	**Suggested UCL to Use**											
279					95% KM (t) UCL	0.00915				95% KM (Percentile Bootstrap) UCL		0.00888
280												
281	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
282	Recommendations are based upon data size, data distribution, and skewness.											
283	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
284	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
285												

286	**Bis(2-ethylhexyl)phthalate**										
287											
288	**General Statistics**										
289	Total Number of Observations					10	Number of Distinct Observations				10
290	Number of Detects					7	Number of Non-Detects				3
291	Number of Distinct Detects					7	Number of Distinct Non-Detects				3
292	Minimum Detect					0.101	Minimum Non-Detect				0.354
293	Maximum Detect					2.42	Maximum Non-Detect				0.4
294	Variance Detects					0.665	Percent Non-Detects				30%
295	Mean Detects					0.673	SD Detects				0.816
296	Median Detects					0.403	CV Detects				1.212
297	Skewness Detects					2.116	Kurtosis Detects				4.649
298	Mean of Logged Detects					-0.915	SD of Logged Detects				1.078
299											
300	**Normal GOF Test on Detects Only**										
301	Shapiro Wilk Test Statistic					0.724	**Shapiro Wilk GOF Test**				
302	5% Shapiro Wilk Critical Value					0.803	Detected Data Not Normal at 5% Significance Level				
303	Lilliefors Test Statistic					0.328	**Lilliefors GOF Test**				
304	5% Lilliefors Critical Value					0.335	Detected Data appear Normal at 5% Significance Level				
305	**Detected Data appear Approximate Normal at 5% Significance Level**										
306											
307	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
308	Mean					0.525	Standard Error of Mean				0.231
309	SD					0.673	95% KM (BCA) UCL				0.975
310	95% KM (t) UCL					0.948	95% KM (Percentile Bootstrap) UCL				0.919
311	95% KM (z) UCL					0.904	95% KM Bootstrap t UCL				1.969
312	90% KM Chebyshev UCL					1.217	95% KM Chebyshev UCL				1.531
313	97.5% KM Chebyshev UCL					1.966	99% KM Chebyshev UCL				2.821
314											
315	**Gamma GOF Tests on Detected Observations Only**										
316	A-D Test Statistic					0.364	**Anderson-Darling GOF Test**				
317	5% A-D Critical Value					0.726	Detected data appear Gamma Distributed at 5% Significance Level				
318	K-S Test Statistic					0.251	**Kolmogrov-Smirnoff GOF**				
319	5% K-S Critical Value					0.319	Detected data appear Gamma Distributed at 5% Significance Level				
320	**Detected data appear Gamma Distributed at 5% Significance Level**										
321											
322	**Gamma Statistics on Detected Data Only**										
323	k hat (MLE)					1.1	k star (bias corrected MLE)				0.724
324	Theta hat (MLE)					0.612	Theta star (bias corrected MLE)				0.93
325	nu hat (MLE)					15.4	nu star (bias corrected)				10.13
326	MLE Mean (bias corrected)					0.673	MLE Sd (bias corrected)				0.791
327											
328	**Gamma Kaplan-Meier (KM) Statistics**										
329	k hat (KM)					0.608	nu hat (KM)				12.17
330	Approximate Chi Square Value (12.17, α)					5.338	Adjusted Chi Square Value (12.17, β)				4.577
331	95% Gamma Approximate KM-UCL (use when n>=50)					1.196	95% Gamma Adjusted KM-UCL (use when n<50)				1.395
332											
333	**Gamma ROS Statistics using Imputed Non-Detects**										
334	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
335	GROS may not be used when kstar of detected data is small such as < 0.1										
336	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
337	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
338	Minimum					0.01	Mean				0.474
339	Maximum					2.42	Median				0.218
340	SD					0.739	CV				1.559
341	k hat (MLE)					0.498	k star (bias corrected MLE)				0.415
342	Theta hat (MLE)					0.952	Theta star (bias corrected MLE)				1.141
343	nu hat (MLE)					9.963	nu star (bias corrected)				8.307
344	MLE Mean (bias corrected)					0.474	MLE Sd (bias corrected)				0.736
345							Adjusted Level of Significance (β)				0.0267
346	Approximate Chi Square Value (8.31, α)					2.914	Adjusted Chi Square Value (8.31, β)				2.388
347	95% Gamma Approximate UCL (use when n>=50)					1.351	95% Gamma Adjusted UCL (use when n<50)				1.649
348											
349	**Lognormal GOF Test on Detected Observations Only**										
350	Shapiro Wilk Test Statistic					0.968	**Shapiro Wilk GOF Test**				
351	5% Shapiro Wilk Critical Value					0.803	Detected Data appear Lognormal at 5% Significance Level				
352	Lilliefors Test Statistic					0.182	**Lilliefors GOF Test**				
353	5% Lilliefors Critical Value					0.335	Detected Data appear Lognormal at 5% Significance Level				
354	**Detected Data appear Lognormal at 5% Significance Level**										
355											
356	**Lognormal ROS Statistics Using Imputed Non-Detects**										
357	Mean in Original Scale					0.518	Mean in Log Scale				-1.2
358	SD in Original Scale					0.711	SD in Log Scale				0.992
359	95% t UCL (assumes normality of ROS data)					0.93	95% Percentile Bootstrap UCL				0.928
360	95% BCA Bootstrap UCL					1.129	95% Bootstrap t UCL				2.191
361	95% H-UCL (Log ROS)					1.368					
362											

	A	B	C	D	E	F	G	H	I	J	K	L
363	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
364					KM Mean (logged)	-1.187				95% H-UCL (KM -Log)		1.283
365					KM SD (logged)	0.963				95% Critical H Value (KM-Log)		3.028
366					KM Standard Error of Mean (logged)	0.349						
367												
368	**DL/2 Statistics**											
369	**DL/2 Normal**						**DL/2 Log-Transformed**					
370					Mean in Original Scale	0.527				Mean in Log Scale		-1.147
371					SD in Original Scale	0.706				SD in Log Scale		0.956
372					95% t UCL (Assumes normality)	0.936				95% H-Stat UCL		1.312
373	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
374												
375	**Nonparametric Distribution Free UCL Statistics**											
376	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
377												
378	**Suggested UCL to Use**											
379					95% KM (t) UCL	0.948				95% KM (Percentile Bootstrap) UCL		0.919
380												
381	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
382	Recommendations are based upon data size, data distribution, and skewness.											
383	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
384	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
385												
386												

387	**Copper**										
388											
389	**General Statistics**										
390					Total Number of Observations	10			Number of Distinct Observations		10
391									Number of Missing Observations		0
392					Minimum	52.4			Mean		720
393					Maximum	3410			Median		270.5
394					SD	1088			Std. Error of Mean		344.1
395					Coefficient of Variation	1.511			Skewness		2.162
396											
397	**Normal GOF Test**										
398					Shapiro Wilk Test Statistic	0.635			**Shapiro Wilk GOF Test**		
399					5% Shapiro Wilk Critical Value	0.842			Data Not Normal at 5% Significance Level		
400					Lilliefors Test Statistic	0.393			**Lilliefors GOF Test**		
401					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level		
402	**Data Not Normal at 5% Significance Level**										
403											
404	**Assuming Normal Distribution**										
405					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
406					95% Student's-t UCL	1351			95% Adjusted-CLT UCL (Chen-1995)		1537
407									95% Modified-t UCL (Johnson-1978)		1390
408											
409	**Gamma GOF Test**										
410					A-D Test Statistic	0.823			**Anderson-Darling Gamma GOF Test**		
411					5% A-D Critical Value	0.757			Data Not Gamma Distributed at 5% Significance Level		
412					K-S Test Statistic	0.283			**Kolmogrov-Smirnoff Gamma GOF Test**		
413					5% K-S Critical Value	0.276			Data Not Gamma Distributed at 5% Significance Level		
414	**Data Not Gamma Distributed at 5% Significance Level**										
415											
416	**Gamma Statistics**										
417					k hat (MLE)	0.75			k star (bias corrected MLE)		0.592
418					Theta hat (MLE)	959.7			Theta star (bias corrected MLE)		1217
419					nu hat (MLE)	15.01			nu star (bias corrected)		11.84
420					MLE Mean (bias corrected)	720			MLE Sd (bias corrected)		935.9
421									Approximate Chi Square Value (0.05)		5.12
422					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value		4.377
423											
424	**Assuming Gamma Distribution**										
425					95% Approximate Gamma UCL (use when n>=50))	1665			95% Adjusted Gamma UCL (use when n<50)		1947
426											
427	**Lognormal GOF Test**										
428					Shapiro Wilk Test Statistic	0.928			**Shapiro Wilk Lognormal GOF Test**		
429					5% Shapiro Wilk Critical Value	0.842			Data appear Lognormal at 5% Significance Level		
430					Lilliefors Test Statistic	0.201			**Lilliefors Lognormal GOF Test**		
431					5% Lilliefors Critical Value	0.28			Data appear Lognormal at 5% Significance Level		
432	**Data appear Lognormal at 5% Significance Level**										
433											
434	**Lognormal Statistics**										
435					Minimum of Logged Data	3.959			Mean of logged Data		5.781
436					Maximum of Logged Data	8.134			SD of logged Data		1.274
437											
438	**Assuming Lognormal Distribution**										
439					95% H-UCL	3500			90% Chebyshev (MVUE) UCL		1469
440					95% Chebyshev (MVUE) UCL	1842			97.5% Chebyshev (MVUE) UCL		2360
441					99% Chebyshev (MVUE) UCL	3378					
442											
443	**Nonparametric Distribution Free UCL Statistics**										
444	**Data appear to follow a Discernible Distribution at 5% Significance Level**										
445											
446	**Nonparametric Distribution Free UCLs**										
447					95% CLT UCL	1286			95% Jackknife UCL		1351
448					95% Standard Bootstrap UCL	1259			95% Bootstrap-t UCL		4993
449					95% Hall's Bootstrap UCL	4838			95% Percentile Bootstrap UCL		1343
450					95% BCA Bootstrap UCL	1519					
451					90% Chebyshev(Mean, Sd) UCL	1752			95% Chebyshev(Mean, Sd) UCL		2220
452					97.5% Chebyshev(Mean, Sd) UCL	2869			99% Chebyshev(Mean, Sd) UCL		4144
453											
454	**Suggested UCL to Use**										
455					95% Chebyshev (Mean, Sd) UCL	2220					
456											
457	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
458	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
459	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
460	For additional insight the user may want to consult a statistician.										
461											

462	**Di-n-butylphthalate**										
463											
464	**General Statistics**										
465	Total Number of Observations				10	Number of Distinct Observations					10
466	Number of Detects				7	Number of Non-Detects					3
467	Number of Distinct Detects				7	Number of Distinct Non-Detects					3
468	Minimum Detect				0.414	Minimum Non-Detect					0.342
469	Maximum Detect				6.76	Maximum Non-Detect					0.4
470	Variance Detects				5.171	Percent Non-Detects					30%
471	Mean Detects				2.224	SD Detects					2.274
472	Median Detects				1.47	CV Detects					1.022
473	Skewness Detects				1.658	Kurtosis Detects					2.43
474	Mean of Logged Detects				0.38	SD of Logged Detects					0.992
475											
476	**Normal GOF Test on Detects Only**										
477	Shapiro Wilk Test Statistic				0.799	**Shapiro Wilk GOF Test**					
478	5% Shapiro Wilk Critical Value				0.803	Detected Data Not Normal at 5% Significance Level					
479	Lilliefors Test Statistic				0.322	**Lilliefors GOF Test**					
480	5% Lilliefors Critical Value				0.335	Detected Data appear Normal at 5% Significance Level					
481	**Detected Data appear Approximate Normal at 5% Significance Level**										
482											
483	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
484	Mean				1.66	Standard Error of Mean					0.67
485	SD				1.961	95% KM (BCA) UCL					2.772
486	95% KM (t) UCL				2.888	95% KM (Percentile Bootstrap) UCL					2.762
487	95% KM (z) UCL				2.762	95% KM Bootstrap t UCL					5.248
488	90% KM Chebyshev UCL				3.669	95% KM Chebyshev UCL					4.58
489	97.5% KM Chebyshev UCL				5.843	99% KM Chebyshev UCL					8.325
490											
491	**Gamma GOF Tests on Detected Observations Only**										
492	A-D Test Statistic				0.32	**Anderson-Darling GOF Test**					
493	5% A-D Critical Value				0.723	Detected data appear Gamma Distributed at 5% Significance Level					
494	K-S Test Statistic				0.239	**Kolmogrov-Smirnoff GOF**					
495	5% K-S Critical Value				0.318	Detected data appear Gamma Distributed at 5% Significance Level					
496	**Detected data appear Gamma Distributed at 5% Significance Level**										
497											
498	**Gamma Statistics on Detected Data Only**										
499	k hat (MLE)				1.334	k star (bias corrected MLE)					0.858
500	Theta hat (MLE)				1.667	Theta star (bias corrected MLE)					2.594
501	nu hat (MLE)				18.68	nu star (bias corrected)					12.01
502	MLE Mean (bias corrected)				2.224	MLE Sd (bias corrected)					2.402
503											
504	**Gamma Kaplan-Meier (KM) Statistics**										
505	k hat (KM)				0.716	nu hat (KM)					14.32
506	Approximate Chi Square Value (14.32, α)				6.792	Adjusted Chi Square Value (14.32, β)					5.914
507	95% Gamma Approximate KM-UCL (use when n>=50)				3.5	95% Gamma Adjusted KM-UCL (use when n<50)					4.019
508											
509	**Gamma ROS Statistics using Imputed Non-Detects**										
510	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
511	GROS may not be used when kstar of detected data is small such as < 0.1										
512	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
513	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
514	Minimum				0.01	Mean					1.56
515	Maximum				6.76	Median					0.824
516	SD				2.143	CV					1.374
517	k hat (MLE)				0.419	k star (bias corrected MLE)					0.36
518	Theta hat (MLE)				3.726	Theta star (bias corrected MLE)					4.337
519	nu hat (MLE)				8.373	nu star (bias corrected)					7.195
520	MLE Mean (bias corrected)				1.56	MLE Sd (bias corrected)					2.601
521						Adjusted Level of Significance (β)					0.0267
522	Approximate Chi Square Value (7.19, α)				2.278	Adjusted Chi Square Value (7.19, β)					1.828
523	95% Gamma Approximate UCL (use when n>=50)				4.927	95% Gamma Adjusted UCL (use when n<50)					6.14
524											
525	**Lognormal GOF Test on Detected Observations Only**										
526	Shapiro Wilk Test Statistic				0.959	**Shapiro Wilk GOF Test**					
527	5% Shapiro Wilk Critical Value				0.803	Detected Data appear Lognormal at 5% Significance Level					
528	Lilliefors Test Statistic				0.178	**Lilliefors GOF Test**					
529	5% Lilliefors Critical Value				0.335	Detected Data appear Lognormal at 5% Significance Level					
530	**Detected Data appear Lognormal at 5% Significance Level**										
531											
532	**Lognormal ROS Statistics Using Imputed Non-Detects**										
533	Mean in Original Scale				1.592	Mean in Log Scale					-0.377
534	SD in Original Scale				2.117	SD in Log Scale					1.464
535	95% t UCL (assumes normality of ROS data)				2.82	95% Percentile Bootstrap UCL					2.778
536	95% BCA Bootstrap UCL				3.22	95% Bootstrap t UCL					4.739
537	95% H-UCL (Log ROS)				14.99						
538											

	A	B	C	D	E	F	G	H	I	J	K	L
539	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
540					KM Mean (logged)	-0.0559				95% H-UCL (KM -Log)		4.595
541					KM SD (logged)	1.017				95% Critical H Value (KM-Log)		3.138
542					KM Standard Error of Mean (logged)	0.347						
543												
544	**DL/2 Statistics**											
545	**DL/2 Normal**						**DL/2 Log-Transformed**					
546					Mean in Original Scale	1.612				Mean in Log Scale		-0.245
547					SD in Original Scale	2.102				SD in Log Scale		1.292
548					95% t UCL (Assumes normality)	2.831				95% H-Stat UCL		9.008
549	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
550												
551	**Nonparametric Distribution Free UCL Statistics**											
552	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
553												
554	**Suggested UCL to Use**											
555					95% KM (t) UCL	2.888				95% KM (Percentile Bootstrap) UCL		2.762
556												
557	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
558	Recommendations are based upon data size, data distribution, and skewness.											
559	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
560	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
561												

562	**2,4-DNT**										
563											
564	**General Statistics**										
565	Total Number of Observations				10	Number of Distinct Observations					10
566	Number of Detects				6	Number of Non-Detects					4
567	Number of Distinct Detects				6	Number of Distinct Non-Detects					4
568	Minimum Detect				2.79	Minimum Non-Detect					0.342
569	Maximum Detect				15.7	Maximum Non-Detect					0.4
570	Variance Detects				23.72	Percent Non-Detects					40%
571	Mean Detects				5.903	SD Detects					4.87
572	Median Detects				4.105	CV Detects					0.825
573	Skewness Detects				2.293	Kurtosis Detects					5.403
574	Mean of Logged Detects				1.584	SD of Logged Detects					0.611
575											
576	**Normal GOF Test on Detects Only**										
577	Shapiro Wilk Test Statistic				0.658	**Shapiro Wilk GOF Test**					
578	5% Shapiro Wilk Critical Value				0.788	Detected Data Not Normal at 5% Significance Level					
579	Lilliefors Test Statistic				0.392	**Lilliefors GOF Test**					
580	5% Lilliefors Critical Value				0.362	Detected Data Not Normal at 5% Significance Level					
581	**Detected Data Not Normal at 5% Significance Level**										
582											
583	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
584	Mean				3.679	Standard Error of Mean					1.521
585	SD				4.391	95% KM (BCA) UCL					6.12
586	95% KM (t) UCL				6.467	95% KM (Percentile Bootstrap) UCL					6.258
587	95% KM (z) UCL				6.181	95% KM Bootstrap t UCL					7.868
588	90% KM Chebyshev UCL				8.242	95% KM Chebyshev UCL					10.31
589	97.5% KM Chebyshev UCL				13.18	99% KM Chebyshev UCL					18.81
590											
591	**Gamma GOF Tests on Detected Observations Only**										
592	A-D Test Statistic				0.783	**Anderson-Darling GOF Test**					
593	5% A-D Critical Value				0.702	Detected Data Not Gamma Distributed at 5% Significance Level					
594	K-S Test Statistic				0.337	**Kolmogrov-Smirnoff GOF**					
595	5% K-S Critical Value				0.335	Detected Data Not Gamma Distributed at 5% Significance Level					
596	**Detected Data Not Gamma Distributed at 5% Significance Level**										
597											
598	**Gamma Statistics on Detected Data Only**										
599	k hat (MLE)				2.763	k star (bias corrected MLE)					1.493
600	Theta hat (MLE)				2.136	Theta star (bias corrected MLE)					3.955
601	nu hat (MLE)				33.16	nu star (bias corrected)					17.91
602	MLE Mean (bias corrected)				5.903	MLE Sd (bias corrected)					4.832
603											
604	**Gamma Kaplan-Meier (KM) Statistics**										
605	k hat (KM)				0.702	nu hat (KM)					14.04
606	Approximate Chi Square Value (14.04, α)				6.597	Adjusted Chi Square Value (14.04, β)					5.734
607	95% Gamma Approximate KM-UCL (use when n>=50)				7.828	95% Gamma Adjusted KM-UCL (use when n<50)					9.006
608											
609	**Gamma ROS Statistics using Imputed Non-Detects**										
610	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
611	GROS may not be used when kstar of detected data is small such as < 0.1										
612	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
613	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
614	Minimum				0.01	Mean					3.546
615	Maximum				15.7	Median					3.165
616	SD				4.737	CV					1.336
617	k hat (MLE)				0.317	k star (bias corrected MLE)					0.288
618	Theta hat (MLE)				11.19	Theta star (bias corrected MLE)					12.3
619	nu hat (MLE)				6.335	nu star (bias corrected)					5.768
620	MLE Mean (bias corrected)				3.546	MLE Sd (bias corrected)					6.603
621						Adjusted Level of Significance (β)					0.0267
622	Approximate Chi Square Value (5.77, α)				1.523	Adjusted Chi Square Value (5.77, β)					1.177
623	95% Gamma Approximate UCL (use when n>=50)				13.43	95% Gamma Adjusted UCL (use when n<50)					17.38
624											
625	**Lognormal GOF Test on Detected Observations Only**										
626	Shapiro Wilk Test Statistic				0.817	**Shapiro Wilk GOF Test**					
627	5% Shapiro Wilk Critical Value				0.788	Detected Data appear Lognormal at 5% Significance Level					
628	Lilliefors Test Statistic				0.294	**Lilliefors GOF Test**					
629	5% Lilliefors Critical Value				0.362	Detected Data appear Lognormal at 5% Significance Level					
630	**Detected Data appear Lognormal at 5% Significance Level**										
631											
632	**Lognormal ROS Statistics Using Imputed Non-Detects**										
633	Mean in Original Scale				3.95	Mean in Log Scale					0.958
634	SD in Original Scale				4.42	SD in Log Scale					0.928
635	95% t UCL (assumes normality of ROS data)				6.512	95% Percentile Bootstrap UCL					6.399
636	95% BCA Bootstrap UCL				7.765	95% Bootstrap t UCL					9.275
637	95% H-UCL (Log ROS)				9.997						
638											

	A	B	C	D	E	F	G	H	I	J	K	L
639	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
640					KM Mean (logged)	0.521				95% H-UCL (KM -Log)		25.77
641					KM SD (logged)	1.371				95% Critical H Value (KM-Log)		3.911
642					KM Standard Error of Mean (logged)	0.475						
643												
644	**DL/2 Statistics**											
645			**DL/2 Normal**				**DL/2 Log-Transformed**					
646					Mean in Original Scale	3.614				Mean in Log Scale		0.265
647					SD in Original Scale	4.681				SD in Log Scale		1.763
648					95% t UCL (Assumes normality)	6.328				95% H-Stat UCL		105.1
649	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
650												
651	**Nonparametric Distribution Free UCL Statistics**											
652	**Detected Data appear Lognormal Distributed at 5% Significance Level**											
653												
654	**Suggested UCL to Use**											
655					95% KM (t) UCL	6.467				95% KM (% Bootstrap) UCL		6.258
656												
657	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
658	Recommendations are based upon data size, data distribution, and skewness.											
659	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
660	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
661												

662	**Diphenylamine**										
663											
664	**General Statistics**										
665	Total Number of Observations				10	Number of Distinct Observations					10
666	Number of Detects				5	Number of Non-Detects					5
667	Number of Distinct Detects				5	Number of Distinct Non-Detects					5
668	Minimum Detect				0.0717	Minimum Non-Detect					0.342
669	Maximum Detect				1.3	Maximum Non-Detect					0.4
670	Variance Detects				0.26	Percent Non-Detects					50%
671	Mean Detects				0.401	SD Detects					0.51
672	Median Detects				0.182	CV Detects					1.271
673	Skewness Detects				2.082	Kurtosis Detects					4.423
674	Mean of Logged Detects				-1.439	SD of Logged Detects					1.086
675											
676	**Normal GOF Test on Detects Only**										
677	Shapiro Wilk Test Statistic				0.705	**Shapiro Wilk GOF Test**					
678	5% Shapiro Wilk Critical Value				0.762	Detected Data Not Normal at 5% Significance Level					
679	Lilliefors Test Statistic				0.372	**Lilliefors GOF Test**					
680	5% Lilliefors Critical Value				0.396	Detected Data appear Normal at 5% Significance Level					
681	**Detected Data appear Approximate Normal at 5% Significance Level**										
682											
683	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
684	Mean				0.289	Standard Error of Mean					0.127
685	SD				0.347	95% KM (BCA) UCL					0.504
686	95% KM (t) UCL				0.521	95% KM (Percentile Bootstrap) UCL					0.504
687	95% KM (z) UCL				0.497	95% KM Bootstrap t UCL					1.16
688	90% KM Chebyshev UCL				0.669	95% KM Chebyshev UCL					0.842
689	97.5% KM Chebyshev UCL				1.081	99% KM Chebyshev UCL					1.551
690											
691	**Gamma GOF Tests on Detected Observations Only**										
692	A-D Test Statistic				0.455	**Anderson-Darling GOF Test**					
693	5% A-D Critical Value				0.69	Detected data appear Gamma Distributed at 5% Significance Level					
694	K-S Test Statistic				0.273	**Kolmogrov-Smirnoff GOF**					
695	5% K-S Critical Value				0.364	Detected data appear Gamma Distributed at 5% Significance Level					
696	**Detected data appear Gamma Distributed at 5% Significance Level**										
697											
698	**Gamma Statistics on Detected Data Only**										
699	k hat (MLE)				1.087	k star (bias corrected MLE)					0.568
700	Theta hat (MLE)				0.369	Theta star (bias corrected MLE)					0.706
701	nu hat (MLE)				10.87	nu star (bias corrected)					5.683
702	MLE Mean (bias corrected)				0.401	MLE Sd (bias corrected)					0.532
703											
704	**Gamma Kaplan-Meier (KM) Statistics**										
705	k hat (KM)				0.693	nu hat (KM)					13.86
706	Approximate Chi Square Value (13.86, α)				6.479	Adjusted Chi Square Value (13.86, β)					5.625
707	95% Gamma Approximate KM-UCL (use when n>=50)				0.618	95% Gamma Adjusted KM-UCL (use when n<50)					0.712
708											
709	**Gamma ROS Statistics using Imputed Non-Detects**										
710	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
711	GROS may not be used when kstar of detected data is small such as < 0.1										
712	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
713	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
714	Minimum				0.0717	Mean					0.281
715	Maximum				1.3	Median					0.162
716	SD				0.363	CV					1.289
717	k hat (MLE)				1.523	k star (bias corrected MLE)					1.133
718	Theta hat (MLE)				0.185	Theta star (bias corrected MLE)					0.248
719	nu hat (MLE)				30.47	nu star (bias corrected)					22.66
720	MLE Mean (bias corrected)				0.281	MLE Sd (bias corrected)					0.264
721						Adjusted Level of Significance (β)					0.0267
722	Approximate Chi Square Value (22.66, α)				12.83	Adjusted Chi Square Value (22.66, β)					11.57
723	95% Gamma Approximate UCL (use when n>=50)				0.497	95% Gamma Adjusted UCL (use when n<50)					0.551
724											
725	**Lognormal GOF Test on Detected Observations Only**										
726	Shapiro Wilk Test Statistic				0.944	**Shapiro Wilk GOF Test**					
727	5% Shapiro Wilk Critical Value				0.762	Detected Data appear Lognormal at 5% Significance Level					
728	Lilliefors Test Statistic				0.204	**Lilliefors GOF Test**					
729	5% Lilliefors Critical Value				0.396	Detected Data appear Lognormal at 5% Significance Level					
730	**Detected Data appear Lognormal at 5% Significance Level**										
731											
732	**Lognormal ROS Statistics Using Imputed Non-Detects**										
733	Mean in Original Scale				0.282	Mean in Log Scale					-1.625
734	SD in Original Scale				0.362	SD in Log Scale					0.75
735	95% t UCL (assumes normality of ROS data)				0.492	95% Percentile Bootstrap UCL					0.497
736	95% BCA Bootstrap UCL				0.632	95% Bootstrap t UCL					1.794
737	95% H-UCL (Log ROS)				0.502						
738											

	A	B	C	D	E	F	G	H	I	J	K	L
739	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
740					KM Mean (logged)	-1.652				95% H-UCL (KM -Log)		0.555
741					KM SD (logged)	0.809				95% Critical H Value (KM-Log)		2.728
742					KM Standard Error of Mean (logged)	0.347						
743												
744	**DL/2 Statistics**											
745			**DL/2 Normal**						**DL/2 Log-Transformed**			
746					Mean in Original Scale	0.29				Mean in Log Scale		-1.58
747					SD in Original Scale	0.36				SD in Log Scale		0.741
748					95% t UCL (Assumes normality)	0.499				95% H-Stat UCL		0.515
749	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
750												
751	**Nonparametric Distribution Free UCL Statistics**											
752	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
753												
754	**Suggested UCL to Use**											
755					95% KM (t) UCL	0.521				95% KM (Percentile Bootstrap) UCL		0.504
756												
757	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
758	Recommendations are based upon data size, data distribution, and skewness.											
759	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
760	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
761												
762												

763	**Lead**										
764											
765	**General Statistics**										
766	Total Number of Observations				10	Number of Distinct Observations					10
767						Number of Missing Observations					0
768	Minimum				50.5	Mean					119.4
769	Maximum				259	Median					94.95
770	SD				71.93	Std. Error of Mean					22.75
771	Coefficient of Variation				0.603	Skewness					1.003
772											
773	**Normal GOF Test**										
774	Shapiro Wilk Test Statistic				0.875	**Shapiro Wilk GOF Test**					
775	5% Shapiro Wilk Critical Value				0.842	Data appear Normal at 5% Significance Level					
776	Lilliefors Test Statistic				0.217	**Lilliefors GOF Test**					
777	5% Lilliefors Critical Value				0.28	Data appear Normal at 5% Significance Level					
778	**Data appear Normal at 5% Significance Level**										
779											
780	**Assuming Normal Distribution**										
781	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
782	95% Student's-t UCL				161	95% Adjusted-CLT UCL (Chen-1995)					164.5
783						95% Modified-t UCL (Johnson-1978)					162.3
784											
785	**Gamma GOF Test**										
786	A-D Test Statistic				0.357	**Anderson-Darling Gamma GOF Test**					
787	5% A-D Critical Value				0.731	Detected data appear Gamma Distributed at 5% Significance Level					
788	K-S Test Statistic				0.165	**Kolmogrov-Smirnoff Gamma GOF Test**					
789	5% K-S Critical Value				0.268	Detected data appear Gamma Distributed at 5% Significance Level					
790	**Detected data appear Gamma Distributed at 5% Significance Level**										
791											
792	**Gamma Statistics**										
793	k hat (MLE)				3.342	k star (bias corrected MLE)					2.406
794	Theta hat (MLE)				35.71	Theta star (bias corrected MLE)					49.6
795	nu hat (MLE)				66.84	nu star (bias corrected)					48.12
796	MLE Mean (bias corrected)				119.4	MLE Sd (bias corrected)					76.94
797						Approximate Chi Square Value (0.05)					33.2
798	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value					31.06
799											
800	**Assuming Gamma Distribution**										
801	95% Approximate Gamma UCL (use when n>=50))				173	95% Adjusted Gamma UCL (use when n<50)					184.9
802											
803	**Lognormal GOF Test**										
804	Shapiro Wilk Test Statistic				0.926	**Shapiro Wilk Lognormal GOF Test**					
805	5% Shapiro Wilk Critical Value				0.842	Data appear Lognormal at 5% Significance Level					
806	Lilliefors Test Statistic				0.162	**Lilliefors Lognormal GOF Test**					
807	5% Lilliefors Critical Value				0.28	Data appear Lognormal at 5% Significance Level					
808	**Data appear Lognormal at 5% Significance Level**										
809											
810	**Lognormal Statistics**										
811	Minimum of Logged Data				3.922	Mean of logged Data					4.625
812	Maximum of Logged Data				5.557	SD of logged Data					0.588
813											
814	**Assuming Lognormal Distribution**										
815	95% H-UCL				192.3	90% Chebyshev (MVUE) UCL					186.9
816	95% Chebyshev (MVUE) UCL				217.7	97.5% Chebyshev (MVUE) UCL					260.4
817	99% Chebyshev (MVUE) UCL				344.4						
818											
819	**Nonparametric Distribution Free UCL Statistics**										
820	**Data appear to follow a Discernible Distribution at 5% Significance Level**										
821											
822	**Nonparametric Distribution Free UCLs**										
823	95% CLT UCL				156.8	95% Jackknife UCL					161
824	95% Standard Bootstrap UCL				154.5	95% Bootstrap-t UCL					182.4
825	95% Hall's Bootstrap UCL				187.5	95% Percentile Bootstrap UCL					158.3
826	95% BCA Bootstrap UCL				159.5						
827	90% Chebyshev(Mean, Sd) UCL				187.6	95% Chebyshev(Mean, Sd) UCL					218.5
828	97.5% Chebyshev(Mean, Sd) UCL				261.4	99% Chebyshev(Mean, Sd) UCL					345.7
829											
830	**Suggested UCL to Use**										
831	95% Student's-t UCL				161						
832											
833	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
834	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
835	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
836	For additional insight the user may want to consult a statistician.										
837											

838	**Mercury**										
839											
840	**General Statistics**										
841	Total Number of Observations				10	Number of Distinct Observations					10
842	Number of Detects				7	Number of Non-Detects					3
843	Number of Distinct Detects				7	Number of Distinct Non-Detects					3
844	Minimum Detect				0.00514	Minimum Non-Detect					0.0103
845	Maximum Detect				0.488	Maximum Non-Detect					0.0119
846	Variance Detects				0.0328	Percent Non-Detects					30%
847	Mean Detects				0.0775	SD Detects					0.181
848	Median Detects				0.0107	CV Detects					2.336
849	Skewness Detects				2.644	Kurtosis Detects					6.994
850	Mean of Logged Detects				-4.185	SD of Logged Detects					1.572
851											
852	**Normal GOF Test on Detects Only**										
853	Shapiro Wilk Test Statistic				0.468	**Shapiro Wilk GOF Test**					
854	5% Shapiro Wilk Critical Value				0.803	Detected Data Not Normal at 5% Significance Level					
855	Lilliefors Test Statistic				0.497	**Lilliefors GOF Test**					
856	5% Lilliefors Critical Value				0.335	Detected Data Not Normal at 5% Significance Level					
857	**Detected Data Not Normal at 5% Significance Level**										
858											
859	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
860	Mean				0.0564	Standard Error of Mean					0.0491
861	SD				0.144	95% KM (BCA) UCL					0.153
862	95% KM (t) UCL				0.147	95% KM (Percentile Bootstrap) UCL					0.152
863	95% KM (z) UCL				0.137	95% KM Bootstrap t UCL					2.775
864	90% KM Chebyshev UCL				0.204	95% KM Chebyshev UCL					0.271
865	97.5% KM Chebyshev UCL				0.363	99% KM Chebyshev UCL					0.545
866											
867	**Gamma GOF Tests on Detected Observations Only**										
868	A-D Test Statistic				1.622	**Anderson-Darling GOF Test**					
869	5% A-D Critical Value				0.767	Detected Data Not Gamma Distributed at 5% Significance Level					
870	K-S Test Statistic				0.486	**Kolmogrov-Smirnoff GOF**					
871	5% K-S Critical Value				0.331	Detected Data Not Gamma Distributed at 5% Significance Level					
872	**Detected Data Not Gamma Distributed at 5% Significance Level**										
873											
874	**Gamma Statistics on Detected Data Only**										
875	k hat (MLE)				0.404	k star (bias corrected MLE)					0.326
876	Theta hat (MLE)				0.192	Theta star (bias corrected MLE)					0.238
877	nu hat (MLE)				5.651	nu star (bias corrected)					4.563
878	MLE Mean (bias corrected)				0.0775	MLE Sd (bias corrected)					0.136
879											
880	**Gamma Kaplan-Meier (KM) Statistics**										
881	k hat (KM)				0.154	nu hat (KM)					3.079
882	Approximate Chi Square Value (3.08, α)				0.396	Adjusted Chi Square Value (3.08, β)					0.272
883	95% Gamma Approximate KM-UCL (use when n>=50)				0.439	95% Gamma Adjusted KM-UCL (use when n<50)					0.639
884											
885	**Gamma ROS Statistics using Imputed Non-Detects**										
886	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
887	GROS may not be used when kstar of detected data is small such as < 0.1										
888	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
889	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
890	Minimum				0.00514	Mean					0.0572
891	Maximum				0.488	Median					0.01
892	SD				0.151	CV					2.644
893	k hat (MLE)				0.446	k star (bias corrected MLE)					0.379
894	Theta hat (MLE)				0.128	Theta star (bias corrected MLE)					0.151
895	nu hat (MLE)				8.915	nu star (bias corrected)					7.574
896	MLE Mean (bias corrected)				0.0572	MLE Sd (bias corrected)					0.093
897						Adjusted Level of Significance (β)					0.0267
898	Approximate Chi Square Value (7.57, α)				2.491	Adjusted Chi Square Value (7.57, β)					2.014
899	95% Gamma Approximate UCL (use when n>=50)				0.174	95% Gamma Adjusted UCL (use when n<50)					0.215
900											
901	**Lognormal GOF Test on Detected Observations Only**										
902	Shapiro Wilk Test Statistic				0.661	**Shapiro Wilk GOF Test**					
903	5% Shapiro Wilk Critical Value				0.803	Detected Data Not Lognormal at 5% Significance Level					
904	Lilliefors Test Statistic				0.401	**Lilliefors GOF Test**					
905	5% Lilliefors Critical Value				0.335	Detected Data Not Lognormal at 5% Significance Level					
906	**Detected Data Not Lognormal at 5% Significance Level**										
907											
908	**Lognormal ROS Statistics Using Imputed Non-Detects**										
909	Mean in Original Scale				0.0563	Mean in Log Scale					-4.435
910	SD in Original Scale				0.152	SD in Log Scale					1.349
911	95% t UCL (assumes normality of ROS data)				0.144	95% Percentile Bootstrap UCL					0.152
912	95% BCA Bootstrap UCL				0.2	95% Bootstrap t UCL					3.247
913	95% H-UCL (Log ROS)				0.167						
914											

	A	B	C	D	E	F	G	H	I	J	K	L
915	**DL/2 Statistics**											
916	**DL/2 Normal**						**DL/2 Log-Transformed**					
917					Mean in Original Scale	0.0559				Mean in Log Scale		-4.491
918					SD in Original Scale	0.152				SD in Log Scale		1.375
919					95% t UCL (Assumes normality)	0.144				95% H-Stat UCL		0.174
920	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
921												
922	**Nonparametric Distribution Free UCL Statistics**											
923	**Data do not follow a Discernible Distribution at 5% Significance Level**											
924												
925	**Suggested UCL to Use**											
926					99% KM (Chebyshev) UCL	0.545						
927	**Warning: Recommended UCL exceeds the maximum observation**											
928												
929	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
930	Recommendations are based upon data size, data distribution, and skewness.											
931	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
932	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
933												

934	**Perchlorate**										
935											
936	**General Statistics**										
937	Total Number of Observations				10	Number of Distinct Observations					9
938	Number of Detects				5	Number of Non-Detects					5
939	Number of Distinct Detects				5	Number of Distinct Non-Detects					4
940	Minimum Detect				5.9000E-4	Minimum Non-Detect					0.00204
941	Maximum Detect				0.00574	Maximum Non-Detect					0.00215
942	Variance Detects				4.3971E-6	Percent Non-Detects					50%
943	Mean Detects				0.00206	SD Detects					0.0021
944	Median Detects				0.00135	CV Detects					1.017
945	Skewness Detects				2.024	Kurtosis Detects					4.257
946	Mean of Logged Detects				-6.511	SD of Logged Detects					0.852
947											
948	**Normal GOF Test on Detects Only**										
949	Shapiro Wilk Test Statistic				0.737	**Shapiro Wilk GOF Test**					
950	5% Shapiro Wilk Critical Value				0.762	Detected Data Not Normal at 5% Significance Level					
951	Lilliefors Test Statistic				0.372	**Lilliefors GOF Test**					
952	5% Lilliefors Critical Value				0.396	Detected Data appear Normal at 5% Significance Level					
953	**Detected Data appear Approximate Normal at 5% Significance Level**										
954											
955	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
956	Mean				0.0016	Standard Error of Mean					5.2968E-4
957	SD				0.00143	95% KM (BCA) UCL					0.00249
958	95% KM (t) UCL				0.00257	95% KM (Percentile Bootstrap) UCL					0.00249
959	95% KM (z) UCL				0.00247	95% KM Bootstrap t UCL					0.00369
960	90% KM Chebyshev UCL				0.00319	95% KM Chebyshev UCL					0.00391
961	97.5% KM Chebyshev UCL				0.00491	99% KM Chebyshev UCL					0.00687
962											
963	**Gamma GOF Tests on Detected Observations Only**										
964	A-D Test Statistic				0.441	**Anderson-Darling GOF Test**					
965	5% A-D Critical Value				0.686	Detected data appear Gamma Distributed at 5% Significance Level					
966	K-S Test Statistic				0.297	**Kolmogrov-Smirnoff GOF**					
967	5% K-S Critical Value				0.361	Detected data appear Gamma Distributed at 5% Significance Level					
968	**Detected data appear Gamma Distributed at 5% Significance Level**										
969											
970	**Gamma Statistics on Detected Data Only**										
971	k hat (MLE)				1.679	k star (bias corrected MLE)					0.805
972	Theta hat (MLE)				0.00123	Theta star (bias corrected MLE)					0.00256
973	nu hat (MLE)				16.79	nu star (bias corrected)					8.05
974	MLE Mean (bias corrected)				0.00206	MLE Sd (bias corrected)					0.0023
975											
976	**Gamma Kaplan-Meier (KM) Statistics**										
977	k hat (KM)				1.249	nu hat (KM)					24.98
978	Approximate Chi Square Value (24.98, α)				14.59	Adjusted Chi Square Value (24.98, β)					13.23
979	95% Gamma Approximate KM-UCL (use when n>=50)				0.00274	95% Gamma Adjusted KM-UCL (use when n<50)					0.00302
980											
981	**Gamma ROS Statistics using Imputed Non-Detects**										
982	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
983	GROS may not be used when kstar of detected data is small such as < 0.1										
984	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
985	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
986	Minimum				5.9000E-4	Mean					0.00603
987	Maximum				0.01	Median					0.00787
988	SD				0.00441	CV					0.731
989	k hat (MLE)				1.259	k star (bias corrected MLE)					0.948
990	Theta hat (MLE)				0.00479	Theta star (bias corrected MLE)					0.00636
991	nu hat (MLE)				25.18	nu star (bias corrected)					18.96
992	MLE Mean (bias corrected)				0.00603	MLE Sd (bias corrected)					0.00619
993						Adjusted Level of Significance (β)					0.0267
994	Approximate Chi Square Value (18.96, α)				10.09	Adjusted Chi Square Value (18.96, β)					8.983
995	95% Gamma Approximate UCL (use when n>=50)				0.0113	95% Gamma Adjusted UCL (use when n<50)					0.0127
996											
997	**Lognormal GOF Test on Detected Observations Only**										
998	Shapiro Wilk Test Statistic				0.937	**Shapiro Wilk GOF Test**					
999	5% Shapiro Wilk Critical Value				0.762	Detected Data appear Lognormal at 5% Significance Level					
1000	Lilliefors Test Statistic				0.243	**Lilliefors GOF Test**					
1001	5% Lilliefors Critical Value				0.396	Detected Data appear Lognormal at 5% Significance Level					
1002	**Detected Data appear Lognormal at 5% Significance Level**										
1003											
1004	**Lognormal ROS Statistics Using Imputed Non-Detects**										
1005	Mean in Original Scale				0.0016	Mean in Log Scale					-6.658
1006	SD in Original Scale				0.00149	SD in Log Scale					0.61
1007	95% t UCL (assumes normality of ROS data)				0.00246	95% Percentile Bootstrap UCL					0.00251
1008	95% BCA Bootstrap UCL				0.00301	95% Bootstrap t UCL					0.00456
1009	95% H-UCL (Log ROS)				0.00251						
1010											

	A	B	C	D	E	F	G	H	I	J	K	L
1011	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
1012					KM Mean (logged)	-6.679				95% H-UCL (KM -Log)		0.00255
1013					KM SD (logged)	0.63				95% Critical H Value (KM-Log)		2.416
1014					KM Standard Error of Mean (logged)	0.268						
1015												
1016	**DL/2 Statistics**											
1017	**DL/2 Normal**						**DL/2 Log-Transformed**					
1018					Mean in Original Scale	0.00155				Mean in Log Scale		-6.689
1019					SD in Original Scale	0.0015				SD in Log Scale		0.599
1020					95% t UCL (Assumes normality)	0.00242				95% H-Stat UCL		0.00239
1021	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1022												
1023	**Nonparametric Distribution Free UCL Statistics**											
1024	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
1025												
1026	**Suggested UCL to Use**											
1027					95% KM (t) UCL	0.00257				95% KM (Percentile Bootstrap) UCL		0.00249
1028												
1029	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1030	Recommendations are based upon data size, data distribution, and skewness.											
1031	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1032	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1033												

1034	**TATB**										
1035											
1036	**General Statistics**										
1037	Total Number of Observations				10	Number of Distinct Observations					8
1038	Number of Detects				7	Number of Non-Detects					3
1039	Number of Distinct Detects				7	Number of Distinct Non-Detects					1
1040	Minimum Detect				0.435	Minimum Non-Detect					1
1041	Maximum Detect				9.71	Maximum Non-Detect					1
1042	Variance Detects				10.59	Percent Non-Detects					30%
1043	Mean Detects				3.381	SD Detects					3.255
1044	Median Detects				2.07	CV Detects					0.963
1045	Skewness Detects				1.402	Kurtosis Detects					1.909
1046	Mean of Logged Detects				0.754	SD of Logged Detects					1.123
1047											
1048	**Normal GOF Test on Detects Only**										
1049	Shapiro Wilk Test Statistic				0.865	**Shapiro Wilk GOF Test**					
1050	5% Shapiro Wilk Critical Value				0.803	Detected Data appear Normal at 5% Significance Level					
1051	Lilliefors Test Statistic				0.228	**Lilliefors GOF Test**					
1052	5% Lilliefors Critical Value				0.335	Detected Data appear Normal at 5% Significance Level					
1053	**Detected Data appear Normal at 5% Significance Level**										
1054											
1055	**Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs**										
1056	Mean				2.521	Standard Error of Mean					0.971
1057	SD				2.843	95% KM (BCA) UCL					4.201
1058	95% KM (t) UCL				4.302	95% KM (Percentile Bootstrap) UCL					4.182
1059	95% KM (z) UCL				4.119	95% KM Bootstrap t UCL					6.048
1060	90% KM Chebyshev UCL				5.435	95% KM Chebyshev UCL					6.755
1061	97.5% KM Chebyshev UCL				8.588	99% KM Chebyshev UCL					12.19
1062											
1063	**Gamma GOF Tests on Detected Observations Only**										
1064	A-D Test Statistic				0.218	**Anderson-Darling GOF Test**					
1065	5% A-D Critical Value				0.725	Detected data appear Gamma Distributed at 5% Significance Level					
1066	K-S Test Statistic				0.164	**Kolmogrov-Smirnoff GOF**					
1067	5% K-S Critical Value				0.318	Detected data appear Gamma Distributed at 5% Significance Level					
1068	**Detected data appear Gamma Distributed at 5% Significance Level**										
1069											
1070	**Gamma Statistics on Detected Data Only**										
1071	k hat (MLE)				1.217	k star (bias corrected MLE)					0.791
1072	Theta hat (MLE)				2.777	Theta star (bias corrected MLE)					4.275
1073	nu hat (MLE)				17.04	nu star (bias corrected)					11.07
1074	MLE Mean (bias corrected)				3.381	MLE Sd (bias corrected)					3.802
1075											
1076	**Gamma Kaplan-Meier (KM) Statistics**										
1077	k hat (KM)				0.786	nu hat (KM)					15.72
1078	Approximate Chi Square Value (15.72, α)				7.764	Adjusted Chi Square Value (15.72, β)					6.815
1079	95% Gamma Approximate KM-UCL (use when n>=50)				5.103	95% Gamma Adjusted KM-UCL (use when n<50)					5.814
1080											
1081	**Gamma ROS Statistics using Imputed Non-Detects**										
1082	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
1083	GROS may not be used when kstar of detected data is small such as < 0.1										
1084	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
1085	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
1086	Minimum				0.01	Mean					2.431
1087	Maximum				9.71	Median					1.304
1088	SD				3.071	CV					1.263
1089	k hat (MLE)				0.481	k star (bias corrected MLE)					0.403
1090	Theta hat (MLE)				5.054	Theta star (bias corrected MLE)					6.027
1091	nu hat (MLE)				9.622	nu star (bias corrected)					8.069
1092	MLE Mean (bias corrected)				2.431	MLE Sd (bias corrected)					3.828
1093						Adjusted Level of Significance (β)					0.0267
1094	Approximate Chi Square Value (8.07, α)				2.775	Adjusted Chi Square Value (8.07, β)					2.265
1095	95% Gamma Approximate UCL (use when n>=50)				7.07	95% Gamma Adjusted UCL (use when n<50)					8.662
1096											
1097	**Lognormal GOF Test on Detected Observations Only**										
1098	Shapiro Wilk Test Statistic				0.95	**Shapiro Wilk GOF Test**					
1099	5% Shapiro Wilk Critical Value				0.803	Detected Data appear Lognormal at 5% Significance Level					
1100	Lilliefors Test Statistic				0.189	**Lilliefors GOF Test**					
1101	5% Lilliefors Critical Value				0.335	Detected Data appear Lognormal at 5% Significance Level					
1102	**Detected Data appear Lognormal at 5% Significance Level**										
1103											
1104	**Lognormal ROS Statistics Using Imputed Non-Detects**										
1105	Mean in Original Scale				2.536	Mean in Log Scale					0.325
1106	SD in Original Scale				2.989	SD in Log Scale					1.179
1107	95% t UCL (assumes normality of ROS data)				4.269	95% Percentile Bootstrap UCL					4.067
1108	95% BCA Bootstrap UCL				4.52	95% Bootstrap t UCL					5.937
1109	95% H-UCL (Log ROS)				10.91						
1110											

	A	B	C	D	E	F	G	H	I	J	K	L
1111	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
1112					KM Mean (logged)	0.324				95% H-UCL (KM -Log)		8.355
1113					KM SD (logged)	1.093				95% Critical H Value (KM-Log)		3.297
1114					KM Standard Error of Mean (logged)	0.376						
1115												
1116	**DL/2 Statistics**											
1117	**DL/2 Normal**						**DL/2 Log-Transformed**					
1118					Mean in Original Scale	2.517				Mean in Log Scale		0.32
1119					SD in Original Scale	3				SD in Log Scale		1.153
1120					95% t UCL (Assumes normality)	4.256				95% H-Stat UCL		9.986
1121	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
1122												
1123	**Nonparametric Distribution Free UCL Statistics**											
1124	**Detected Data appear Normal Distributed at 5% Significance Level**											
1125												
1126	**Suggested UCL to Use**											
1127					95% KM (t) UCL	4.302				95% KM (Percentile Bootstrap) UCL		4.182
1128												
1129	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1130	Recommendations are based upon data size, data distribution, and skewness.											
1131	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
1132	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
1133												
1134												

1135	**Zinc**										
1136											
1137	**General Statistics**										
1138					Total Number of Observations	10			Number of Distinct Observations		10
1139									Number of Missing Observations		0
1140					Minimum	43.7			Mean		68.34
1141					Maximum	194			Median		49.95
1142					SD	46.3			Std. Error of Mean		14.64
1143					Coefficient of Variation	0.678			Skewness		2.704
1144											
1145	**Normal GOF Test**										
1146					Shapiro Wilk Test Statistic	0.578			**Shapiro Wilk GOF Test**		
1147					5% Shapiro Wilk Critical Value	0.842			Data Not Normal at 5% Significance Level		
1148					Lilliefors Test Statistic	0.37			**Lilliefors GOF Test**		
1149					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level		
1150	**Data Not Normal at 5% Significance Level**										
1151											
1152	**Assuming Normal Distribution**										
1153					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**		
1154					95% Student's-t UCL	95.18			95% Adjusted-CLT UCL (Chen-1995)		105.8
1155									95% Modified-t UCL (Johnson-1978)		97.27
1156											
1157	**Gamma GOF Test**										
1158					A-D Test Statistic	1.496			**Anderson-Darling Gamma GOF Test**		
1159					5% A-D Critical Value	0.729			Data Not Gamma Distributed at 5% Significance Level		
1160					K-S Test Statistic	0.335			**Kolmogrov-Smirnoff Gamma GOF Test**		
1161					5% K-S Critical Value	0.268			Data Not Gamma Distributed at 5% Significance Level		
1162	**Data Not Gamma Distributed at 5% Significance Level**										
1163											
1164	**Gamma Statistics**										
1165					k hat (MLE)	4.165			k star (bias corrected MLE)		2.982
1166					Theta hat (MLE)	16.41			Theta star (bias corrected MLE)		22.92
1167					nu hat (MLE)	83.3			nu star (bias corrected)		59.64
1168					MLE Mean (bias corrected)	68.34			MLE Sd (bias corrected)		39.57
1169									Approximate Chi Square Value (0.05)		42.89
1170					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value		40.43
1171											
1172	**Assuming Gamma Distribution**										
1173					95% Approximate Gamma UCL (use when n>=50))	95.04			95% Adjusted Gamma UCL (use when n<50)		100.8
1174											
1175	**Lognormal GOF Test**										
1176					Shapiro Wilk Test Statistic	0.703			**Shapiro Wilk Lognormal GOF Test**		
1177					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level		
1178					Lilliefors Test Statistic	0.302			**Lilliefors Lognormal GOF Test**		
1179					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level		
1180	**Data Not Lognormal at 5% Significance Level**										
1181											
1182	**Lognormal Statistics**										
1183					Minimum of Logged Data	3.777			Mean of logged Data		4.1
1184					Maximum of Logged Data	5.268			SD of logged Data		0.464
1185											
1186	**Assuming Lognormal Distribution**										
1187					95% H-UCL	93.94			90% Chebyshev (MVUE) UCL		96.06
1188					95% Chebyshev (MVUE) UCL	109.5			97.5% Chebyshev (MVUE) UCL		128.2
1189					99% Chebyshev (MVUE) UCL	164.8					
1190											
1191	**Nonparametric Distribution Free UCL Statistics**										
1192	**Data do not follow a Discernible Distribution (0.05)**										
1193											
1194	**Nonparametric Distribution Free UCLs**										
1195					95% CLT UCL	92.42			95% Jackknife UCL		95.18
1196					95% Standard Bootstrap UCL	91.2			95% Bootstrap-t UCL		230.6
1197					95% Hall's Bootstrap UCL	197.1			95% Percentile Bootstrap UCL		95.41
1198					95% BCA Bootstrap UCL	108.3					
1199					90% Chebyshev(Mean, Sd) UCL	112.3			95% Chebyshev(Mean, Sd) UCL		132.2
1200					97.5% Chebyshev(Mean, Sd) UCL	159.8			99% Chebyshev(Mean, Sd) UCL		214
1201											
1202	**Suggested UCL to Use**										
1203					95% Student's-t UCL	95.18			or 95% Modified-t UCL		97.27
1204											
1205	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
1206	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
1207	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
1208	For additional insight the user may want to consult a statistician.										
1209											
1210											

1211	**Dioxins Mammals**										
1212											
1213	**General Statistics**										
1214	Total Number of Observations				10	Number of Distinct Observations					10
1215						Number of Missing Observations					0
1216	Minimum				7.4000E-8	Mean					1.2572E-6
1217	Maximum				5.6500E-6	Median					2.9250E-7
1218	SD				1.9111E-6	Std. Error of Mean					6.0434E-7
1219	Coefficient of Variation				N/A	Skewness					1.891
1220											
1221	**Normal GOF Test**										
1222	Shapiro Wilk Test Statistic				0.643	**Shapiro Wilk GOF Test**					
1223	5% Shapiro Wilk Critical Value				0.842	Data Not Normal at 5% Significance Level					
1224	Lilliefors Test Statistic				0.37	**Lilliefors GOF Test**					
1225	5% Lilliefors Critical Value				0.28	Data Not Normal at 5% Significance Level					
1226	**Data Not Normal at 5% Significance Level**										
1227											
1228	**Assuming Normal Distribution**										
1229	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
1230	95% Student's-t UCL				2.3650E-6	95% Adjusted-CLT UCL (Chen-1995)					2.6375E-6
1231						95% Modified-t UCL (Johnson-1978)					2.4253E-6
1232											
1233	**Gamma GOF Test**										
1234	A-D Test Statistic				1.107	**Anderson-Darling Gamma GOF Test**					
1235	5% A-D Critical Value				0.763	Data Not Gamma Distributed at 5% Significance Level					
1236	K-S Test Statistic				0.332	**Kolmogrov-Smirnoff Gamma GOF Test**					
1237	5% K-S Critical Value				0.277	Data Not Gamma Distributed at 5% Significance Level					
1238	**Data Not Gamma Distributed at 5% Significance Level**										
1239											
1240	**Gamma Statistics**										
1241	k hat (MLE)				0.68	k star (bias corrected MLE)					0.543
1242	Theta hat (MLE)				1.8475E-6	Theta star (bias corrected MLE)					2.3152E-6
1243	nu hat (MLE)				13.61	nu star (bias corrected)					10.86
1244	MLE Mean (bias corrected)				1.2572E-6	MLE Sd (bias corrected)					1.7061E-6
1245						Approximate Chi Square Value (0.05)					4.486
1246	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value					3.8
1247											
1248	**Assuming Gamma Distribution**										
1249	95% Approximate Gamma UCL (use when n>=50))				3.0434E-6	95% Adjusted Gamma UCL (use when n<50)					3.5926E-6
1250											
1251	**Lognormal GOF Test**										
1252	Shapiro Wilk Test Statistic				0.869	**Shapiro Wilk Lognormal GOF Test**					
1253	5% Shapiro Wilk Critical Value				0.842	Data appear Lognormal at 5% Significance Level					
1254	Lilliefors Test Statistic				0.261	**Lilliefors Lognormal GOF Test**					
1255	5% Lilliefors Critical Value				0.28	Data appear Lognormal at 5% Significance Level					
1256	**Data appear Lognormal at 5% Significance Level**										
1257											
1258	**Lognormal Statistics**										
1259	Minimum of Logged Data				-16.42	Mean of logged Data					-14.48
1260	Maximum of Logged Data				-12.08	SD of logged Data					1.343
1261											
1262	**Assuming Lognormal Distribution**										
1263	95% H-UCL				7.1038E-6	90% Chebyshev (MVUE) UCL					2.5867E-6
1264	95% Chebyshev (MVUE) UCL				3.2592E-6	97.5% Chebyshev (MVUE) UCL					4.1926E-6
1265	99% Chebyshev (MVUE) UCL				6.0261E-6						
1266											
1267	**Nonparametric Distribution Free UCL Statistics**										
1268	**Data appear to follow a Discernible Distribution at 5% Significance Level**										
1269											
1270	**Nonparametric Distribution Free UCLs**										
1271	95% CLT UCL				2.2513E-6	95% Jackknife UCL					2.3650E-6
1272	95% Standard Bootstrap UCL				2.2078E-6	95% Bootstrap-t UCL					6.7656E-6
1273	95% Hall's Bootstrap UCL				8.1566E-6	95% Percentile Bootstrap UCL					2.2531E-6
1274	95% BCA Bootstrap UCL				2.5483E-6						
1275	90% Chebyshev(Mean, Sd) UCL				3.0702E-6	95% Chebyshev(Mean, Sd) UCL					3.8915E-6
1276	97.5% Chebyshev(Mean, Sd) UCL				5.0313E-6	99% Chebyshev(Mean, Sd) UCL					7.2703E-6
1277											
1278	**Suggested UCL to Use**										
1279	95% Chebyshev (Mean, Sd) UCL				3.8915E-6						
1280											
1281	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
1282	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
1283	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
1284	For additional insight the user may want to consult a statistician.										
1285											
1286											

1287	**Dioxins Avian**										
1288											
1289	**General Statistics**										
1290	Total Number of Observations				10	Number of Distinct Observations					10
1291						Number of Missing Observations					0
1292	Minimum				1.8600E-8	Mean					1.7752E-6
1293	Maximum				7.2100E-6	Median					5.2550E-7
1294	SD				2.8020E-6	Std. Error of Mean					8.8608E-7
1295	Coefficient of Variation				N/A	Skewness					1.627
1296											
1297	**Normal GOF Test**										
1298	Shapiro Wilk Test Statistic				0.653	**Shapiro Wilk GOF Test**					
1299	5% Shapiro Wilk Critical Value				0.842	Data Not Normal at 5% Significance Level					
1300	Lilliefors Test Statistic				0.365	**Lilliefors GOF Test**					
1301	5% Lilliefors Critical Value				0.28	Data Not Normal at 5% Significance Level					
1302	**Data Not Normal at 5% Significance Level**										
1303											
1304	**Assuming Normal Distribution**										
1305	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
1306	95% Student's-t UCL				3.3995E-6	95% Adjusted-CLT UCL (Chen-1995)					3.7199E-6
1307						95% Modified-t UCL (Johnson-1978)					3.4755E-6
1308											
1309	**Gamma GOF Test**										
1310	A-D Test Statistic				0.531	**Anderson-Darling Gamma GOF Test**					
1311	5% A-D Critical Value				0.79	Detected data appear Gamma Distributed at 5% Significance Level					
1312	K-S Test Statistic				0.236	**Kolmogrov-Smirnoff Gamma GOF Test**					
1313	5% K-S Critical Value				0.283	Detected data appear Gamma Distributed at 5% Significance Level					
1314	**Detected data appear Gamma Distributed at 5% Significance Level**										
1315											
1316	**Gamma Statistics**										
1317	k hat (MLE)				0.431	k star (bias corrected MLE)					0.368
1318	Theta hat (MLE)				4.1174E-6	Theta star (bias corrected MLE)					4.8178E-6
1319	nu hat (MLE)				8.623	nu star (bias corrected)					7.369
1320	MLE Mean (bias corrected)				1.7752E-6	MLE Sd (bias corrected)					2.9245E-6
1321						Approximate Chi Square Value (0.05)					2.376
1322	Adjusted Level of Significance				0.0267	Adjusted Chi Square Value					1.913
1323											
1324	**Assuming Gamma Distribution**										
1325	95% Approximate Gamma UCL (use when n>=50)				5.5071E-6	95% Adjusted Gamma UCL (use when n<50)					6.8377E-6
1326											
1327	**Lognormal GOF Test**										
1328	Shapiro Wilk Test Statistic				0.936	**Shapiro Wilk Lognormal GOF Test**					
1329	5% Shapiro Wilk Critical Value				0.842	Data appear Lognormal at 5% Significance Level					
1330	Lilliefors Test Statistic				0.148	**Lilliefors Lognormal GOF Test**					
1331	5% Lilliefors Critical Value				0.28	Data appear Lognormal at 5% Significance Level					
1332	**Data appear Lognormal at 5% Significance Level**										
1333											
1334	**Lognormal Statistics**										
1335	Minimum of Logged Data				-17.8	Mean of logged Data					-14.75
1336	Maximum of Logged Data				-11.84	SD of logged Data					2.061
1337											
1338	**Assuming Lognormal Distribution**										
1339	95% H-UCL				1.4784E-4	90% Chebyshev (MVUE) UCL					6.2394E-6
1340	95% Chebyshev (MVUE) UCL				8.1230E-6	97.5% Chebyshev (MVUE) UCL					1.0737E-5
1341	99% Chebyshev (MVUE) UCL				1.5873E-5						
1342											
1343	**Nonparametric Distribution Free UCL Statistics**										
1344	**Data appear to follow a Discernible Distribution at 5% Significance Level**										
1345											
1346	**Nonparametric Distribution Free UCLs**										
1347	95% CLT UCL				3.2327E-6	95% Jackknife UCL					3.3995E-6
1348	95% Standard Bootstrap UCL				3.1780E-6	95% Bootstrap-t UCL					8.2882E-6
1349	95% Hall's Bootstrap UCL				1.0371E-5	95% Percentile Bootstrap UCL					3.2045E-6
1350	95% BCA Bootstrap UCL				3.7286E-6						
1351	90% Chebyshev(Mean, Sd) UCL				4.4335E-6	95% Chebyshev(Mean, Sd) UCL					5.6375E-6
1352	97.5% Chebyshev(Mean, Sd) UCL				7.3088E-6	99% Chebyshev(Mean, Sd) UCL					1.0592E-5
1353											
1354	**Suggested UCL to Use**										
1355	95% Adjusted Gamma UCL				6.8377E-6						
1356											
1357	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.										
1358	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)										
1359	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.										
1360	For additional insight the user may want to consult a statistician.										
1361											

Antimony	D_Antimon	**Aroclor-12**	D_Aroclor-1	**Aroclor-12**	D_Aroclor-1	**Bis(2-ethy**	D_Bis(2-eth	**Copper**	D_Copper	**Di-n-butyl**	D_Di-n-but	**2,4-DNT**	D_2,4-DNT	**Diphenyla**	D_Dipheny	**Lead**	D_Lead	**Mercury**	D_Mercury	**Perchlora**	D_Perchlor	**TATB**	D_TATB	**Zinc**	D_Zinc	**Dioxins Ma**	D_Dioxins I	**Dioxins Av**	D_Dioxins Avian
0.566	1	0.0381	1	0.0177	1	0.101	1	312	1	0.414	1	0.349	0	0.349	0	217	1	0.488	1	0.000948	1	5.19	1	194	1	3.84E-06	1	7.21E-06	1
3.36	1	0.002	1	0.0016	1	0.403	1	1910	1	0.342	0	0.342	0	0.342	0	50.5	1	0.0103	0	0.00206	0	0.435	1	43.7	1	2.49E-07	1	5.52E-08	1
2.5	1	0.0031	1	0.0028	1	0.354	0	52.4	1	0.354	0	0.354	0	0.354	0	53.8	1	0.00514	1	0.00168	1	1	0	45.8	1	2.90E-07	1	1.05E-07	1
1.16	0	0.0084	1	0.0052	1	0.4	0	79.8	1	0.4	0	0.4	0	0.4	0	51.2	1	0.00956	1	0.00135	1	1	0	56.8	1	2.95E-07	1	5.47E-07	1
2.18	1	0.007	1	0.0054	1	2.42	1	3410	1	6.76	1	15.7	1	1.3	1	98	1	0.0128	1	0.00574	1	0.592	1	91	1	5.65E-06	1	6.75E-06	1
0.996	1	0.005	1	0.0026	1	0.144	1	196	1	3.68	1	4.52	1	0.309	1	91.9	1	0.00523	1	0.00208	0	9.71	1	49.4	1	2.83E-07	1	5.44E-08	1
0.478	1	0.0108	1	0.0063	1	0.358	0	225	1	1.12	1	2.79	1	0.182	1	139	1	0.0107	1	0.00215	0	1	0	46.3	1	2.72E-07	1	5.04E-07	1
0.758	1	0.0113	1	0.0135	1	0.291	1	323	1	0.527	1	5.18	1	0.348	0	259	1	0.011	1	0.00059	1	2.07	1	60.2	1	1.20E-06	1	1.93E-06	1
0.523	1	0.0028	1	0.0034	0	0.915	1	229	1	1.6	1	3.69	1	0.0717	1	83.1	1	0.0108	0	0.00204	0	3.69	1	45.7	1	7.40E-08	1	1.86E-08	1
1.05	1	0.0058	1	0.0026	1	0.437	1	463	1	1.47	1	3.54	1	0.143	1	150	1	0.0119	0	0.00208	0	1.98	1	50.5	1	4.19E-07	1	5.78E-07	1

Aroclor-126	D_Aroclor-1	**Benzo(b)flu**	D_Benzo(b)flu	**Bis(2-eth**	D_Bis(2-etl	**Copper**	D_Copper	**Di-n-buty**	D_Di-n-but	**Fluoranth**	D_Fluorant	**HMX**	D_HMX	**Lead**	D_Lead	**Perchlora**	D_Perchlor	**Pyrene**	D_Pyrene	**RDX**	D_RDX	**TATB**	D_TATB	**Uranium-**	D_Uranium	**Uranium-**	D_Uranium	**Uranium-**	D_Uranium	**1,3-Xylen**	D_1,3-Xyle	**Dioxins Ma**	D_Dioxins	**Dioxins Av**	D_Dioxins Avian
0.0017	1	0.0283	1	0.346	0	49.1	1	0.147	1	0.0162	1	0.974	1	18.9	1	0.00208	0	0.0121	1	1.16	1	7.98	1	3.62	1	0.515	1	19.4	1	0.00105	1	3.37E-06	1	2.31E-06	1
0.0175	0	0.035	0	0.132	1	32	1	0.31	1	0.035	0	0.267	1	17.6	1	0.000717	1	0.035	0	0.5	0	37.3	1	0.648	1	0.0446	0	1.31	1	0.00039	1	3.82E-07	1	1.30E-07	1
0.0016	1	0.0257	1	0.342	0	99.2	1	0.342	0	0.0106	1	7.69	1	22.4	1	0.00206	0	0.0342	0	0.5	0	30.5	1	13.8	1	1.83	1	105	1	0.00206	0	3.55E-06	1	2.36E-06	1
0.017	0	0.0396	1	0.128	1	349	1	0.341	0	0.0651	1	2.41	1	20.6	1	0.00905	1	0.122	1	2.61	1	30.8	1	0.56	1	0.0396	0	0.788	1	0.000823	1	1.05E-07	1	2.51E-08	1
0.0172	0	0.0342	0	8.4	1	212	1	0.342	0	0.0342	0	0.222	1	11.1	1	0.000669	1	0.0342	0	0.189	1	29.1	1	3.02	1	0.446	1	18.6	1	0.00206	0	1.04E-06	1	8.94E-07	1
0.0027	1	0.0353	0	0.353	0	88.7	1	1.2	1	0.0353	0	2.27	1	30.7	1	0.00213	0	0.0353	0	0.105	1	24.4	1	1.01	1	0.075	1	4.09	1	0.00213	0	2.41E-07	1	5.88E-08	1
0.0342	0	0.0343	0	0.289	1	83.2	1	0.343	0	0.0343	0	0.151	1	32.9	1	0.00206	0	0.0343	0	0.138	1	34.9	1	0.726	1	0.0524	0	1.19	1	0.00206	0	1.25E-07	1	2.84E-08	1
0.0174	0	0.0348	0	0.247	1	55.9	1	0.0884	1	0.0348	0	0.5	0	23.8	1	0.000912	1	0.0348	0	0.144	1	31.1	1	0.847	1	0.0749	1	1.57	1	0.00209	0	5.22E-07	1	1.62E-07	1
0.019	0	0.038	0	0.38	0	32.5	1	0.38	0	0.038	0	0.5	0	13.9	1	0.000594	1	0.038	0	0.5	0	11.4	1	4.09	1	0.558	1	26.4	1	0.00229	0	4.51E-07	1	1.39E-07	1
0.0013	1	0.037	0	0.37	0	7.09	1	0.37	0	0.037	0	24.5	1	10.9	1	0.00166	1	0.037	0	0.5	0	1.35	1	1.5	1	0.179	1	5.29	1	0.00223	0	1.20E-07	1	2.62E-08	1
0.0167	0	0.0334	0	0.0833	1	1470	1	0.334	0	0.0334	0	67.4	1	14.5	1	0.00202	0	0.0334	0	0.5	0	23.7	1	2.45	1	0.274	1	15.6	1	0.00202	0	7.10E-07	1	2.22E-07	1
0.0168	0	0.0337	0	0.337	0	49.9	1	0.337	0	0.0337	0	0.5	0	20.8	1	0.00203	0	0.0337	0	0.5	0	27.9	1	3.04	1	0.418	1	19.8	1	0.00203	0	8.62E-07	1	2.67E-07	1
0.0351	0	0.0183	1	0.351	0	34.1	1	0.146	1	0.0242	1	1.18	1	20.1	1	0.00212	0	0.0211	1	0.5	0	33.8	1	2.16	1	0.259	1	10.6	1	0.00212	0	4.38E-06	1	2.75E-06	1
0.0207	1	0.0334	0	0.334	0	61.1	1	0.334	0	0.0334	0	0.419	1	18.1	1	0.00272	1	0.0334	0	0.5	0	16.9	1	5.11	1	0.648	1	31.7	1	0.000565	1	4.01E-06	1	2.78E-06	1
0.0172	0	0.0915	1	0.343	0	27.5	1	0.133	1	0.142	1	0.516	1	19.7	1	0.00206	0	0.137	1	0.608	1	3.52	1	1.8	1	0.185	1	9.21	1	0.00101	1	3.74E-06	1	2.54E-06	1
0.0168	0	0.0336	0	0.108	1	31.9	1	0.0827	1	0.0336	0	0.5	0	10.6	1	0.000854	1	0.0336	0	0.5	0	7.73	1	2.08	1	0.32	1	12.1	1	0.00203	0	1.37E-06	1	4.39E-07	1
0.0188	0	0.0157	1	0.374	0	13.4	1	0.374	0	0.0202	1	0.5	0	10.9	1	0.000585	1	0.0285	1	0.5	0	1.14	1	1.32	1	0.168	1	5.81	1	0.00226	0	4.91E-07	1	1.48E-07	1
0.0183	0	0.0365	0	0.365	0	22	1	0.365	0	0.0365	0	0.5	0	11.9	1	0.00219	0	0.0365	0	0.5	0	1.74	1	1.15	1	0.096	1	3.9	1	0.00219	0	1.84E-07	1	3.86E-08	1
0.0177	0	0.0353	0	0.0889	1	29.6	1	0.176	1	0.0353	0	0.0346	0	19	1	0.00213	0	0.0353	0	0.5	0	19.8	1	2.87	1	0.314	1	16.3	1	0.00213	0	1.61E-05	1	1.08E-05	1

Supplement 4-10

Predicting and Controlling Noise from Detonation Activities

Los Alamos
NATIONAL LABORATORY
EST. 1943

Deployed Environmental Safety Health
Weapons Facility Operations

To: Brian Watkins, WFO-DO C919
Thru: Thomas Sisneros, WFO-DO, MS C919
From: Bob Stokes, DESH-WFO, MS C927
Phone: 505-606-0947
Symbol: DESH-20-018
Date: March 26, 2020

Subject: Predicting and Controlling Noise from Detonation Activities

Since the 1950s explosives testing has been conducted on Laboratory property. While the explosive noise was noticeable, the majority of this time the test were not concerning to the public. Addressing several citizens concerns in 2007 the noise produced during explosives test were studied with regard predicting and mitigating noise to neighboring communities, Laboratory workers, and management processes. Subsequent concerns made it clear that information could be made more quickly available for the Laboratory's communications office also.

Prior to 2007 outdoor explosive work at LANL was conducted believing the remoteness of the area and hilly terrain would mitigate the noise to our neighboring communities. Following a set of explosive shot in 2007 initiated to reduce the explosive inventory numerous complaints were received. As a result, the Weapons Division began work on a process to predict the noise at site boundaries. Between 2007 and 2011, many explosive shots were conducted with noise monitoring in place. Using the inputs from these noise measurements and pertinent meteorology inputs a predictive model for noise was developed.

The predictive model is nick named "Noise Machine" provides an adequate approximation of the noise level being generated during open detonation activities. Today outdoor explosive shots that are greater than 10lbs are require to be evaluated to predicted noise level prior to firing. The Noise Machine is a Java application used by weapons personnel to predict sound levels that will occur at the time of firing. For predicted sound levels above 110 dB, the programmatic responsible line manager must be notified to review weather conditions such as temperature, wind speed, and wind direction and the details of the shot configuration to decide whether to execute the shot. If predicted sound levels exceed 115dB, the division manager approval is required prior to firing. While the Noise Machine is an adequate predictor of the noise generated during open air detonations the randomness weather could cause the prediction to fluctuate a few dB.

Workers involved in actual open detonation operations are stationed in the control building at the site during detonation. Based on past personnel exposure monitoring the impulse sound level will be between 126dB and 134dB. These levels are below the occupational exposure limit of 140dB set by the American Conference of Governmental Industrial Hygienist (ACGIH). Various types of hearing protection are available to workers and visitors during open detonation operations as a precautionary measure.

LA-UR-20-24479

To allow for quick response to community concerns access control personnel notify Laboratory communication office of shot activities If The Noise Machine is unavailable, then all shots that weigh over 10lbs require division management approval prior to firing.

The work performed by the Weapons Division and Weapons Facilities Operations to address noise has provided an adequate process to understand and mitigate noise to LANL workers and neighboring communities. Management having personal responsibility for predicted noise greater than 110dB provides an assurance that the noise issue is taken seriously. Finally, the prior notification of shot activities provided to the LANL Communication Office provides the Laboratory the ability to respond to public concerns quickly.

RCS:rcs

Copy: Brian Watkins, WFO-DO, bwatkins@lanl.gov
Thomas Sisneros, WFO-DO, tsisneros@lanl.gov
Chuck Mielke, J-DO cmielke@lanl.gov
Eric Brown, M-DO, en_brown@lanl.gov
Stephanie Archuleta, DESH-DO, sarchuleta@lanl.gov
Janice Salazar, DESH-WFO, jaragon@lanl.gov
Bob Lechel, DESH-WFO, lechel@lanl.gov
Mandy Smith, DGL-M6, demanda@lanl.gov
Luciana Vigil-Holterman, EPC-WMP, luciana@lanl.gov

Supplement 4-11

Open Burning Unit Groundwater Monitoring and Surface Drainage Information

Table 4.11-1. Pertinent Groundwater Data At or Above Regulatory Standards for Monitoring the TA-16 Burn Ground, 2000-2019

Location	Analyte	# of analyses	# of Detects	% Detects	Detects versus Nondetects	Minimum Report Result	Maximum Report Result	Action Limit	Units	Action Limit Type	# of Exceedances	First Sample Date	Last Sample Date
Spring													
Bulldog Spring	Iron	46	45	97.8	45/1	45	5120	1000	µg/L	NM GW STD	9	9/9/2004	8/14/2019
Burning Ground Spring	Iron	131	98	74.8	98/33	22.3	1710	1000	µg/L	NM GW STD	10	1/10/2000	8/17/2019
Burning Ground Spring	RDX	74	71	95.9	71/3	6	100	9.66	µg/L	NMED A1 TAP SCRN LVL	66	1/31/2000	8/17/2019
Martin Spring	Aluminum	122	87	71.3	87/35	51	8620	5000	µg/L	NM GW STD	6	1/10/2000	8/10/2019
Martin Spring	Arsenic	122	31	25.4	31/91	1.3	10.1	10	µg/L	NM GW STD	1	1/10/2000	8/10/2019
Martin Spring	Benzo(a)anthracene	19	1	5.3	1/18	0.186	0.186	0.12	µg/L	NMED A1 TAP SCRN LVL	1	4/18/2001	2/23/2018
Martin Spring	Boron	114	114	100.0	114/0	508	2840	750	µg/L	NM GW STD	109	1/10/2000	8/10/2019
Martin Spring	Iron	122	91	74.6	91/31	29.3	5200	1000	µg/L	NM GW STD	23	1/10/2000	8/10/2019
Martin Spring	Nitrobenzene	88	1	1.1	1/87	2.4	2.4	1.4	µg/L	NMED A1 TAP SCRN LVL	1	1/31/2000	8/10/2019
Martin Spring	RDX	70	67	95.7	67/3	3.54	230	9.66	µg/L	NMED A1 TAP SCRN LVL	65	1/31/2000	8/10/2019
SWSC Spring	Iron	67	56	83.6	56/11	41.6	10200	1000	µg/L	NM GW STD	15	1/10/2000	3/16/2019
SWSC Spring	Lead	67	13	19.4	13/54	0.204	20.2	15	µg/L	NM GW STD	1	1/10/2000	3/16/2019
SWSC Spring	Perchlorate	37	22	59.5	22/15	0.428	17.1	13.8	µg/L	NMED A1 TAP SCRN LVL	1	3/21/2000	3/16/2019
SWSC Spring	RDX	36	35	97.2	35/1	12.7	296	9.66	µg/L	NMED A1 TAP SCRN LVL	35	1/31/2000	3/16/2019
Alluvial													
CDV-16-02656	Barium	88	86	97.7	86/2	1150	5150	2000	µg/L	NM GW STD	80	3/23/2000	8/17/2019
CDV-16-02656	Cadmium	88	28	31.8	28/60	0.041	5.2	5	µg/L	NM GW STD	1	3/23/2000	8/17/2019
CDV-16-02656	Lead	88	37	42.0	37/51	0.063	16.4	15	µg/L	NM GW STD	1	3/23/2000	8/17/2019
CDV-16-02659	Barium	92	92	100.0	92/0	3130	13600	2000	µg/L	NM GW STD	92	3/28/2000	8/10/2019
CDV-16-02659	Dinitrobenzene[1,3-]	56	1	1.8	1/55	12	12	2	µg/L	EPA TAP SCRN LVL	1	3/28/2000	8/10/2019
CDV-16-02659	Mercury	106	2	1.9	2/104	0.063	4.4	2	µg/L	NM GW STD	1	3/28/2000	8/10/2019
CDV-16-02659	RDX	57	56	98.2	56/1	2.51	112	9.66	µg/L	NMED A1 TAP SCRN LVL	38	3/28/2000	8/10/2019
CDV-16-611923	Barium	27	27	100.0	27/0	4950	49400	2000	µg/L	NM GW STD	27	4/2/2010	8/9/2019
CDV-16-611923	Iron	27	26	96.3	26/1	83.6	11900	1000	µg/L	NM GW STD	16	4/2/2010	8/9/2019
CDV-16-611923	Manganese	27	27	100.0	27/0	2.05	7510	200	µg/L	NM GW STD	21	4/2/2010	8/9/2019
CDV-16-611923	RDX	23	21	91.3	21/2	0.285	15	9.66	µg/L	NMED A1 TAP SCRN LVL	1	4/2/2010	8/9/2019
CDV-16-611937	Barium	20	20	100.0	20/0	148	13500	2000	µg/L	NM GW STD	15	4/1/2010	8/9/2019
CDV-16-611937	Iron	20	20	100.0	20/0	486	13700	1000	µg/L	NM GW STD	18	4/1/2010	8/9/2019
CDV-16-611937	Manganese	20	20	100.0	20/0	323	4060	200	µg/L	NM GW STD	20	4/1/2010	8/9/2019
FLC-16-25280	Aluminum	9	9	100.0	9/0	1740	29900	5000	µg/L	NM GW STD	6	4/3/2008	3/8/2019
FLC-16-25280	Iron	9	9	100.0	9/0	1100	16700	1000	µg/L	NM GW STD	9	4/3/2008	3/8/2019
FLC-16-25280	Manganese	9	9	100.0	9/0	12.4	345	200	µg/L	NM GW STD	2	4/3/2008	3/8/2019

Location	Analyte	# of analyses	# of Detects	% Detects	Detects versus Nondetects	Minimum Report Result	Maximum Report Result	Action Limit	Units	Action Limit Type	# of Exceedances	First Sample Date	Last Sample Date
FLC-16-25280	Tetrachloroethene	8	8	100.0	8/0	6.09	200	5	µg/L	NM GW STD	8	2/16/2006	3/8/2019
FLC-16-25280	Trichloroethene	8	8	100.0	8/0	2.97	11.8	5	µg/L	NM GW STD	3	2/16/2006	3/8/2019
Intermediate													
16-26644	RDX	29	29	100.0	29/0	0.876	96.5	9.66	µg/L	NMED A1 TAP SCRN LVL	9	4/20/2010	8/7/2019
16-26644	Tetrachloroethene	21	21	100.0	21/0	0.64	5.03	5	µg/L	NM GW STD	1	4/20/2010	8/7/2019
CdV-16-1(i)	RDX	34	34	100.0	34/0	22.2	37.4	9.66	µg/L	NMED A1 TAP SCRN LVL	34	6/1/2005	11/1/2019
CdV-16-2(i)r	RDX	37	36	97.3	36/1	1.34	128	9.66	µg/L	NMED A1 TAP SCRN LVL	35	12/15/2005	8/12/2019
CDV-16-4ip S1	RDX	30	30	100.0	30/0	104	265	9.66	µg/L	NMED A1 TAP SCRN LVL	30	8/31/2010	8/12/2019
CDV-9-1(i) S1	RDX	16	16	100.0	16/0	8.03	37.3	9.66	µg/L	NMED A1 TAP SCRN LVL	15	5/21/2015	8/6/2019
R-25b	Bromodichloromethane	19	3	15.8	3/16	0.587	2.18	1.34	µg/L	NMED A1 TAP SCRN LVL	1	1/5/2009	3/20/2017
R-25b	Chlorodibromomethane	19	3	15.8	3/16	1.27	3.04	1.68	µg/L	NMED A1 TAP SCRN LVL	1	1/5/2009	3/20/2017
R-25b	Lead	28	13	46.4	13/15	0.512	54	15	µg/L	NM GW STD	2	1/5/2009	3/20/2017
R-25b	Total Dissolved Solids	19	19	100.0	19/0	32.9	1880	1000	mg/L	NM GW STD	3	1/5/2009	3/20/2017
R-26 PZ-2	Cobalt	14	14	100.0	14/0	2.15	98.2	50	µg/L	NM GW STD	3	4/15/2009	3/5/2019
R-26 PZ-2	Iron	14	8	57.1	8/6	34.2	16900	1000	µg/L	NM GW STD	4	4/15/2009	3/5/2019
R-26 PZ-2	Lead	14	4	28.6	4/10	0.968	16.7	15	µg/L	NM GW STD	1	4/15/2009	3/5/2019
R-26 PZ-2	Manganese	14	13	92.9	13/1	12	1380	200	µg/L	NM GW STD	4	4/15/2009	3/5/2019

EPA TAP SCRN LVL = U.S. Environmental Protection Agency screening level for tap water.
NMED A1 TAP SCRN LVL = New Mexico Environment Department screening level for tap water.
NM GW STD = New Mexico groundwater standard.

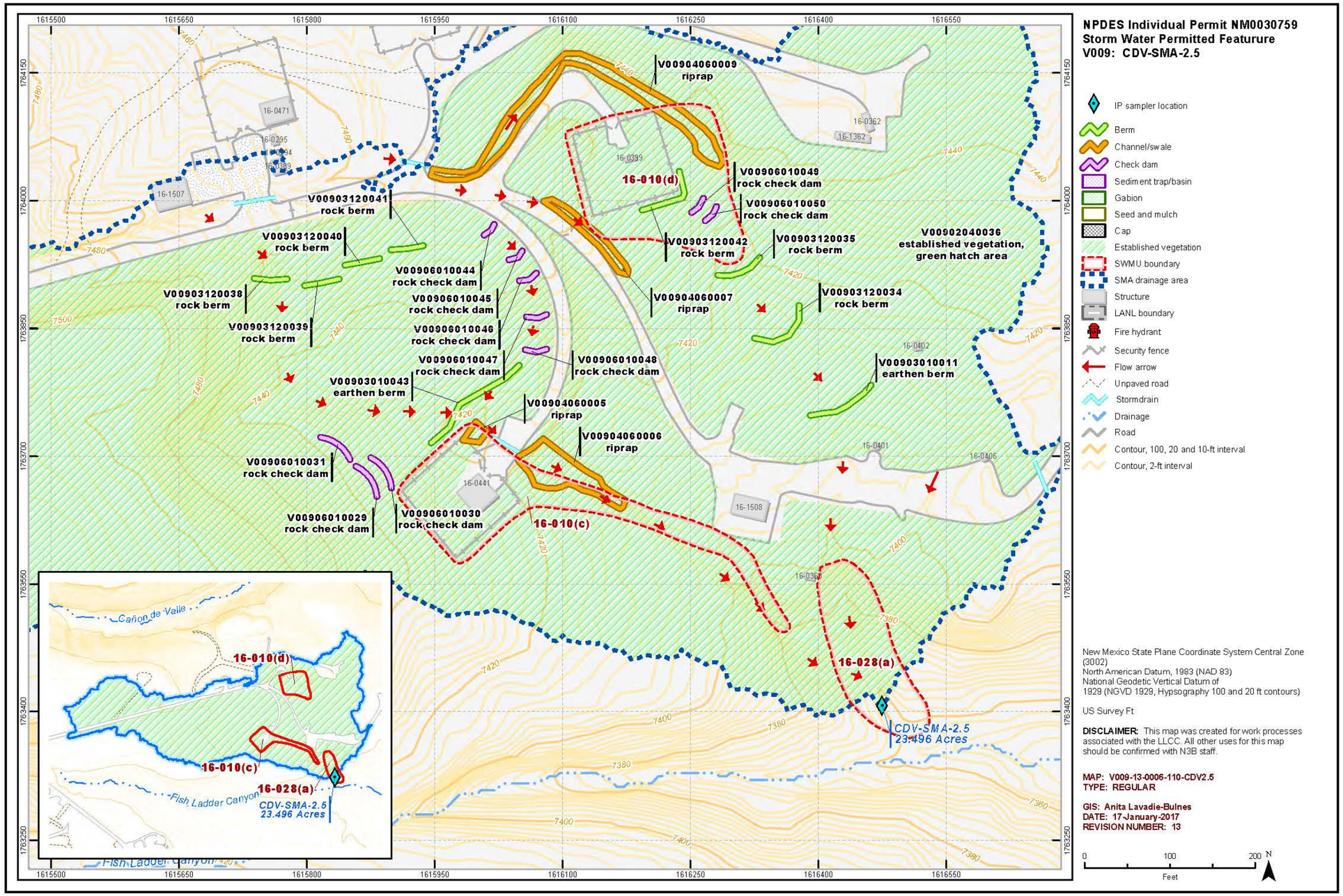
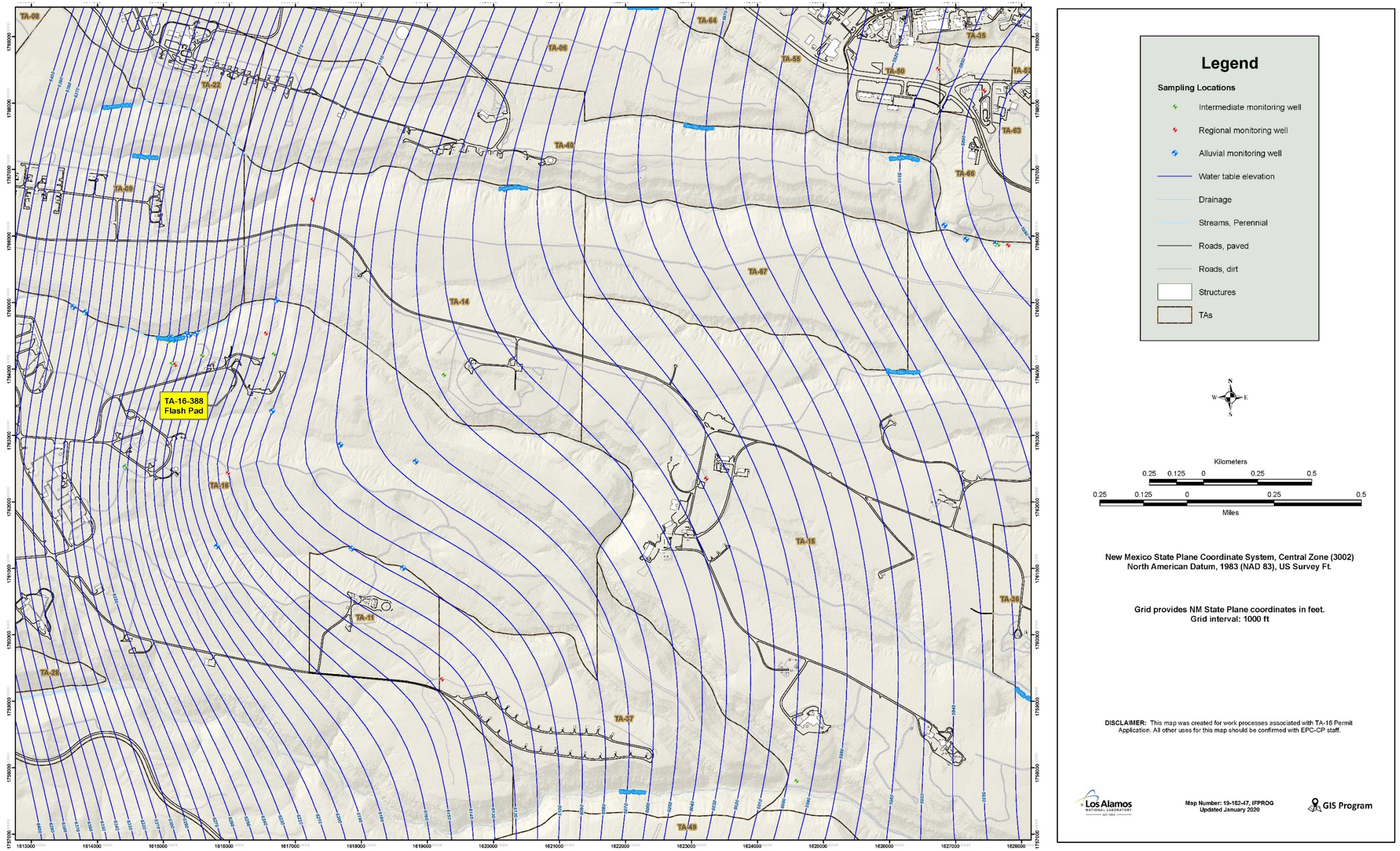


Figure 4.11-1. Drainage Control Features Near the TA-16-388 Open Burning Unit.



Legend

Sampling Locations

- Intermediate monitoring well
- Regional monitoring well
- Alluvial monitoring well
- Water table elevation
- Drainage
- Streams, Perennial
- Roads, paved
- Roads, dirt
- Structures
- TAs

N
W E
S

Kilometers
0.25 0.125 0 0.25 0.5

0.25 0.125 0 0.25 0.5
Miles

New Mexico State Plane Coordinate System, Central Zone (3002)
North American Datum, 1983 (NAD 83), US Survey Ft.

Grid provides NM State Plane coordinates in feet.
Grid interval: 1000 ft

DISCLAIMER: This map was created for work processes associated with TA-16 Permit Application. All other uses for this map should be confirmed with EPC-CP staff.

Los Alamos NATIONAL LABORATORY EST. 1943

Map Number: 19-182-47, IFPROG
Updated January 2020

GIS Program

Figure 4.11-2. Water Table Contours and Sampling Locations Downgradient of Unit at Technical Area 16

Supplement 4-12

Air Sampling at Open Burning Treatment Unit

2022 Technical Area (TA) 16-388 Flash Pad Air Sampling Summary for Resource Conservation and Recovery Act (RCRA) Permitting at Los Alamos National Laboratory

U.S. Department of Energy,
National Nuclear Security Administration Los Alamos Field Office, and
Triad National Security, LLC

[This page is intentionally blank.]

I Introduction

This report provides a summary of air sampling conducted by the Environmental Compliance Programs Group (EPC-CP) Airnet team. The team collected four samples in 2022 that were analyzed for metals and dioxin/furan compounds in support of the Resource Conservation and Recovery Act (RCRA) permit application process for a thermal treatment unit at the Los Alamos National Laboratory (LANL). The open burning thermal treatment unit is known as the Technical Area 16 (TA-16) 388 Flash Pad.

II Background

The TA-16-388 Flash Pad was installed in 1998 and has been utilized for the treatment of waste explosives and explosives-contaminated wastes exclusively. In the late summer of 2022, after the publication of a memorandum from the U.S. Environmental Protection Agency (EPA), regarding open burning and open detonation of waste explosives, the U.S. Department of Energy National Nuclear Security Administration, Los Alamos Field Office (NA-LA) and Triad National Security, LLC (Triad) determined that additional efforts to monitor air at the treatment unit was desired to reaffirm conclusions of air monitoring events conducted in 2010 and 2011 at the LANL open burning and open detonation units.

This document is a brief description of the work that was performed by the AIRNET team in the vicinity of the TA-16-388 Flash Pad, located within the TA-16 boundaries. The TA-16-388 Flash Pad is comprised of a 22 by 22 -foot (ft) concrete pad, with a 3 ft high wall on three sides. Three propane burners are currently used to treat hazardous waste within metal cages arranged on a metal platform. Individual burn treatment events typically last approximately 1 hour. Shannon Allen and Joan Lujan made up the field team. Shannon coordinated the equipment purchase and sample analysis. David Fuehne and Shimi Didla performed the data analysis with support from Luciana Vigil-Holterman.

III Air Sampling Events

Four air samples were collected that represent five different thermal treatment events, each occurring on different days (08/23/22, 08/25/22, 10/26/22, 11/01/22, and 11/02/22). Because of the equipment available at the time, only one type of sample was collected in August 2022. In October and November 2022, there were two types of samples collected. This section describes the four sampling events.

III.1 08/23/22 – 08/26/22 Sample Event

On Tuesday, 08/23/22 two air samplers were deployed at the TA-16 Burning Grounds. One was in the dominant downwind direction for the area (north of the TA-16-388 Flash Pad canopy) 72 meters from the unit; and the other was placed in a secondary downwind direction (east-southeast of the canopy), 69 meters from the unit. These locations (see Figure 1) were based on consultation with meteorology representatives. Additionally, a blank sample was collected for this event. The location of the air samplers was somewhat limited by power availability in the area, as generators may have affected the analytical results. The air samples were collected using high volume air samplers and an 8x10 inch polypropylene filter and were removed from the samplers on the morning of 08/26/22. The two samples and a blank polypropylene filter were sent off-site for chemical analysis for metals at GEL Laboratories LLC in Charleston, South Carolina utilizing EPA analytical methods 7471B, 6020B, 6010D.

During the time of deployment, two thermal treatments were conducted. One on 08/23/22 and another on 08/25/22. Both treatments consisted of 24 pounds of explosives machining waste. Explosives machining

waste is made up of water and machined waste explosives mixtures along with some cloth materials used for filtering out wet explosives from the water that is then reused in the machining process.

III.2 10/26/22 – 10/27/22 Sample Event

On Wednesday, 10/26/22 four air samplers were deployed at the TA-16 Burning Grounds. Sample locations were again identified based on consultation with meteorology representatives (see Figures 1 and 2). One high volume air sampler and one TE-1000 PUF (poly-urethane foam) high volume air sampler were placed 45 meters northwest of the canopy in the dominant wind downwind direction for the area, and the other two samplers (one of each) were located 59 meters northeast of the canopy in the predicted downwind direction for the day. The samples were collected on the morning of 10/27/22 and they along with the appropriate blank filters were sent off-site for chemical analysis. One sample from each location were placed in glassine envelopes, sealed in ziplock bags and sent by the LANL Sample Management Office to GEL Laboratories LLC in Charleston, South Carolina for analyses for metal concentrations utilizing EPA analytical methods 7471B, 6020B, 6010D. The other samples were placed in a cooler with ice for transportation to the LANL Sample Management Office and were subsequently shipped in a cooler with ice sent to Cape Fear Analytical, LLC in Wilmington, North Carolina for analysis by EPA compendium method TO-9A for polychlorinated dibenzo-p-dioxins and dibenzofurans (dioxin/furans).

One thermal treatment took place on the morning of 10/26/22 that consisted of 20 pounds of combustible debris. Explosives-contaminated combustible debris waste consists of explosives-contaminated debris that is generated as a result of explosives research laboratories and processing operations.

III.3 11/01/22 – 11/02/22 Sample Event

On Tuesday, 11/01/22 air samplers were deployed in the same manner and locations as the air samplers for the October sampling event. The samples were collected on the morning of 11/02/22 and those and the appropriate blanks were sent off to GEL and Cape Fear in the same manner and for the same analyses. These analytical results represent a thermal treatment from the morning of 11/01/22 of 80 pounds of explosives machining waste.

III.4 11/02/22 – 11/03/22 Sample Event

On Wednesday, 11/02/22 air samplers were deployed in the same manner and locations as the air samplers for the October sampling event. The samples were collected on the morning of 11/03/22 and those and the appropriate blanks were sent off to GEL and Cape Fear in the same manner and for the same analyses. These analytical results represent a thermal treatment from 11/02/22 of 40 pounds of explosives-contaminated sand waste. This waste stream consists of explosives-contaminated sand media from water filtration activities or maintenance activities.

IV Analytical Data and Data Analysis

Evaluations of the analytical data for each of the events sampled is included in Tables 1 (metals) and 2 (dioxin/furan). Field data were coordinated with the analyzed concentration data results to calculate volume concentrations that were then compared to chronic EPA Regional Screening Levels (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables) or, in the case of copper and mercury, Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency Reference Exposure Levels. These comparisons are included in Tables 1 and 2.

Calculated concentrations for detected metals were directly compared to the lowest available chronic screening levels. In some cases, the cancer screening level was utilized and in others only the noncancer screening level was available. Excepting chromium, all detected concentrations were determined to be

below the applicable chronic screening levels. In the case of chromium, there are no available comparison values for total chromium; therefore, the very conservative screening level for hexavalent chromium was utilized and in all samples that chromium was collected, it was present above the cancer screening level. It should be noted that there is no reason to expect any chromium in area is of the hexavalent valence state, and that EPA's noncancer screening level (at 0.1 micrograms per cubic meter) is well above all calculated concentrations.

Table 2 includes the analytical data for the PUF samples. There was a single detection of tetrachlorodibenzodioxin [2, 3, 7, 8-] within the six samples submitted for analysis. The calculated concentration of this congener was determined to be below the chronic cancer EPA Regional Screening Level.

Data comparisons included within this document represent the most conservative evaluation that could be conducted with the data gathered. The sample collection events were conducted over a longer time frame than the samples collected in 2011. That summary document is included as Attachment 1for completeness. Because the samplers were deployed for greater than just each treatment event and cooldown period, it was determined that chronic screening levels would be the more appropriate comparison. Additionally, chronic screening levels tend to be lower than acute screening levels.

Of the detected metals, aluminum, antimony, barium, copper, iron, lead, manganese, nickel, silver, and zinc were detected in both 2011 and 2022. Cadmium was only detected in 2011; and calcium, chromium, magnesium, mercury, potassium, sodium, thallium, and vanadium were only detected in 2022. In comparison, it should be noted that some Airnet samples on the Laboratory perimeter and at regional stations are routinely analyzed for airborne metals to provide trending over time. The metals analyzed for in these samples are aluminum, beryllium, and calcium. The measured air concentrations near the TA-16 Flash Pad in 2022 were consistent with or lower than levels measured at other locations around the Laboratory and the region, indicating their presence is likely from natural wind-blown soil and not a product of TA-16 operations.

V Conclusions

As with the 2011 sample collection events, analytical results and calculated concentration indicate that operations at the TA-16-388 Flash Pad did not exceed any appropriate state or federal screening levels identified for the analytes monitored. Lastly, where comparable, results are consistent with other air monitoring conducted throughout the LANL facility and the nearby region.

[This page is intentionally blank.]

FIGURES AND TABLES

[This page is intentionally blank.]

Site ID	Description	Time Period
16-0441A	north of canopy, 72 meters from burn tray	August 2022 particulate sampling
16-0441B	east-southeast of canopy, 69 meters from burn tray	August 2022 particulate sampling
16-0441C	QA/Blank sample	Both August and Oct/Nov sampling
16-0441D	Northwest of 16-0441 Canopy; 45m from burn tray	October/November sampling, particulate & PUF volatiles
16-0441E	Northeast of 16-0441 Canopy; 59m from burn tray	October/November sampling, particulate & PUF volatiles



Figure 1. Locations of air samplers for August 2022 sample collection.



Figure 2. Air samplers positioned for October and November 2022 sample collections.

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441A	08/26/2022	Silver	8.00E-01	N	4872.7894	1.64E-04	n/a		n/a
TA16-0441A	08/26/2022	Aluminum	3.05E+02	Y	4872.7894	6.26E-02	5.20E+00	N	N
TA16-0441A	08/26/2022	Arsenic	8.00E-01	N	4872.7894	1.64E-04	6.50E-04	C	n/a
TA16-0441A	08/26/2022	Barium	8.13E+00	Y	4872.7894	1.67E-03	5.20E-01	N	N
TA16-0441A	08/26/2022	Beryllium	8.00E-02	N	4872.7894	1.64E-05	1.20E-03	C	n/a
TA16-0441A	08/26/2022	Calcium	1.10E+03	Y	4872.7894	2.26E-01	n/a		n/a
TA16-0441A	08/26/2022	Cadmium	8.00E-01	N	4872.7894	1.64E-04	1.60E-03	C	n/a
TA16-0441A	08/26/2022	Cobalt	1.20E+00	N	4872.7894	2.46E-04	3.10E-04	C	n/a
TA16-0441A	08/26/2022	Chromium	1.56E+00	Y	4872.7894	3.20E-04	1.20E-05	C	Y
TA16-0441A	08/26/2022	Copper	1.51E+01	Y	4872.7894	3.10E-03	1.00E+02		N
TA16-0441A	08/26/2022	Iron	3.72E+02	Y	4872.7894	7.63E-02	n/a		n/a
TA16-0441A	08/26/2022	Mercury	3.22E-02	N	4872.7894	6.61E-06	3.00E-02		n/a
TA16-0441A	08/26/2022	Potassium	7.10E+02	Y	4872.7894	1.46E-01	n/a		n/a
TA16-0441A	08/26/2022	Magnesium	1.35E+02	Y	4872.7894	2.77E-02	n/a		n/a
TA16-0441A	08/26/2022	Manganese	1.76E+01	Y	4872.7894	3.61E-03	5.20E-02	N	N
TA16-0441A	08/26/2022	Sodium	1.75E+02	Y	4872.7894	3.59E-02	n/a		n/a
TA16-0441A	08/26/2022	Nickel	1.13E+00	Y	4872.7894	2.32E-04	1.00E-02	N	N
TA16-0441A	08/26/2022	Lead	4.71E+00	Y	4872.7894	9.67E-04	1.50E-01	N	N
TA16-0441A	08/26/2022	Antimony	8.20E+00	N	4872.7894	1.68E-03	3.10E-01	N	n/a
TA16-0441A	08/26/2022	Selenium	1.32E+00	N	4872.7894	2.71E-04	2.10E+01	N	n/a
TA16-0441A	08/26/2022	Thallium	4.61E-01	Y	4872.7894	9.46E-05	n/a		n/a
TA16-0441A	08/26/2022	Vanadium	8.00E-01	N	4872.7894	1.64E-04	1.00E-01	N	n/a
TA16-0441A	08/26/2022	Zinc	3.25E+01	Y	4872.7894	6.67E-03	n/a		n/a
TA16-0441B	08/26/2022	Silver	8.00E-01	N	5015.5070	1.60E-04	n/a		n/a
TA16-0441B	08/26/2022	Aluminum	2.70E+02	Y	5015.5070	5.38E-02	5.20E+00	N	N

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441B	08/26/2022	Arsenic	8.00E-01	N	5015.5070	1.60E-04	6.50E-04	C	n/a
TA16-0441B	08/26/2022	Barium	6.47E+00	Y	5015.5070	1.29E-03	5.20E-01	N	N
TA16-0441B	08/26/2022	Beryllium	8.00E-02	N	5015.5070	1.60E-05	1.20E-03	C	n/a
TA16-0441B	08/26/2022	Calcium	6.62E+02	Y	5015.5070	1.32E-01	n/a		n/a
TA16-0441B	08/26/2022	Cadmium	8.00E-01	N	5015.5070	1.60E-04	1.60E-03	C	n/a
TA16-0441B	08/26/2022	Cobalt	1.20E+00	N	5015.5070	2.39E-04	3.10E-04	C	n/a
TA16-0441B	08/26/2022	Chromium	1.56E+00	Y	5015.5070	3.11E-04	1.20E-05	C	Y
TA16-0441B	08/26/2022	Copper	1.66E+01	Y	5015.5070	3.31E-03	1.00E+02		N
TA16-0441B	08/26/2022	Iron	3.27E+02	Y	5015.5070	6.52E-02	n/a		n/a
TA16-0441B	08/26/2022	Mercury	3.22E-02	N	5015.5070	6.42E-06	3.00E-02		n/a
TA16-0441B	08/26/2022	Potassium	2.94E+02	N	5015.5070	5.86E-02	n/a		n/a
TA16-0441B	08/26/2022	Magnesium	1.13E+02	Y	5015.5070	2.25E-02	n/a		n/a
TA16-0441B	08/26/2022	Manganese	8.18E+00	Y	5015.5070	1.63E-03	5.20E-02	N	N
TA16-0441B	08/26/2022	Sodium	7.88E+01	Y	5015.5070	1.57E-02	n/a		n/a
TA16-0441B	08/26/2022	Nickel	1.22E+00	Y	5015.5070	2.43E-04	1.00E-02	N	N
TA16-0441B	08/26/2022	Lead	2.64E+00	N	5015.5070	5.26E-04	1.50E-01	N	n/a
TA16-0441B	08/26/2022	Antimony	2.64E+00	N	5015.5070	5.26E-04	3.10E-01	N	n/a
TA16-0441B	08/26/2022	Selenium	1.32E+00	N	5015.5070	2.63E-04	2.10E+01	N	n/a
TA16-0441B	08/26/2022	Thallium	2.40E-01	N	5015.5070	4.79E-05	n/a		n/a
TA16-0441B	08/26/2022	Vanadium	8.00E-01	N	5015.5070	1.60E-04	1.00E-01	N	n/a
TA16-0441B	08/26/2022	Zinc	2.75E+01	Y	5015.5070	5.48E-03	n/a		n/a
TA16-0441C	08/26/2022	Silver	8.00E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Aluminum	5.44E+01	N	n/a QA blank	n/a	5.20E+00	N	n/a
TA16-0441C	08/26/2022	Arsenic	8.00E-01	N	n/a QA blank	n/a	6.50E-04	C	n/a
TA16-0441C	08/26/2022	Barium	8.00E-01	N	n/a QA blank	n/a	5.20E-01	N	n/a
TA16-0441C	08/26/2022	Beryllium	8.00E-02	N	n/a QA blank	n/a	1.20E-03	C	n/a
TA16-0441C	08/26/2022	Calcium	1.12E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Cadmium	8.00E-01	N	n/a QA blank	n/a	1.60E-03	C	n/a
TA16-0441C	08/26/2022	Cobalt	1.20E+00	N	n/a QA blank	n/a	3.10E-04	C	n/a

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441C	08/26/2022	Chromium	1.20E+00	N	n/a QA blank	n/a	1.20E-05	C	n/a
TA16-0441C	08/26/2022	Copper	2.40E+00	N	n/a QA blank	n/a	1.00E+02		n/a
TA16-0441C	08/26/2022	Iron	6.40E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Mercury	3.22E-02	N	n/a QA blank	n/a	3.00E-02		n/a
TA16-0441C	08/26/2022	Potassium	1.20E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Magnesium	6.80E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Manganese	1.60E+00	N	n/a QA blank	n/a	5.20E-02	N	n/a
TA16-0441C	08/26/2022	Sodium	5.60E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Nickel	4.00E-01	N	n/a QA blank	n/a	1.00E-02	N	n/a
TA16-0441C	08/26/2022	Lead	2.64E+00	N	n/a QA blank	n/a	1.50E-01	N	n/a
TA16-0441C	08/26/2022	Antimony	3.14E+00	Y	n/a QA blank	n/a	3.10E-01	N	n/a
TA16-0441C	08/26/2022	Selenium	1.32E+00	N	n/a QA blank	n/a	2.10E+01	N	n/a
TA16-0441C	08/26/2022	Thallium	2.40E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	08/26/2022	Vanadium	8.00E-01	N	n/a QA blank	n/a	1.00E-01	N	n/a
TA16-0441C	08/26/2022	Zinc	5.87E+00	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Silver	8.00E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Aluminum	5.44E+01	N	n/a QA blank	n/a	5.20E+00	N	n/a
TA16-0441C	10/27/2022	Arsenic	8.00E-01	N	n/a QA blank	n/a	6.50E-04	C	n/a
TA16-0441C	10/27/2022	Barium	8.00E-01	N	n/a QA blank	n/a	5.20E-01	N	n/a
TA16-0441C	10/27/2022	Beryllium	8.00E-02	N	n/a QA blank	n/a	1.20E-03	C	n/a
TA16-0441C	10/27/2022	Calcium	3.13E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Cadmium	8.00E-01	N	n/a QA blank	n/a	1.60E-03	C	n/a
TA16-0441C	10/27/2022	Cobalt	1.20E+00	N	n/a QA blank	n/a	3.10E-04	C	n/a
TA16-0441C	10/27/2022	Chromium	1.20E+00	N	n/a QA blank	n/a	1.20E-05	C	n/a
TA16-0441C	10/27/2022	Copper	2.40E+00	N	n/a QA blank	n/a	1.00E+02		n/a
TA16-0441C	10/27/2022	Iron	6.40E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Mercury	3.22E-02	N	n/a QA blank	n/a	3.00E-02		n/a
TA16-0441C	10/27/2022	Potassium	4.01E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Magnesium	6.80E+01	N	n/a QA blank	n/a	n/a		n/a

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441C	10/27/2022	Manganese	1.60E+00	N	n/a QA blank	n/a	5.20E-02	N	n/a
TA16-0441C	10/27/2022	Sodium	2.83E+02	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Nickel	4.00E-01	N	n/a QA blank	n/a	1.00E-02	N	n/a
TA16-0441C	10/27/2022	Lead	2.64E+00	N	n/a QA blank	n/a	1.50E-01	N	n/a
TA16-0441C	10/27/2022	Antimony	2.64E+00	N	n/a QA blank	n/a	3.10E-01	N	n/a
TA16-0441C	10/27/2022	Selenium	1.32E+00	N	n/a QA blank	n/a	2.10E+01	N	n/a
TA16-0441C	10/27/2022	Thallium	2.40E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	10/27/2022	Vanadium	8.00E-01	N	n/a QA blank	n/a	1.00E-01	N	n/a
TA16-0441C	10/27/2022	Zinc	1.97E+01	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Silver	8.00E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Aluminum	5.44E+01	N	n/a QA blank	n/a	5.20E+00	N	n/a
TA16-0441C	11/02/2022	Arsenic	8.00E-01	N	n/a QA blank	n/a	6.50E-04	C	n/a
TA16-0441C	11/02/2022	Barium	8.96E-01	Y	n/a QA blank	n/a	5.20E-01	N	n/a
TA16-0441C	11/02/2022	Beryllium	8.00E-02	N	n/a QA blank	n/a	1.20E-03	C	n/a
TA16-0441C	11/02/2022	Calcium	2.72E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Cadmium	8.00E-01	N	n/a QA blank	n/a	1.60E-03	C	n/a
TA16-0441C	11/02/2022	Cobalt	1.20E+00	N	n/a QA blank	n/a	3.10E-04	C	n/a
TA16-0441C	11/02/2022	Chromium	1.93E+00	Y	n/a QA blank	n/a	1.20E-05	C	n/a
TA16-0441C	11/02/2022	Copper	3.31E+00	Y	n/a QA blank	n/a	1.00E+02		n/a
TA16-0441C	11/02/2022	Iron	6.40E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Mercury	3.22E-02	N	n/a QA blank	n/a	3.00E-02		n/a
TA16-0441C	11/02/2022	Potassium	1.49E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Magnesium	6.80E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Manganese	1.60E+00	N	n/a QA blank	n/a	5.20E-02	N	n/a
TA16-0441C	11/02/2022	Sodium	5.60E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Nickel	4.00E-01	N	n/a QA blank	n/a	1.00E-02	N	n/a
TA16-0441C	11/02/2022	Lead	4.38E+00	Y	n/a QA blank	n/a	1.50E-01	N	n/a
TA16-0441C	11/02/2022	Antimony	3.33E+00	Y	n/a QA blank	n/a	3.10E-01	N	n/a
TA16-0441C	11/02/2022	Selenium	1.32E+00	N	n/a QA blank	n/a	2.10E+01	N	n/a

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441C	11/02/2022	Thallium	2.40E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/02/2022	Vanadium	8.00E-01	N	n/a QA blank	n/a	1.00E-01	N	n/a
TA16-0441C	11/02/2022	Zinc	8.47E+00	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Silver	8.00E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Aluminum	5.44E+01	N	n/a QA blank	n/a	5.20E+00	N	n/a
TA16-0441C	11/03/2022	Arsenic	8.00E-01	N	n/a QA blank	n/a	6.50E-04	C	n/a
TA16-0441C	11/03/2022	Barium	8.00E-01	N	n/a QA blank	n/a	5.20E-01	N	n/a
TA16-0441C	11/03/2022	Beryllium	8.00E-02	N	n/a QA blank	n/a	1.20E-03	C	n/a
TA16-0441C	11/03/2022	Calcium	1.33E+02	Y	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Cadmium	8.00E-01	N	n/a QA blank	n/a	1.60E-03	C	n/a
TA16-0441C	11/03/2022	Cobalt	1.20E+00	N	n/a QA blank	n/a	3.10E-04	C	n/a
TA16-0441C	11/03/2022	Chromium	1.20E+00	N	n/a QA blank	n/a	1.20E-05	C	n/a
TA16-0441C	11/03/2022	Copper	2.40E+00	N	n/a QA blank	n/a	1.00E+02		n/a
TA16-0441C	11/03/2022	Iron	6.40E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Mercury	3.22E-02	N	n/a QA blank	n/a	3.00E-02		n/a
TA16-0441C	11/03/2022	Potassium	1.20E+02	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Magnesium	6.80E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Manganese	1.60E+00	N	n/a QA blank	n/a	5.20E-02	N	n/a
TA16-0441C	11/03/2022	Sodium	5.60E+01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Nickel	4.98E-01	Y	n/a QA blank	n/a	1.00E-02	N	n/a
TA16-0441C	11/03/2022	Lead	2.64E+00	N	n/a QA blank	n/a	1.50E-01	N	n/a
TA16-0441C	11/03/2022	Antimony	2.64E+00	N	n/a QA blank	n/a	3.10E-01	N	n/a
TA16-0441C	11/03/2022	Selenium	1.32E+00	N	n/a QA blank	n/a	2.10E+01	N	n/a
TA16-0441C	11/03/2022	Thallium	2.40E-01	N	n/a QA blank	n/a	n/a		n/a
TA16-0441C	11/03/2022	Vanadium	8.00E-01	N	n/a QA blank	n/a	1.00E-01	N	n/a
TA16-0441C	11/03/2022	Zinc	7.19E+00	N	n/a QA blank	n/a	n/a		n/a
TA16-0441D	10/27/2022	Silver	8.00E-01	N	1671.8357	4.79E-04	n/a		n/a
TA16-0441D	10/27/2022	Aluminum	1.01E+02	Y	1671.8357	6.04E-02	5.20E+00	N	N
TA16-0441D	10/27/2022	Arsenic	8.00E-01	N	1671.8357	4.79E-04	6.50E-04	C	n/a

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441D	10/27/2022	Barium	5.24E+00	Y	1671.8357	3.13E-03	5.20E-01	N	N
TA16-0441D	10/27/2022	Beryllium	8.00E-02	N	1671.8357	4.79E-05	1.20E-03	C	n/a
TA16-0441D	10/27/2022	Calcium	3.97E+02	Y	1671.8357	2.37E-01	n/a		n/a
TA16-0441D	10/27/2022	Cadmium	8.00E-01	N	1671.8357	4.79E-04	1.60E-03	C	n/a
TA16-0441D	10/27/2022	Cobalt	1.20E+00	N	1671.8357	7.18E-04	3.10E-04	C	n/a
TA16-0441D	10/27/2022	Chromium	1.75E+00	Y	1671.8357	1.05E-03	1.20E-05	C	Y
TA16-0441D	10/27/2022	Copper	1.57E+01	Y	1671.8357	9.39E-03	1.00E+02		N
TA16-0441D	10/27/2022	Iron	1.48E+02	Y	1671.8357	8.85E-02	n/a		n/a
TA16-0441D	10/27/2022	Mercury	4.70E-02	Y	1671.8357	2.81E-05	3.00E-02		N
TA16-0441D	10/27/2022	Potassium	3.25E+02	Y	1671.8357	1.94E-01	n/a		n/a
TA16-0441D	10/27/2022	Magnesium	6.80E+01	N	1671.8357	4.07E-02	n/a		n/a
TA16-0441D	10/27/2022	Manganese	3.47E+00	Y	1671.8357	2.08E-03	5.20E-02	N	N
TA16-0441D	10/27/2022	Sodium	2.65E+02	N	1671.8357	1.59E-01	n/a		n/a
TA16-0441D	10/27/2022	Nickel	1.60E+00	Y	1671.8357	9.57E-04	1.00E-02	N	N
TA16-0441D	10/27/2022	Lead	2.64E+00	N	1671.8357	1.58E-03	1.50E-01	N	n/a
TA16-0441D	10/27/2022	Antimony	2.64E+00	N	1671.8357	1.58E-03	3.10E-01	N	n/a
TA16-0441D	10/27/2022	Selenium	1.32E+00	N	1671.8357	7.90E-04	2.10E+01	N	n/a
TA16-0441D	10/27/2022	Thallium	2.40E-01	N	1671.8357	1.44E-04	n/a		n/a
TA16-0441D	10/27/2022	Vanadium	8.00E-01	N	1671.8357	4.79E-04	1.00E-01	N	n/a
TA16-0441D	10/27/2022	Zinc	3.47E+01	Y	1671.8357	2.08E-02	n/a		n/a
TA16-0441D	11/02/2022	Silver	8.00E-01	N	1631.0592	4.90E-04	n/a		n/a
TA16-0441D	11/02/2022	Aluminum	1.46E+02	Y	1631.0592	8.95E-02	5.20E+00	N	N
TA16-0441D	11/02/2022	Arsenic	8.00E-01	N	1631.0592	4.90E-04	6.50E-04	C	n/a
TA16-0441D	11/02/2022	Barium	6.21E+00	Y	1631.0592	3.81E-03	5.20E-01	N	N
TA16-0441D	11/02/2022	Beryllium	8.00E-02	N	1631.0592	4.90E-05	1.20E-03	C	n/a
TA16-0441D	11/02/2022	Calcium	5.55E+02	Y	1631.0592	3.40E-01	n/a		n/a
TA16-0441D	11/02/2022	Cadmium	8.00E-01	N	1631.0592	4.90E-04	1.60E-03	C	n/a
TA16-0441D	11/02/2022	Cobalt	1.20E+00	N	1631.0592	7.36E-04	3.10E-04	C	n/a
TA16-0441D	11/02/2022	Chromium	1.32E+00	Y	1631.0592	8.09E-04	1.20E-05	C	Y

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441D	11/02/2022	Copper	3.36E+01	Y	1631.0592	2.06E-02	1.00E+02		N
TA16-0441D	11/02/2022	Iron	1.93E+02	Y	1631.0592	1.18E-01	n/a		n/a
TA16-0441D	11/02/2022	Mercury	3.22E-02	N	1631.0592	1.97E-05	3.00E-02		n/a
TA16-0441D	11/02/2022	Potassium	1.88E+02	Y	1631.0592	1.15E-01	n/a		n/a
TA16-0441D	11/02/2022	Magnesium	6.80E+01	N	1631.0592	4.17E-02	n/a		n/a
TA16-0441D	11/02/2022	Manganese	5.74E+00	Y	1631.0592	3.52E-03	5.20E-02	N	N
TA16-0441D	11/02/2022	Sodium	6.47E+01	Y	1631.0592	3.97E-02	n/a		n/a
TA16-0441D	11/02/2022	Nickel	1.05E+00	Y	1631.0592	6.44E-04	1.00E-02	N	N
TA16-0441D	11/02/2022	Lead	5.69E+00	Y	1631.0592	3.49E-03	1.50E-01	N	N
TA16-0441D	11/02/2022	Antimony	3.15E+00	Y	1631.0592	1.93E-03	3.10E-01	N	N
TA16-0441D	11/02/2022	Selenium	1.32E+00	N	1631.0592	8.09E-04	2.10E+01	N	n/a
TA16-0441D	11/02/2022	Thallium	2.40E-01	N	1631.0592	1.47E-04	n/a		n/a
TA16-0441D	11/02/2022	Vanadium	8.00E-01	N	1631.0592	4.90E-04	1.00E-01	N	n/a
TA16-0441D	11/02/2022	Zinc	3.00E+01	Y	1631.0592	1.84E-02	n/a		n/a
TA16-0441D	11/03/2022	Silver	4.00E+00	N	1543.5597	2.59E-03	n/a		n/a
TA16-0441D	11/03/2022	Aluminum	2.23E+02	Y	1543.5597	1.44E-01	5.20E+00	N	N
TA16-0441D	11/03/2022	Arsenic	4.00E+00	N	1543.5597	2.59E-03	6.50E-04	C	n/a
TA16-0441D	11/03/2022	Barium	4.96E+00	Y	1543.5597	3.21E-03	5.20E-01	N	N
TA16-0441D	11/03/2022	Beryllium	4.00E-01	N	1543.5597	2.59E-04	1.20E-03	C	n/a
TA16-0441D	11/03/2022	Calcium	5.01E+02	Y	1543.5597	3.25E-01	n/a		n/a
TA16-0441D	11/03/2022	Cadmium	4.00E+00	N	1543.5597	2.59E-03	1.60E-03	C	n/a
TA16-0441D	11/03/2022	Cobalt	4.00E+00	N	1543.5597	2.59E-03	3.10E-04	C	n/a
TA16-0441D	11/03/2022	Chromium	1.79E+00	Y	1543.5597	1.16E-03	1.20E-05	C	Y
TA16-0441D	11/03/2022	Copper	3.03E+01	Y	1543.5597	1.96E-02	1.00E+02		N
TA16-0441D	11/03/2022	Iron	2.82E+02	Y	1543.5597	1.83E-01	n/a		n/a
TA16-0441D	11/03/2022	Mercury	9.60E-02	N	1543.5597	6.22E-05	3.00E-02		n/a
TA16-0441D	11/03/2022	Potassium	2.30E+02	N	1543.5597	1.49E-01	n/a		n/a
TA16-0441D	11/03/2022	Magnesium	1.01E+02	Y	1543.5597	6.54E-02	n/a		n/a
TA16-0441D	11/03/2022	Manganese	9.23E+00	Y	1543.5597	5.98E-03	5.20E-02	N	N

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441D	11/03/2022	Sodium	1.61E+02	Y	1543.5597	1.04E-01	n/a		n/a
TA16-0441D	11/03/2022	Nickel	7.46E-01	Y	1543.5597	4.83E-04	1.00E-02	N	N
TA16-0441D	11/03/2022	Lead	4.71E+00	Y	1543.5597	3.05E-03	1.50E-01	N	N
TA16-0441D	11/03/2022	Antimony	1.60E+01	N	1543.5597	1.04E-02	3.10E-01	N	n/a
TA16-0441D	11/03/2022	Selenium	4.00E+00	N	1543.5597	2.59E-03	2.10E+01	N	n/a
TA16-0441D	11/03/2022	Thallium	8.00E-01	N	1543.5597	5.18E-04	n/a		n/a
TA16-0441D	11/03/2022	Vanadium	4.00E+00	N	1543.5597	2.59E-03	1.00E-01	N	n/a
TA16-0441D	11/03/2022	Zinc	2.32E+01	N	1543.5597	1.50E-02	n/a		n/a
TA16-0441E	10/27/2022	Silver	8.00E-01	N	1645.3310	4.86E-04	n/a		n/a
TA16-0441E	10/27/2022	Aluminum	7.44E+01	Y	1645.3310	4.52E-02	5.20E+00	N	N
TA16-0441E	10/27/2022	Arsenic	8.00E-01	N	1645.3310	4.86E-04	6.50E-04	C	n/a
TA16-0441E	10/27/2022	Barium	3.68E+00	Y	1645.3310	2.24E-03	5.20E-01	N	N
TA16-0441E	10/27/2022	Beryllium	8.00E-02	N	1645.3310	4.86E-05	1.20E-03	C	n/a
TA16-0441E	10/27/2022	Calcium	3.46E+02	Y	1645.3310	2.10E-01	n/a		n/a
TA16-0441E	10/27/2022	Cadmium	8.00E-01	N	1645.3310	4.86E-04	1.60E-03	C	n/a
TA16-0441E	10/27/2022	Cobalt	1.20E+00	N	1645.3310	7.29E-04	3.10E-04	C	n/a
TA16-0441E	10/27/2022	Chromium	1.20E+00	N	1645.3310	7.29E-04	1.20E-05	C	n/a
TA16-0441E	10/27/2022	Copper	1.31E+01	Y	1645.3310	7.96E-03	1.00E+02		N
TA16-0441E	10/27/2022	Iron	1.31E+02	Y	1645.3310	7.96E-02	n/a		n/a
TA16-0441E	10/27/2022	Mercury	3.98E-02	Y	1645.3310	2.42E-05	3.00E-02		N
TA16-0441E	10/27/2022	Potassium	3.03E+02	Y	1645.3310	1.84E-01	n/a		n/a
TA16-0441E	10/27/2022	Magnesium	6.80E+01	N	1645.3310	4.13E-02	n/a		n/a
TA16-0441E	10/27/2022	Manganese	2.85E+00	Y	1645.3310	1.73E-03	5.20E-02	N	N
TA16-0441E	10/27/2022	Sodium	2.57E+02	N	1645.3310	1.56E-01	n/a		n/a
TA16-0441E	10/27/2022	Nickel	6.25E+00	Y	1645.3310	3.80E-03	1.00E-02	N	N
TA16-0441E	10/27/2022	Lead	2.64E+00	N	1645.3310	1.60E-03	1.50E-01	N	n/a
TA16-0441E	10/27/2022	Antimony	2.64E+00	N	1645.3310	1.60E-03	3.10E-01	N	n/a
TA16-0441E	10/27/2022	Selenium	1.32E+00	N	1645.3310	8.02E-04	2.10E+01	N	n/a
TA16-0441E	10/27/2022	Thallium	2.40E-01	N	1645.3310	1.46E-04	n/a		n/a

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441E	10/27/2022	Vanadium	8.00E-01	N	1645.3310	4.86E-04	1.00E-01	N	n/a
TA16-0441E	10/27/2022	Zinc	2.22E+01	Y	1645.3310	1.35E-02	n/a		n/a
TA16-0441E	11/02/2022	Silver	1.07E+00	Y	1635.8080	6.54E-04	n/a		n/a
TA16-0441E	11/02/2022	Aluminum	1.62E+02	Y	1635.8080	9.90E-02	5.20E+00	N	N
TA16-0441E	11/02/2022	Arsenic	8.00E-01	N	1635.8080	4.89E-04	6.50E-04	C	n/a
TA16-0441E	11/02/2022	Barium	6.16E+00	Y	1635.8080	3.77E-03	5.20E-01	N	N
TA16-0441E	11/02/2022	Beryllium	8.00E-02	N	1635.8080	4.89E-05	1.20E-03	C	n/a
TA16-0441E	11/02/2022	Calcium	4.75E+02	Y	1635.8080	2.90E-01	n/a		n/a
TA16-0441E	11/02/2022	Cadmium	8.00E-01	N	1635.8080	4.89E-04	1.60E-03	C	n/a
TA16-0441E	11/02/2022	Cobalt	1.20E+00	N	1635.8080	7.34E-04	3.10E-04	C	n/a
TA16-0441E	11/02/2022	Chromium	1.27E+00	Y	1635.8080	7.76E-04	1.20E-05	C	Y
TA16-0441E	11/02/2022	Copper	1.99E+01	Y	1635.8080	1.22E-02	1.00E+02		N
TA16-0441E	11/02/2022	Iron	2.06E+02	Y	1635.8080	1.26E-01	n/a		n/a
TA16-0441E	11/02/2022	Mercury	3.22E-02	N	1635.8080	1.97E-05	3.00E-02		n/a
TA16-0441E	11/02/2022	Potassium	1.88E+02	Y	1635.8080	1.15E-01	n/a		n/a
TA16-0441E	11/02/2022	Magnesium	6.80E+01	N	1635.8080	4.16E-02	n/a		n/a
TA16-0441E	11/02/2022	Manganese	6.57E+00	Y	1635.8080	4.02E-03	5.20E-02	N	N
TA16-0441E	11/02/2022	Sodium	6.97E+01	Y	1635.8080	4.26E-02	n/a		n/a
TA16-0441E	11/02/2022	Nickel	1.37E+00	Y	1635.8080	8.38E-04	1.00E-02	N	N
TA16-0441E	11/02/2022	Lead	5.17E+00	Y	1635.8080	3.16E-03	1.50E-01	N	N
TA16-0441E	11/02/2022	Antimony	2.64E+00	N	1635.8080	1.61E-03	3.10E-01	N	n/a
TA16-0441E	11/02/2022	Selenium	1.32E+00	N	1635.8080	8.07E-04	2.10E+01	N	n/a
TA16-0441E	11/02/2022	Thallium	2.40E-01	N	1635.8080	1.47E-04	n/a		n/a
TA16-0441E	11/02/2022	Vanadium	8.00E-01	N	1635.8080	4.89E-04	1.00E-01	N	n/a
TA16-0441E	11/02/2022	Zinc	2.26E+01	Y	1635.8080	1.38E-02	n/a		n/a
TA16-0441E	11/03/2022	Silver	4.00E+00	N	1617.4670	2.47E-03	n/a		n/a
TA16-0441E	11/03/2022	Aluminum	2.10E+02	Y	1617.4670	1.30E-01	5.20E+00	N	N
TA16-0441E	11/03/2022	Arsenic	4.00E+00	N	1617.4670	2.47E-03	6.50E-04	C	n/a
TA16-0441E	11/03/2022	Barium	5.03E+00	Y	1617.4670	3.11E-03	5.20E-01	N	N

Table 1: Metals Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (ug/FILTER)	Detected	Air_Volume (m3)	Concentration (ug/m3)	Residential Air RSL from Generic RSL Table (CR=1E-06), THQ=1.0) (ug/m3)	Cancer or Noncancer (C or N)	Above Screeing Level?
TA16-0441E	11/03/2022	Beryllium	4.00E-01	N	1617.4670	2.47E-04	1.20E-03	C	n/a
TA16-0441E	11/03/2022	Calcium	5.05E+02	Y	1617.4670	3.12E-01	n/a		n/a
TA16-0441E	11/03/2022	Cadmium	4.00E+00	N	1617.4670	2.47E-03	1.60E-03	C	n/a
TA16-0441E	11/03/2022	Cobalt	4.00E+00	N	1617.4670	2.47E-03	3.10E-04	C	n/a
TA16-0441E	11/03/2022	Chromium	2.38E+00	Y	1617.4670	1.47E-03	1.20E-05	C	Y
TA16-0441E	11/03/2022	Copper	3.02E+01	Y	1617.4670	1.87E-02	1.00E+02		N
TA16-0441E	11/03/2022	Iron	2.49E+02	Y	1617.4670	1.54E-01	n/a		n/a
TA16-0441E	11/03/2022	Mercury	9.60E-02	N	1617.4670	5.94E-05	3.00E-02		n/a
TA16-0441E	11/03/2022	Potassium	2.05E+02	N	1617.4670	1.27E-01	n/a		n/a
TA16-0441E	11/03/2022	Magnesium	8.50E+01	Y	1617.4670	5.26E-02	n/a		n/a
TA16-0441E	11/03/2022	Manganese	9.58E+00	Y	1617.4670	5.92E-03	5.20E-02	N	N
TA16-0441E	11/03/2022	Sodium	1.60E+02	Y	1617.4670	9.89E-02	n/a		n/a
TA16-0441E	11/03/2022	Nickel	6.04E-01	Y	1617.4670	3.73E-04	1.00E-02	N	N
TA16-0441E	11/03/2022	Lead	1.60E+01	N	1617.4670	9.89E-03	1.50E-01	N	n/a
TA16-0441E	11/03/2022	Antimony	1.60E+01	N	1617.4670	9.89E-03	3.10E-01	N	n/a
TA16-0441E	11/03/2022	Selenium	4.00E+00	N	1617.4670	2.47E-03	2.10E+01	N	n/a
TA16-0441E	11/03/2022	Thallium	8.00E-01	N	1617.4670	4.95E-04	n/a		n/a
TA16-0441E	11/03/2022	Vanadium	8.83E-01	Y	1617.4670	5.46E-04	1.00E-01	N	N
TA16-0441E	11/03/2022	Zinc	1.67E+01	N	1617.4670	1.03E-02	n/a		n/a

Note: Concentration is calculated using (ug/FILTER)/Air_Volume (m3)
Items not included as "N" or "C" = California Reference Exposure Levels (chronic) or no screening levels available

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441C	10/27/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	7.72	N	n/a QA blank	n/a	7.40E-02	n/a	20
TA16-0441C	10/27/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Pentachlorodibenzofurans (Totals)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.0	N	n/a QA blank	n/a		n/a	200
TA16-0441C	10/27/2022	Hexachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a	2.20E+00	n/a	100
TA16-0441C	10/27/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Pentachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Heptachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Heptachlorodibenzofurans (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.0	N	n/a QA blank	n/a		n/a	200
TA16-0441C	10/27/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Tetrachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	20
TA16-0441C	10/27/2022	Tetrachlorodibenzofuran[2,3,7,8-]	5.96	N	n/a QA blank	n/a		n/a	20
TA16-0441C	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzofurans (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Tetrachlorodibenzofurans (Totals)	0.000	N	n/a QA blank	n/a		n/a	20
TA16-0441C	10/27/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	10/27/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	5.48	N	n/a QA blank	n/a	7.40E-02	n/a	20.0

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441C	11/02/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Pentachlorodibenzofurans (Totals)	0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20	N	n/a QA blank	n/a		n/a	200
TA16-0441C	11/02/2022	Hexachlorodibenzodioxins (Total)	0	N	n/a QA blank	n/a	2.20E+00	n/a	100
TA16-0441C	11/02/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Pentachlorodibenzodioxins (Total)	0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Heptachlorodibenzodioxins (Total)	0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Heptachlorodibenzofurans (Total)	0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20	N	n/a QA blank	n/a		n/a	200
TA16-0441C	11/02/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Tetrachlorodibenzodioxins (Total)	0	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/02/2022	Tetrachlorodibenzofuran[2,3,7,8-]	4.52	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzofurans (Total)	0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Tetrachlorodibenzofurans (Totals)	0	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/02/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/02/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	6.52	N	n/a QA blank	n/a	7.40E-02	n/a	20.0
TA16-0441C	11/03/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Pentachlorodibenzofurans (Totals)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.0	N	n/a QA blank	n/a		n/a	200
TA16-0441C	11/03/2022	Hexachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a	2.20E+00	n/a	100

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441C	11/03/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Pentachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Heptachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Heptachlorodibenzofurans (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.0	N	n/a QA blank	n/a		n/a	200
TA16-0441C	11/03/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Tetrachlorodibenzodioxins (Total)	0.000	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/03/2022	Tetrachlorodibenzofuran[2,3,7,8-]	4.40	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzofurans (Total)	0.000	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Tetrachlorodibenzofurans (Totals)	0.000	N	n/a QA blank	n/a		n/a	20.0
TA16-0441C	11/03/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441C	11/03/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.0	N	n/a QA blank	n/a		n/a	100
TA16-0441D	10/27/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	5.88	N	228.9	2.57E-02	7.40E-02	n/a	20
TA16-0441D	10/27/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Pentachlorodibenzofurans (Totals)	0.00	N	228.9	0.00E+00		n/a	100
TA16-0441D	10/27/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	228.9	8.74E-02		n/a	200
TA16-0441D	10/27/2022	Hexachlorodibenzodioxins (Total)	0.00	N	228.9	0.00E+00	2.20E+00	n/a	100
TA16-0441D	10/27/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Pentachlorodibenzodioxins (Total)	0.00	N	228.9	0.00E+00		n/a	100
TA16-0441D	10/27/2022	Heptachlorodibenzodioxins (Total)	0.00	N	228.9	0.00E+00		n/a	100
TA16-0441D	10/27/2022	Heptachlorodibenzofurans (Total)	0.00	N	228.9	0.00E+00		n/a	100

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441D	10/27/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	228.9	8.74E-02		n/a	200
TA16-0441D	10/27/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	228.9	0.00E+00		n/a	20
TA16-0441D	10/27/2022	Tetrachlorodibenzofuran[2,3,7,8-]	5.32	N	228.9	2.32E-02		n/a	20
TA16-0441D	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzofurans (Total)	0.00	N	228.9	0.00E+00		n/a	100
TA16-0441D	10/27/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	228.9	0.00E+00		n/a	20
TA16-0441D	10/27/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	10/27/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	228.9	4.37E-02		n/a	100
TA16-0441D	11/02/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	8.12	N	222.3	3.65E-02	7.40E-02	n/a	20
TA16-0441D	11/02/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Pentachlorodibenzofurans (Totals)	0.00	N	222.3	0.00E+00		n/a	100
TA16-0441D	11/02/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	222.3	9.00E-02		n/a	200
TA16-0441D	11/02/2022	Hexachlorodibenzodioxins (Total)	0.00	N	222.3	0.00E+00	2.20E+00	n/a	100
TA16-0441D	11/02/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Pentachlorodibenzodioxins (Total)	0.00	N	222.3	0.00E+00		n/a	100
TA16-0441D	11/02/2022	Heptachlorodibenzodioxins (Total)	0.00	N	222.3	0.00E+00		n/a	100
TA16-0441D	11/02/2022	Heptachlorodibenzofurans (Total)	0.00	N	222.3	0.00E+00		n/a	100
TA16-0441D	11/02/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	222.3	9.00E-02		n/a	200
TA16-0441D	11/02/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	222.3	0.00E+00		n/a	20

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441D	11/02/2022	Tetrachlorodibenzofuran[2,3,7,8-]	5.16	N	222.3	2.32E-02		n/a	20
TA16-0441D	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzofurans (Total)	0.00	N	222.3	0.00E+00		n/a	100
TA16-0441D	11/02/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	222.3	0.00E+00		n/a	20
TA16-0441D	11/02/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/02/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	222.3	4.50E-02		n/a	100
TA16-0441D	11/03/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	5.28	N	223.06	2.37E-02	7.40E-02	n/a	20.0
TA16-0441D	11/03/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Pentachlorodibenzofurans (Totals)	0.00	N	223.06	0.00E+00		n/a	100
TA16-0441D	11/03/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	223.06	8.97E-02		n/a	200
TA16-0441D	11/03/2022	Hexachlorodibenzodioxins (Total)	0.00	N	223.06	0.00E+00	2.20E+00	n/a	100
TA16-0441D	11/03/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Pentachlorodibenzodioxins (Total)	0.00	N	223.06	0.00E+00		n/a	100
TA16-0441D	11/03/2022	Heptachlorodibenzodioxins (Total)	0.00	N	223.06	0.00E+00		n/a	100
TA16-0441D	11/03/2022	Heptachlorodibenzofurans (Total)	0.00	N	223.06	0.00E+00		n/a	100
TA16-0441D	11/03/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	223.06	8.97E-02		n/a	200
TA16-0441D	11/03/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	223.06	0.00E+00		n/a	20.0
TA16-0441D	11/03/2022	Tetrachlorodibenzofuran[2,3,7,8-]	4.40	N	223.06	1.97E-02		n/a	20.0
TA16-0441D	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzofurans (Total)	0.00	N	223.06	0.00E+00		n/a	100
TA16-0441D	11/03/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	223.06	0.00E+00		n/a	20.0

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441D	11/03/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441D	11/03/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	223.06	4.48E-02		n/a	100
TA16-0441E	10/27/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	7.48	N	205.17	3.65E-02	7.40E-02	n/a	20.0
TA16-0441E	10/27/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Pentachlorodibenzofurans (Totals)	0.00	N	205.17	0.00E+00		n/a	100
TA16-0441E	10/27/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	205.17	9.75E-02		n/a	200
TA16-0441E	10/27/2022	Hexachlorodibenzodioxins (Total)	0.00	N	205.17	0.00E+00	2.20E+00	n/a	100
TA16-0441E	10/27/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Pentachlorodibenzodioxins (Total)	0.00	N	205.17	0.00E+00		n/a	100
TA16-0441E	10/27/2022	Heptachlorodibenzodioxins (Total)	0.00	N	205.17	0.00E+00		n/a	100
TA16-0441E	10/27/2022	Heptachlorodibenzofurans (Total)	0.00	N	205.17	0.00E+00		n/a	100
TA16-0441E	10/27/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	205.17	9.75E-02		n/a	200
TA16-0441E	10/27/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	205.17	0.00E+00		n/a	20.0
TA16-0441E	10/27/2022	Tetrachlorodibenzofuran[2,3,7,8-]	5.52	N	205.17	2.69E-02		n/a	20.0
TA16-0441E	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Hexachlorodibenzofurans (Total)	0.00	N	205.17	0.00E+00		n/a	100
TA16-0441E	10/27/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	205.17	0.00E+00		n/a	20.0
TA16-0441E	10/27/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	205.17	4.87E-02		n/a	100

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441E	10/27/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	10/27/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	205.17	4.87E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Pentachlorodibenzofurans (Totals)	0.00	N	204.83	0.00E+00		n/a	100
TA16-0441E	11/02/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	204.83	9.76E-02		n/a	200
TA16-0441E	11/02/2022	Hexachlorodibenzodioxins (Total)	0.00	N	204.83	0.00E+00	2.20E+00	n/a	100
TA16-0441E	11/02/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Pentachlorodibenzodioxins (Total)	0.00	N	204.83	0.00E+00		n/a	100
TA16-0441E	11/02/2022	Heptachlorodibenzodioxins (Total)	0.00	N	204.83	0.00E+00		n/a	100
TA16-0441E	11/02/2022	Heptachlorodibenzofurans (Total)	0.00	N	204.83	0.00E+00		n/a	100
TA16-0441E	11/02/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	204.83	9.76E-02		n/a	200
TA16-0441E	11/02/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	204.83	0.00E+00		n/a	20.0
TA16-0441E	11/02/2022	Tetrachlorodibenzofuran[2,3,7,8-]	4.08	N	204.83	1.99E-02		n/a	20.0
TA16-0441E	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzofurans (Total)	0.00	N	204.83	0.00E+00		n/a	100
TA16-0441E	11/02/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	204.83	0.00E+00		n/a	20.0
TA16-0441E	11/02/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	204.83	4.88E-02		n/a	100
TA16-0441E	11/02/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	7.28	Y	204.83	3.55E-02	7.40E-02	N	20.0

Table 2: Dioxin/Furan Congener Concentrations Measured in Air at the Technical Area 16 Burning Ground in 2022 (continued)

Location ID	Sample Date	Parameter	Report Result (pg/Filter)	Detected	Air_Volume (m3)	Concentration (pg/m3)	EPA Screeing Levels (pg/m3)	Above Screeing Level?	Report Detection Limit
TA16-0441E	11/03/2022	Tetrachlorodibenzodioxin[2,3,7,8-]	4.80	N	197.22	2.43E-02	7.40E-02	n/a	20.0
TA16-0441E	11/03/2022	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Pentachlorodibenzofurans (Totals)	0.00	N	197.22	0.00E+00		n/a	100
TA16-0441E	11/03/2022	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	20.00	N	197.22	1.01E-01		n/a	200
TA16-0441E	11/03/2022	Hexachlorodibenzodioxins (Total)	0.00	N	197.22	0.00E+00	2.20E+00	n/a	100
TA16-0441E	11/03/2022	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Pentachlorodibenzodioxins (Total)	0.00	N	197.22	0.00E+00		n/a	100
TA16-0441E	11/03/2022	Heptachlorodibenzodioxins (Total)	0.00	N	197.22	0.00E+00		n/a	100
TA16-0441E	11/03/2022	Heptachlorodibenzofurans (Total)	0.00	N	197.22	0.00E+00		n/a	100
TA16-0441E	11/03/2022	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	20.00	N	197.22	1.01E-01		n/a	200
TA16-0441E	11/03/2022	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Pentachlorodibenzodioxin[1,2,3,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Tetrachlorodibenzodioxins (Total)	0.00	N	197.22	0.00E+00		n/a	20.0
TA16-0441E	11/03/2022	Tetrachlorodibenzofuran[2,3,7,8-]	3.94	N	197.22	2.00E-02		n/a	20.0
TA16-0441E	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzofurans (Total)	0.00	N	197.22	0.00E+00		n/a	100
TA16-0441E	11/03/2022	Tetrachlorodibenzofurans (Totals)	0.00	N	197.22	0.00E+00		n/a	20.0
TA16-0441E	11/03/2022	Pentachlorodibenzofuran[2,3,4,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Pentachlorodibenzofuran[1,2,3,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzofuran[1,2,3,6,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzofuran[2,3,4,6,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzofuran[1,2,3,4,7,8-]	10.00	N	197.22	5.07E-02		n/a	100
TA16-0441E	11/03/2022	Hexachlorodibenzofuran[1,2,3,7,8,9-]	10.00	N	197.22	5.07E-02		n/a	100

Note: Concentration is calculated using (pg/FILTER)/Air_Volume (m3)

Attachment 1: Technical Area (TA) 16-388 Open Burning Air Sampling Summary for Resource Conservation and Recovery Act (RCRA)Permitting at Los Alamos National Laboratory (LA-UR-12-22096)

Technical Area (TA) 16-388 Open Burning Air Sampling Summary for Resource Conservation and Recovery Act (RCRA) Permitting at Los Alamos National Laboratory (LA-UR-12-22096)

Andrew Green and Shannon Allen

In March 2011 the Environmental Data and Analysis Group (ENV-EDA) AIRNET team conducted sampling of suites of dioxins, furans and metals in support of the RCRA permit for Los Alamos National Laboratory (LANL) operated by LANS, LLC. This document is a brief description of the work that was performed by the AIRNET team in the vicinity of the Technical Area (TA) 16-388 flash pad, located within the TA-16 boundaries. The TA-16-388 flash pad is comprised of a 22 by 22 foot (ft) concrete pad, with a 3 ft high wall on three sides. Two propane burners are used to treat hazardous waste within a metal tray. Individual burn treatment events typically last approximately 0.5 hours. Shannon Allen headed up the field team of Joan Lujan, Melissa Coronado, William Smith, and Louis Naranjo. Shannon coordinated the equipment purchase and sample analysis. Andrew Green performed the data analysis with support from Tammy Diaz.

Waste Streams Treated

Air samples were collected during five different treatment events, each occurring on different days (03/08/11, 03/09/11, 03/10/11, 03/15/11, 03/16/11). The treatment events consisted of wastes that contain water and high explosives waste resulting from high explosives machining operations. The specific explosives treated were PBX 9501 (95% HMX, 2.5% Estane, 2.5% BDNPA), PBX 9502 (95% TATB, 5% KEL-F 800); and a mixture of DAAF (3,3'-Diamino-4,4' azoxyfurazan), and water. Water saturated high explosives was the principal waste stream treated at the TA-16-388 flash pad.

Dioxin and Furan Detection Equipment and Methodology

Dioxin and furan samples were collected using a TE-1000 PUF (poly-urethane foam) high volume air sampler purchased from Tisch Environmental, Inc. Samplers were run one to three hours at approximately 35 cubic feet per minute. Collection duration was based upon the length of the burn. One field blank was collected for each treatment event. Samples were placed in a cooler with ice for transportation to the Sample Management Office, and were subsequently shipped in a cooler with ice to Test America in Knoxville, Tennessee for TO-9a analysis by the LANL ENV Sample Management Office.

Metals Detection Equipment and Methodology

Metals samples were collected using high volume air samplers purchased from Hi-Q Environmental Products Company, and an 8x10 inch polypropylene filter. Samplers were run one to three hours at approximately 40 cubic feet per minute. Collection duration was based upon the length of the burn. One field blank polypropylene filter was collected for each

treatment event. Sample filters were placed in glassine envelopes, sealed in ziplock bags, and shipped to ALS Laboratories in Ft. Collins, Colorado by the LANL ENV Sample Management Office.

Sampling Location Selection and Methodology

Two TE-1000 poly-urethane foam (PUF) samplers and two Hi-Q high volume samplers were used for collection at each treatment event. The down wind direction was determined by observing a wind sock prior to setting up for collection for each event. Samplers were placed 25ft to 75ft from the flash pad. One TE-1000 PUF sampler and one Hi-Q sampler were placed in the observed down-wind direction. Another identical set was placed in the second most dominant down-wind direction (based on observations) to maximize the odds of sampling the plume in the event of a wind direction shift. Samplers were placed as close to the flash pad as seemed reasonably possible without sustaining equipment damage. All samplers were powered using extension cords, so no generator emissions were present.

Data Analysis

The field data were coordinated with the data analysis results to derive volume concentrations which were then compared to acute air inhalation exposure concentrations listed in the companion database of the 2005 US Environmental Protection Agency (EPA) *Human Health Hazard Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA530-R-05-006) when available. Other acute inhalation screening levels were identified within the 1999 *Air Toxics Hot Spots Program Risk Assessment Guidelines Part I The Determination of Acute Reference Exposure Levels for Airborne Toxicants,* drafted by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency. The details of these comparisons are attached to this document as Table 1.

Concluding Remarks

Data were collected following the standard protocol for such measurements.

Comparisons with identified screening levels indicate operations that were monitored did not exceed any appropriate state or federal levels specified for the analytes monitored.

References

2005, EPA. Human Health Hazard Risk Assessment Protocol for Hazardous Waste Combustion Facilities Final. United States Environmental Protection Agency. Office of Solid Waste and Emergency Response. EPA530-R-05-006. September 2005. http://www.epa.gov/osw/hazard/tsd/td/combust/risk.htm

1999, California Office of Environmental Health Hazardous Assessment (OEHHA). Air Toxics Hot Spots Program Risk Assessment Guidelines Part I The Determination of Acute Reference Exposure Levels for Airborne Toxicants. Technical Report. Office of

Environmental Health Hazard Assessment, California EPA. March 1999.
http://oehha.ca.gov/air/acute_rels/acuterel.html

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5532	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Heptachlorodibenzodioxin[1,2,3,4	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Heptachlorodibenzodioxins	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Heptachlorodibenzodioxins	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Heptachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Heptachlorodibenzodioxins	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Heptachlorodibenzodioxins	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Heptachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Heptachlorodibenzodioxins	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Heptachlorodibenzodioxins	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Heptachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Heptachlorodibenzodioxins	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Heptachlorodibenzodioxins	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Heptachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Heptachlorodibenzodioxins	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Heptachlorodibenzodioxins	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Heptachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5535	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Heptachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Heptachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Heptachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Heptachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Heptachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Heptachlorodibenzofurans (Total)	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Heptachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzodioxin[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5538	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzodioxin[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzodioxin[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzodioxins (Total)	1.4	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzodioxins (Total)	2.8	pg/Filter	0.17	64.8	11.02	0.25			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzodioxins (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzodioxins (Total)	1.3	pg/Filter	0.17792	114	20.28	0.06			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzodioxins (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzodioxins (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.1797	162	29.11	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzodioxins (Total)	50	pg/Filter	0.17049	162.6	27.72	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzodioxins (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.19	118.8	22.14	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16871	126.6	21.36	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1979	53.4	10.57	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17	64.8	11.02	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17601	123.6	21.76	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17792	114	20.28	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5541	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17815	158.4	28.22	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.16878	159	26.84	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzofuran[1,2,3,4,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzofuran[1,2,3,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5545	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzofuran[2,3,4,6,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Hexachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Hexachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Hexachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Hexachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Hexachlorodibenzofurans (Total)	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Hexachlorodibenzofurans (Total)	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.19	118.8	22.1	4.52			1.50E-03		1.50E-06		
RE16-11-5533	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.16871	126.6	21.4	4.68			1.50E-03		1.50E-06		
RE16-11-5534	Octachlorodibenzodioxin[1,2,3,4,	2.1	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.1979	53.4	10.6	9.46			1.50E-03		1.50E-06		
RE16-11-5536	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.17	64.8	11	9.08			1.50E-03		1.50E-06		
RE16-11-5537	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.17601	123.6	21.8	4.60			1.50E-03		1.50E-06		
RE16-11-5539	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.17792	114	20.3	4.93			1.50E-03		1.50E-06		
RE16-11-5540	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.17815	158.4	28.2	3.54			1.50E-03		1.50E-06		
RE16-11-5543	Octachlorodibenzodioxin[1,2,3,4,	9.9	pg/Filter	0.16878	159	26.8	0.37			1.50E-03		1.50E-06		
RE16-11-5544	Octachlorodibenzodioxin[1,2,3,4,	2.6	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.1797	162	29.1	3.44			1.50E-03		1.50E-06		
RE16-11-5546	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter	0.17049	162.6	27.7	3.61			1.50E-03		1.50E-06		
RE16-11-5547	Octachlorodibenzodioxin[1,2,3,4,	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.19	118.8	22.1	4.52			1.50E-03		1.50E-06		
RE16-11-5533	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.16871	126.6	21.4	4.68			1.50E-03		1.50E-06		
RE16-11-5534	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.1979	53.4	10.6	9.46			1.50E-03		1.50E-06		
RE16-11-5536	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.17	64.8	11	9.08			1.50E-03		1.50E-06		
RE16-11-5537	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.17601	123.6	21.8	4.60			1.50E-03		1.50E-06		
RE16-11-5539	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.17792	114	20.3	4.93			1.50E-03		1.50E-06		
RE16-11-5540	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.17815	158.4	28.2	3.54			1.50E-03		1.50E-06		
RE16-11-5543	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.16878	159	26.8	3.73			1.50E-03		1.50E-06		
RE16-11-5544	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.1797	162	29.1	3.44			1.50E-03		1.50E-06		
RE16-11-5546	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter	0.17049	162.6	27.7	3.61			1.50E-03		1.50E-06		
RE16-11-5547	Octachlorodibenzofuran[1,2,3,4,6	100	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5532	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Pentachlorodibenzodioxin[1,2,3,7	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Pentachlorodibenzodioxins	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Pentachlorodibenzodioxins	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Pentachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Pentachlorodibenzodioxins	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Pentachlorodibenzodioxins	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Pentachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Pentachlorodibenzodioxins	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Pentachlorodibenzodioxins	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Pentachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Pentachlorodibenzodioxins	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Pentachlorodibenzodioxins	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Pentachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Pentachlorodibenzodioxins	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Pentachlorodibenzodioxins	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Pentachlorodibenzodioxins	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Pentachlorodibenzofuran[1,2,3,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5535	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Pentachlorodibenzofuran[2,3,4,7,	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Pentachlorodibenzofurans	50	pg/Filter	0.19	118.8	22.1	2.26			1.50E-03		1.50E-06		
RE16-11-5533	Pentachlorodibenzofurans	50	pg/Filter	0.16871	126.6	21.4	2.34			1.50E-03		1.50E-06		
RE16-11-5534	Pentachlorodibenzofurans	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Pentachlorodibenzofurans	50	pg/Filter	0.1979	53.4	10.6	4.73			1.50E-03		1.50E-06		
RE16-11-5536	Pentachlorodibenzofurans	50	pg/Filter	0.17	64.8	11	4.54			1.50E-03		1.50E-06		
RE16-11-5537	Pentachlorodibenzofurans	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Pentachlorodibenzofurans	50	pg/Filter	0.17601	123.6	21.8	2.30			1.50E-03		1.50E-06		
RE16-11-5539	Pentachlorodibenzofurans	50	pg/Filter	0.17792	114	20.3	2.47			1.50E-03		1.50E-06		
RE16-11-5540	Pentachlorodibenzofurans	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Pentachlorodibenzofurans	50	pg/Filter	0.17815	158.4	28.2	1.77			1.50E-03		1.50E-06		
RE16-11-5543	Pentachlorodibenzofurans	50	pg/Filter	0.16878	159	26.8	1.86			1.50E-03		1.50E-06		
RE16-11-5544	Pentachlorodibenzofurans	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Pentachlorodibenzofurans	50	pg/Filter	0.1797	162	29.1	1.72			1.50E-03		1.50E-06		
RE16-11-5546	Pentachlorodibenzofurans	50	pg/Filter	0.17049	162.6	27.7	1.80			1.50E-03		1.50E-06		
RE16-11-5547	Pentachlorodibenzofurans	50	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.19	118.8	22.1	0.45			1.50E-03		1.50E-06		
RE16-11-5533	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.16871	126.6	21.4	0.47			1.50E-03		1.50E-06		
RE16-11-5534	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.1979	53.4	10.6	0.95			1.50E-03		1.50E-06		
RE16-11-5536	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.17	64.8	11	0.91			1.50E-03		1.50E-06		
RE16-11-5537	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.17601	123.6	21.8	0.46			1.50E-03		1.50E-06		
RE16-11-5539	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.17792	114	20.3	0.49			1.50E-03		1.50E-06		
RE16-11-5540	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.17815	158.4	28.2	0.35			1.50E-03		1.50E-06		
RE16-11-5543	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.16878	159	26.8	0.37			1.50E-03		1.50E-06		
RE16-11-5544	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.1797	162	29.1	0.34			1.50E-03		1.50E-06		
RE16-11-5546	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter	0.17049	162.6	27.7	0.36			1.50E-03		1.50E-06		
RE16-11-5547	Tetrachlorodibenzodioxin[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.19	118.8	22.1	0.45			1.50E-03		1.50E-06		
RE16-11-5533	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.16871	126.6	21.4	0.47			1.50E-03		1.50E-06		
RE16-11-5534	Tetrachlorodibenzodioxins (Total)	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.1979	53.4	10.6	0.95			1.50E-03		1.50E-06		
RE16-11-5536	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.17	64.8	11	0.91			1.50E-03		1.50E-06		
RE16-11-5537	Tetrachlorodibenzodioxins (Total)	10	pg/Filter			0				1.50E-03		1.50E-06		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5538	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.17601	123.6	21.8	0.46			1.50E-03		1.50E-06		
RE16-11-5539	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.17792	114	20.3	0.49			1.50E-03		1.50E-06		
RE16-11-5540	Tetrachlorodibenzodioxins (Total)	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.17815	158.4	28.2	0.35			1.50E-03		1.50E-06		
RE16-11-5543	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.16878	159	26.8	0.37			1.50E-03		1.50E-06		
RE16-11-5544	Tetrachlorodibenzodioxins (Total)	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.1797	162	29.1	0.34			1.50E-03		1.50E-06		
RE16-11-5546	Tetrachlorodibenzodioxins (Total)	10	pg/Filter	0.17049	162.6	27.7	0.36			1.50E-03		1.50E-06		
RE16-11-5547	Tetrachlorodibenzodioxins (Total)	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.19	118.8	22.1	0.45			1.50E-03		1.50E-06		
RE16-11-5533	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.16871	126.6	21.4	0.47			1.50E-03		1.50E-06		
RE16-11-5534	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.1979	53.4	10.6	0.95			1.50E-03		1.50E-06		
RE16-11-5536	Tetrachlorodibenzofuran[2,3,7,8-	0.88	pg/Filter	0.17	64.8	11	0.08			1.50E-03		1.50E-06		
RE16-11-5537	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.17601	123.6	21.8	0.46			1.50E-03		1.50E-06		
RE16-11-5539	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.17792	114	20.3	0.49			1.50E-03		1.50E-06		
RE16-11-5540	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.17815	158.4	28.2	0.35			1.50E-03		1.50E-06		
RE16-11-5543	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.16878	159	26.8	0.37			1.50E-03		1.50E-06		
RE16-11-5544	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.1797	162	29.1	0.34			1.50E-03		1.50E-06		
RE16-11-5546	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter	0.17049	162.6	27.7	0.36			1.50E-03		1.50E-06		
RE16-11-5547	Tetrachlorodibenzofuran[2,3,7,8-	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5532	Tetrachlorodibenzofurans	10	pg/Filter	0.19	118.8	22.1	0.45			1.50E-03		1.50E-06		
RE16-11-5533	Tetrachlorodibenzofurans	10	pg/Filter	0.16871	126.6	21.4	0.47			1.50E-03		1.50E-06		
RE16-11-5534	Tetrachlorodibenzofurans	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5535	Tetrachlorodibenzofurans	10	pg/Filter	0.1979	53.4	10.6	0.95			1.50E-03		1.50E-06		
RE16-11-5536	Tetrachlorodibenzofurans	0.88	pg/Filter	0.17	64.8	11	0.08			1.50E-03		1.50E-06		
RE16-11-5537	Tetrachlorodibenzofurans	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5538	Tetrachlorodibenzofurans	10	pg/Filter	0.17601	123.6	21.8	0.46			1.50E-03		1.50E-06		
RE16-11-5539	Tetrachlorodibenzofurans	10	pg/Filter	0.17792	114	20.3	0.49			1.50E-03		1.50E-06		
RE16-11-5540	Tetrachlorodibenzofurans	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5541	Tetrachlorodibenzofurans	10	pg/Filter	0.17815	158.4	28.2	0.35			1.50E-03		1.50E-06		
RE16-11-5543	Tetrachlorodibenzofurans	10	pg/Filter	0.16878	159	26.8	0.37			1.50E-03		1.50E-06		
RE16-11-5544	Tetrachlorodibenzofurans	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5545	Tetrachlorodibenzofurans	10	pg/Filter	0.1797	162	29.1	0.34			1.50E-03		1.50E-06		
RE16-11-5546	Tetrachlorodibenzofurans	10	pg/Filter	0.17049	162.6	27.7	0.36			1.50E-03		1.50E-06		
RE16-11-5547	Tetrachlorodibenzofurans	10	pg/Filter			0				1.50E-03		1.50E-06		
RE16-11-5522	Aluminum	27	ug/FILT	1.11852	114	128	0.21	detect		none specified				
RE16-11-5523	Aluminum	12	ug/FILT	1.10436	126	139	0.09	detect		none specified				
RE16-11-5524	Aluminum	20	ug/FILT			0				none specified				
RE16-11-5525	Aluminum	11	ug/FILT	1.10436	54	59.6	0.18	detect		none specified				
RE16-11-5526	Aluminum	81	ug/FILT	1.10436	60	66.3	1.22	detect		none specified				
RE16-11-5527	Aluminum	31	ug/FILT	1.10436	120	133	0.23	detect		none specified				
RE16-11-5528	Aluminum	26	ug/FILT	1.10436	108	119	0.22	detect		none specified				
RE16-11-5529	Aluminum	200	ug/FILT	1.0902	156	170	1.18	detect		none specified				
RE16-11-5530	Aluminum	98	ug/FILT	1.10436	156	172	0.57	detect		none specified				

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5531	Aluminum	14	ug/FILT	1.0902	162	177	0.08	detect		none specified				
RE16-11-5542	Aluminum	28	ug/FILT	1.0902	162	177	0.16	detect	10	none specified				
RE16-11-5522	Antimony	0.032	ug/FILT	1.11852	114	128	0.00			1.50E+00		1.50E+03		
RE16-11-5523	Antimony	0.024	ug/FILT	1.10436	126	139	0.00			1.50E+00		1.50E+03		
RE16-11-5524	Antimony	0.032	ug/FILT			0	0.00			1.50E+00		1.50E+03		
RE16-11-5525	Antimony	0.06	ug/FILT	1.10436	54	59.6	0.00			1.50E+00		1.50E+03		
RE16-11-5526	Antimony	0.06	ug/FILT	1.10436	60	66.3	0.00			1.50E+00		1.50E+03		
RE16-11-5527	Antimony	0.06	ug/FILT	1.10436	120	133	0.00			1.50E+00		1.50E+03		
RE16-11-5528	Antimony	[illegible]	[illegible]	1.10436	108	119	0.00	detect		1.50E+00		1.50E+03		
RE16-11-5529	Antimony			1.0902	156	170	0.00			1.50E+00		1.50E+03		
RE16-11-5530	Antimony			1.10436	156	172	0.00			1.50E+00		1.50E+03		
RE16-11-5531	Antimony			1.0902	162	177	0.00			1.50E+00		1.50E+03		
RE16-11-5542	Antimony			1.0902	162	177	0.00		1	1.50E+00		1.50E+03		
RE16-11-5522	Arsenic			1.11852	114	128	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5523	Arsenic			1.10436	126	139	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5524	Arsenic					0	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5525	Arsenic			1.10436	54	59.6	0.01			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5526	Arsenic			1.10436	60	66.3	0.01			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5527	Arsenic			1.10436	120	133	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5528	Arsenic			1.10436	108	119	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5529	Arsenic			1.0902	156	170	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5530	Arsenic			1.10436	156	172	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5531	Arsenic			1.0902	162	177	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5542	Arsenic			1.0902	162	177	0.00			1.90E-04	1.90E-01	1.90E-01		
RE16-11-5522	Barium			1.11852	114	128	0.00	detect		1.50E+00		1.50E+03		
RE16-11-5523	Barium	0.16	ug/FILT	1.10436	126	139	0.00			1.50E+00		1.50E+03		
RE16-11-5524	Barium	0.58	ug/FILT			0	0.00			1.50E+00		1.50E+03		
RE16-11-5525	Barium	0.3	ug/FILT	1.10436	54	59.6	0.01	detect		1.50E+00		1.50E+03		
RE16-11-5526	Barium	1	ug/FILT	1.10436	60	66.3	0.02	detect		1.50E+00		1.50E+03		
RE16-11-5527	Barium	0.8	ug/FILT	1.10436	120	133	0.01	detect		1.50E+00		1.50E+03		
RE16-11-5528	Barium	0.63	ug/FILT	1.10436	108	119	0.01	detect		1.50E+00		1.50E+03		
RE16-11-5529	Barium	1.2	ug/FILT	1.0902	156	170	0.01	detect		1.50E+00		1.50E+03		
RE16-11-5530	Barium	1.8	ug/FILT	1.10436	156	172	0.01	detect		1.50E+00		1.50E+03		
RE16-11-5531	Barium	0.42	ug/FILT	1.0902	162	177	0.00	detect		1.50E+00		1.50E+03		
RE16-11-5542	Barium	1.2	ug/FILT	1.0902	162	177	0.01	detect	9	1.50E+00		1.50E+03		
RE16-11-5522	Beryllium	0.1	ug/FILT	1.11852	114	128	0.00			5.00E-03		5.00E+00		
RE16-11-5523	Beryllium	0.1	ug/FILT	1.10436	126	139	0.00			5.00E-03		5.00E+00		
RE16-11-5524	Beryllium	0.1	ug/FILT			0	0.00			5.00E-03		5.00E+00		
RE16-11-5525	Beryllium	0.1	ug/FILT	1.10436	54	59.6	0.00			5.00E-03		5.00E+00		
RE16-11-5526	Beryllium	0.1	ug/FILT	1.10436	60	66.3	0.00			5.00E-03		5.00E+00		
RE16-11-5527	Beryllium	0.1	ug/FILT	1.10436	120	133	0.00			5.00E-03		5.00E+00		
RE16-11-5528	Beryllium	0.1	ug/FILT	1.10436	108	119	0.00			5.00E-03		5.00E+00		
RE16-11-5529	Beryllium	0.1	ug/FILT	1.0902	156	170	0.00			5.00E-03		5.00E+00		
RE16-11-5530	Beryllium	0.1	ug/FILT	1.10436	156	172	0.00			5.00E-03		5.00E+00		
RE16-11-5531	Beryllium	0.1	ug/FILT	1.0902	162	177	0.00			5.00E-03		5.00E+00		
RE16-11-5542	Beryllium	0.1	ug/FILT	1.0902	162	177	0.00			5.00E-03		5.00E+00		
RE16-11-5522	Cadmium	0.042	ug/FILT	1.11852	114	128	0.00			3.00E-02		3.00E+01		
RE16-11-5523	Cadmium	0.09	ug/FILT	1.10436	126	139	0.00	detect		3.00E-02		3.00E+01		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5524	Cadmium	0.13	ug/FILT			0	0.00			3.00E-02		3.00E+01		
RE16-11-5525	Cadmium	0.12	ug/FILT	1.10436	54	59.6	0.00	detect		3.00E-02		3.00E+01		
RE16-11-5526	Cadmium	0.63	ug/FILT	1.10436	60	66.3	0.01	detect		3.00E-02		3.00E+01		
RE16-11-5527	Cadmium	1.1	ug/FILT	1.10436	120	133	0.01	detect		3.00E-02		3.00E+01		
RE16-11-5528	Cadmium	0.97	ug/FILT	1.10436	108	119	0.01	detect		3.00E-02		3.00E+01		
RE16-11-5529	Cadmium	12	ug/FILT	1.0902	156	170	0.07	detect		3.00E-02		3.00E+01		
RE16-11-5530	Cadmium	11	ug/FILT	1.10436	156	172	0.06	detect		3.00E-02		3.00E+01		
RE16-11-5531	Cadmium	0.024	ug/FILT	1.0902	162	177	0.00			3.00E-02		3.00E+01		
RE16-11-5542	Cadmium	0.38	ug/FILT	1.0902	162	177	0.00	detect	8	3.00E-02		3.00E+01		
RE16-11-5522	Calcium	34	ug/FILT	1.11852	114	128	0.27			none specified				
RE16-11-5523	Calcium	30	ug/FILT	1.10436	126	139	0.22			none specified				
RE16-11-5524	Calcium	21	ug/FILT			0	0.00			none specified				
RE16-11-5525	Calcium	38	ug/FILT	1.10436	54	59.6	0.64			none specified				
RE16-11-5526	Calcium	30	ug/FILT	1.10436	60	66.3	0.45			none specified				
RE16-11-5527	Calcium	62	ug/FILT	1.10436	120	133	0.47			none specified				
RE16-11-5528	Calcium	50	ug/FILT	1.10436	108	119	0.42			none specified				
RE16-11-5529	Calcium	38	ug/FILT	1.0902	156	170	0.22			none specified				
RE16-11-5530	Calcium	48	ug/FILT	1.10436	156	172	0.28			none specified				
RE16-11-5531	Calcium	58	ug/FILT	1.0902	162	177	0.33			none specified				
RE16-11-5542	Calcium	42	ug/FILT	1.0902	162	177	0.24			none specified				
RE16-11-5522	Chromium	0.51	ug/FILT	1.11852	114	128	0.00			1.50E+00		1.50E+03		
RE16-11-5523	Chromium	0.56	ug/FILT	1.10436	126	139	0.00			1.50E+00		1.50E+03		
RE16-11-5524	Chromium	0.6	ug/FILT			0	0.00			1.50E+00		1.50E+03		
RE16-11-5525	Chromium	0.22	ug/FILT	1.10436	54	59.6	0.00			1.50E+00		1.50E+03		
RE16-11-5526	Chromium	0.56	ug/FILT	1.10436	60	66.3	0.01			1.50E+00		1.50E+03		
RE16-11-5527	Chromium	1	ug/FILT	1.10436	120	133	0.01			1.50E+00		1.50E+03		
RE16-11-5528	Chromium	0.95	ug/FILT	1.10436	108	119	0.01			1.50E+00		1.50E+03		
RE16-11-5529	Chromium	0.87	ug/FILT	1.0902	156	170	0.01			1.50E+00		1.50E+03		
RE16-11-5530	Chromium	0.86	ug/FILT	1.10436	156	172	0.00			1.50E+00		1.50E+03		
RE16-11-5531	Chromium	0.29	ug/FILT	1.0902	162	177	0.00			1.50E+00		1.50E+03		
RE16-11-5542	Chromium	0.4	ug/FILT	1.0902	162	177	0.00			1.50E+00		1.50E+03		
RE16-11-5522	Cobalt	0.2	ug/FILT	1.11852	114	128	0.00			none specified				
RE16-11-5523	Cobalt	0.02	ug/FILT	1.10436	126	139	0.00			none specified				
RE16-11-5524	Cobalt	0.024	ug/FILT			0	0.00			none specified				
RE16-11-5525	Cobalt	0.2	ug/FILT	1.10436	54	59.6	0.00			none specified				
RE16-11-5526	Cobalt	0.03	ug/FILT	1.10436	60	66.3	0.00			none specified				
RE16-11-5527	Cobalt	0.092	ug/FILT	1.10436	120	133	0.00			none specified				
RE16-11-5528	Cobalt	0.036	ug/FILT	1.10436	108	119	0.00			none specified				
RE16-11-5529	Cobalt	0.05	ug/FILT	1.0902	156	170	0.00			none specified				
RE16-11-5530	Cobalt	0.15	ug/FILT	1.10436	156	172	0.00			none specified				
RE16-11-5531	Cobalt	0.2	ug/FILT	1.0902	162	177	0.00			none specified				
RE16-11-5542	Cobalt	0.062	ug/FILT	1.0902	162	177	0.00			none specified				
RE16-11-5522	Copper	0.87	ug/FILT	1.11852	114	128	0.01			none specified	1.00E+02	1.00E+02		
RE16-11-5523	Copper	1.7	ug/FILT	1.10436	126	139	0.01			none specified	1.00E+02	1.00E+02		
RE16-11-5524	Copper	0.55	ug/FILT			0	0.00			none specified	1.00E+02	1.00E+02		
RE16-11-5525	Copper	1.9	ug/FILT	1.10436	54	59.6	0.03			none specified	1.00E+02	1.00E+02		
RE16-11-5526	Copper	1.1	ug/FILT	1.10436	60	66.3	0.02			none specified	1.00E+02	1.00E+02		
RE16-11-5527	Copper	1.8	ug/FILT	1.10436	120	133	0.01			none specified	1.00E+02	1.00E+02		

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5528	Copper	3.2	ug/FILT	1.10436	108	119	0.03	detect		none specified	1.00E+02	1.00E+02		
RE16-11-5529	Copper	2.8	ug/FILT	1.0902	156	170	0.02	detect		none specified	1.00E+02	1.00E+02		
RE16-11-5530	Copper	1.5	ug/FILT	1.10436	156	172	0.01			none specified	1.00E+02	1.00E+02		
RE16-11-5531	Copper	1.3	ug/FILT	1.0902	162	177	0.01			none specified	1.00E+02	1.00E+02		
RE16-11-5542	Copper	2.6	ug/FILT	1.0902	162	177	0.01	detect	3	none specified	1.00E+02	1.00E+02		
RE16-11-5522	Iron	36	ug/FILT	1.11852	114	128	0.28	detect		none specified				
RE16-11-5523	Iron	15	ug/FILT	1.10436	126	139	0.11			none specified				
RE16-11-5524	Iron	38	ug/FILT			0	0.00			none specified				
RE16-11-5525	Iron	7.1	ug/FILT	1.10436	54	59.6	0.12			none specified				
RE16-11-5526	Iron	24	ug/FILT	1.10436	60	66.3	0.36	detect		none specified				
RE16-11-5527	Iron	53	ug/FILT	1.10436	120	133	0.40	detect		none specified				
RE16-11-5528	Iron	45	ug/FILT	1.10436	108	119	0.38	detect		none specified				
RE16-11-5529	Iron	82	ug/FILT	1.0902	156	170	0.48	detect		none specified				
RE16-11-5530	Iron	110	ug/FILT	1.10436	156	172	0.64	detect		none specified				
RE16-11-5531	Iron	17	ug/FILT	1.0902	162	177	0.10			none specified				
RE16-11-5542	Iron	42	ug/FILT	1.0902	162	177	0.24	detect	7	none specified				
RE16-11-5522	Lead	0.63	ug/FILT	1.11852	114	128	0.00	detect		1.50E-01		1.50E+02		
RE16-11-5523	Lead	1.7	ug/FILT	1.10436	126	139	0.01	detect		1.50E-01		1.50E+02		
RE16-11-5524	Lead	2.1	ug/FILT			0	0.00			1.50E-01		1.50E+02		
RE16-11-5525	Lead	1.6	ug/FILT	1.10436	54	59.6	0.03	detect		1.50E-01		1.50E+02		
RE16-11-5526	Lead	11	ug/FILT	1.10436	60	66.3	0.17	detect		1.50E-01		1.50E+02		
RE16-11-5527	Lead	19	ug/FILT	1.10436	120	133	0.14	detect		1.50E-01		1.50E+02		
RE16-11-5528	Lead	35	ug/FILT	1.10436	108	119	0.29	detect		1.50E-01		1.50E+02		
RE16-11-5529	Lead	180	ug/FILT	1.0902	156	170	1.06	detect		1.50E-01		1.50E+02		
RE16-11-5530	Lead	190	ug/FILT	1.10436	156	172	1.10	detect		1.50E-01		1.50E+02		
RE16-11-5531	Lead	0.34	ug/FILT	1.0902	162	177	0.00	detect		1.50E-01		1.50E+02		
RE16-11-5542	Lead	6.7	ug/FILT	1.0902	162	177	0.04	detect	10	1.50E-01		1.50E+02		
RE16-11-5522	Magnesium	5.2	ug/FILT	1.11852	114	128	0.04			none specified				
RE16-11-5523	Magnesium	4.7	ug/FILT	1.10436	126	139	0.03			none specified				
RE16-11-5524	Magnesium	8.1	ug/FILT			0	0.00			none specified				
RE16-11-5525	Magnesium	20	ug/FILT	1.10436	54	59.6	0.34			none specified				
RE16-11-5526	Magnesium	4.6	ug/FILT	1.10436	60	66.3	0.07			none specified				
RE16-11-5527	Magnesium	8.6	ug/FILT	1.10436	120	133	0.06			none specified				
RE16-11-5528	Magnesium	8.1	ug/FILT	1.10436	108	119	0.07			none specified				
RE16-11-5529	Magnesium	15	ug/FILT	1.0902	156	170	0.09			none specified				
RE16-11-5530	Magnesium	14	ug/FILT	1.10436	156	172	0.08			none specified				
RE16-11-5531	Magnesium	6	ug/FILT	1.0902	162	177	0.03			none specified				
RE16-11-5542	Magnesium	5	ug/FILT	1.0902	162	177	0.03			none specified				
RE16-11-5522	Manganese	0.34	ug/FILT	1.11852	114	128	0.00			none specified				
RE16-11-5523	Manganese	0.25	ug/FILT	1.10436	126	139	0.00			none specified				
RE16-11-5524	Manganese	0.25	ug/FILT			0	0.00			none specified				
RE16-11-5525	Manganese	0.078	ug/FILT	1.10436	54	59.6	0.00			none specified				
RE16-11-5526	Manganese	0.33	ug/FILT	1.10436	60	66.3	0.00			none specified				
RE16-11-5527	Manganese	1.2	ug/FILT	1.10436	120	133	0.01	detect		none specified				
RE16-11-5528	Manganese	0.63	ug/FILT	1.10436	108	119	0.01	detect		none specified				
RE16-11-5529	Manganese	0.8	ug/FILT	1.0902	156	170	0.00	detect		none specified				
RE16-11-5530	Manganese	1.3	ug/FILT	1.10436	156	172	0.01	detect		none specified				
RE16-11-5531	Manganese	0.35	ug/FILT	1.0902	162	177	0.00			none specified				

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5542	Manganese	0.57	ug/FILT	1.0902	162	177	0.00	detect	5	none specified				
RE16-11-5522	Nickel	0.24	ug/FILT	1.11852	114	128	0.00			6.00E-03	6.00E+02	6.00E+00		
RE16-11-5523	Nickel	1.2	ug/FILT	1.10436	126	139	0.01	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5524	Nickel	0.36	ug/FILT			0	0.00			6.00E-03	6.00E+02	6.00E+00		
RE16-11-5525	Nickel	0.35	ug/FILT	1.10436	54	59.6	0.01			6.00E-03	6.00E+02	6.00E+00		
RE16-11-5526	Nickel	2.1	ug/FILT	1.10436	60	66.3	0.03	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5527	Nickel	4.5	ug/FILT	1.10436	120	133	0.03	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5528	Nickel	1.1	ug/FILT	1.10436	108	119	0.01	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5529	Nickel	2.1	ug/FILT	1.0902	156	170	0.01	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5530	Nickel	8.7	ug/FILT	1.10436	156	172	0.05	detect		6.00E-03	6.00E+02	6.00E+00		
RE16-11-5531	Nickel	0.64	ug/FILT	1.0902	162	177	0.00			6.00E-03	6.00E+02	6.00E+00		
RE16-11-5542	Nickel	4	ug/FILT	1.0902	162	177	0.02	detect	7	6.00E-03	6.00E+02	6.00E+00		
RE16-11-5522	Potassium	200	ug/FILT	1.11852	114	128	1.57			none specified				
RE16-11-5523	Potassium	200	ug/FILT	1.10436	126	139	1.44			none specified				
RE16-11-5524	Potassium	200	ug/FILT			0	0.00			none specified				
RE16-11-5525	Potassium	200	ug/FILT	1.10436	54	59.6	3.35			none specified				
RE16-11-5526	Potassium	18	ug/FILT	1.10436	60	66.3	0.27			none specified				
RE16-11-5527	Potassium	200	ug/FILT	1.10436	120	133	1.51			none specified				
RE16-11-5528	Potassium	200	ug/FILT	1.10436	108	119	1.68			none specified				
RE16-11-5529	Potassium	200	ug/FILT	1.0902	156	170	1.18			none specified				
RE16-11-5530	Potassium	200	ug/FILT	1.10436	156	172	1.16			none specified				
RE16-11-5531	Potassium	200	ug/FILT	1.0902	162	177	1.13			none specified				
RE16-11-5542	Potassium	200	ug/FILT	1.0902	162	177	1.13			none specified				
RE16-11-5522	Selenium	0.2	ug/FILT	1.11852	114	128	0.00			1.47E+00		1.47E+03		
RE16-11-5523	Selenium	0.2	ug/FILT	1.10436	126	139	0.00			1.47E+00		1.47E+03		
RE16-11-5524	Selenium	0.2	ug/FILT			0	0.00			1.47E+00		1.47E+03		
RE16-11-5525	Selenium	0.2	ug/FILT	1.10436	54	59.6	0.00			1.47E+00		1.47E+03		
RE16-11-5526	Selenium	0.2	ug/FILT	1.10436	60	66.3	0.00			1.47E+00		1.47E+03		
RE16-11-5527	Selenium	0.2	ug/FILT	1.10436	120	133	0.00			1.47E+00		1.47E+03		
RE16-11-5528	Selenium	0.2	ug/FILT	1.10436	108	119	0.00			1.47E+00		1.47E+03		
RE16-11-5529	Selenium	0.2	ug/FILT	1.0902	156	170	0.00			1.47E+00		1.47E+03		
RE16-11-5530	Selenium	0.2	ug/FILT	1.10436	156	172	0.00			1.47E+00		1.47E+03		
RE16-11-5531	Selenium	0.2	ug/FILT	1.0902	162	177	0.00			1.47E+00		1.47E+03		
RE16-11-5542	Selenium	0.2	ug/FILT	1.0902	162	177	0.00			1.47E+00		1.47E+03		
RE16-11-5522	Silver	0.034	ug/FILT	1.11852	114	128	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5523	Silver	0.014	ug/FILT	1.10436	126	139	0.00			3.00E-01		3.00E+02		
RE16-11-5524	Silver	0.044	ug/FILT			0	0.00			3.00E-01		3.00E+02		
RE16-11-5525	Silver	0.1	ug/FILT	1.10436	54	59.6	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5526	Silver	0.046	ug/FILT	1.10436	60	66.3	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5527	Silver	0.098	ug/FILT	1.10436	120	133	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5528	Silver	0.22	ug/FILT	1.10436	108	119	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5529	Silver	0.022	ug/FILT	1.0902	156	170	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5530	Silver	0.038	ug/FILT	1.10436	156	172	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5531	Silver	0.032	ug/FILT	1.0902	162	177	0.00	detect		3.00E-01		3.00E+02		
RE16-11-5542	Silver	0.01	ug/FILT	1.0902	162	177	0.00		8	3.00E-01		3.00E+02		
RE16-11-5522	Sodium	200	ug/FILT	1.11852	114	128	1.57			none specified				
RE16-11-5523	Sodium	24	ug/FILT	1.10436	126	139	0.17			none specified				
RE16-11-5524	Sodium	200	ug/FILT			0	0.00			none specified				

Sample Name	Analyte Description	Std Result	Std Result Unit	Flow rate (m^3/min)	Flow time (min)	Flow vol m^3	Conc. In air (pg or ug/m^3)	Detection	# of Detects per Analyte	Acute Inhalation Exposure levels (mg/m^3)	CA Acute Reference Exposure Levels (RELs) (mg/m^3)	Conversion of exposure levels to pg or ug/m^3	Exceed Acute Conc?	# of real exceeds per analyte
RE16-11-5525	Sodium	200	ug/FILT	1.10436	54	59.6	3.35			none specified				
RE16-11-5526	Sodium	150	ug/FILT	1.10436	60	66.3	2.26			none specified				
RE16-11-5527	Sodium	200	ug/FILT	1.10436	120	133	1.51			none specified				
RE16-11-5528	Sodium	200	ug/FILT	1.10436	108	119	1.68			none specified				
RE16-11-5529	Sodium	42	ug/FILT	1.0902	156	170	0.25			none specified				
RE16-11-5530	Sodium	48	ug/FILT	1.10436	156	172	0.28			none specified				
RE16-11-5531	Sodium	200	ug/FILT	1.0902	162	177	1.13			none specified				
RE16-11-5542	Sodium	58	ug/FILT	1.0902	162	177	0.33			none specified				
RE16-11-5522	Thallium	0.006	ug/FILT	1.11852	114	128	0.00			3.00E-01		3.00E+02		
RE16-11-5523	Thallium	0.01	ug/FILT	1.10436	126	139	0.00			3.00E-01		3.00E+02		
RE16-11-5524	Thallium	0.006	ug/FILT			0	0.00			3.00E-01		3.00E+02		
RE16-11-5525	Thallium	0.04	ug/FILT	1.10436	54	59.6	0.00			3.00E-01		3.00E+02		
RE16-11-5526	Thallium	0.04	ug/FILT	1.10436	60	66.3	0.00			3.00E-01		3.00E+02		
RE16-11-5527	Thallium	0.012	ug/FILT	1.10436	120	133	0.00			3.00E-01		3.00E+02		
RE16-11-5528	Thallium	0.04	ug/FILT	1.10436	108	119	0.00			3.00E-01		3.00E+02		
RE16-11-5529	Thallium	0.04	ug/FILT	1.0902	156	170	0.00			3.00E-01		3.00E+02		
RE16-11-5530	Thallium	0.04	ug/FILT	1.10436	156	172	0.00			3.00E-01		3.00E+02		
RE16-11-5531	Thallium	0.04	ug/FILT	1.0902	162	177	0.00			3.00E-01		3.00E+02		
RE16-11-5542	Thallium	0.04	ug/FILT	1.0902	162	177	0.00			3.00E-01		3.00E+02		
RE16-11-5522	Vanadium	0.2	ug/FILT	1.11852	114	128	0.00			none specified				
RE16-11-5523	Vanadium	0.2	ug/FILT	1.10436	126	139	0.00			none specified				
RE16-11-5524	Vanadium	0.2	ug/FILT			0	0.00			none specified				
RE16-11-5525	Vanadium	0.2	ug/FILT	1.10436	54	59.6	0.00			none specified				
RE16-11-5526	Vanadium	0.2	ug/FILT	1.10436	60	66.3	0.00			none specified				
RE16-11-5527	Vanadium	0.2	ug/FILT	1.10436	120	133	0.00			none specified				
RE16-11-5528	Vanadium	0.2	ug/FILT	1.10436	108	119	0.00			none specified				
RE16-11-5529	Vanadium	0.056	ug/FILT	1.0902	156	170	0.00			none specified				
RE16-11-5530	Vanadium	0.058	ug/FILT	1.10436	156	172	0.00			none specified				
RE16-11-5531	Vanadium	0.2	ug/FILT	1.0902	162	177	0.00			none specified				
RE16-11-5542	Vanadium	0.2	ug/FILT	1.0902	162	177	0.00			none specified				
RE16-11-5522	Zinc	2.5	ug/FILT	1.11852	114	128	0.02			3.00E+01		3.00E+04		
RE16-11-5523	Zinc	4.6	ug/FILT	1.10436	126	139	0.03	detect		3.00E+01		3.00E+04		
RE16-11-5524	Zinc	2	ug/FILT			0	0.00			3.00E+01		3.00E+04		
RE16-11-5525	Zinc	7.9	ug/FILT	1.10436	54	59.6	0.13	detect		3.00E+01		3.00E+04		
RE16-11-5526	Zinc	5.3	ug/FILT	1.10436	60	66.3	0.08	detect		3.00E+01		3.00E+04		
RE16-11-5527	Zinc	17	ug/FILT	1.10436	120	133	0.13	detect		3.00E+01		3.00E+04		
RE16-11-5528	Zinc	12	ug/FILT	1.10436	108	119	0.10	detect		3.00E+01		3.00E+04		
RE16-11-5529	Zinc	7.3	ug/FILT	1.0902	156	170	0.04	detect		3.00E+01		3.00E+04		
RE16-11-5530	Zinc	8.1	ug/FILT	1.10436	156	172	0.05	detect		3.00E+01		3.00E+04		
RE16-11-5531	Zinc	20	ug/FILT	1.0902	162	177	0.11	detect		3.00E+01		3.00E+04		
RE16-11-5542	Zinc	5.3	ug/FILT	1.0902	162	177	0.03	detect	9	3.00E+01		3.00E+04		

Supplement 4-13

Thermal Measurements at the TA-16-388 Flash Pad

Table of Contents

Contents

1.0 Introduction 1

2.0 Thermal Measurement Set-Up and Methodology 1

3.0 Data Analysis 2

3.1 Temperature Verification Test – April 3, 2013 2

3.2 Temperature Verification Test – April 18, 2013 3

4.0 Results 4

5.0 Conclusions 6

6.0 References 6

Attachment A – Excerpt of April 3, 2013 Thermal Images 12

Attachment B – Excerpt of April 18, 2013 Thermal Images 14

Figure 1 – Measurement Locations 8

Figure 2 - April 3, 2013 10

Figure 3 - April 18, 2013 11

1.0 Introduction

The single remaining active open burning treatment unit at the Los Alamos National Laboratory is known as the TA-16-388 Flash Pad and is used to treat explosives and explosives-contaminated hazardous waste utilizing two propane burners in an open air environment. As part of the Resource Conservation and Recovery Act (RCRA) application process for this unit, the U.S. Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) have determined that an exercise to verify treatment temperatures at the unit was necessary. This report details the thermal measurements collected from two open burning treatment events conducted at the TA-16-388 Flash Pad and discusses how those temperatures may have an effect on combustion products from treatment events at the unit. The treatment events occurred on April 3, 2013 and April 18, 2013. The wastes treated during the test were the most routinely treated waste stream for open burning.

In order to provide definitive verification of the burner output temperature, three different measurement types were used. Type K thermocouples provided contact measurements on and around the screen or cage that surrounds the waste within the burn tray. Non-contact temperature measurements were made using an infrared pyrometer and an infrared thermal imager. Two different pyrometers were used during testing, one during each of the two tests. All three measurement methodologies were used for each test.

2.0 Thermal Measurement Set-Up and Methodology

Three different measurement methods were employed in order to give the most comprehensive thermal profile of the burn in the treatment unit. For all treatment events, waste material is placed within a screen cage inside the burn tray to minimize the escape of any embers from the area during treatment. Thermocouples were arranged around the screen in which the waste material is placed for burning. A pyrometer was aimed at the screen in the first test and at a graphite target in the second test. The graphite target was utilized in the second test to lessen the variation of the pyrometer signal that was present during the April 3rd test due to turbulence. The graphite target created a larger mass for the pyrometer to be aimed at that was less susceptible to movement created by the burner outputs. Finally, a thermal imager was placed where it could view the entire burning area in the unit. This placement provided both spot measurements and a complete picture of the treatment temperatures achieved in the unit. All equipment used in the two tests is either itself NIST (National Institute of Standards and Technology)-traceable, or was verified using NIST-traceable equipment. Signals from the thermocouples and the pyrometers were data-logged using a Graphtec GL800 midi Data Logger. All signals were logged at a rate of 5 per second.

A thermocouple is a temperature measurement device consisting of a junction of two dissimilar metals. When the junction is heated, a voltage will be created that is temperature-dependent. This voltage is then converted to a calibrated temperature reading. The type K thermocouples used during testing have

a temperature range from -330°F to 2100°F. In both tests, Type K thermocouples were placed at several points in and around the burn tray (Figure 1).

A pyrometer was set up to measure temperature at the surface of the screen (Figure 1). A pyrometer is a non-contact temperature measurement device that detects thermal radiation to determine the temperature of an object's surface without contacting the object. The measurement of the thermal radiation is output as a current signal that is converted to the corresponding temperature by the data logger. Two different pyrometers were used in each of the two tests, one reading from 1652°F to 4532°F and the other reading from 914°F to 3632°F.

A thermal imager works in a manner similar to a pyrometer. It is a non-contact device that detects infrared energy and converts it to an electrical signal. The images created depict different temperatures as different colors and are included within Attachments A and B of this report. A color key for the images is shown on each page. In each thermogram, the waste screen or cage (Ar1) is outlined in blue. The pyrometer was aimed at the waste; the approximate target area is indicated by the crosshairs (marked as "Sp1" on each thermogram). The thermal imager was set to capture an image every 10 seconds.

3.0 Data Analysis

The following sections describe the temperature verification activities associated with each of the waste treatment events measured. The sections include a general description of the waste treated, the location and type of instruments used to measure temperature, and a description of the type of data obtained from each test. Excerpts from the images that were generated from the thermal imager are included as Attachments A and B of this report. Full sets of images and data from the pyrometers and thermocouples are included with the electronic copy of the permit modification request to the New Mexico Environment Department- Hazardous Waste Bureau (NMED-HWB) only and are not included as part of this report due to their size.

3.1 Temperature Verification Test – April 3, 2013

On April 3, 2013, 22.7 pounds of hazardous waste were treated at the TA-16-388 Flash Pad. The waste stream treated consisted of explosives-contaminated filter socks that are generated during explosives machining operations. The filter socks are used to filter explosives from water used as a cooling agent during machining operations. Types of explosives that may be present in the machining waste include PBX 9501, PBX 9502, TNT, COMP-B, PETN, PBX 9404, PBX 9407, X-0211, LX-07 and XTX-8003. The waste stream is characterized with the Environmental Protection Agency (EPA) Hazardous Waste Number D003. The waste stream is part of the routinely treated explosives machining waste stream and the treatment event took place for 38 minutes. As shown in Figure 2, the burners were briefly turned off and re-started three times near the end of this test so the operator could visually check for the presence of unburned waste material.

Type K thermocouples were used to record the temperatures at several locations around the waste material. Thermocouples were placed on the east, west, and north sides of the screen enclosing the

material (Figure 1). In this test the pyrometer was aimed directly at the waste screen/flames. The pyrometer used for this test begins measuring temperature at 1650°F. Within one minute, the waste temperature as measured with the pyrometer rose to over 1900°F, and to over 2300°F within four minutes.

Figure 2 presents all thermocouple and pyrometer data obtained during the April 3, 2013 test. The temperature during the 38 minute treatment process remains relatively steady during the treatment process with the exception of the times that the burners are turned off. Figure 2 also shows the loss of data when the north and east thermocouples lost connection due to damage by the direct flame. The variability in the data depicted by the green and purple lines, as well as the strong dips in the purple line while the propane burners are on, are indicative of data loss even though the lines follow the same general pattern of the still working thermocouples. However, the exact point at which the thermocouple connection was lost during the treatment process is unknown.

The thermal images (thermograms) in Attachment A of this report depict the overall thermal profile of the burn area throughout the test[1]. The thermal imager was set to capture an image every 10 seconds, and the data shows that the temperature of the screened or waste cage area (shown as Ar1) rose to over 2000°F within one minute. The thermograms within Attachment A in addition to the thermocouple and pyrometer data in Figure 2 show that the temperature within the burn cage stays at a relatively constant temperature throughout the treatment process.

3.2 Temperature Verification Test – April 18, 2013

On April 18, 2013, 40 pounds of the explosive PBX 9501 and 36.5 pounds of the explosive PBX 9502 were treated at the TA-16-388 Flash Pad. The waste treated is also part of the routinely treated explosives machining waste stream and consisted of explosives generated from machining operations and was a mixture of PBX 9501 and PBX 9502 explosives cuttings and shavings with water. The waste stream is characterized with the EPA Hazardous Waste Number D003. The waste treatment event took place for 43 minutes. The burners were briefly turned off and re-started twice near the end of this test in order to visually determine the presence of unburned waste material.

Type K thermocouples were placed in the same locations used during the April 3 test, with the addition of a thermocouple on the north side of the waste containment screen or cage (Figure 1). For this burning operation, thermocouples with longer sheath material were used in order to prevent the connection point burn out that occurred in the April 3, 2013 test. Data was again collected from the north, west, and south thermocouples (Figure 1).

The pyrometer used during this tests begins measuring temperature at 914°F. In this test, the pyrometer was aimed at a ½ inch thick graphite target. Due to the presence of this target, the ramp time of the

[1] *Note that the time stamp shown in each thermal image is 1 hour behind the time shown in the corresponding Figure 2 data, because the thermal imager's clock had not been re-set to Daylight Savings Time (e.g., 7:55am on the thermogram corresponds to 8:55 am on Figure 2).*

pyrometer was slower during this test than the April 3 test. It took approximately two minutes for the pyrometer temperature to rise above 1500°F due to the thermal mass of the graphite target. The pyrometer temperature reached 2000°F within 5 minutes of turning the burners on. The decrease in peak temperature compared to the April 3 test was due to the graphite target being measured rather than the direct flame.

Figure 3 presents the pyrometer and thermocouple data obtained during this test. During the 43 minute treatment event, the temperatures within the screen are well above 1500°F and remain relatively steady while the propane burners are on. The slower rise in temperature that was mentioned in the north, west, and south thermocouples was due to inadvertent contact of the thermocouples with the steel burn tray used to contain the waste materials. Due to the large thermal mass of the tray, the time necessary to bring that mass to temperature is considerably longer than the time required to bring the material and area around it up to the normal operating temperature.

The thermal imager was placed in approximately the same location as the April 3 burn and the thermograms within Attachment B of this report show that the temperature of the cage area containing the waste material (shown as Ar1) rose to over 2000°F. Images were captured every 10 seconds[2] and showed a steady temperature profile. Additionally, after the propane burners were turned off initially, only one of the burners was reignited to finish the treatment process. Temperature measurements after that point still indicate a greater than 2000°F maximum overall temperature for the screened area and a temperature above 1900°F in the middle of the screened area.

4.0 Results

The data collected during these tests demonstrated that the waste is being fully treated in the TA-16-388 Flash Pad at an operating temperature above 2000 °F. The thermal image data collected, along with the pyrometer data, show that the overall temperature in the unit rises quickly and consistently operates at above 2000°F during open burning waste treatment operations. The geometry of the burn pan is such that flames from the two propane burners intersect the waste inside the burn cage that is within the burn tray. The data indicate that the waste temperature rises rapidly – from ambient to above 1500 ˚F – in approximately 60 seconds as shown in Figure 2.

As the temperature begins to rise, the waste begins to lose water via evaporation, as the water in both of the waste streams tested is heated by the two propane burners. Organics, including the explosives within the waste, begin thermal decomposition into gaseous products at the same time that the water is evaporating. In general, the combustion products or emissions from most energetic materials treated by open burning in an unconfined state will be represented by water, carbon dioxide, carbon monoxide, oxides of nitrogen. Saturated short chain hydrocarbons, acetylene, ethylene, propene, benzene, toluene, and particulate matter may also be formed, but are rapidly oxidized to primarily water and

[2] *Note that the time stamp shown in each thermal image is 1 hour behind the time shown in the corresponding Figure 3 data, because the thermal imager's clock had not been re-set to Daylight Savings Time (e.g., 7:38am on the thermogram corresponds to 8:38 am on Figure 3).*

carbon dioxide. Chlorinated materials in the waste, such as plastics or the binders within the explosives, also undergo the thermal decomposition process. (Mitchell & Suggs, 1998)

The thermal images and thermocouple/pyrometer graphs show that during the initial 60 seconds after the start of the burn, temperatures inside the screened area in the burn tray holding the waste are between 400 and 1400˚F. After this point in the burn test, temperatures within the burn cage area are consistently above 1500˚F. In each of the burn test events, high temperatures, over 1500˚F were maintained and the each of the tests occurred for more than 30 minutes. Most treatment events at the TA-16-388 Flash Pad last approximately 30 minutes.

One of the concerns about emissions products associated with open burning treatment activities is the potential to produce dioxins and furan congeners. Products of incomplete combustion, like dioxins and furans, form at a temperature range of approximately 550 to 1115 ˚F (Kulkarni, Crespo, and Afonso, 2007). Dioxins and furans are destroyed at temperatures above 1400˚F (EPA, 2010) and will be decomposed predominantly into gaseous combustion products such as the oxidized compounds of carbon and nitrogen, water, and minute quantities of diatomic chlorine and hydrogen chloride can be expected.

Additional information on the formation and destruction of dioxins and furans can be found from the American Chemistry Council's (2003) *Dioxin Fact Sheet.* The sheet highlights that there are three conditions necessary to prevent formation and increase the destruction of any dioxins and furans present due to incomplete combustion of waste:

1. The waste must be combusted at a high temperature to ensure efficient waste destruction,
2. The waste must have adequate combustion time, and
3. The heat must be distributed evenly through turbulence in the combustion zone.

During the ramp-up of temperature in the first 60 seconds of an open burning treatment, the temperature within the screened area will pass through the temperature zone necessary for dioxin and furan formation. However, because the waste within the burn tray is also coming up to temperature, incomplete combustion products will be minimized during that time frame. Additionally, the thermographs in Attachments A and B show that waste temperature rises above 1500 ˚F by the time 60 seconds have elapsed. The waste temperature continues to rise to above 2000 ˚F, where it is maintained for the rest of the 30-minute duration of a burn cycle. At high combustion temperatures, dioxins are not thermodynamically stable and decomposition is favored (Huan and Buekens, 1995). The temperature necessary for destruction of dioxin and furan congeners is met in every burn operation. In addition, the propane burners are fixed at the burn tray that contains the waste for the entire treatment event; therefore, the waste receives sufficient dwell time within the combustion zone to further reduce the potential for dioxin/furan formation.

The third condition, turbulence in the area where waste treatment is occurring, is induced by the combination of flames directed at the waste from the two propane burners and the formation of combustion gases immediately above the waste. The thermographs clearly depict the turbulence of the gases immediately above the waste cage throughout the burn event. They show that the temperature of

combustion gases exceeds 2000˚F within 30 seconds after the burners are ignited. Within 50 seconds after ignition, gas temperatures are greater than 2300 ˚F.

Also, dwell time for air surrounding the screened burn area is relatively short when compared to a confined environment. The availability of air surrounding the treatment event and the turbulence created by the propane burners, lead to quick cooling time as gaseous combustion products escape from the immediate burn area. Fast cooling of these gases minimizes the likelihood of dioxin and furan formation when compared to that of a confined environment (Environment Australia, 1999) for every open burning treatment operation.

5.0 Conclusions

This report provides evidence that the thermal treatment unit at the TA-16-388 Flash Pad is capable of providing sufficient temperatures and time to treat the explosive and explosive contaminated waste streams managed at the unit. Temperatures attained at the unit exceed 1400°F within 60 seconds of the start of the burn and temperatures above 1500°F (>2000°F routinely) can be maintained continuously for the duration of the burn while the propane burners are in operation. The temperatures observed in the tests resulted in decomposition of the waste streams and the data provided objective feedback regarding burn conditions and operational factors that potentially affect the burns. These included determining the range of burn duration times and other factors associated with the potential production of combustion products.

Dioxins and furans that may be formed as incomplete combustion products due to open burning treatment operations are decomposed during the 30 minute treatment period. Thermal data collected using thermocouples, pyrometers, and a thermal imager show the temperature within the burn tray where the waste is held reaches and sustains temperatures that are great enough to decompose dioxins and furans. Standard operations for waste treatment at the unit also meet three other factors that are known to minimize the potential for the formation of dioxins and furans during thermal treatment. Therefore, the thermal data and images from both tests clearly demonstrate that conditions to prevent formation of dioxins and furans are present throughout every open burning treatment operation at the TA-16-388 Flash Pad open burning treatment unit. The amount of dioxins and furans expected to be added to the air due to open burning treatment events will be minimal, not measurable, and likely not contribute to ground level concentrations.

6.0 References

Environment Australia, 1999. *Incineration and Dioxins: Review of Formation Processes,* consultancy report prepared by Environmental and Safety Services for Environment Australia, Commonwealth Department of the Environment and Heritage, Canberra.

Environmental Protection Agency (EPA), 2010. Course: Basic Concepts in Environmental Sciences, Module 6: Air Pollutants/Control Techniques. Air Pollution Training Institute (APTI). U.S.

Environmental Protection Agency funded, Cooperative Assistance Agreement CT-825724 to North Carolina State University. January 29, 2010.

Huan, H., and A. Buekens, 1995. *On the Mechanisms of Dioxin Formation in Combustion Processes.* Chemosphere, Vol. 31, No. 9, pp. 4099-4117. Department of Chemical Engineering and Industrial Chemistry, Free University of Brussels, Pleinlaan 2, 1050 Brussels, Belgium. 1995

Mitchell, W.J., Jack Suggs. 1998. *Emission Factors for the Disposal of Energetic Materials by Open Burning and Open detonation (OB/OD)*. EPA/600/R-98/103. Research Triangle Park, NC. August 1998.

Kulkarni, Prashant S., João G. Crespo, Carlos A. M. Afonso. 2007. *Dioxins sources and current remediation technologies – A review.* Science Direct. Environmental International 34 (2008) 139-153. September 2007.

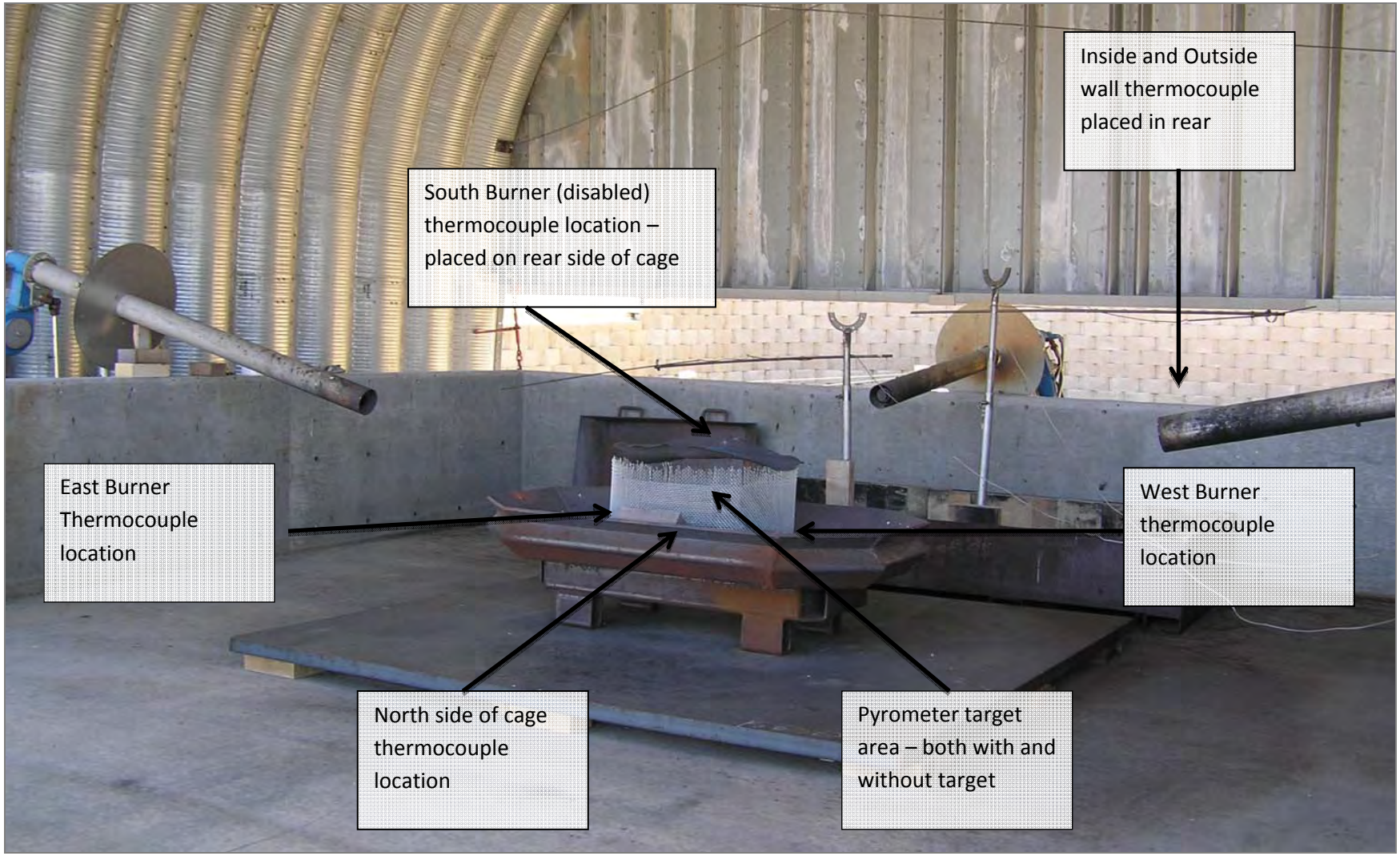


FIGURE 1 – MEASUREMENT LOCATIONS

TA-16-388 Burn Data

April 3, 2013

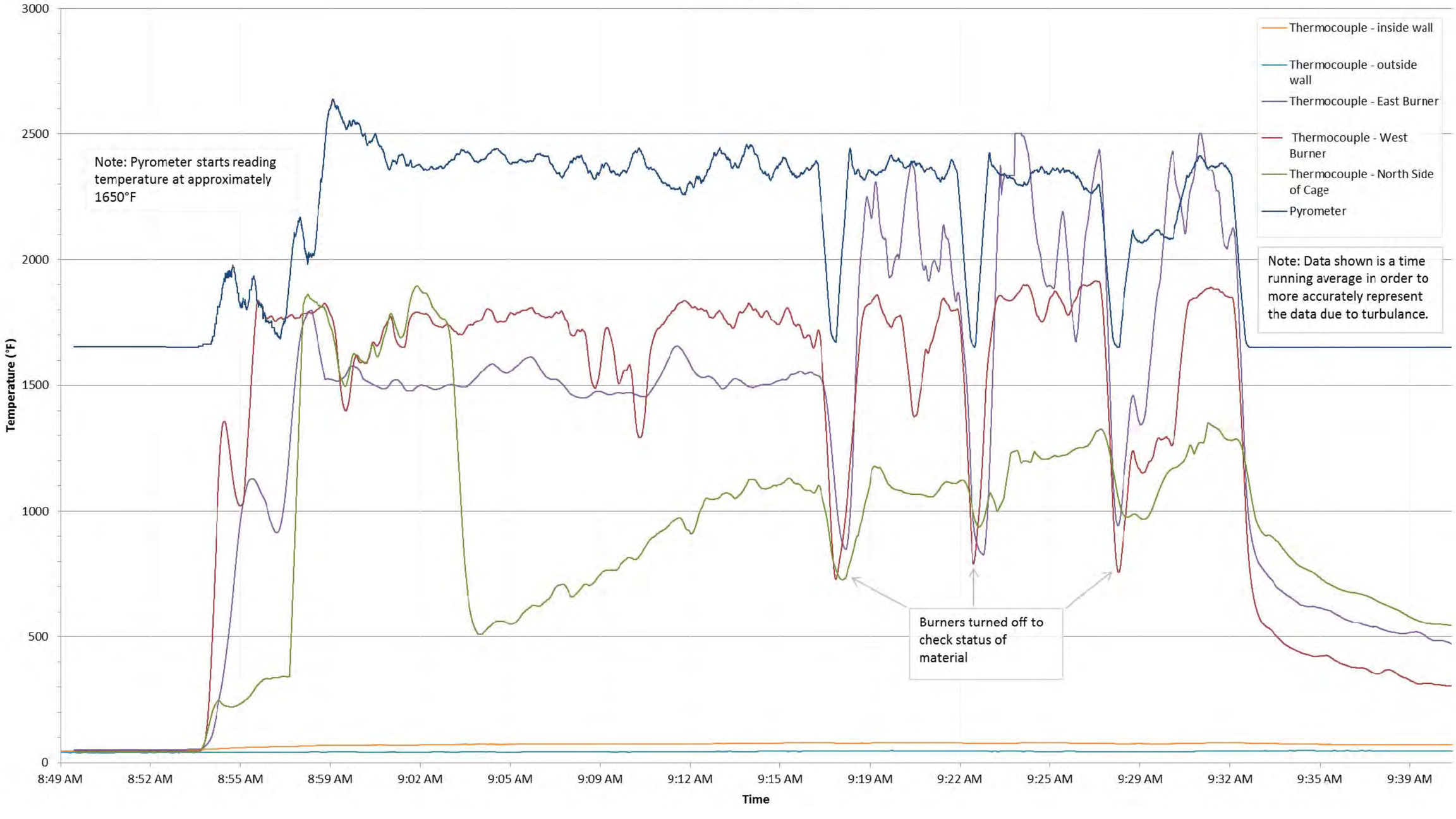


FIGURE 2 - APRIL 3, 2013

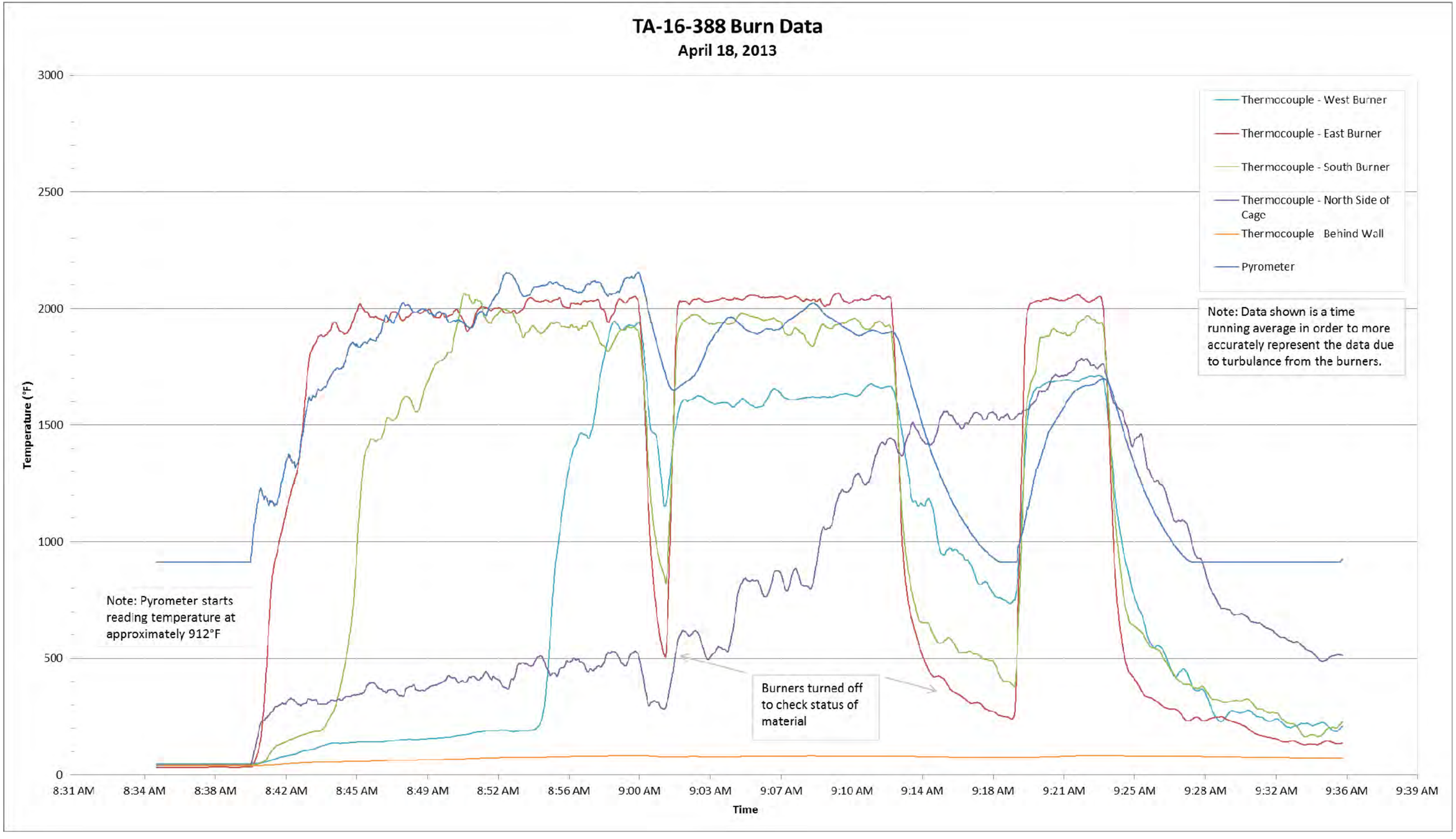
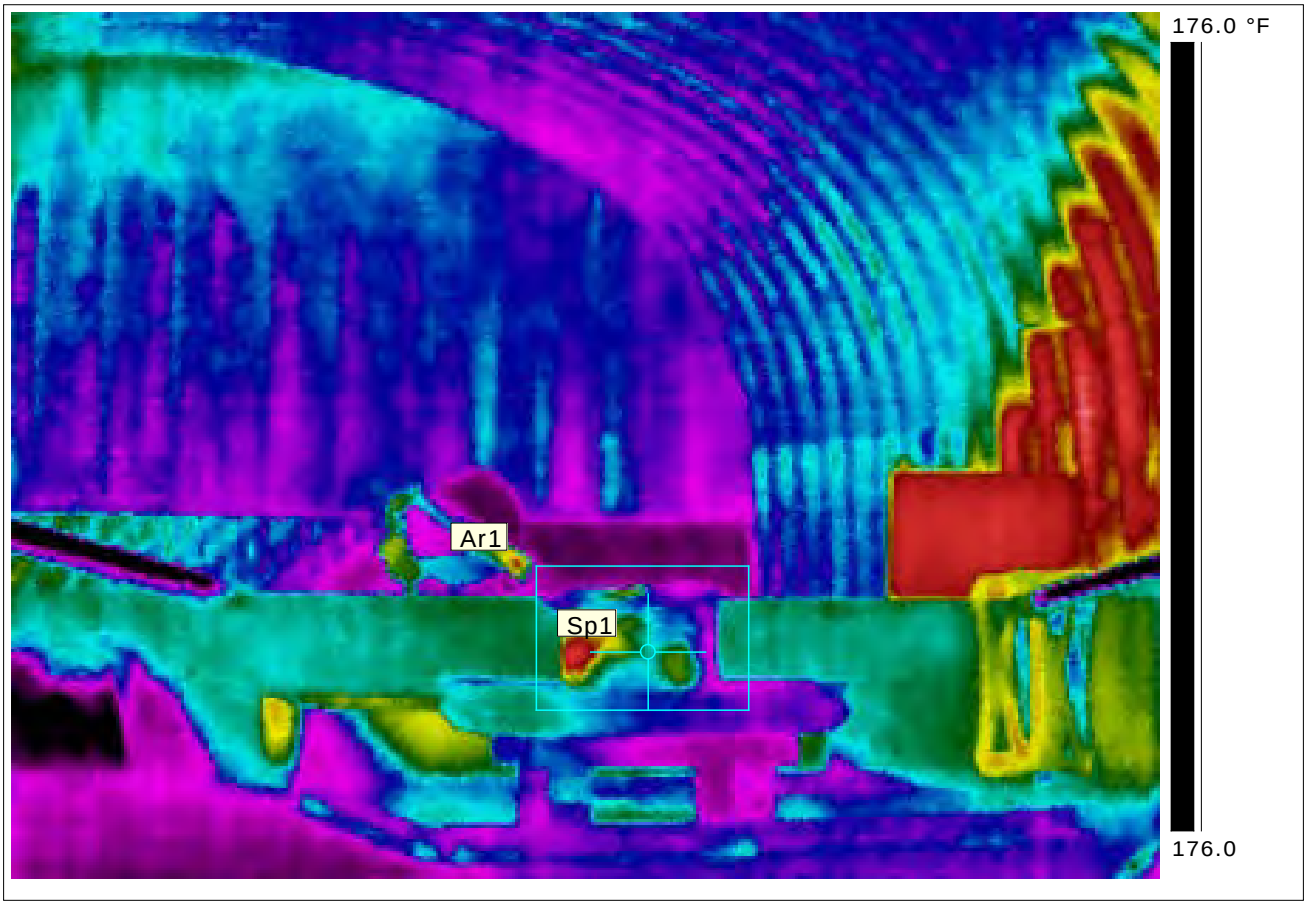


FIGURE 3 - APRIL 18, 2013

Attachment A – Excerpt of April 3, 2013 Thermal Images

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/3/2013

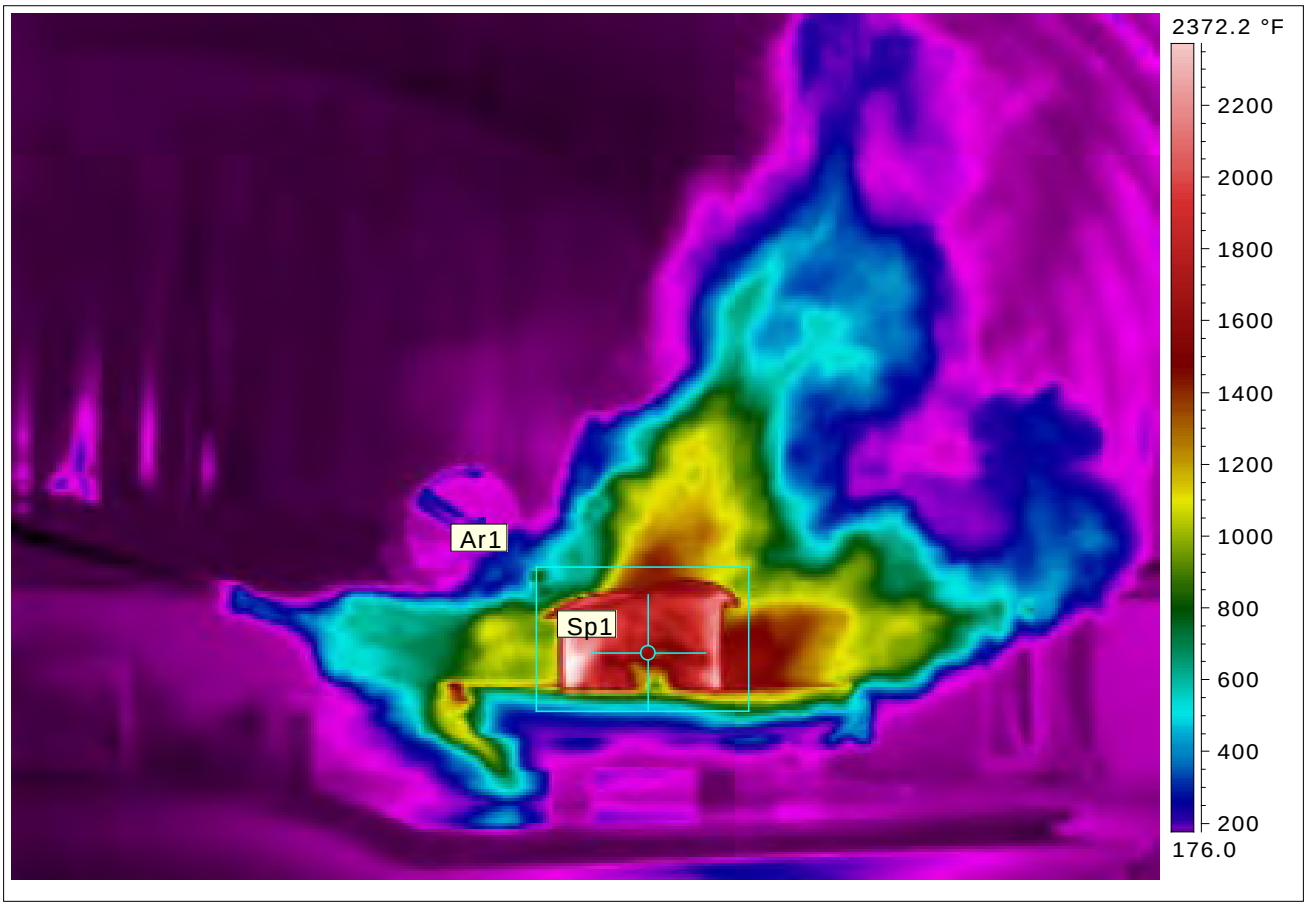


Ar1 Max. Temperature	<176.0 °F
Sp1 Temperature	<176.0 °F
Date	4/3/2013
Image Time	7:55:16 AM
Emissivity	0.69

Directly before burn start

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

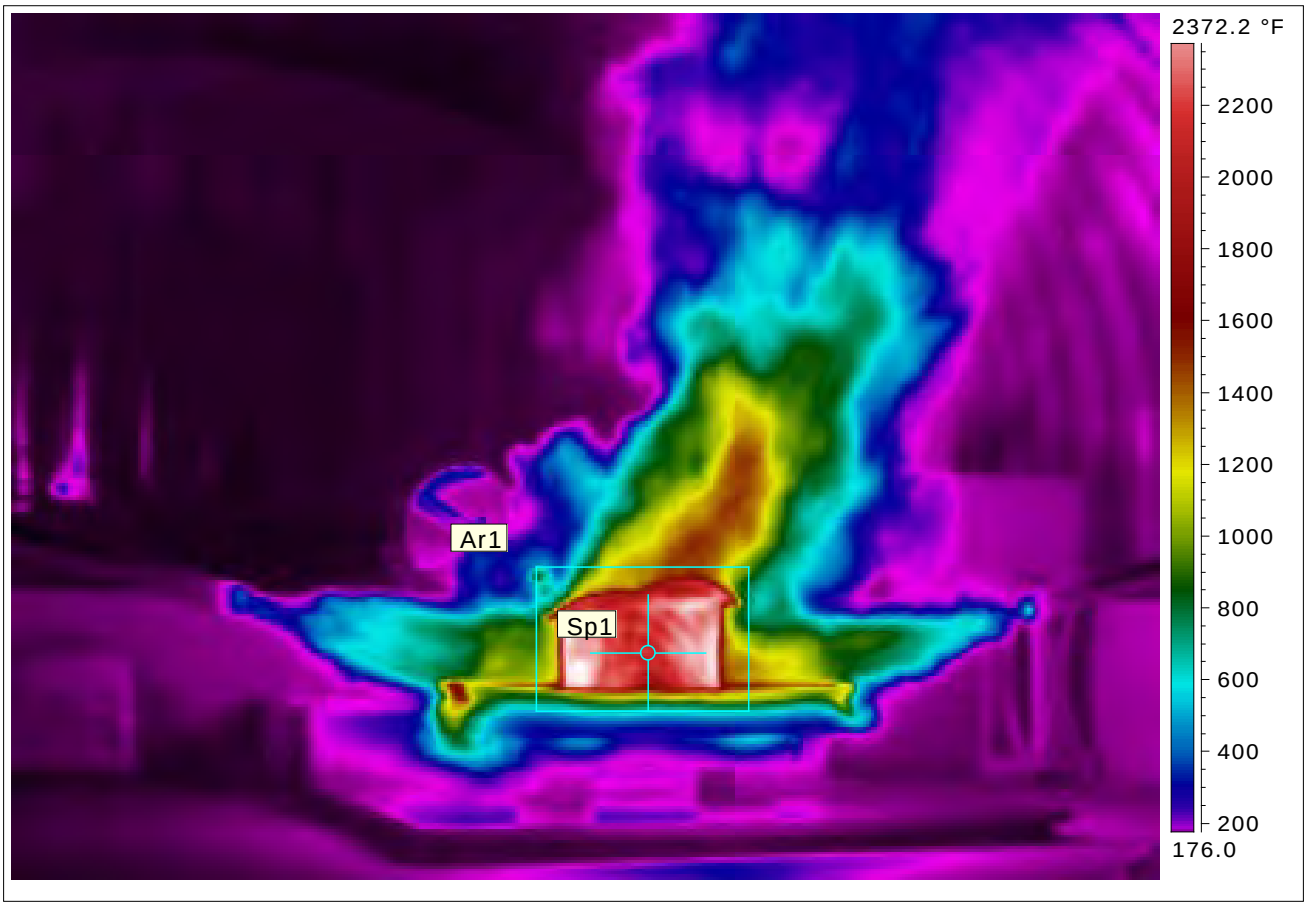


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1495.6 °F
Date	4/3/2013
Image Time	7:59:08 AM
Emissivity	0.69

Approximately 4 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

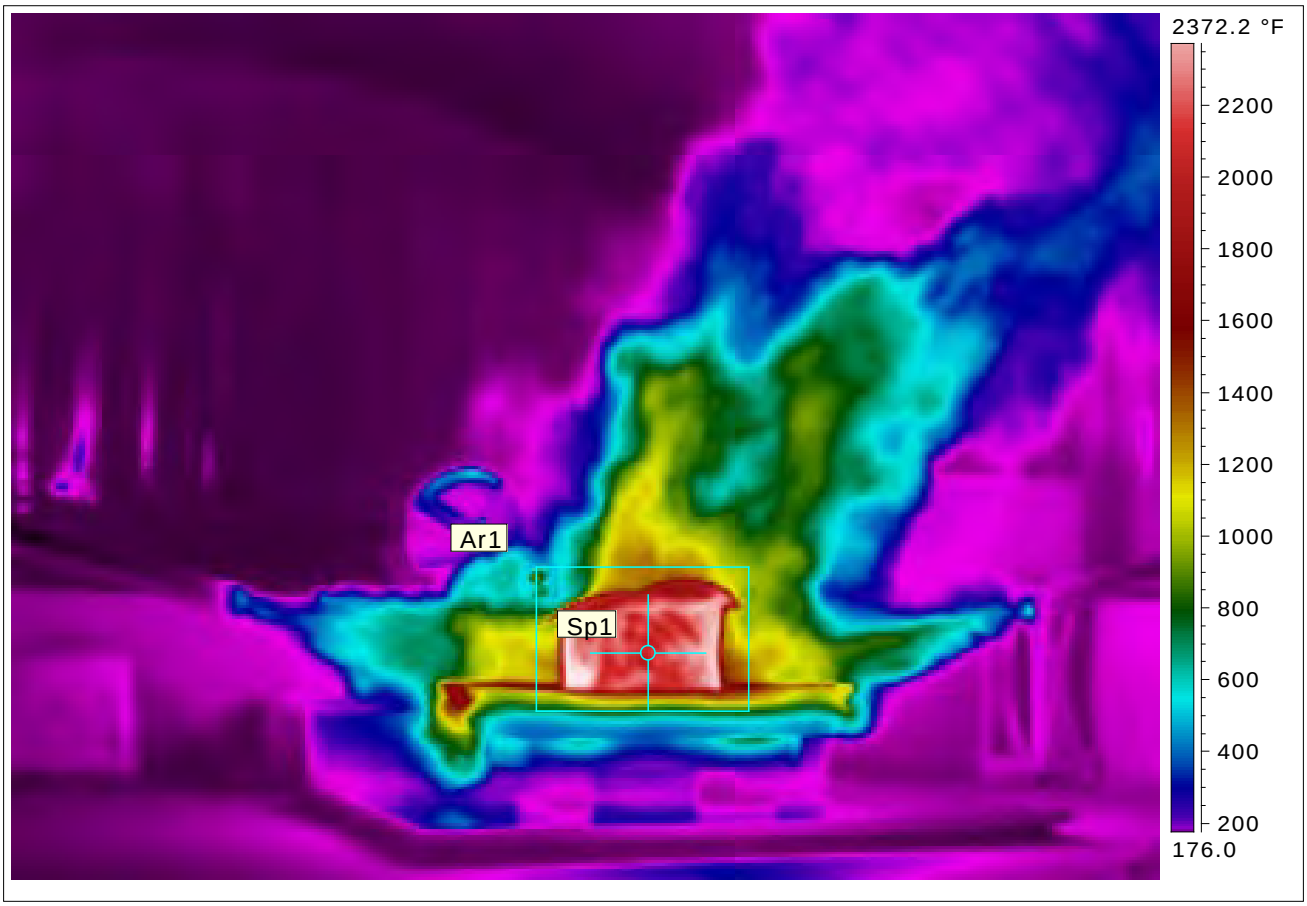


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	2131.8 °F
Date	4/3/2013
Image Time	8:02:09 AM
Emissivity	0.69

Approximately 7 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

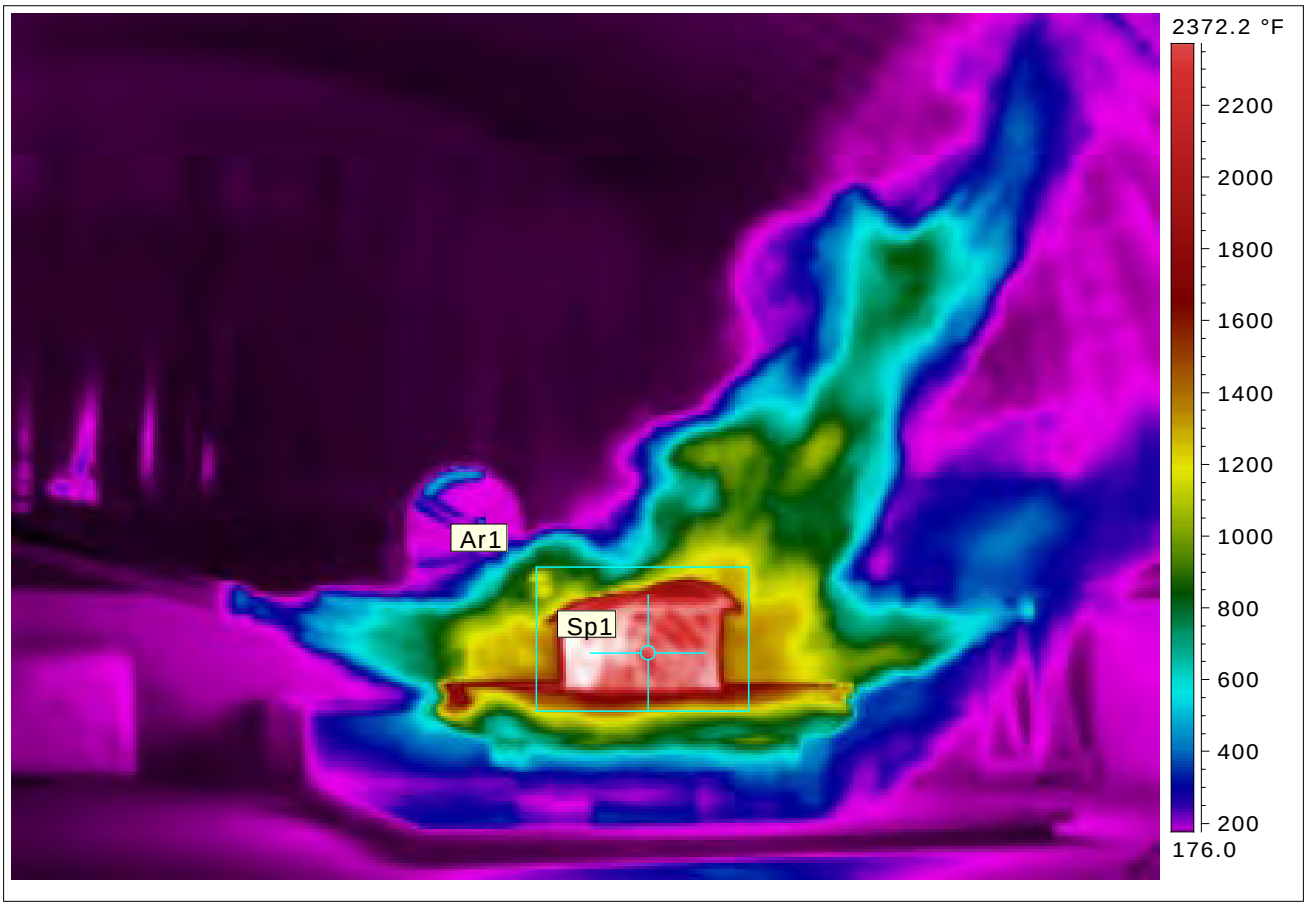


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	2082.6 °F
Date	4/3/2013
Image Time	8:05:00 AM
Emissivity	0.69

Approximately 10 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/3/2013

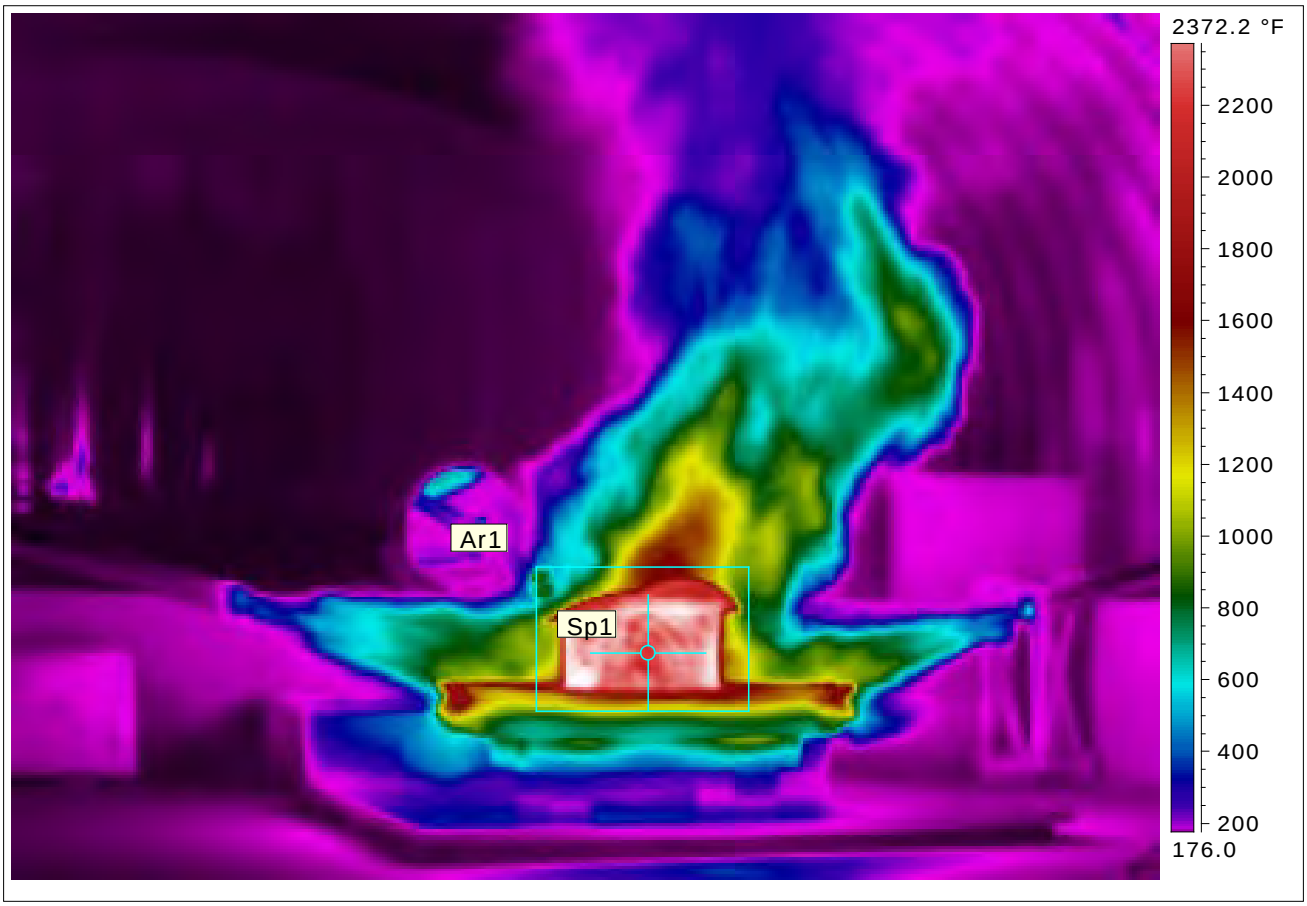


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	*2329.3 °F
Date	4/3/2013
Image Time	8:09:02 AM
Emissivity	0.69

Approximately 14 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/3/2013

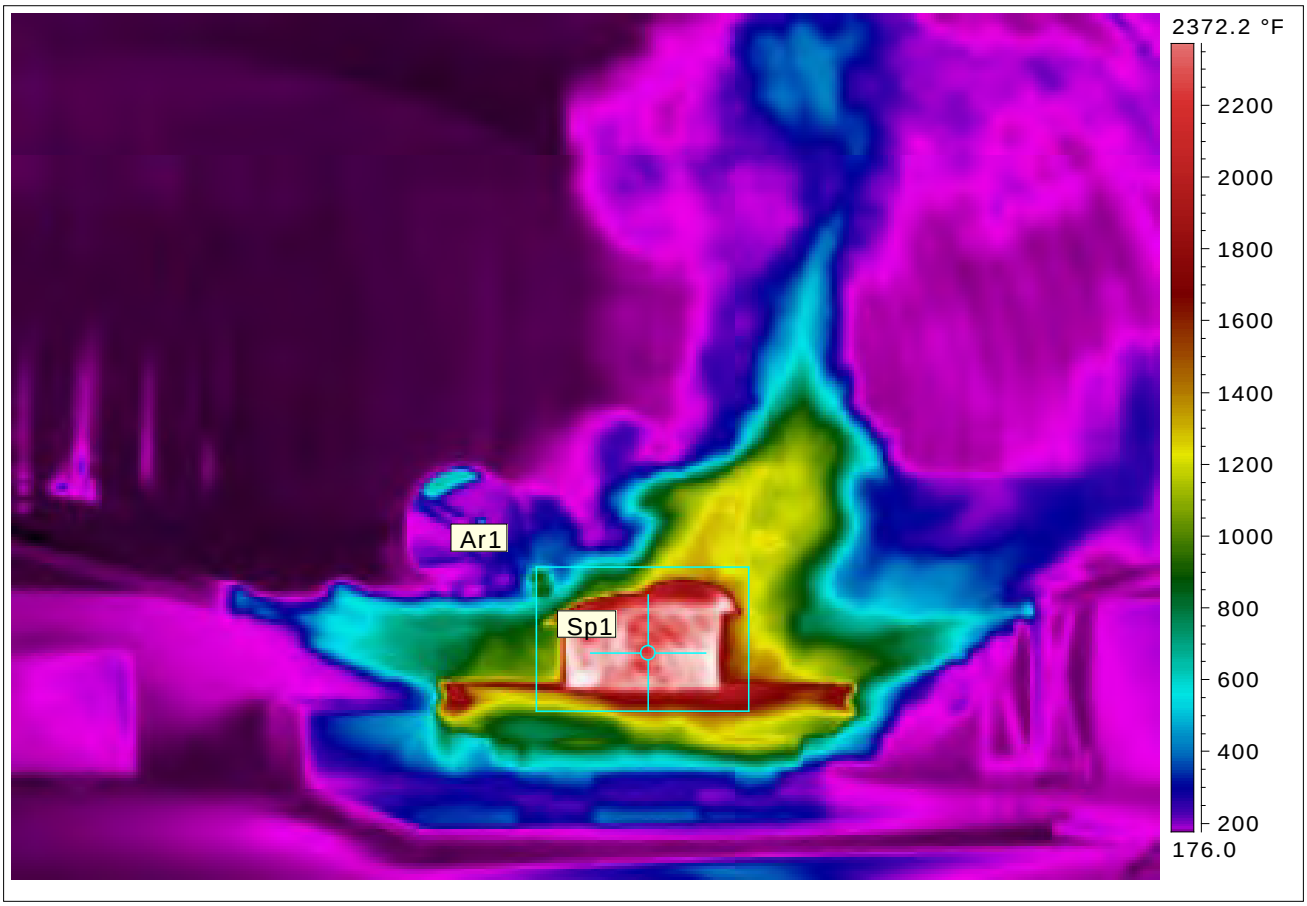


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	*2225.3 °F
Date	4/3/2013
Image Time	8:12:03 AM
Emissivity	0.69

Approximately 17 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

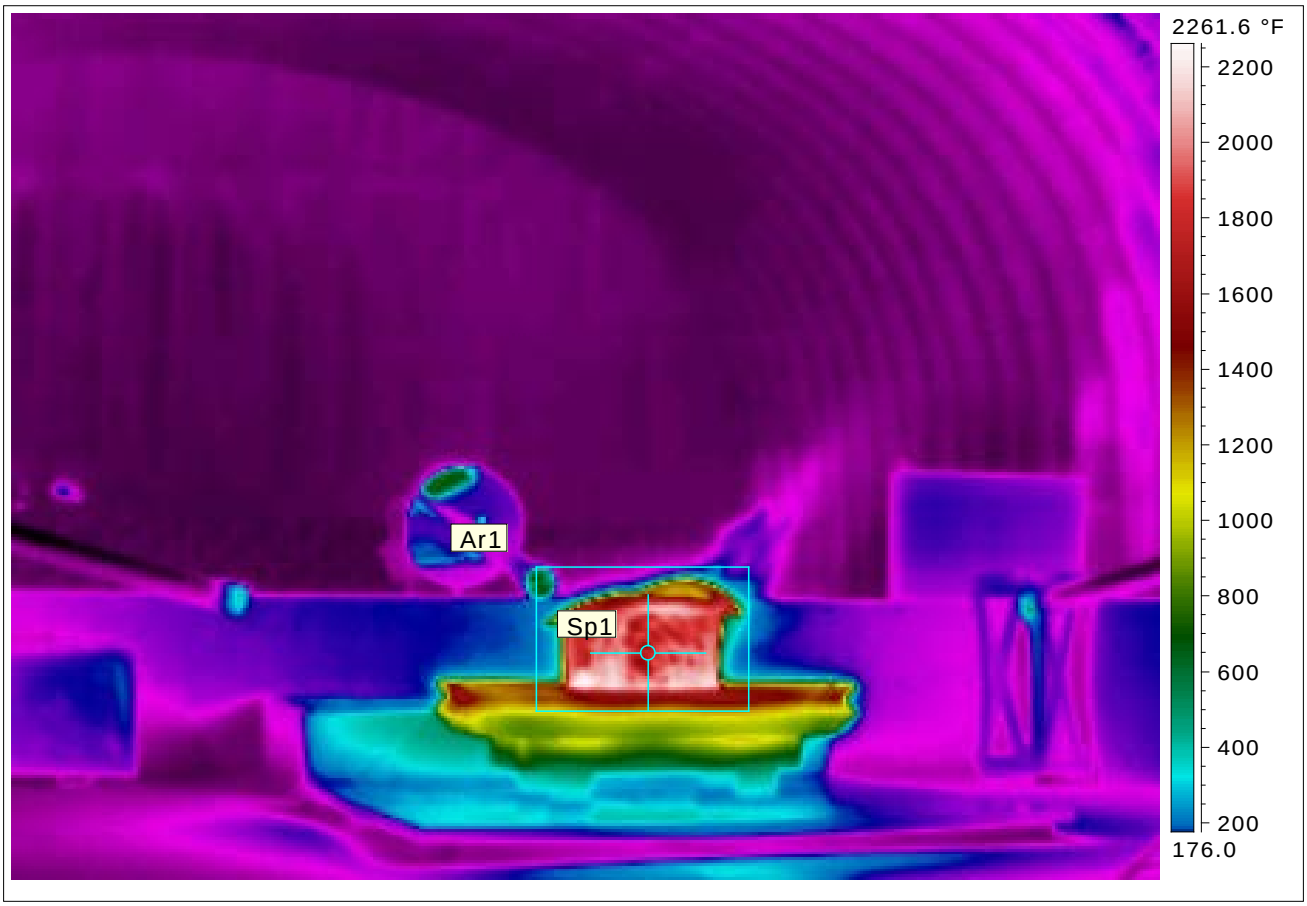


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	*2290.4 °F
Date	4/3/2013
Image Time	8:15:00 AM
Emissivity	0.69

Approximately 20 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/3/2013

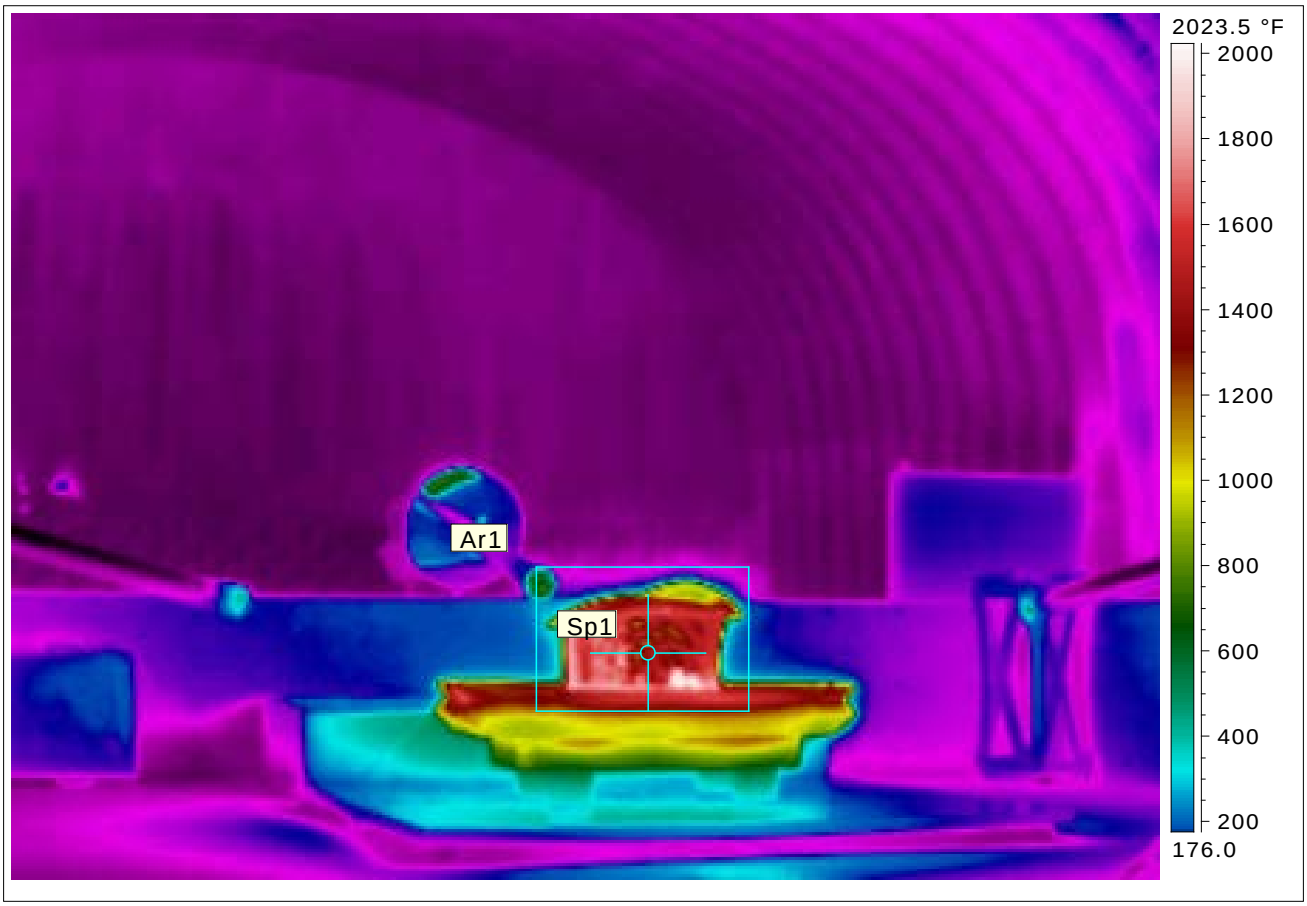


Ar1 Max. Temperature	*2241.4 °F
Sp1 Temperature	1823.8 °F
Date	4/3/2013
Image Time	8:18:37 AM
Emissivity	0.69

Approximately 24 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

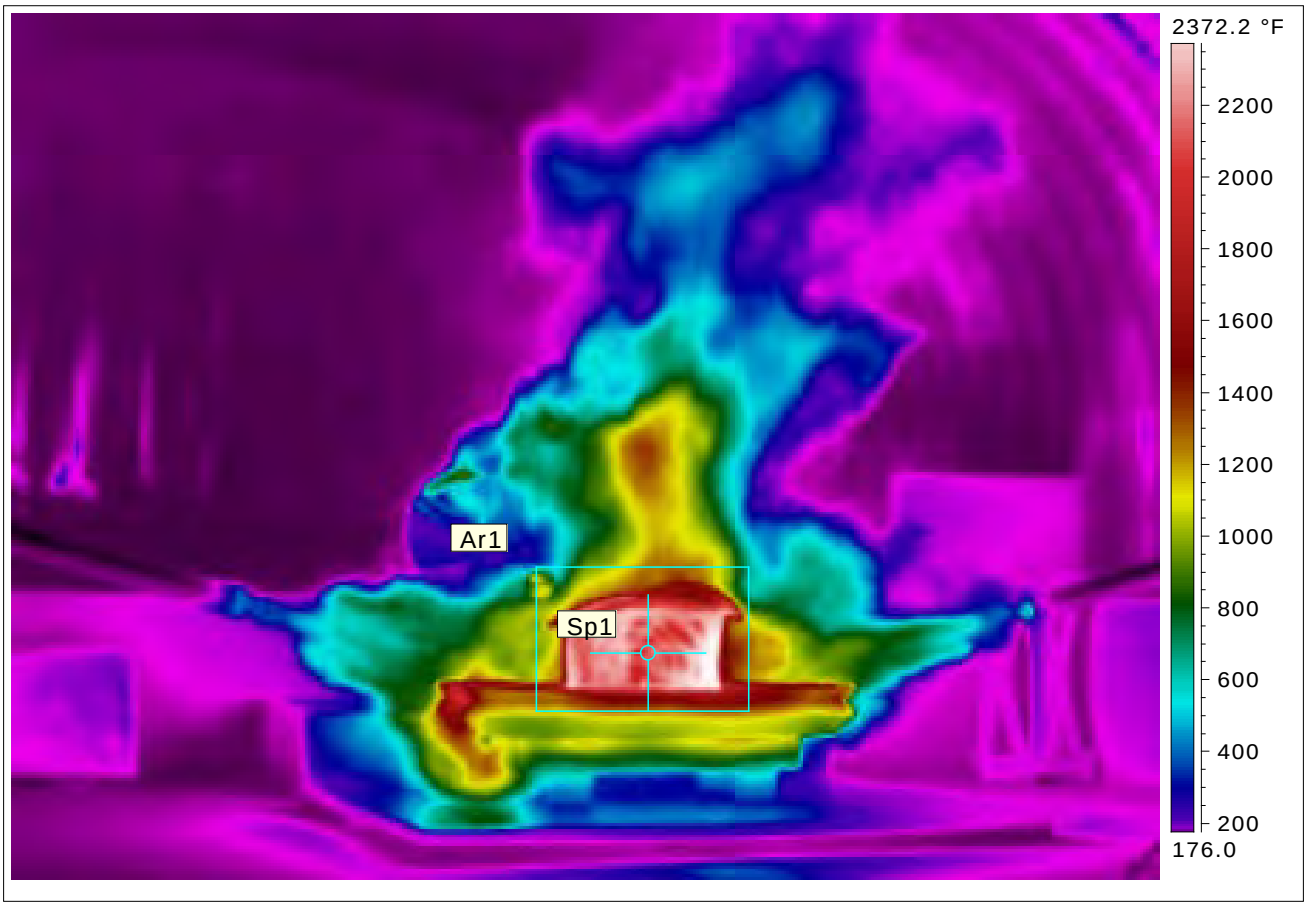


Ar1 Max. Temperature	2013.7 °F
Sp1 Temperature	1445.1 °F
Date	4/3/2013
Image Time	8:23:49 AM
Emissivity	0.69

Approximately 29 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

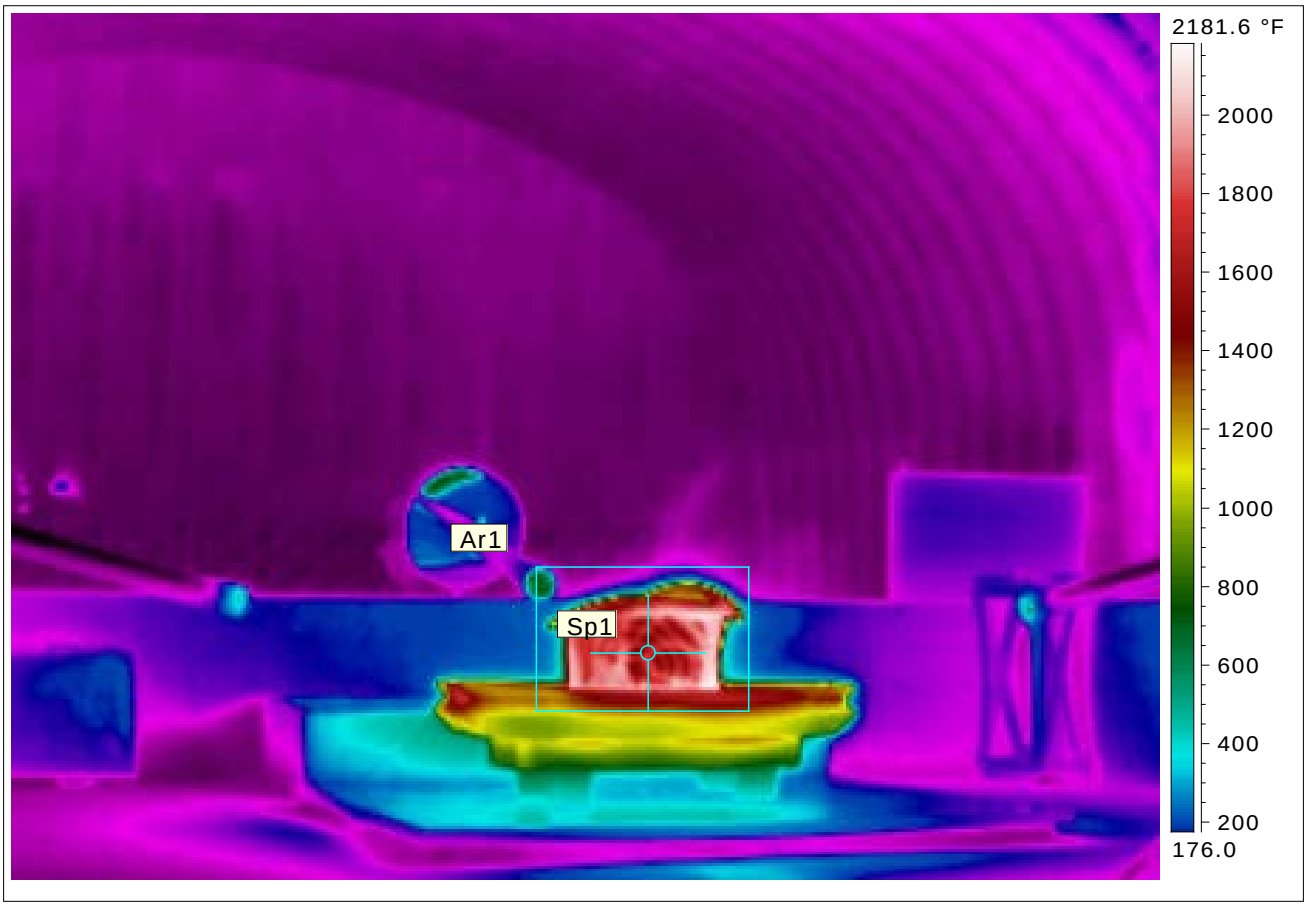


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	2115.1 °F
Date	4/3/2013
Image Time	8:25:00 AM
Emissivity	0.69

Approximately 30 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

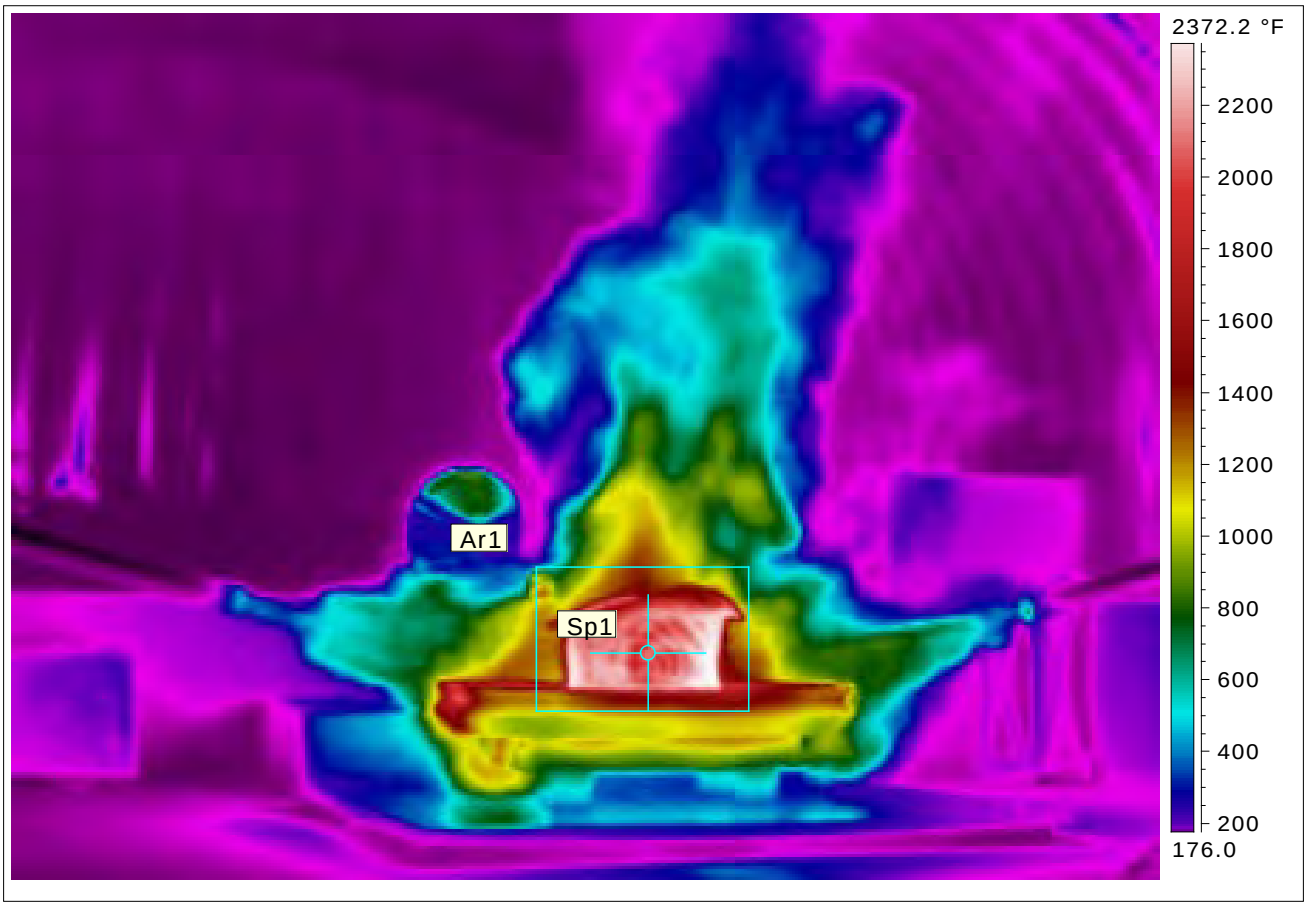


Ar1 Max. Temperature	2177.0 °F
Sp1 Temperature	1720.0 °F
Date	4/3/2013
Image Time	8:29:02 AM
Emissivity	0.69

Approximately 34 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	Report Date: **June 5, 2013**

Thermogram Image.Date 4/3/2013

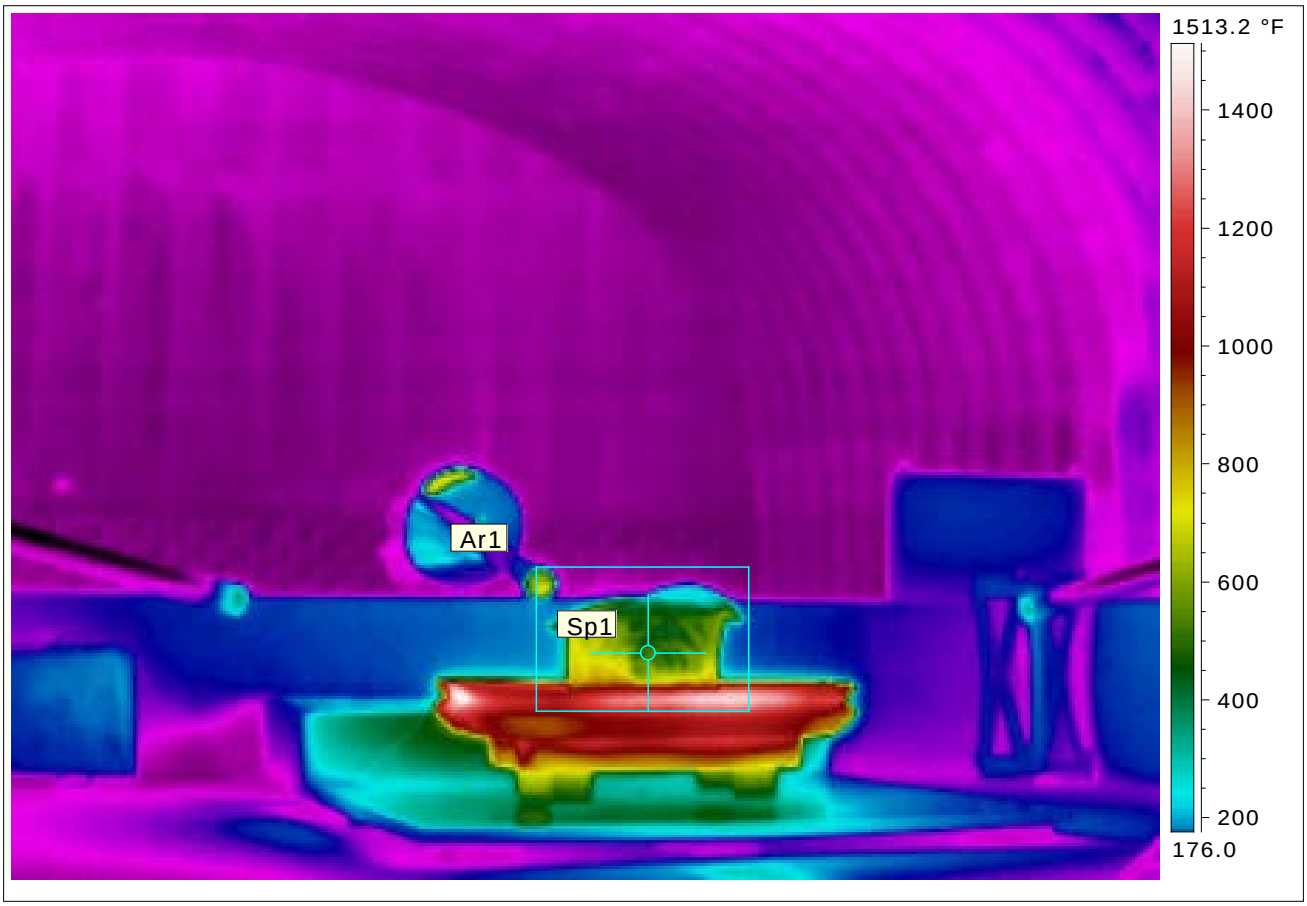


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	2110.3 °F
Date	4/3/2013
Image Time	8:32:13 AM
Emissivity	0.69

Approximately 37 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST.1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/3/2013



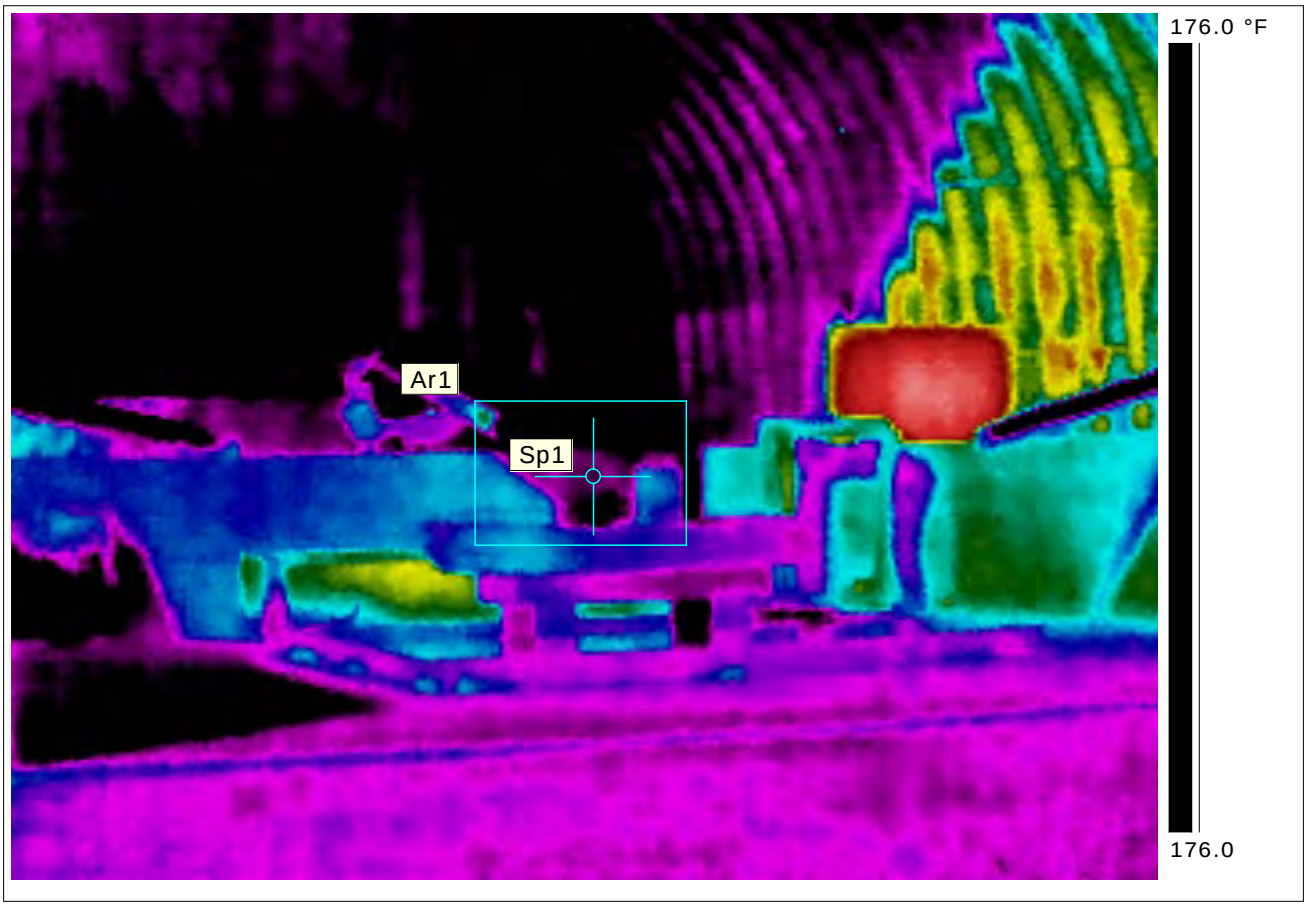
Ar1 Max. Temperature	1439.3 °F
Sp1 Temperature	530.5 °F
Date	4/3/2013
Image Time	8:35:10 AM
Emissivity	0.69

Approximately 40 minutes after burn start time

Attachment B – Excerpt of April 18, 2013 Thermal Images

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

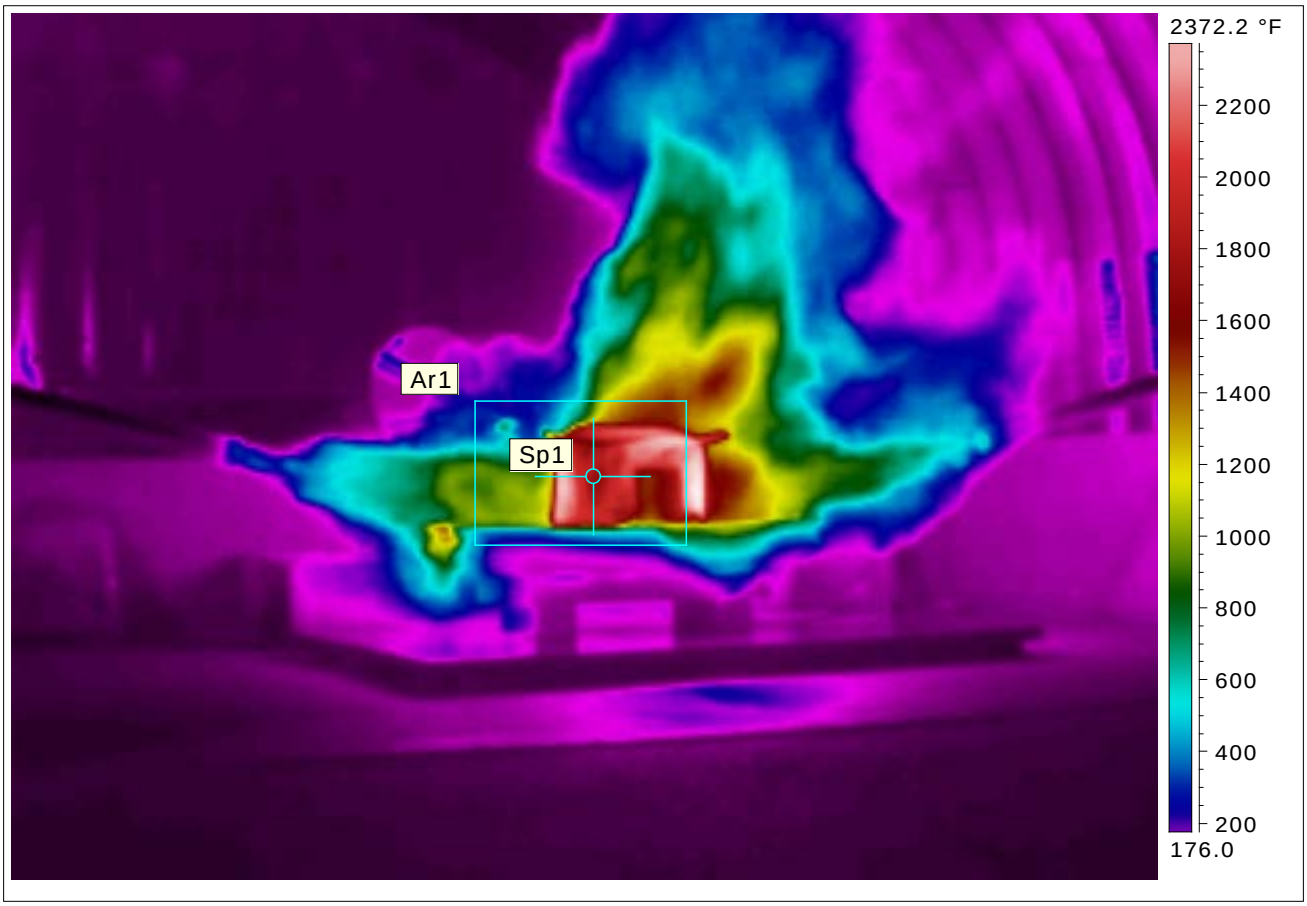


Ar1 Max. Temperature	<176.0 °F
Sp1 Temperature	<176.0 °F
Date	4/18/2013
Image Time	7:38:50 AM
Emissivity	0.69

Directly before burn start

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

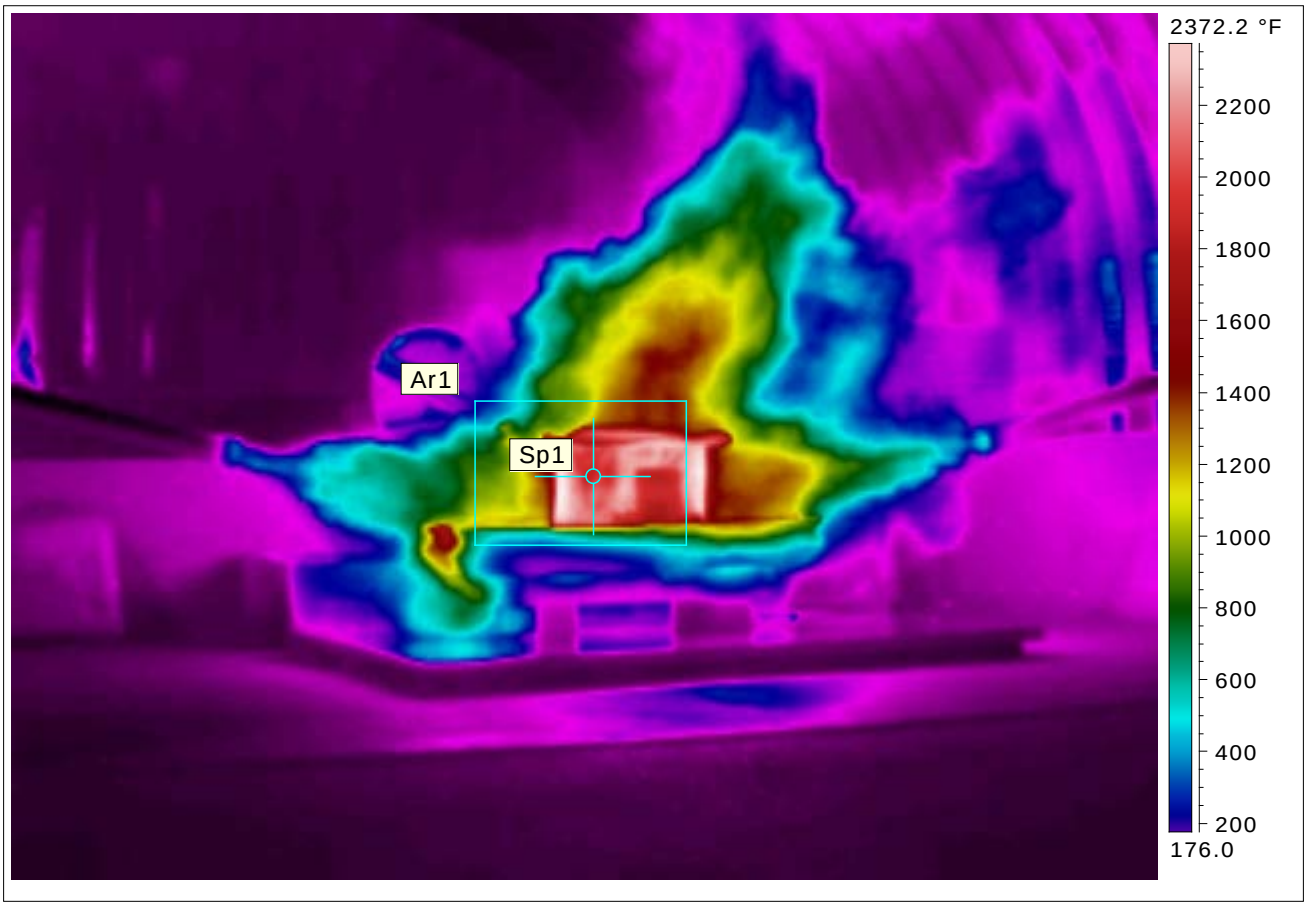


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1721.2 °F
Date	4/18/2013
Image Time	7:42:02 AM
Emissivity	0.69

Approximately 3 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

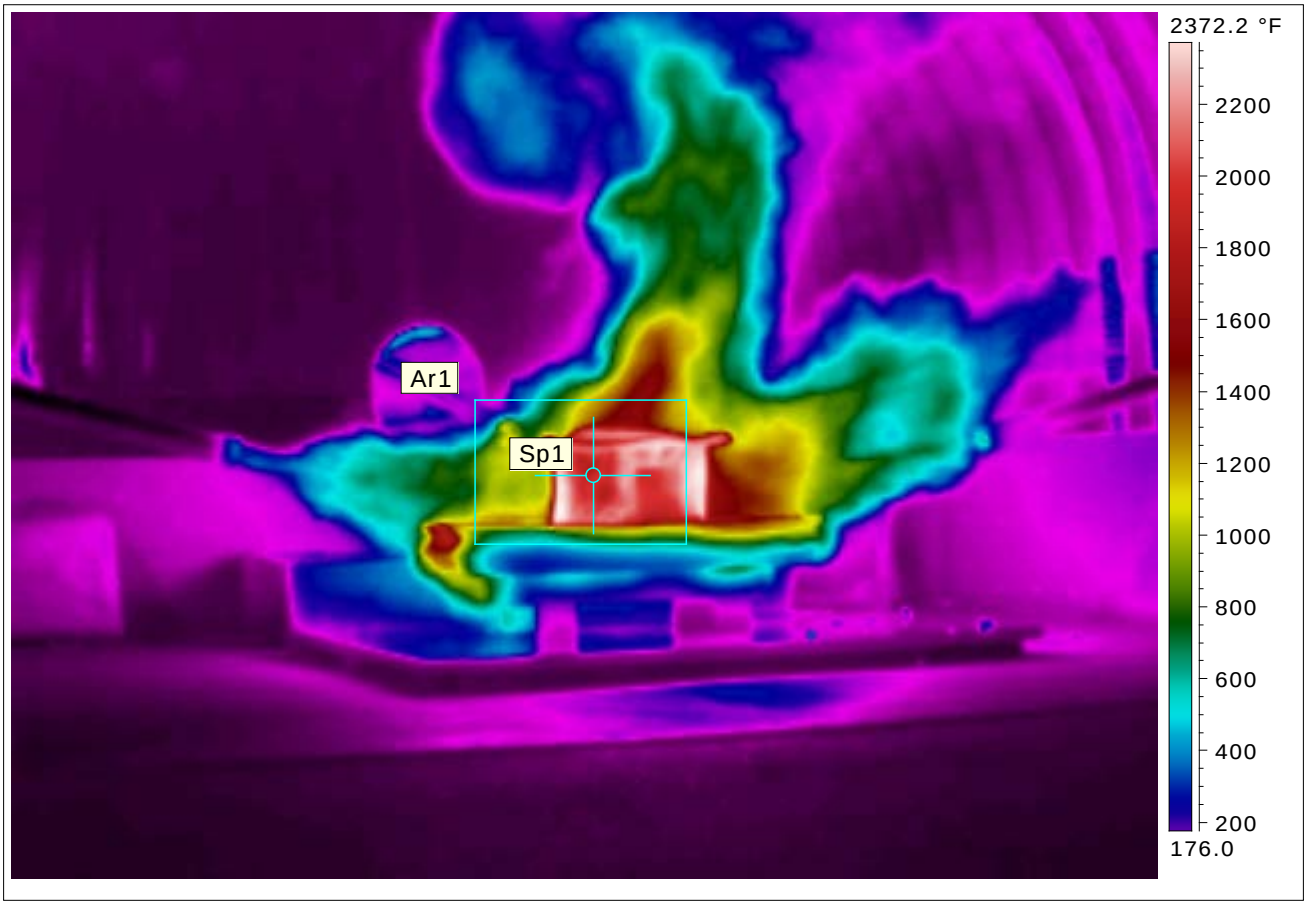


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1951.0 °F
Date	4/18/2013
Image Time	7:45:04 AM
Emissivity	0.69

Approximately 6 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

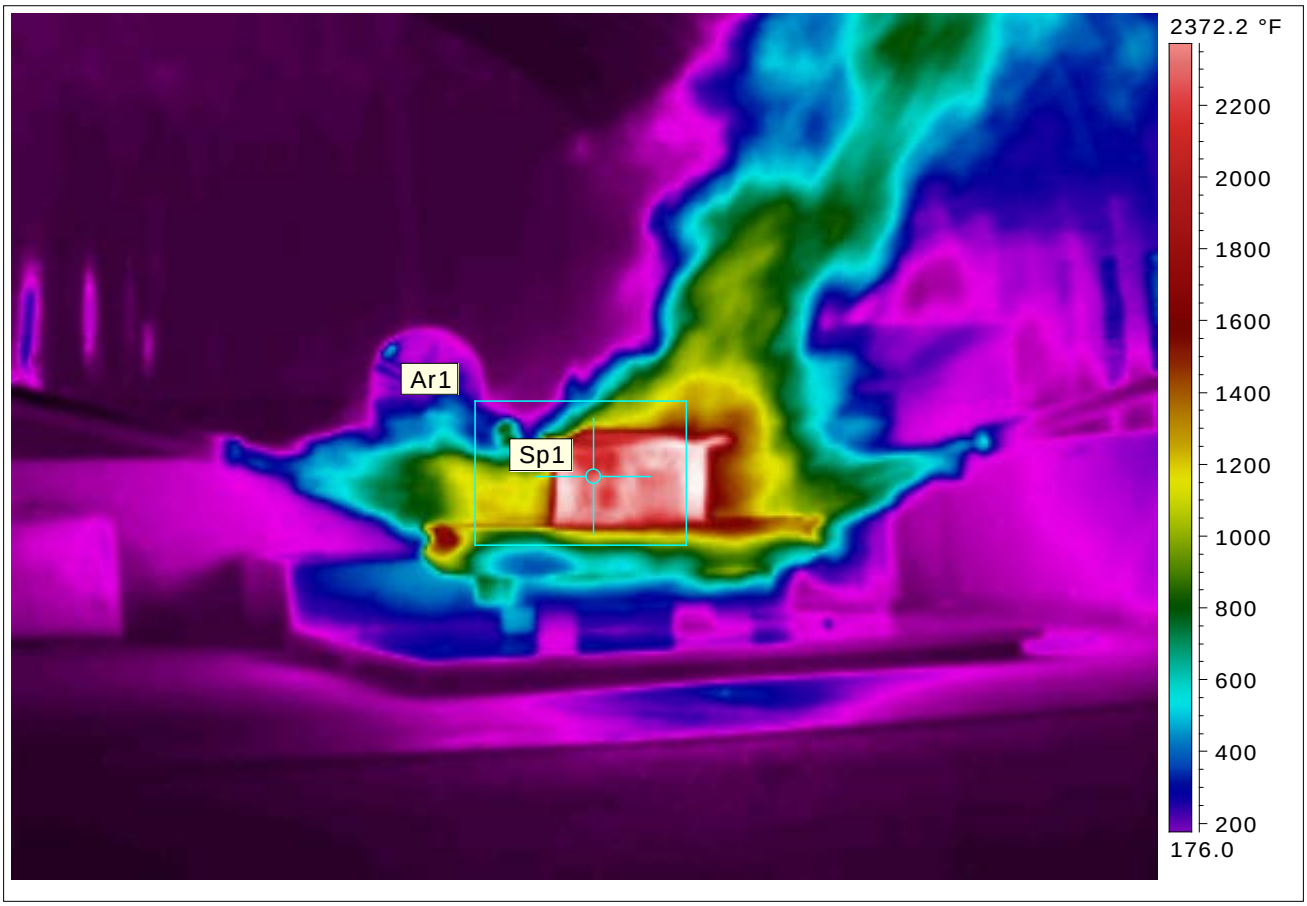


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1953.0 °F
Date	4/18/2013
Image Time	7:49:06 AM
Emissivity	0.69

Approximately 10 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

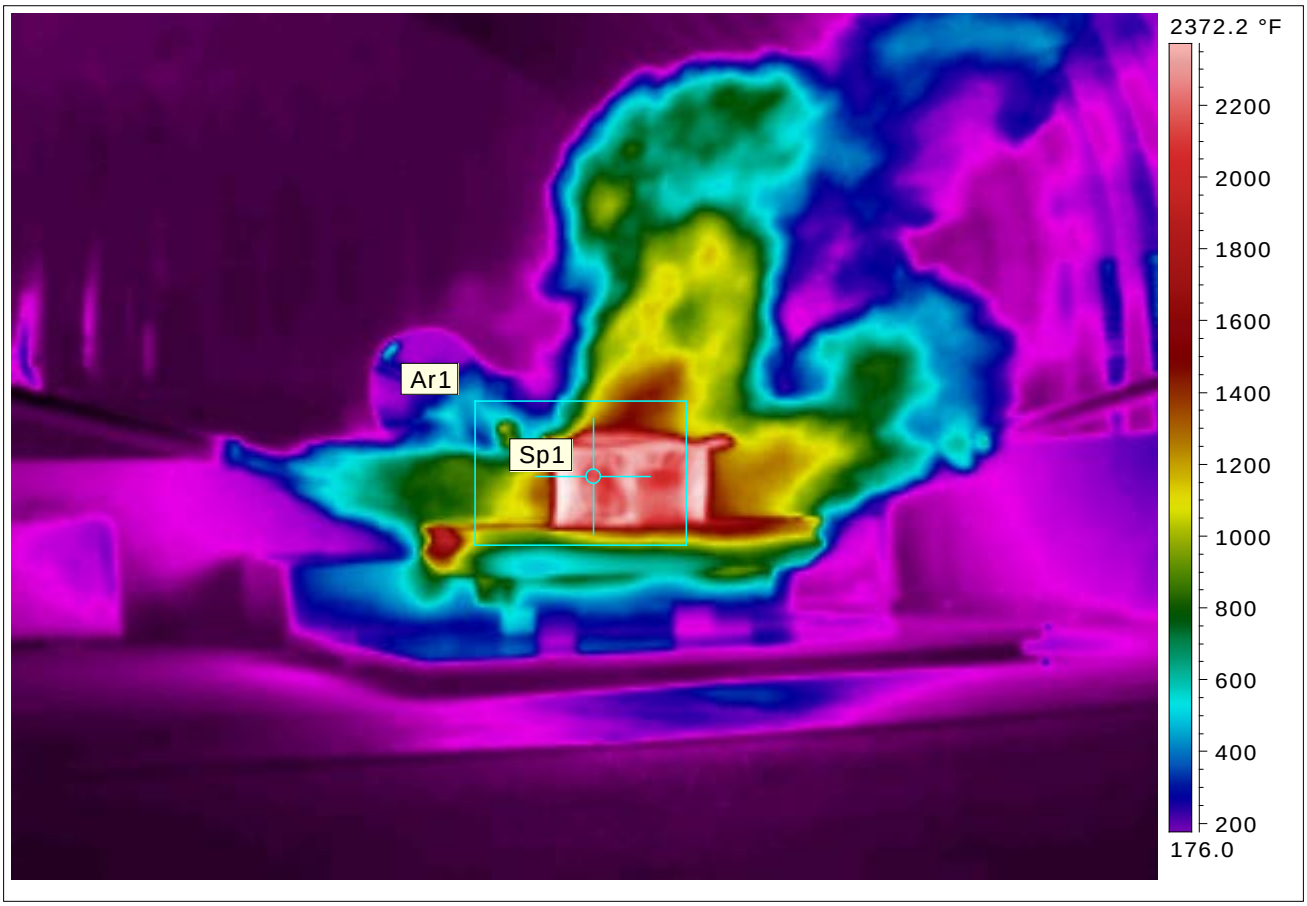


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	*2319.1 °F
Date	4/18/2013
Image Time	7:52:07 AM
Emissivity	0.69

Approximately 13 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

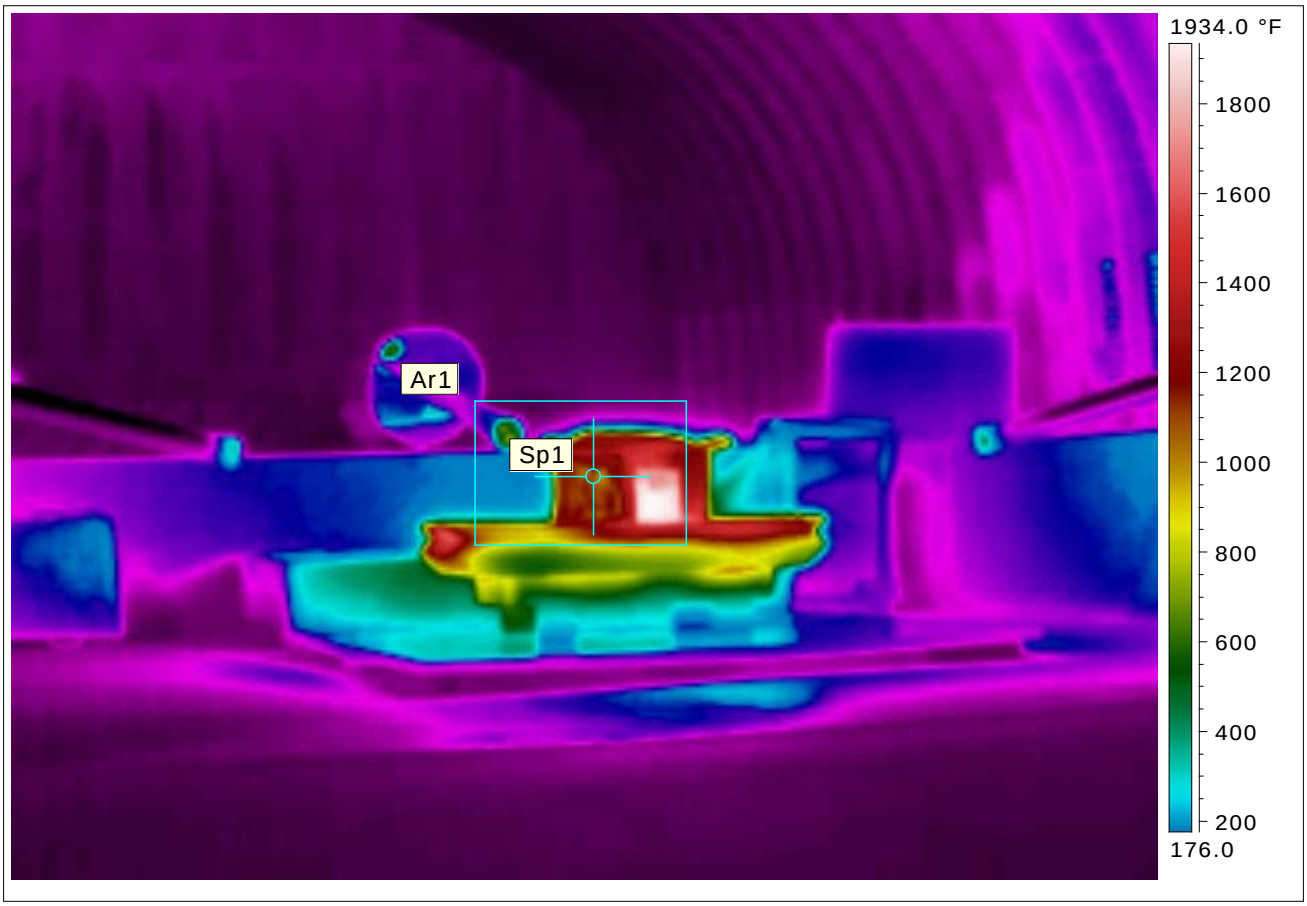


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	2166.0 °F
Date	4/18/2013
Image Time	7:56:09 AM
Emissivity	0.69

Approximately 17 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

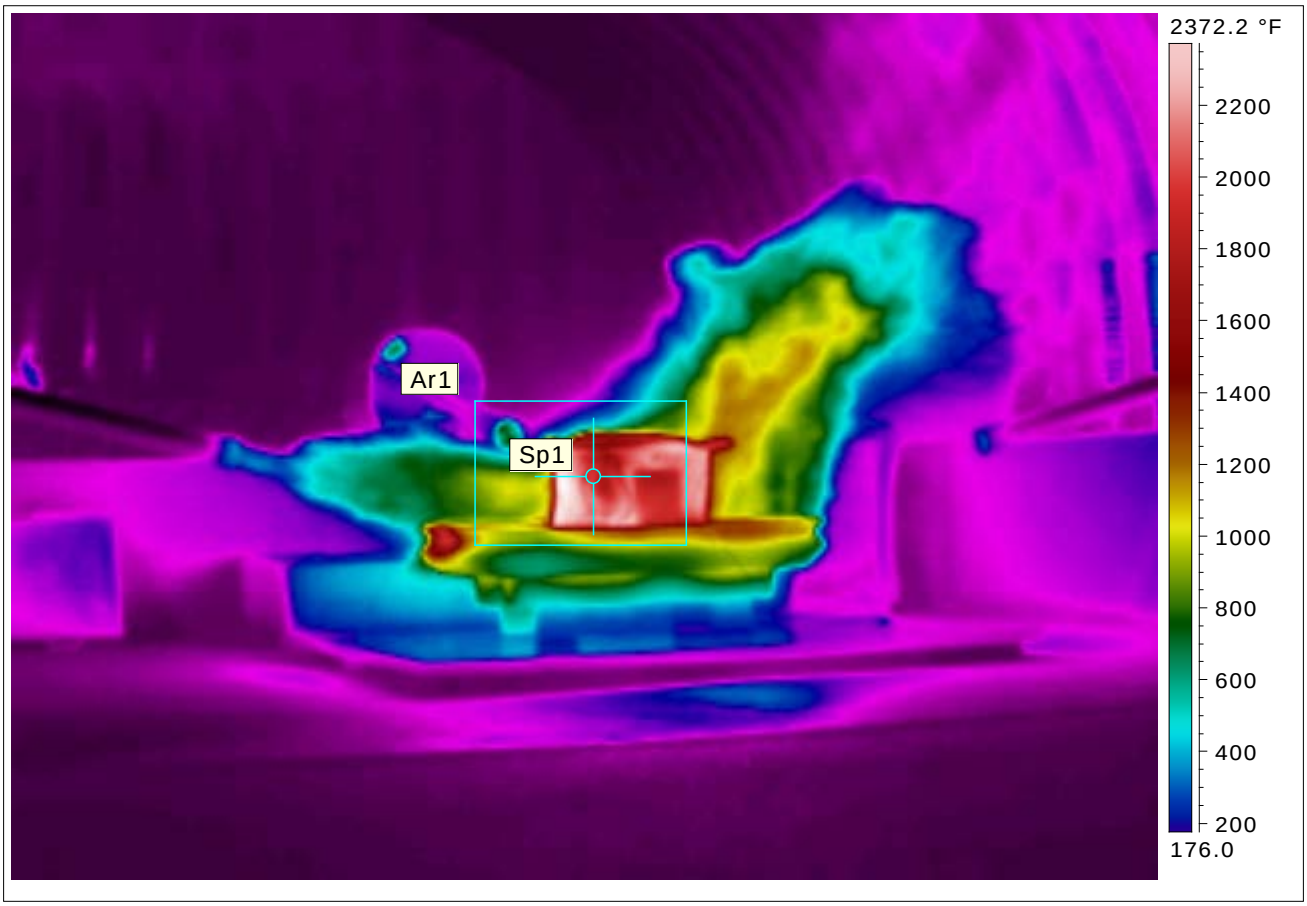


Ar1 Max. Temperature	1930.6 °F
Sp1 Temperature	1056.3 °F
Date	4/18/2013
Image Time	7:59:00 AM
Emissivity	0.69

Approximately 20 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

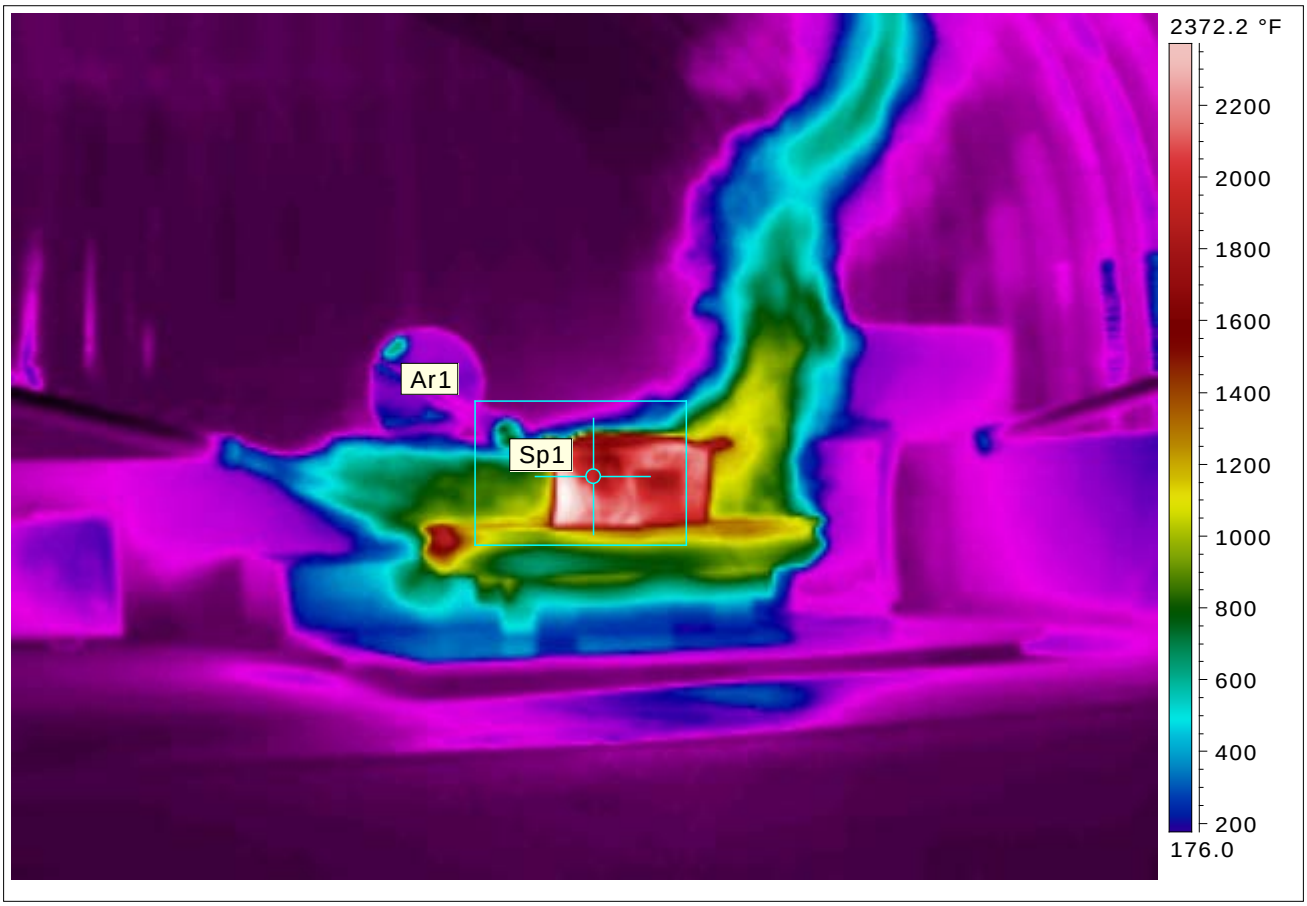


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1939.9 °F
Date	4/18/2013
Image Time	8:01:52 AM
Emissivity	0.69

Approximately 23 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

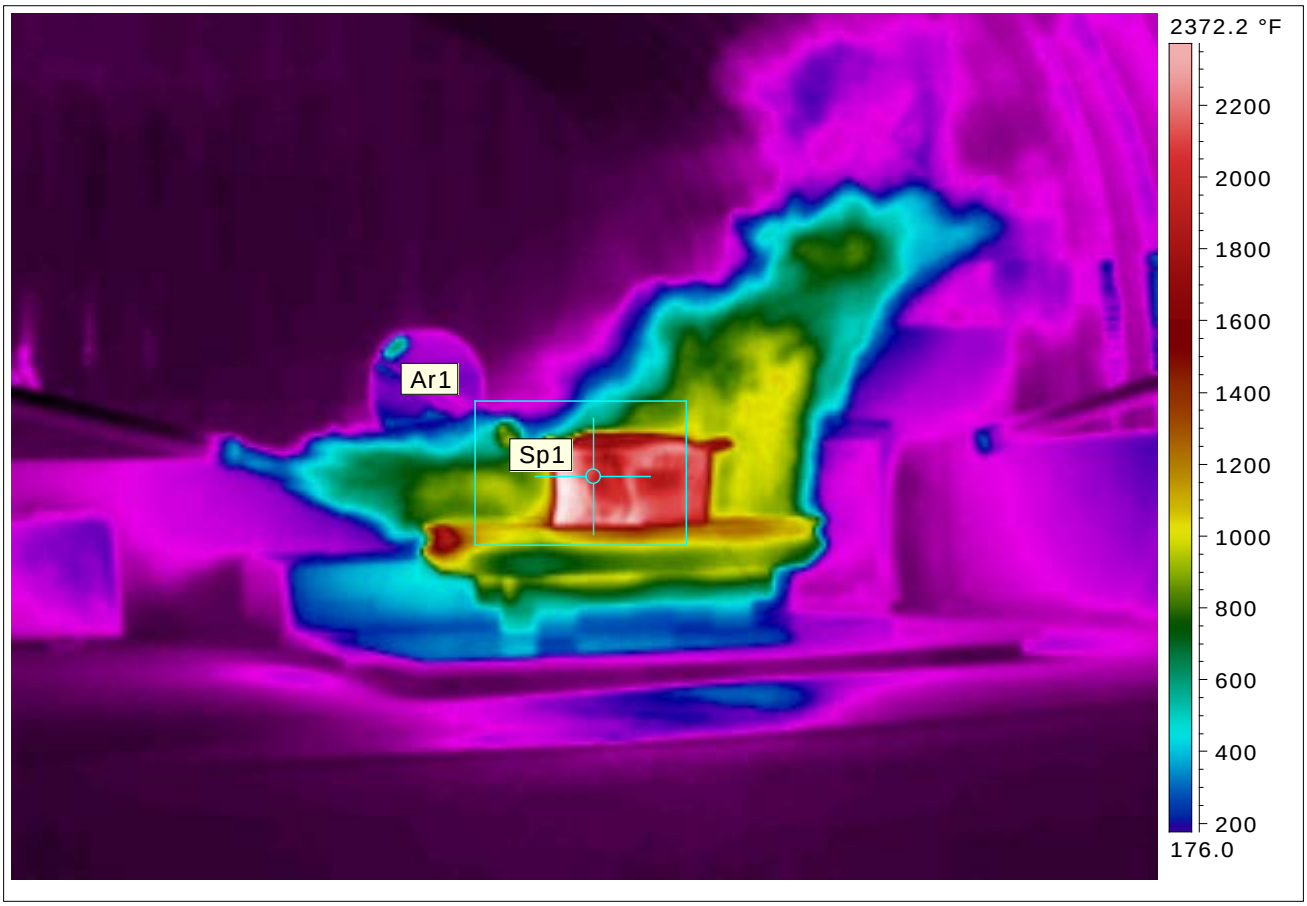


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1914.3 °F
Date	4/18/2013
Image Time	8:03:02 AM
Emissivity	0.69

Approximately 24 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

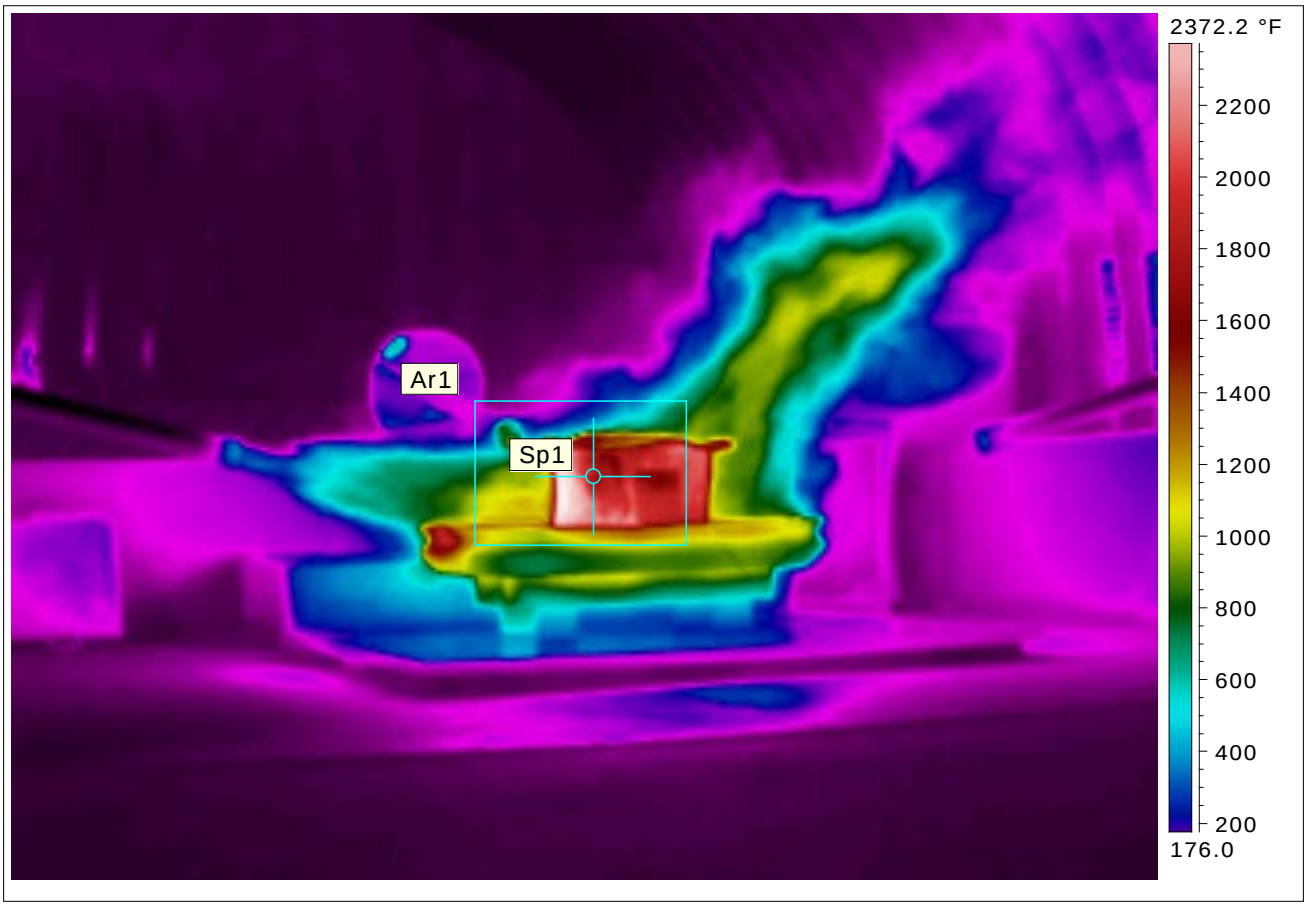


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1967.0 °F
Date	4/18/2013
Image Time	8:07:09 AM
Emissivity	0.69

Approximately 28 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

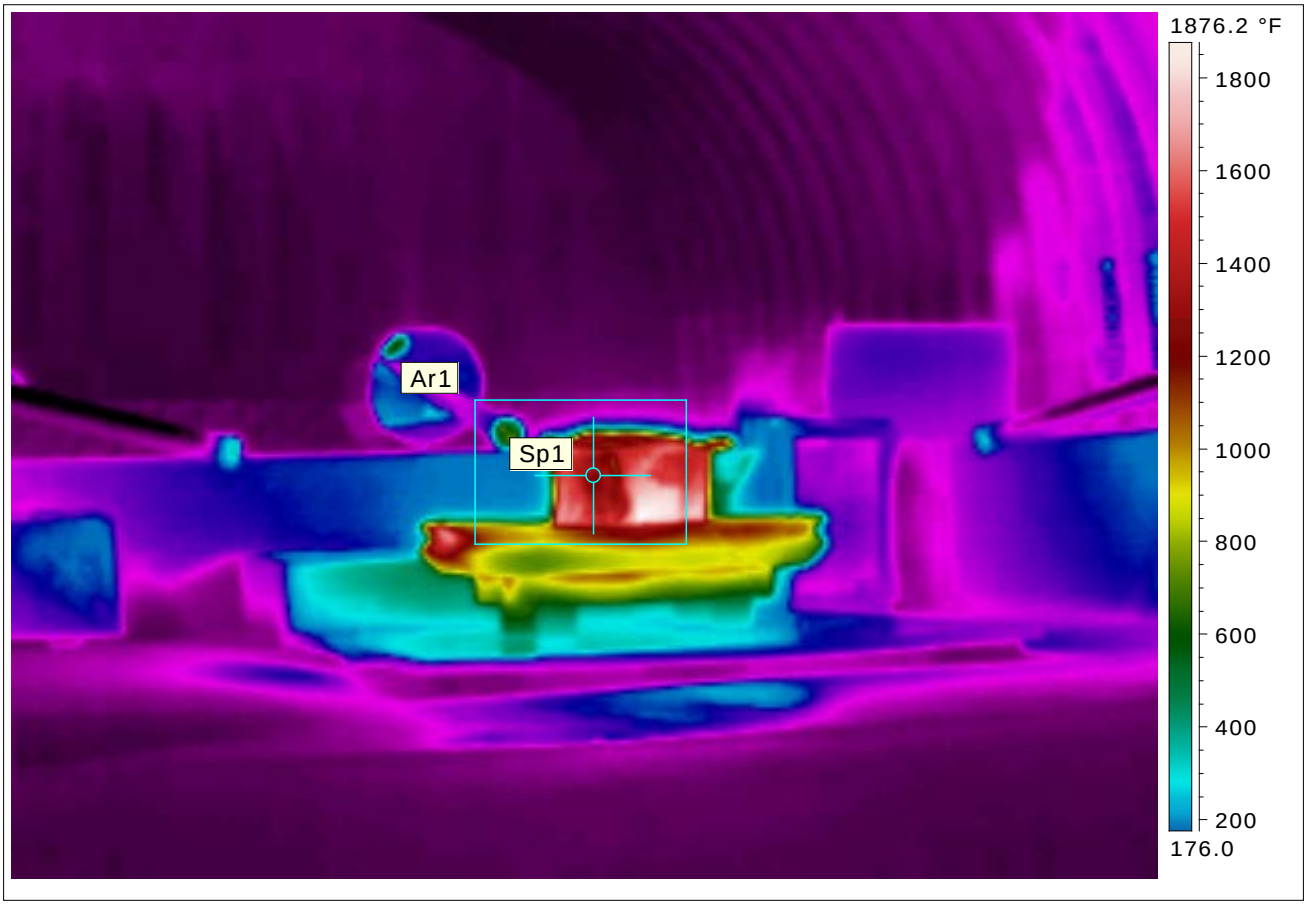


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1756.0 °F
Date	4/18/2013
Image Time	8:10:01 AM
Emissivity	0.69

Approximately 31 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

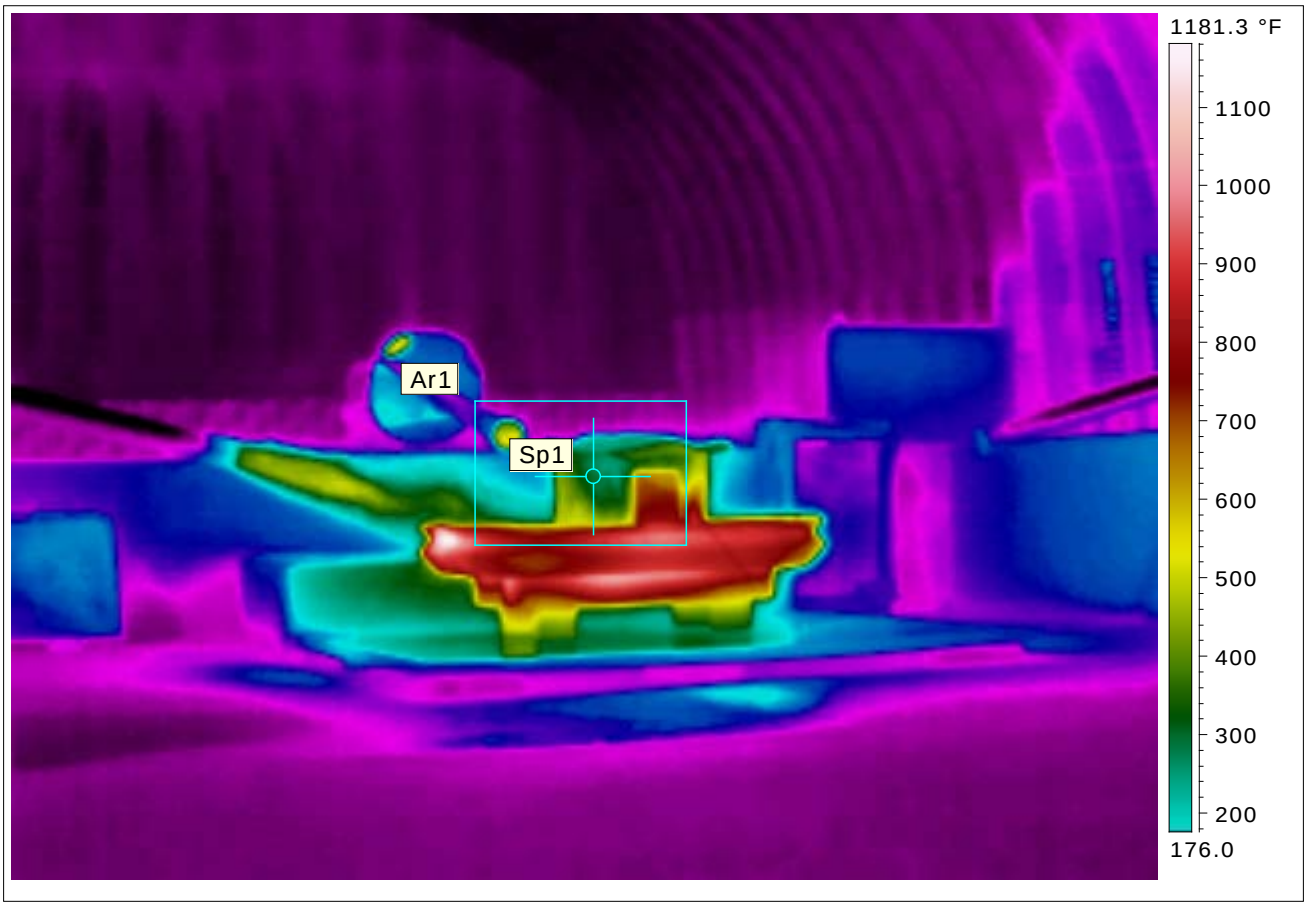


Ar1 Max. Temperature	1870.1 °F
Sp1 Temperature	1194.2 °F
Date	4/18/2013
Image Time	8:11:41 AM
Emissivity	0.69

Approximately 33 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

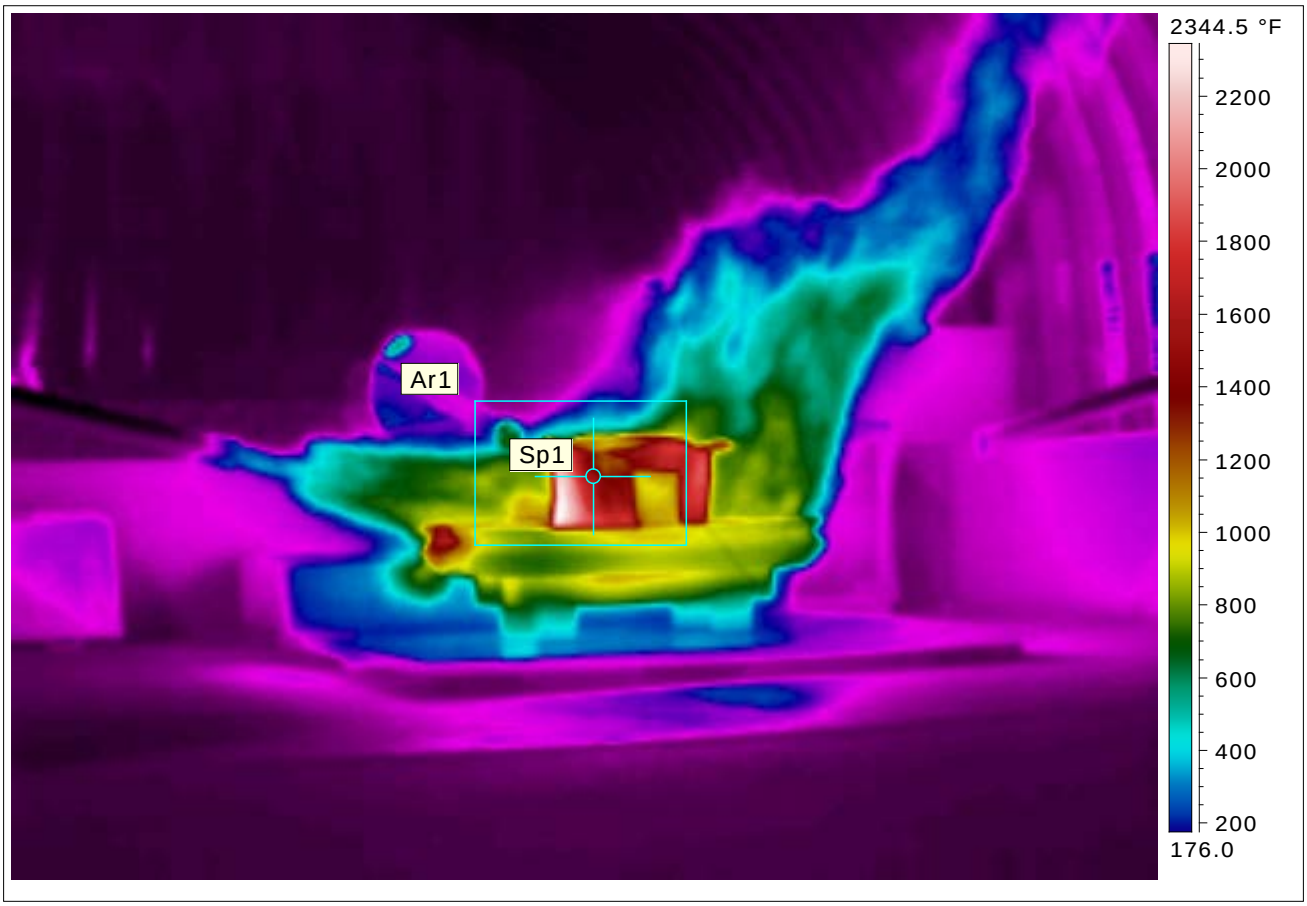


Ar1 Max. Temperature	968.4 °F
Sp1 Temperature	*293.3 °F
Date	4/18/2013
Image Time	8:17:49 AM
Emissivity	0.69

Approximately 39 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

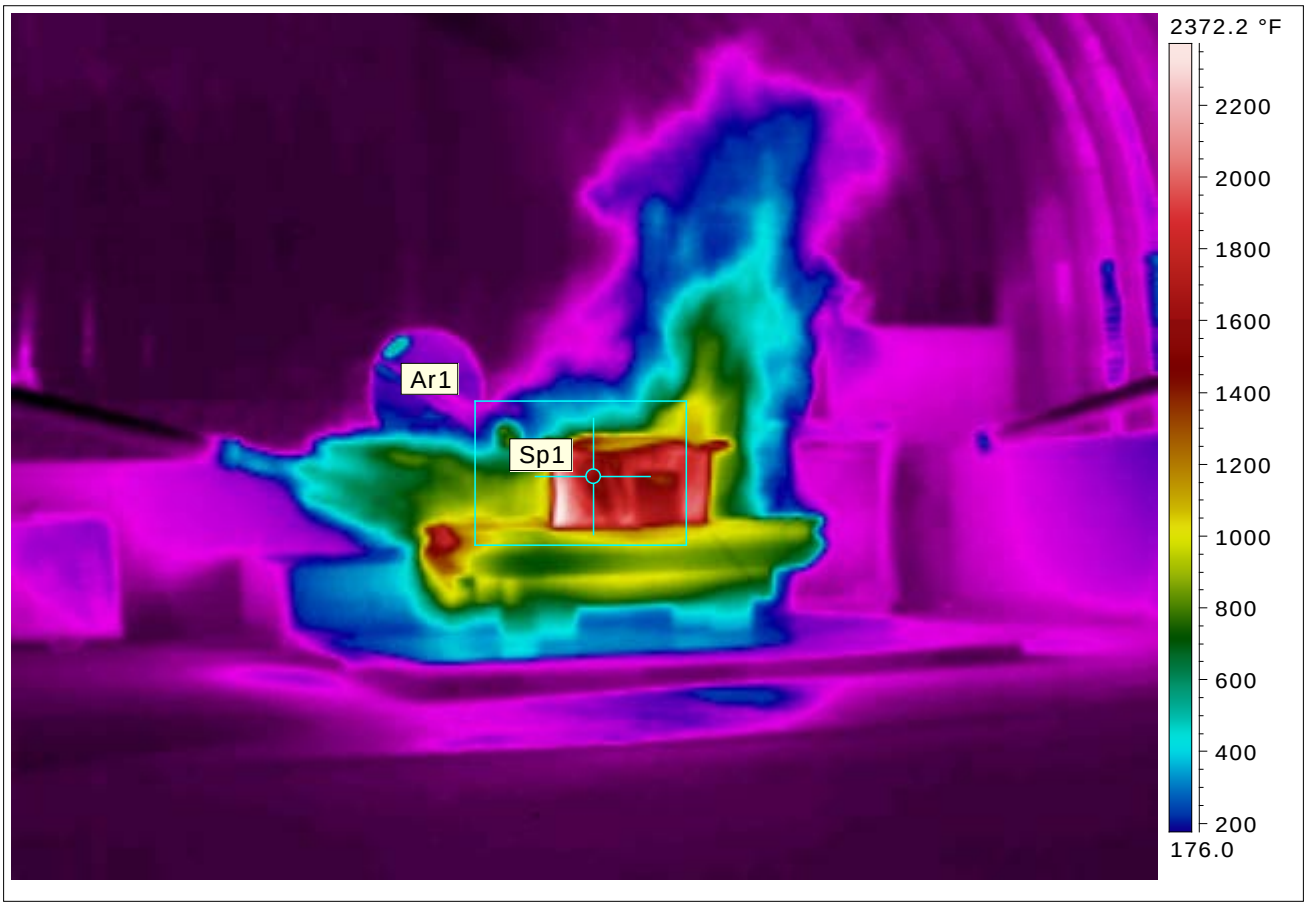


Ar1 Max. Temperature	*2368.1 °F
Sp1 Temperature	1527.4 °F
Date	4/18/2013
Image Time	8:18:06 AM
Emissivity	0.69

Approximately 39 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

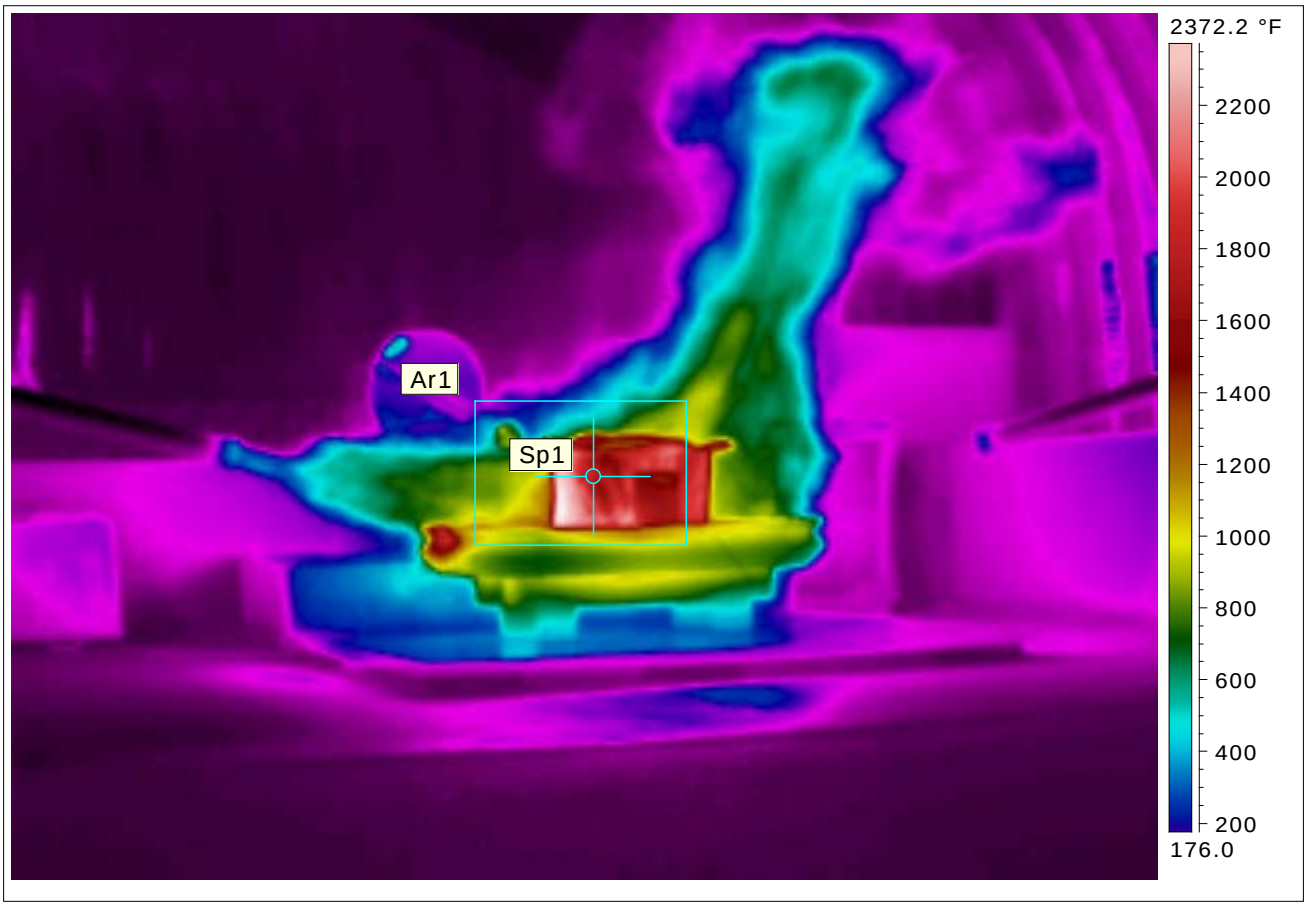


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1470.5 °F
Date	4/18/2013
Image Time	8:21:07 AM
Emissivity	0.69

Approximately 42 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013

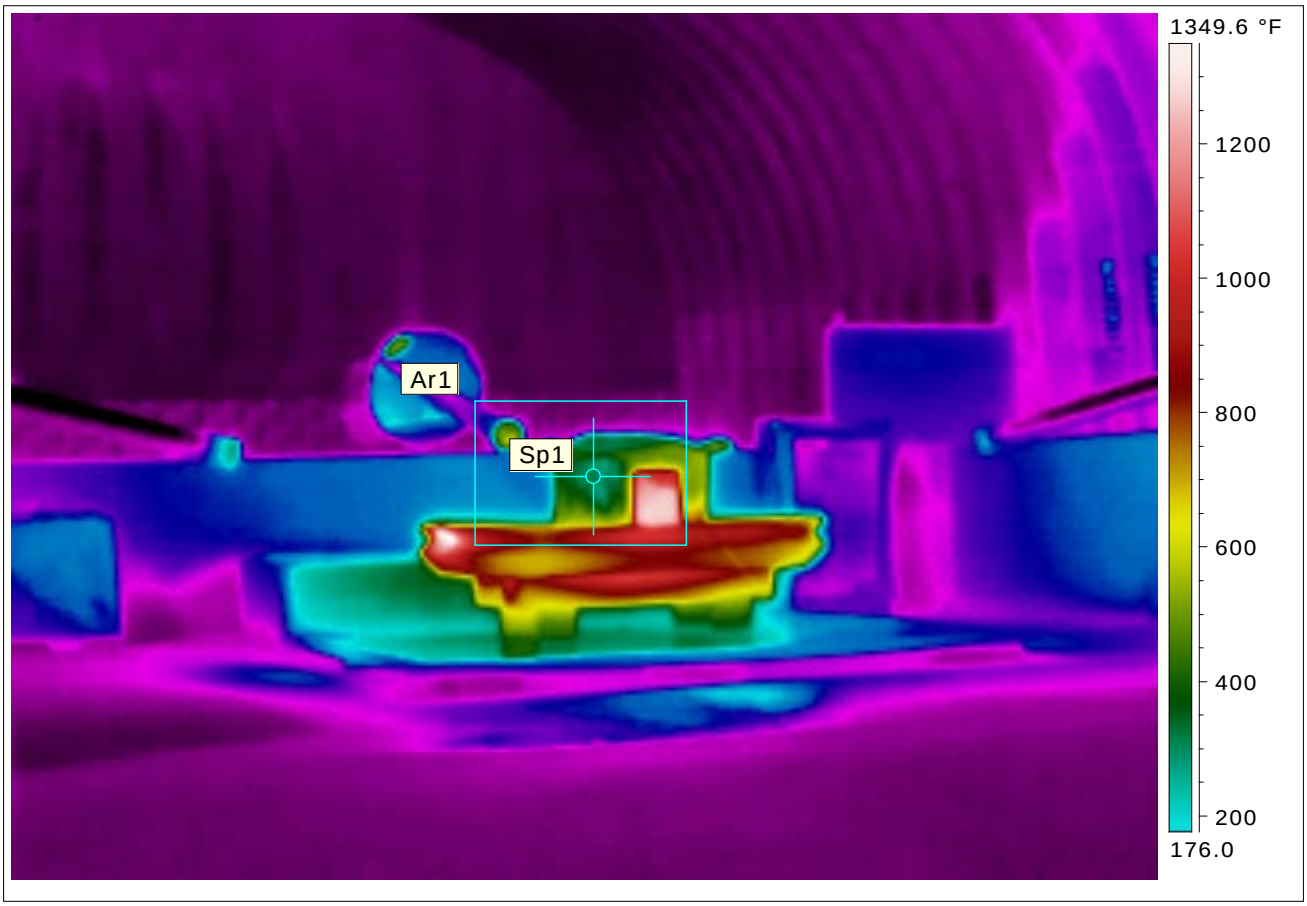


Ar1 Max. Temperature	>2372.2 °F
Sp1 Temperature	1757.1 °F
Date	4/18/2013
Image Time	8:22:08 AM
Emissivity	0.69

Approximately 43 minutes after burn start time

Los Alamos NATIONAL LABORATORY EST. 1943	Thermography Inspection at **TA-16 388 Open Burn Site**	**Report Date:** **June 5, 2013**

Thermogram Image.Date 4/18/2013



Ar1 Max. Temperature	1274.8 °F
Sp1 Temperature	*316.9 °F
Date	4/18/2013
Image Time	8:23:38 AM
Emissivity	0.69

Approximately 44 minutes after burn start time

Supplement 4-14

2018 Soil Sampling Results Summary Report for the Open Burning Unit at Technical Area (TA) 16-388 Flash Pad

TA-16-388 Flash Pad

This summary report includes discussion of the analytical results for soil sampling conducted at the Technical Area 16 (TA-16) Burn Ground at the TA-16-388 Flash Pad open burning hazardous waste management unit. The soil sampling was conducted on September 25, 2018 a total of 12 soil samples were collected from 12 locations (Figure 1). Sampling locations were pre-selected based on a defined area where deposition of particulates from air to soil and areas of potential storm water runoff is most likely to occur. Additional discrete grab sample locations northeast of the Flash Pad were also sampled, where a dioxin/furan contaminated hotspot was identified during previous soil monitoring events. The 12 soil samples were analyzed for explosives, perchlorates, volatile organic compounds (VOCs), semi-volatile compounds (SVOCs), dioxins/furans, and total metals. Each sample was collected from a depth of 0-2 inches below ground surface.

Various units have been in use for open burning operations from 1951 to the present and historically have been used for the open burning treatment of explosives hazardous waste. Other high explosives processing activities and waste treatment activities have also occurred at the TA-16 Burn Ground area, but the TA-16-388 Flash Pad unit has only been used for hazardous waste treatment activities. Other areas where past explosives processing activities occurred and the locations of past waste management units are known as solid waste management units (SWMUs).

Previous Sample Collection Events

Prior to the 2018 soil sampling event, three soil sampling events were conducted in 2009, 2012, and 2013 as part of the monitoring effort for the TA-16-388 hazardous waste management unit. The soil sampling is part of monitoring to assess the potential for release of contaminants from the treatment operations at the open burning treatment unit and to determine if constituents from historic operations are present within the soil around the unit that may adversely affect human health or the environment. Although analytically quantifying the specific contamination from operations at the open burning treatment unit is not possible due to the varied history of operations at the TA-16 Burn Ground, the data gathered from past, current, and future monitoring will be incorporated into risk analyses to make decisions concerning additional preventative or protective measures that could be introduced at the site. Data collected through monitoring also provide long term information about the TA-16 Burn Ground that will be useful to determine closure requirements.

Results from the 2009 sampling event indicate that no metals or dioxins/furans exceed either the New Mexico Environment Department (NMED) Residential Soil Screening Levels (RSSLs) (NMED, 2012) or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSL) (EPA, 2012). Dioxin/furan congeners were detected in each sample; the number of congeners detected ranged from 3 to 17 (Los Alamos National Laboratory [LANL], 2010).

For the 2012 sampling event, 12 soils sample were collected from 12 locations and analyzed for RCRA metals, dioxins/furans, VOCs, SVOCs, explosives compounds, and perchlorates. No metal concentrations were found to exceed either the SSLs or the RSLs. Dioxins/furans were detected above the SSLs and RSLs at two sample locations. A single soil sample location was measured to contain dioxin/furan levels that were an order of magnitude higher than all of the other locations. However, the sample was located very close to three samples collected previously (2009) that did not have dioxin/furans present above the screening levels. One SVOC, Nitrosodimethylamine[N-], was above the soil screening level at all of the soil sample locations. All Nitrosodimethylamine[N-] results were non-detects; however, the reported value of the laboratory quantitation limit (0.345 mg/kg) was above the soil screening level at the time (0.023 mg/kg).

For the 2013 sampling event, 7 soil samples were collected from 0-6 inch depths, from locations approximately 5 feet away from 2012 hot spot soil sample location. Soil samples for this sampling event were analyzed for dioxins/furans, SVOCs, metals, perchlorate and explosives. These locations were chosen primarily for the purposes of determining if the soil in and around the hot spot location had similar levels for dioxins and furans and to determine if there were additional exceedances for other constituents of concern. Two samples collected immediately surrounding the hot spot location were found to exceed their respective SSLs and the RSLs for dioxins and furans. There were no exceedances for SVOCs, metals, perchlorate, or explosives. Details regarding these sampling events are found in Attachment F of *Class 3 Permit Modification Request for Addition of an Open Burning Unit at Technical Area (TA) 16 to the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit, EPA ID No. NM0890010515* (LANL, 2013).

The 2018 soil sampling event was conducted to further characterize the potential for contaminant releases from the unit and provide additional information for the documentation of soil constituent data.

Laboratory Analysis and Reporting

Soil samples were analyzed at a qualified offsite laboratory. The LANL Sample Management Office qualifies contract laboratories and ensures that these laboratories adhere to Environmental Protection Agency (EPA) quality assurance and quality control (QA/QC) requirements. All sampling and analysis were conducted in accordance with QA/QC procedures defined by the latest revision of SW-846 (EPA, 1986) or other NMED-approved procedures. Field sampling procedures and laboratory analyses are evaluated through the use of QA/QC samples to assess the overall quality of the data produced. The field QC samples included trip blanks, field blanks, field duplicates, and equipment rinsate blanks. Field QC samples were given a unique sample identification number and submitted to the analytical laboratory as blind samples. Laboratory QC samples included calibrations, blanks, duplicates, and spike samples. QC sample results are included in the analytical results received from the laboratory, so the results can be applied to the associated samples.

Samples were analyzed for the following constituents using the EPA methods indicated in the parentheses:

- High explosives (SW-846-8330B)
- Metals (SW-846-6010C, SW-846-6020, and SW-846-7471A)
- Dioxins/Furans (SW-846-8290A)
- SVOCs (SW-846-8270D)
- VOCs (SW-846-8260B)
- Perchlorates (SW-846-6850)

Complete analytical results are included in Table 1, *TA-16-388 Flash Pad Analytical Data Summary*. Data are reported with qualifiers that denote the following analytical situations:

- <u>For Dioxins/Furans</u>
    - U – Compound analyzed for, but not detected, reported quantity equals the contract required quantitation limit (CRQL)
    - J - Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard

        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - K – Estimated Maximum Possible Concentration
    - NQ – No qualification
- For Metals
    - U – reading was less than the method detection limit (MDL); reported value equals the CRQL
    - J – The reported value was obtained from a reading less than the CRQL but greater than or equal to the MDL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - NQ – No qualification
- For VOCs and SVOCs
    - U – Compound analyzed for, but not detected; reported value equals the CRQL
    - J – Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
- For Explosives
    - U – Compound analyzed for, but not detected; reported value equals the CRQL
    - J – Estimated value; the analyte is present, but at a concentration below the CRQL
        - J+ – percent recovery is over the qualification standard
        - J- – percent recovery is below the qualification standard
    - B – Analyte detected in associated blank
    - Blank qualifier field – No qualification

Summary of Results

The 12 soil samples were analyzed for explosives, perchlorates, VOCs, SVOCs, dioxins/furans, and total metals. All 12 soil samples did not exceed any of the identified in the most current NMED RSSLs (NMED, 2019) for explosives, perchlorates, VOCs, dioxins/furans and total metals. One SVOC, n-nitrosodimethylamine, appears to be detected above the current NMED RSSL at all sample locations. The paragraphs below provide a discussion of the compounds detected within the soil, as well as other information about the analytical data that provide a more in depth discussion regarding some of the results.

Organic constituents detected within the soils around the TA-16-388 Flash Pad include:

- 2 of the 62 VOCs analyzed;
- 1 of the 69 SVOCs analyzed;
- 5 of the 20 explosives compounds analyzed; and
- 25 of the 25 dioxin or furan compounds analyzed.

Both of the VOCs and the single SVOC detected were measured below applicable NMED RSSLs. However, when a constituent is reported as a CRQL which is greater than the screening level, it appears that the constituent is detected at a concentration that is greater than the NMED RSSL. This is the case for n-nitrosodimethylamine within this dataset. It is not detected in any of the samples analyzed and is included within the 'U' qualifier, as referenced above. Because the reported results are the same as the CRQL, and the CRQL is above the NMED RSSL, n-nitrosodimethylamine appears to be detected at a concentration greater than the NMED RSSLs. Although, the method utilized by the analytical laboratory for SVOC analysis can detect the presence of nitrosamines, it is not the most sensitive; however, since the presence of n-nitrosodimethylamine due to operations at the TA-16-388 Flash Pad is not likely, a more focused analytical validation was deemed not necessary. Further discussion regarding the likelihood of the presence of n-nitrosodimethylamine at the site is below.

N-nitrosodimethylamine is produced by industry only in small amounts for research. It was used to make rocket fuel, but this use was stopped after unusually high levels of the chemical were found in air, water, and soil samples collected near a rocket fuel manufacturing plant. It is currently used in some cosmetic and toiletry products and in cleansers. N-nitrosodimethylamine is unintentionally formed during various manufacturing processes and in air, water, and soil from reactions involving other chemicals called alkylamines. It is also found in some foods and may be formed in the body. When released to the air, it is broken down by sunlight in a matter of minutes. When released to soil, it may evaporate into air or could sink down into deeper soil. It is unlikely that n-nitrosodimethylamine was deposited by past or current activities at the TA-36-8 open detonation unit, given that rocket fuel was never manufactured at LANL

Perchlorate was detected at 2 of the 12 soil sample locations. All detections were below current NMED RSSLs.

Twenty-three (23) of the 23 metals analyzed for were detected in soil around the TA-16-388 Flash Pad. Most of the detected metal concentrations are below the established background levels at Los Alamos National Laboratory. Eight of the metals detected are present at concentrations above background values.

- Antimony (1 location)
- Barium (7 locations)
- Cobalt (1 location)
- Copper (1 location)
- Lead (1 location)
- Nickel (1 location)
- Silver (2 locations)
- Zinc (2 locations)

Human health and ecological risks associated with these detections are included in Permit Application Supplement 4-16, *Technical Area 16 - Open Burn/Open Detonation (OB/OD) Area - TA-16-388 Flash Pad Human Health and Ecological Risk-Screening Assessments*.

Conclusion

Soil sampling and analysis results indicate that the average soil constituent concentrations around the TA-16-388 Flash Pad are less than the NMED RSSLs. The analytical results for high explosives, perchlorates, VOCs, SVOCs and dioxins/furans did not indicate the presence of any constituents greater

than the selected screening levels. Detected metals at 8 soil sample locations were measured above established background values; however there were no detections above current NMED RSSLs.

References

EPA, 1986 (and all approved updates.) *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, U.S. Environmental Protection Agency. Office of Solid Waste and Emergency Response, U.S. government Printing Office, Washington D.C.

LANL, 2013. *Class 3 Permit Modification Request for Addition of an Open Burning Unit at Technical Area (TA) 16 to the Los Alamos Nation Laboratory (LANL) Hazardous Waste Facility Permit, EPA ID No. NM0890010515*. LA-UR-13-27579. September 2013, Los Alamos National Laboratory, Los Alamos, NM. (http://permalink.lanl.gov/object/tr?what=info:lanl-repo/eprr/ERID-250074)

NMED, 2012. *New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation*. February 2012, New Mexico Environment Department, Santa Fe, New Mexico.

NMED, 2019. *New Mexico Environment Department Risk Assessment Guidance for Site Investigations and Remediation*, February 2019 (Revision 2, 6/19/19).

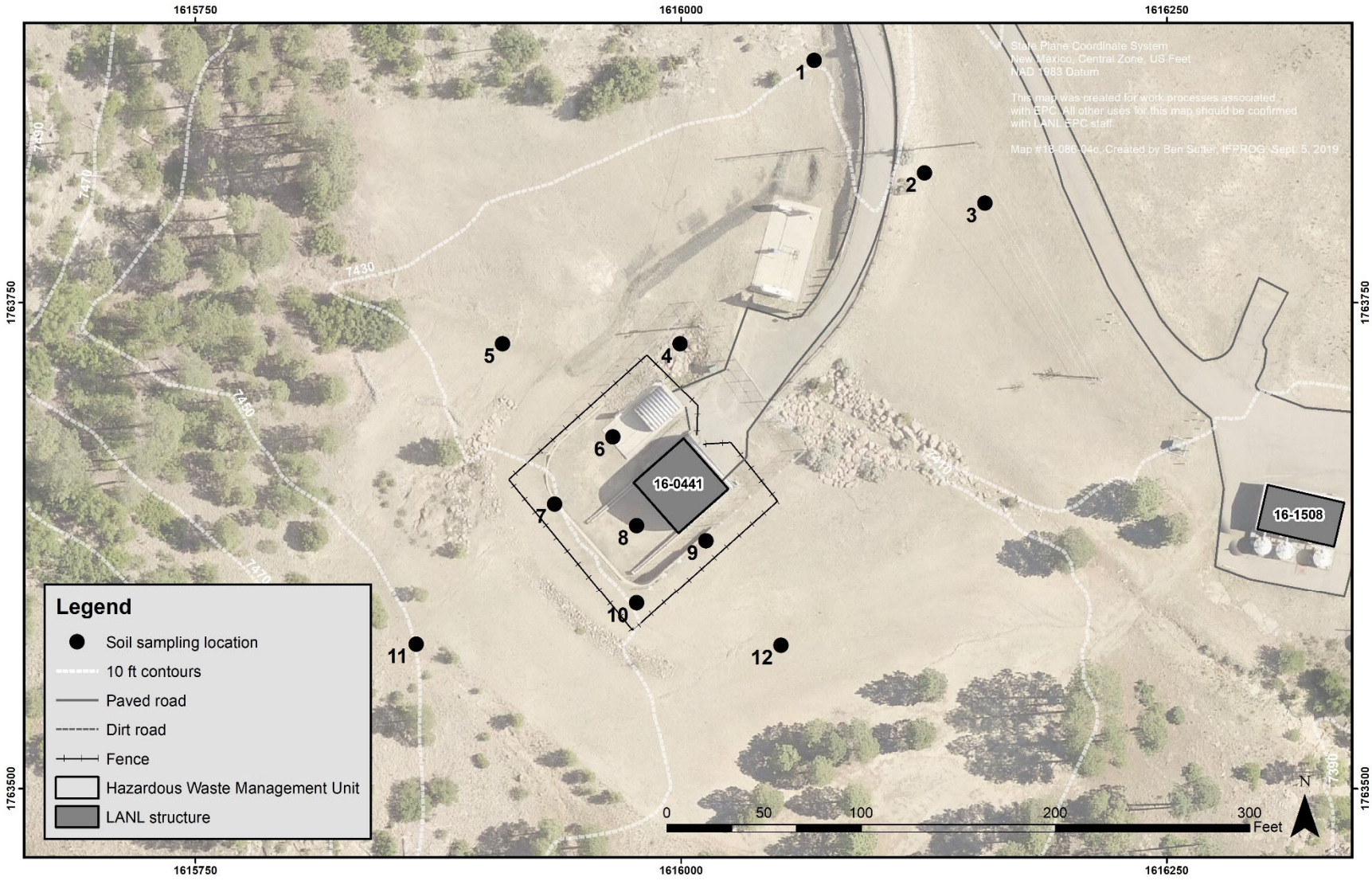


Figure 1. Soil Sample Locations at TA-16-388 Flash Pad

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Acenaphthene	5.19E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
1	Acenaphthylene	5.19E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Acetone	1.71E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
1	Aluminum	5.46E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
1	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Aniline	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Anthracene	5.19E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
1	Antimony	3.32E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
1	Arsenic	1.58E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
1	Azobenzene	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Barium	3.30E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
1	Benzene	3.42E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
1	Benzo(a)anthracene	5.19E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(a)pyrene	5.19E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
1	Benzo(b)fluoranthene	5.19E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(g,h,i)perylene	5.19E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Benzo(k)fluoranthene	5.19E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Benzoic Acid	8.66E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Benzyl Alcohol	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Beryllium	4.07E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
1	Bis(2-chloroethoxy)methane	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bis(2-chloroethyl)ether	5.19E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Bis(2-ethylhexyl)phthalate	5.19E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Bromobenzene	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bromochloromethane	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Bromodichloromethane	3.42E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
1	Bromoform	3.42E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Bromomethane	3.42E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
1	Bromophenyl-phenylether[4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butanone[2-]	1.71E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
1	Butylbenzene[n-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butylbenzene[sec-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Butylbenzene[tert-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Butylbenzylphthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Cadmium	1.01E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
1	Calcium	1.48E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
1	Carbon Disulfide	1.71E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
1	Carbon Tetrachloride	3.42E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
1	Chloro-3-methylphenol[4-]	6.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chloroaniline[4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chlorobenzene	3.42E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
1	Chlorodibromomethane	3.42E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Chloroethane	3.42E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
1	Chloroform	3.42E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
1	Chloromethane	3.42E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
1	Chloronaphthalene[2-]	5.19E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
1	Chlorophenol[2-]	5.19E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
1	Chlorophenyl-phenyl[4-] Ether	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chlorotoluene[2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
1	Chlorotoluene[4-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Chromium	5.08E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
1	Chrysene	5.19E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
1	Cobalt	2.99E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
1	Copper	5.22E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
1	Dibenz(a,h)anthracene	5.19E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
1	Dibenzofuran	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dibromo-3-Chloropropane[1,2-]	5.14E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
1	Dibromoethane[1,2-]	3.42E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
1	Dibromomethane	3.42E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
1	Dichlorobenzene[1,2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1	Dichlorobenzene[1,2-]	5.19E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
1	Dichlorobenzene[1,3-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorobenzene[1,3-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorobenzene[1,4-]	3.42E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1	Dichlorobenzene[1,4-]	5.19E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
1	Dichlorobenzidine[3,3'-]	5.19E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Dichlorodifluoromethane	3.42E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
1	Dichloroethane[1,1-]	3.42E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
1	Dichloroethane[1,2-]	3.42E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
1	Dichloroethene[1,1-]	3.42E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
1	Dichloroethene[cis-1,2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1	Dichloroethene[trans-1,2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Dichlorophenol[2,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
1	Dichloropropane[1,2-]	3.42E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
1	Dichloropropane[1,3-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropane[2,2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[1,1-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[cis-1,3-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dichloropropene[trans-1,3-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Diethylphthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
1	Dimethyl Phthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
1	Dimethylphenol[2,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Di-n-butylphthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
1	Dinitro-2-methylphenol[4,6-]	5.19E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
1	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dinitrophenol[2,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
1	Dinitrotoluene[2,6-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Di-n-octylphthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Di-n-octylphthalate	5.19E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Diphenylamine	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Ethylbenzene	3.42E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
1	Fluoranthene	5.19E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1	Fluorene	5.19E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
1	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.68E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Heptachlorodibenzodioxins (Total)	1.14E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.08E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	6.78E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Heptachlorodibenzofurans (Total)	3.42E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorobenzene	5.19E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
1	Hexachlorobutadiene	5.19E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
1	Hexachlorocyclopentadiene	5.19E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.11E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.95E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	2.74E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzodioxins (Total)	2.69E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,4,7,8-]	7.82E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.01E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.27E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Hexachlorodibenzofurans (Total)	2.02E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Hexachloroethane	5.19E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
1	Hexanone[2-]	1.71E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
1	Indeno(1,2,3-cd)pyrene	5.19E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
1	Iodomethane	1.71E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Iron	1.01E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
1	Isophorone	5.19E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
1	Isopropylbenzene	3.42E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
1	Isopropyltoluene[4-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Lead	1.07E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
1	Magnesium	1.04E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
1	Manganese	2.06E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
1	Mercury	6.81E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
1	Methyl-2-pentanone[4-]	1.71E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
1	Methylene Chloride	1.71E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
1	Methylnaphthalene[2-]	5.19E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
1	Methylphenol[2-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Methylphenol[3-,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Methylphenol[2-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Methylphenol[3-,4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Naphthalene	5.19E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
1	Nickel	3.78E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
1	Nitroaniline[2-]	5.71E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitroaniline[3-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitroaniline[4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrobenzene	5.19E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
1	Nitrophenol[2-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrophenol[4-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrosodimethylamine[N-]	5.19E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	TRUE	N/A	FALSE
1	Nitroso-di-n-propylamine[N-]	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
1	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
1	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
1	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.62E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.29E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Oxybis(1-chloropropane)[2,2'-]	5.19E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzodioxins (Total)	1.65E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzofuran[1,2,3,7,8-]	4.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Pentachlorodibenzofuran[2,3,4,7,8-]	4.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorodibenzofurans (Totals)	4.45E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pentachlorophenol	5.19E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
1	Perchlorate	5.13E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
1	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Phenanthrene	5.19E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1	Phenol	5.19E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
1	Potassium	1.10E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
1	Propylbenzene[1-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Pyrene	5.19E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
1	Pyridine	5.19E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
1	Selenium	6.81E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
1	Silver	1.01E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
1	Sodium	9.00E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
1	Styrene	3.42E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
1	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachlorodibenzodioxin[2,3,7,8-]	1.21E-07	mg/kg	Y	J	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
1	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachlorodibenzofuran[2,3,7,8-]	1.79E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachlorodibenzofurans (Totals)	8.87E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Tetrachloroethane[1,1,1,2-]	3.42E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
1	Tetrachloroethane[1,1,2,2-]	3.42E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
1	Tetrachloroethene	3.42E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
1	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
1	Thallium	1.48E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
1	Toluene	3.42E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
1	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.71E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
1	Trichlorobenzene[1,2,4-]	5.19E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
1	Trichloroethane[1,1,1-]	3.42E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
1	Trichloroethane[1,1,2-]	3.42E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
1	Trichloroethene	3.42E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
1	Trichlorofluoromethane	3.42E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
1	Trichlorophenol[2,4,5-]	5.19E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
1	Trichlorophenol[2,4,6-]	5.19E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
1	Trichloropropane[1,2,3-]	3.42E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
1	Trimethylbenzene[1,2,4-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
1	Trimethylbenzene[1,3,5-]	3.42E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
1	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
1	Vanadium	1.37E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
1	Vinyl Chloride	3.42E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
1	Xylene[1,2-]	3.42E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
1	Xylene[1,3-]+Xylene[1,4-]	6.86E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
1	Zinc	3.98E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
2	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Acenaphthene	1.04E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
2	Acenaphthylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Acetone	1.70E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
2	Aluminum	1.11E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
2	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Aniline	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Anthracene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
2	Antimony	3.27E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
2	Arsenic	2.58E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
2	Azobenzene	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Barium	3.25E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
2	Benzene	3.40E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
2	Benzo(a)anthracene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(a)pyrene	1.04E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
2	Benzo(b)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(g,h,i)perylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Benzo(k)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Benzoic Acid	1.73E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Benzyl Alcohol	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Beryllium	9.01E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
2	Bis(2-chloroethoxy)methane	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bis(2-chloroethyl)ether	1.04E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Bis(2-ethylhexyl)phthalate	1.04E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Bromobenzene	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bromochloromethane	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Bromodichloromethane	3.40E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Bromoform	3.40E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Bromomethane	3.40E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
2	Bromophenyl-phenylether[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butanone[2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
2	Butylbenzene[n-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzene[sec-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzene[tert-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Butylbenzylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Cadmium	9.92E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
2	Calcium	1.91E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
2	Carbon Disulfide	1.70E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
2	Carbon Tetrachloride	3.40E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
2	Chloro-3-methylphenol[4-]	1.39E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chloroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chlorobenzene	3.40E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
2	Chlorodibromomethane	3.40E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Chloroethane	3.40E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
2	Chloroform	3.40E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
2	Chloromethane	3.40E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
2	Chloronaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
2	Chlorophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
2	Chlorophenyl-phenyl[4-] Ether	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chlorotoluene[2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
2	Chlorotoluene[4-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Chromium	8.35E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
2	Chrysene	1.04E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
2	Cobalt	6.01E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
2	Copper	5.53E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
2	Dibenz(a,h)anthracene	1.04E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
2	Dibenzofuran	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dibromo-3-Chloropropane[1,2-]	5.10E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
2	Dibromoethane[1,2-]	3.40E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
2	Dibromomethane	3.40E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
2	Dichlorobenzene[1,2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
2	Dichlorobenzene[1,2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
2	Dichlorobenzene[1,3-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorobenzene[1,3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorobenzene[1,4-]	3.40E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
2	Dichlorobenzene[1,4-]	1.04E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Dichlorobenzidine[3,3'-]	1.04E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Dichlorodifluoromethane	3.40E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
2	Dichloroethane[1,1-]	3.40E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
2	Dichloroethane[1,2-]	3.40E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
2	Dichloroethene[1,1-]	3.40E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
2	Dichloroethene[cis-1,2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
2	Dichloroethene[trans-1,2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
2	Dichlorophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
2	Dichloropropane[1,2-]	3.40E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
2	Dichloropropane[1,3-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropane[2,2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[1,1-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[cis-1,3-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dichloropropene[trans-1,3-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Diethylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
2	Dimethyl Phthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
2	Dimethylphenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Di-n-butylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
2	Dinitro-2-methylphenol[4,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
2	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dinitrophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,4-]	1.04E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
2	Dinitrotoluene[2,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Di-n-octylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Diphenylamine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Ethylbenzene	3.40E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
2	Fluoranthene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
2	Fluorene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
2	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	6.83E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzodioxins (Total)	1.29E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.15E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Heptachlorodibenzofurans (Total)	2.07E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorobenzene	1.04E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
2	Hexachlorobutadiene	1.04E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
2	Hexachlorocyclopentadiene	1.04E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzodioxins (Total)	1.73E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachlorodibenzofurans (Total)	1.04E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Hexachloroethane	1.04E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
2	Hexanone[2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
2	Indeno(1,2,3-cd)pyrene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
2	Iodomethane	1.70E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Iron	1.19E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
2	Isophorone	1.04E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
2	Isopropylbenzene	3.40E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
2	Isopropyltoluene[4-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Lead	1.17E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
2	Magnesium	1.74E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
2	Manganese	2.95E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
2	Mercury	1.17E-02	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
2	Methyl-2-pentanone[4-]	1.70E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
2	Methylene Chloride	1.70E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
2	Methylnaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
2	Methylphenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Methylphenol[3-,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Naphthalene	1.04E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
2	Nickel	7.59E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
2	Nitroaniline[2-]	1.14E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitroaniline[3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrobenzene	1.04E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
2	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
2	Nitrophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrophenol[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrosodimethylamine[N-]	1.04E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
2	Nitroso-di-n-propylamine[N-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
2	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
2	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	4.92E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	4.29E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Oxybis(1-chloropropane)[2,2'-]	1.04E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pentachlorophenol	1.04E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
2	Perchlorate	5.22E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
2	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Phenanthrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
2	Phenol	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
2	Potassium	1.87E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
2	Propylbenzene[1-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Pyrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
2	Pyridine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
2	Selenium	6.56E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
2	Silver	1.34E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
2	Sodium	8.22E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
2	Styrene	3.40E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
2	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachlorodibenzodioxin[2,3,7,8-]	9.99E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
2	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachlorodibenzofuran[2,3,7,8-]	1.21E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Tetrachloroethane[1,1,1,2-]	3.40E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
2	Tetrachloroethane[1,1,2,2-]	3.40E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
2	Tetrachloroethene	3.40E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
2	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
2	Thallium	2.42E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
2	Toluene	3.40E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
2	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
2	Trichlorobenzene[1,2,4-]	1.04E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
2	Trichloroethane[1,1,1-]	3.40E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
2	Trichloroethane[1,1,2-]	3.40E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
2	Trichloroethene	3.40E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
2	Trichlorofluoromethane	3.40E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
2	Trichlorophenol[2,4,5-]	1.04E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
2	Trichlorophenol[2,4,6-]	1.04E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
2	Trichloropropane[1,2,3-]	3.40E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
2	Trimethylbenzene[1,2,4-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trimethylbenzene[1,3,5-]	3.40E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
2	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
2	Vanadium	2.34E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
2	Vinyl Chloride	3.40E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
2	Xylene[1,2-]	3.40E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
2	Xylene[1,3-]+Xylene[1,4-]	6.81E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
2	Zinc	2.30E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
3	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Acenaphthene	1.02E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
3	Acenaphthylene	1.02E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Acetone	1.69E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
3	Aluminum	6.57E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
3	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Aniline	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Anthracene	1.02E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
3	Antimony	3.39E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
3	Arsenic	1.60E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
3	Azobenzene	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Barium	2.24E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
3	Benzene	3.37E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
3	Benzo(a)anthracene	1.02E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(a)pyrene	1.02E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
3	Benzo(b)fluoranthene	1.02E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(g,h,i)perylene	1.02E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Benzo(k)fluoranthene	1.02E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
3	Benzoic Acid	1.71E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Benzyl Alcohol	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Beryllium	4.89E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
3	Bis(2-chloroethoxy)methane	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bis(2-chloroethyl)ether	1.02E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Bis(2-ethylhexyl)phthalate	1.02E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Bromobenzene	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bromochloromethane	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Bromodichloromethane	3.37E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
3	Bromoform	3.37E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Bromomethane	3.37E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
3	Bromophenyl-phenylether[4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butanone[2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
3	Butylbenzene[n-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzene[sec-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzene[tert-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Butylbenzylphthalate	1.02E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Cadmium	1.03E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
3	Calcium	1.55E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
3	Carbon Disulfide	1.69E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
3	Carbon Tetrachloride	3.37E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
3	Chloro-3-methylphenol[4-]	1.36E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chloroaniline[4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chlorobenzene	3.37E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
3	Chlorodibromomethane	3.37E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Chloroethane	3.37E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
3	Chloroform	3.37E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
3	Chloromethane	3.37E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
3	Chloronaphthalene[2-]	1.02E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
3	Chlorophenol[2-]	1.02E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
3	Chlorophenyl-phenyl[4-] Ether	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chlorotoluene[2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
3	Chlorotoluene[4-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Chromium	5.96E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
3	Chrysene	1.02E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
3	Cobalt	3.62E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
3	Copper	5.67E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
3	Dibenz(a,h)anthracene	1.02E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
3	Dibenzofuran	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dibromo-3-Chloropropane[1,2-]	5.06E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
3	Dibromoethane[1,2-]	3.37E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Dibromomethane	3.37E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
3	Dichlorobenzene[1,2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3	Dichlorobenzene[1,2-]	1.02E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3	Dichlorobenzene[1,3-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorobenzene[1,3-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorobenzene[1,4-]	3.37E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3	Dichlorobenzene[1,4-]	1.02E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3	Dichlorobenzidine[3,3'-]	1.02E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
3	Dichlorodifluoromethane	3.37E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
3	Dichloroethane[1,1-]	3.37E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
3	Dichloroethane[1,2-]	3.37E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
3	Dichloroethene[1,1-]	3.37E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
3	Dichloroethene[cis-1,2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
3	Dichloroethene[trans-1,2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
3	Dichlorophenol[2,4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
3	Dichloropropane[1,2-]	3.37E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
3	Dichloropropane[1,3-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropane[2,2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[1,1-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[cis-1,3-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dichloropropene[trans-1,3-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Diethylphthalate	1.02E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
3	Dimethyl Phthalate	1.02E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
3	Dimethylphenol[2,4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Di-n-butylphthalate	1.02E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3	Dinitro-2-methylphenol[4,6-]	1.02E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
3	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dinitrophenol[2,4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,4-]	1.02E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3	Dinitrotoluene[2,6-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Di-n-octylphthalate	1.02E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Diphenylamine	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Ethylbenzene	3.37E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
3	Fluoranthene	1.02E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3	Fluorene	1.02E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	9.39E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Heptachlorodibenzodioxins (Total)	1.61E-03	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	3.16E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.43E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Heptachlorodibenzofurans (Total)	6.74E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorobenzene	1.02E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
3	Hexachlorobutadiene	1.02E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
3	Hexachlorocyclopentadiene	1.02E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.74E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	3.50E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.54E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzodioxins (Total)	3.22E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,4,7,8-]	9.84E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.32E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[1,2,3,7,8,9-]	1.16E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.77E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachlorodibenzofurans (Total)	3.50E-04	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Hexachloroethane	1.02E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
3	Hexanone[2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
3	Indeno(1,2,3-cd)pyrene	1.02E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3	Iodomethane	1.69E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Iron	9.56E+03	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
3	Isophorone	1.02E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
3	Isopropylbenzene	3.37E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
3	Isopropyltoluene[4-]	6.68E-04	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Lead	9.29E+00	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
3	Magnesium	1.20E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
3	Manganese	2.49E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
3	Mercury	6.08E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
3	Methyl-2-pentanone[4-]	1.69E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
3	Methylene Chloride	1.69E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
3	Methylnaphthalene[2-]	1.02E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
3	Methylphenol[2-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Methylphenol[3-,4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Naphthalene	1.02E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
3	Nickel	4.03E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
3	Nitroaniline[2-]	1.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitroaniline[3-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitroaniline[4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrobenzene	1.02E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
3	Nitrophenol[2-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrophenol[4-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrosodimethylamine[N-]	1.02E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
3	Nitroso-di-n-propylamine[N-]	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
3	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
3	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
3	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5.04E-03	mg/kg	Y	R	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5.46E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Oxybis(1-chloropropane)[2,2'-]	1.02E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzodioxin[1,2,3,7,8-]	7.23E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzodioxins (Total)	3.87E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofuran[1,2,3,7,8-]	9.29E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofuran[2,3,4,7,8-]	1.23E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorodibenzofurans (Totals)	6.84E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pentachlorophenol	1.02E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
3	Perchlorate	5.05E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
3	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Phenanthrene	1.02E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3	Phenol	1.02E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
3	Potassium	1.39E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
3	Propylbenzene[1-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Pyrene	1.02E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3	Pyridine	1.02E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
3	Selenium	6.13E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
3	Silver	2.81E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
3	Sodium	7.20E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
3	Styrene	3.37E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
3	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachlorodibenzodioxin[2,3,7,8-]	3.50E-07	mg/kg	Y	J	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
3	Tetrachlorodibenzodioxins (Total)	5.13E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachlorodibenzofuran[2,3,7,8-]	2.78E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachlorodibenzofurans (Totals)	7.57E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Tetrachloroethane[1,1,1,2-]	3.37E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
3	Tetrachloroethane[1,1,2,2-]	3.37E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3	Tetrachloroethene	3.37E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
3	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
3	Thallium	1.79E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
3	Toluene	6.99E-04	mg/kg	Y	J	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
3	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
3	Trichlorobenzene[1,2,4-]	1.02E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
3	Trichloroethane[1,1,1-]	3.37E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
3	Trichloroethane[1,1,2-]	3.37E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
3	Trichloroethene	3.37E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
3	Trichlorofluoromethane	3.37E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3	Trichlorophenol[2,4,5-]	1.02E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3	Trichlorophenol[2,4,6-]	1.02E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
3	Trichloropropane[1,2,3-]	3.37E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
3	Trimethylbenzene[1,2,4-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trimethylbenzene[1,3,5-]	3.37E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
3	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3	Vanadium	1.37E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
3	Vinyl Chloride	3.37E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
3	Xylene[1,2-]	3.37E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
3	Xylene[1,3-]+Xylene[1,4-]	6.76E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
3	Zinc	2.84E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
3 dup	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Acenaphthene	5.13E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
3 dup	Acenaphthylene	5.13E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Acetone	1.69E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
3 dup	Aluminum	6.65E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
3 dup	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Aniline	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Anthracene	5.13E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
3 dup	Antimony	3.35E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
3 dup	Arsenic	1.62E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
3 dup	Azobenzene	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Barium	2.38E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
3 dup	Benzene	3.39E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3 dup	Benzo(a)anthracene	5.13E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Benzo(a)pyrene	5.13E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
3 dup	Benzo(b)fluoranthene	5.13E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Benzo(g,h,i)perylene	5.13E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Benzo(k)fluoranthene	5.13E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Benzoic Acid	8.54E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Benzyl Alcohol	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Beryllium	6.23E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
3 dup	Bis(2-chloroethoxy)methane	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Bis(2-chloroethyl)ether	5.13E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Bis(2-ethylhexyl)phthalate	5.13E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3 dup	Bromobenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Bromochloromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Bromodichloromethane	3.39E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
3 dup	Bromoform	3.39E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
3 dup	Bromomethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
3 dup	Bromophenyl-phenylether[4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Butanone[2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
3 dup	Butylbenzene[n-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Butylbenzene[sec-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Butylbenzene[tert-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Butylbenzylphthalate	5.13E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Cadmium	1.01E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
3 dup	Calcium	1.77E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
3 dup	Carbon Disulfide	1.69E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
3 dup	Carbon Tetrachloride	3.39E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
3 dup	Chloro-3-methylphenol[4-]	6.84E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Chloroaniline[4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Chlorobenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
3 dup	Chlorodibromomethane	3.39E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
3 dup	Chloroethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
3 dup	Chloroform	3.39E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
3 dup	Chloromethane	3.39E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
3 dup	Chloronaphthalene[2-]	5.13E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
3 dup	Chlorophenol[2-]	5.13E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
3 dup	Chlorophenyl-phenyl[4-] Ether	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Chlorotoluene[2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
3 dup	Chlorotoluene[4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Chromium	6.83E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3 dup	Chrysene	5.13E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Cobalt	4.02E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
3 dup	Copper	6.39E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
3 dup	Dibenz(a,h)anthracene	5.13E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dibenzofuran	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dibromo-3-Chloropropane[1,2-]	5.08E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
3 dup	Dibromoethane[1,2-]	3.39E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
3 dup	Dibromomethane	3.39E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,2-]	5.13E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,3-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,4-]	3.39E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3 dup	Dichlorobenzene[1,4-]	5.13E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
3 dup	Dichlorobenzidine[3,3'-]	5.13E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichlorodifluoromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
3 dup	Dichloroethane[1,1-]	3.39E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
3 dup	Dichloroethane[1,2-]	3.39E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
3 dup	Dichloroethene[1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
3 dup	Dichloroethene[cis-1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
3 dup	Dichloroethene[trans-1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
3 dup	Dichlorophenol[2,4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
3 dup	Dichloropropane[1,2-]	3.39E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
3 dup	Dichloropropane[1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichloropropane[2,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichloropropene[1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichloropropene[cis-1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dichloropropene[trans-1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Diethylphthalate	5.13E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
3 dup	Dimethyl Phthalate	5.13E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
3 dup	Dimethylphenol[2,4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3 dup	Di-n-butylphthalate	5.13E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3 dup	Dinitro-2-methylphenol[4,6-]	5.13E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
3 dup	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dinitrophenol[2,4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
3 dup	Dinitrotoluene[2,4-]	5.13E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3 dup	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
3 dup	Dinitrotoluene[2,6-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3 dup	Di-n-octylphthalate	5.13E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Diphenylamine	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Ethylbenzene	3.39E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
3 dup	Fluoranthene	5.13E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3 dup	Fluorene	5.13E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
3 dup	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	1.05E-03	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Heptachlorodibenzodioxins (Total)	1.80E-03	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	3.50E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	1.61E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Heptachlorodibenzofurans (Total)	7.45E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorobenzene	5.13E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
3 dup	Hexachlorobutadiene	5.13E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
3 dup	Hexachlorocyclopentadiene	5.13E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.90E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	3.93E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.96E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzodioxins (Total)	3.56E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzofuran[1,2,3,4,7,8-]	1.08E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.47E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzofuran[1,2,3,7,8,9-]	1.30E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.95E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachlorodibenzofurans (Total)	3.79E-04	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Hexachloroethane	5.13E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
3 dup	Hexanone[2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	HMX	1.49E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
3 dup	Indeno(1,2,3-cd)pyrene	5.13E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Iodomethane	1.69E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Iron	9.70E+03	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
3 dup	Isophorone	5.13E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
3 dup	Isopropylbenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
3 dup	Isopropyltoluene[4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Lead	9.22E+00	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
3 dup	Magnesium	1.29E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
3 dup	Manganese	2.40E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
3 dup	Mercury	5.97E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
3 dup	Methyl-2-pentanone[4-]	1.69E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
3 dup	Methylene Chloride	1.69E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
3 dup	Methylnaphthalene[2-]	5.13E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
3 dup	Methylphenol[2-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3 dup	Methylphenol[3-,4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Naphthalene	5.13E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
3 dup	Nickel	4.74E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
3 dup	Nitroaniline[2-]	5.64E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitroaniline[3-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitroaniline[4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitrobenzene	5.13E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
3 dup	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
3 dup	Nitrophenol[2-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitrophenol[4-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitrosodimethylamine[N-]	5.13E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	TRUE	N/A	FALSE
3 dup	Nitroso-di-n-propylamine[N-]	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
3 dup	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
3 dup	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
3 dup	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5.53E-03	mg/kg	Y	R	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	5.88E-04	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Oxybis(1-chloropropane)[2,2'-]	5.13E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorodibenzodioxin[1,2,3,7,8-]	7.95E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorodibenzodioxins (Total)	4.38E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorodibenzofuran[1,2,3,7,8-]	1.05E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorodibenzofuran[2,3,4,7,8-]	1.32E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorodibenzofurans (Totals)	7.08E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pentachlorophenol	5.13E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
3 dup	Perchlorate	5.11E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
3 dup	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Phenanthrene	5.13E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3 dup	Phenol	5.13E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
3 dup	Potassium	1.56E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
3 dup	Propylbenzene[1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Pyrene	5.13E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
3 dup	Pyridine	5.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
3 dup	Selenium	8.01E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
3 dup	Silver	1.71E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
3 dup	Sodium	9.37E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
3 dup	Styrene	3.39E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
3 dup	TATB	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
3 dup	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Tetrachlorodibenzodioxin[2,3,7,8-]	4.15E-07	mg/kg	Y	J	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
3 dup	Tetrachlorodibenzodioxins (Total)	2.34E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Tetrachlorodibenzofuran[2,3,7,8-]	3.28E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Tetrachlorodibenzofurans (Totals)	1.12E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Tetrachloroethane[1,1,1,2-]	3.39E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
3 dup	Tetrachloroethane[1,1,2,2-]	3.39E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
3 dup	Tetrachloroethene	3.39E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
3 dup	Tetryl	1.49E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
3 dup	Thallium	2.16E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
3 dup	Toluene	3.39E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
3 dup	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.69E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
3 dup	Trichlorobenzene[1,2,4-]	5.13E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
3 dup	Trichloroethane[1,1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
3 dup	Trichloroethane[1,1,2-]	3.39E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
3 dup	Trichloroethene	3.46E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
3 dup	Trichlorofluoromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
3 dup	Trichlorophenol[2,4,5-]	5.13E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
3 dup	Trichlorophenol[2,4,6-]	5.13E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
3 dup	Trichloropropane[1,2,3-]	3.39E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
3 dup	Trimethylbenzene[1,2,4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Trimethylbenzene[1,3,5-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
3 dup	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
3 dup	Vanadium	1.53E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
3 dup	Vinyl Chloride	3.39E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
3 dup	Xylene[1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
3 dup	Xylene[1,3-]+Xylene[1,4-]	6.78E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
3 dup	Zinc	3.16E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
4	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Acenaphthene	5.15E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
4	Acenaphthylene	5.15E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Acetone	1.68E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
4	Aluminum	8.56E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
4	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Aniline	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Anthracene	5.15E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
4	Antimony	3.42E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
4	Arsenic	1.85E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
4	Azobenzene	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Barium	2.20E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
4	Benzene	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
4	Benzo(a)anthracene	5.15E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(a)pyrene	5.15E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
4	Benzo(b)fluoranthene	5.15E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(g,h,i)perylene	5.15E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Benzo(k)fluoranthene	5.15E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Benzoic Acid	8.59E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Benzyl Alcohol	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Beryllium	7.24E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
4	Bis(2-chloroethoxy)methane	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bis(2-chloroethyl)ether	5.15E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Bis(2-ethylhexyl)phthalate	5.15E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Bromobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bromochloromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Bromodichloromethane	3.35E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
4	Bromoform	3.35E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Bromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
4	Bromophenyl-phenylether[4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
4	Butylbenzene[n-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzene[sec-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzene[tert-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Butylbenzylphthalate	5.15E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Cadmium	1.03E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
4	Calcium	2.49E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
4	Carbon Disulfide	1.68E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
4	Carbon Tetrachloride	3.35E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
4	Chloro-3-methylphenol[4-]	6.87E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chloroaniline[4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chlorobenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
4	Chlorodibromomethane	3.35E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Chloroethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
4	Chloroform	3.35E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Chloromethane	3.35E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
4	Chloronaphthalene[2-]	5.15E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
4	Chlorophenol[2-]	5.15E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
4	Chlorophenyl-phenyl[4-] Ether	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chlorotoluene[2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
4	Chlorotoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Chromium	8.03E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
4	Chrysene	5.15E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
4	Cobalt	4.71E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
4	Copper	7.27E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
4	Dibenz(a,h)anthracene	5.15E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
4	Dibenzofuran	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dibromo-3-Chloropropane[1,2-]	5.03E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
4	Dibromoethane[1,2-]	3.35E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
4	Dibromomethane	3.35E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
4	Dichlorobenzene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
4	Dichlorobenzene[1,2-]	5.15E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,3-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorobenzene[1,4-]	3.35E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
4	Dichlorobenzene[1,4-]	5.15E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
4	Dichlorobenzidine[3,3'-]	5.15E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Dichlorodifluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
4	Dichloroethane[1,1-]	3.35E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
4	Dichloroethane[1,2-]	3.35E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
4	Dichloroethene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
4	Dichloroethene[cis-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
4	Dichloroethene[trans-1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
4	Dichlorophenol[2,4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
4	Dichloropropane[1,2-]	3.35E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
4	Dichloropropane[1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropane[2,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[cis-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dichloropropene[trans-1,3-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Diethylphthalate	5.15E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
4	Dimethyl Phthalate	5.15E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
4	Dimethylphenol[2,4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Di-n-butylphthalate	5.15E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Dinitro-2-methylphenol[4,6-]	5.15E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
4	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dinitrophenol[2,4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,4-]	5.15E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
4	Dinitrotoluene[2,6-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Di-n-octylphthalate	5.15E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Diphenylamine	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Ethylbenzene	3.35E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
4	Fluoranthene	5.15E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
4	Fluorene	5.15E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
4	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.11E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzodioxins (Total)	1.42E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.39E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	7.67E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Heptachlorodibenzofurans (Total)	4.07E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorobenzene	5.15E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
4	Hexachlorobutadiene	5.15E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
4	Hexachlorocyclopentadiene	5.15E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachlorodibenzofurans (Total)	1.26E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Hexachloroethane	5.15E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
4	Hexanone[2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	HMX	1.49E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
4	Indeno(1,2,3-cd)pyrene	5.15E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
4	Iodomethane	1.68E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Iron	1.22E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
4	Isophorone	5.15E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
4	Isopropylbenzene	3.35E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
4	Isopropyltoluene[4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Lead	1.19E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	Magnesium	1.97E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
4	Manganese	2.95E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
4	Mercury	7.00E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
4	Methyl-2-pentanone[4-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
4	Methylene Chloride	1.68E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
4	Methylnaphthalene[2-]	5.15E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
4	Methylphenol[2-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Methylphenol[3-,4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Naphthalene	5.15E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
4	Nickel	5.72E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
4	Nitroaniline[2-]	5.67E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitroaniline[3-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitroaniline[4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrobenzene	5.15E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
4	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
4	Nitrophenol[2-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrophenol[4-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrosodimethylamine[N-]	5.15E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	TRUE	N/A	FALSE
4	Nitroso-di-n-propylamine[N-]	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
4	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
4	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
4	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3.34E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3.68E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Oxybis(1-chloropropane)[2,2'-]	5.15E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofuran[1,2,3,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofuran[2,3,4,7,8-]	4.98E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pentachlorophenol	5.15E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
4	Perchlorate	6.20E-04	mg/kg	Y	J	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
4	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Phenanthrene	5.15E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
4	Phenol	5.15E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
4	Potassium	1.75E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
4	Propylbenzene[1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Pyrene	5.15E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
4	Pyridine	5.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
4	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
4	Selenium	9.13E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
4	Silver	2.17E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
4	Sodium	1.03E+02	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
4	Styrene	3.35E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
4	TATB	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzodioxin[2,3,7,8-]	1.20E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
4	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzofuran[2,3,7,8-]	2.15E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachlorodibenzofurans (Totals)	3.49E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Tetrachloroethane[1,1,1,2-]	3.35E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
4	Tetrachloroethane[1,1,2,2-]	3.35E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
4	Tetrachloroethene	3.35E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
4	Tetryl	1.49E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
4	Thallium	1.68E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
4	Toluene	4.83E-04	mg/kg	Y	J	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
4	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.68E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
4	Trichlorobenzene[1,2,4-]	5.15E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
4	Trichloroethane[1,1,1-]	3.35E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
4	Trichloroethane[1,1,2-]	3.35E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
4	Trichloroethene	3.35E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
4	Trichlorofluoromethane	3.35E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
4	Trichlorophenol[2,4,5-]	5.15E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
4	Trichlorophenol[2,4,6-]	5.15E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
4	Trichloropropane[1,2,3-]	3.35E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
4	Trimethylbenzene[1,2,4-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trimethylbenzene[1,3,5-]	3.35E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
4	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
4	Vanadium	1.82E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
4	Vinyl Chloride	3.35E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
4	Xylene[1,2-]	3.35E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
4	Xylene[1,3-]+Xylene[1,4-]	6.71E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
4	Zinc	3.88E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
5	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Acenaphthene	1.03E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
5	Acenaphthylene	1.03E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Acetone	1.70E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
5	Aluminum	7.52E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
5	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Aniline	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Anthracene	1.03E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
5	Antimony	3.40E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
5	Arsenic	2.69E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
5	Azobenzene	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Barium	1.94E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
5	Benzene	3.39E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
5	Benzo(a)anthracene	1.03E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(a)pyrene	1.03E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
5	Benzo(b)fluoranthene	1.03E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(g,h,i)perylene	1.03E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Benzo(k)fluoranthene	1.03E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Benzoic Acid	1.71E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Benzyl Alcohol	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Beryllium	6.59E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
5	Bis(2-chloroethoxy)methane	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bis(2-chloroethyl)ether	1.03E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Bis(2-ethylhexyl)phthalate	1.03E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Bromobenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bromochloromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Bromodichloromethane	3.39E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
5	Bromoform	3.39E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Bromomethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
5	Bromophenyl-phenylether[4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butanone[2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
5	Butylbenzene[n-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butylbenzene[sec-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butylbenzene[tert-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Butylbenzylphthalate	1.03E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Cadmium	1.03E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
5	Calcium	1.61E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
5	Carbon Disulfide	1.70E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Carbon Tetrachloride	3.39E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
5	Chloro-3-methylphenol[4-]	1.37E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chloroaniline[4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chlorobenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
5	Chlorodibromomethane	3.39E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Chloroethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
5	Chloroform	3.39E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
5	Chloromethane	3.39E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
5	Chloronaphthalene[2-]	1.03E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
5	Chlorophenol[2-]	1.03E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
5	Chlorophenyl-phenyl[4-] Ether	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chlorotoluene[2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
5	Chlorotoluene[4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Chromium	7.49E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
5	Chrysene	1.03E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
5	Cobalt	5.45E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
5	Copper	5.87E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
5	Dibenz(a,h)anthracene	1.03E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
5	Dibenzofuran	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dibromo-3-Chloropropane[1,2-]	5.09E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
5	Dibromoethane[1,2-]	3.39E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
5	Dibromomethane	3.39E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
5	Dichlorobenzene[1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
5	Dichlorobenzene[1,2-]	1.03E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
5	Dichlorobenzene[1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorobenzene[1,3-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorobenzene[1,4-]	3.39E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
5	Dichlorobenzene[1,4-]	1.03E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
5	Dichlorobenzidine[3,3'-]	1.03E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Dichlorodifluoromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
5	Dichloroethane[1,1-]	3.39E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
5	Dichloroethane[1,2-]	3.39E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
5	Dichloroethene[1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
5	Dichloroethene[cis-1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
5	Dichloroethene[trans-1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
5	Dichlorophenol[2,4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
5	Dichloropropane[1,2-]	3.39E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
5	Dichloropropane[1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropane[2,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Dichloropropene[1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropene[cis-1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dichloropropene[trans-1,3-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Diethylphthalate	1.03E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
5	Dimethyl Phthalate	1.03E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
5	Dimethylphenol[2,4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Di-n-butylphthalate	1.03E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
5	Dinitro-2-methylphenol[4,6-]	1.03E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
5	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dinitrophenol[2,4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,4-]	1.03E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
5	Dinitrotoluene[2,6-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Di-n-octylphthalate	1.03E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Diphenylamine	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Ethylbenzene	3.39E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
5	Fluoranthene	1.03E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
5	Fluorene	1.03E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
5	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.24E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorobenzene	1.03E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
5	Hexachlorobutadiene	1.03E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
5	Hexachlorocyclopentadiene	1.03E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Hexachloroethane	1.03E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
5	Hexanone[2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Indeno(1,2,3-cd)pyrene	1.03E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
5	Iodomethane	1.70E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Iron	1.09E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
5	Isophorone	1.03E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
5	Isopropylbenzene	3.39E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
5	Isopropyltoluene[4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Lead	1.01E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
5	Magnesium	1.59E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
5	Manganese	2.90E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
5	Mercury	7.17E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
5	Methyl-2-pentanone[4-]	1.70E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
5	Methylene Chloride	1.70E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
5	Methylnaphthalene[2-]	1.03E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
5	Methylphenol[2-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Methylphenol[3-,4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Naphthalene	1.03E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
5	Nickel	7.07E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
5	Nitroaniline[2-]	1.13E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitroaniline[3-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitroaniline[4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrobenzene	1.03E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
5	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
5	Nitrophenol[2-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrophenol[4-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrosodimethylamine[N-]	1.03E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
5	Nitroso-di-n-propylamine[N-]	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
5	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
5	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
5	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.78E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.00E-06	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Oxybis(1-chloropropane)[2,2'-]	1.03E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofuran[1,2,3,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofuran[2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pentachlorophenol	1.03E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
5	Perchlorate	5.09E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Phenanthrene	1.03E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
5	Phenol	1.03E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
5	Potassium	1.47E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
5	Propylbenzene[1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Pyrene	1.03E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
5	Pyridine	1.03E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
5	Selenium	6.61E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
5	Silver	1.20E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
5	Sodium	5.54E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
5	Styrene	3.39E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
5	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachlorodibenzodioxin[2,3,7,8-]	1.52E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
5	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachlorodibenzofuran[2,3,7,8-]	2.12E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Tetrachloroethane[1,1,1,2-]	3.39E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
5	Tetrachloroethane[1,1,2,2-]	3.39E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
5	Tetrachloroethene	3.39E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
5	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
5	Thallium	1.90E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
5	Toluene	3.97E-04	mg/kg	Y	J	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
5	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.70E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
5	Trichlorobenzene[1,2,4-]	1.03E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
5	Trichloroethane[1,1,1-]	3.39E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
5	Trichloroethane[1,1,2-]	3.39E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
5	Trichloroethene	3.39E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
5	Trichlorofluoromethane	3.39E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
5	Trichlorophenol[2,4,5-]	1.03E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
5	Trichlorophenol[2,4,6-]	1.03E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
5	Trichloropropane[1,2,3-]	3.39E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
5	Trimethylbenzene[1,2,4-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trimethylbenzene[1,3,5-]	3.39E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
5	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
5	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
5	Vanadium	2.16E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
5	Vinyl Chloride	3.39E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
5	Xylene[1,2-]	3.39E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
5	Xylene[1,3-]+Xylene[1,4-]	6.79E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
5	Zinc	1.98E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
6	2,4-Diamino-6-nitrotoluene	5.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	2,6-Diamino-4-nitrotoluene	6.60E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	3,5-Dinitroaniline	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Acenaphthene	1.06E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
6	Acenaphthylene	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Acetone	1.74E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
6	Aluminum	1.29E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
6	Amino-2,6-dinitrotoluene[4-]	6.55E-01	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Amino-4,6-dinitrotoluene[2-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Aniline	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Anthracene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
6	Antimony	3.51E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
6	Arsenic	3.16E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
6	Azobenzene	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Barium	1.01E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
6	Benzene	3.47E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
6	Benzo(a)anthracene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(a)pyrene	1.06E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
6	Benzo(b)fluoranthene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(g,h,i)perylene	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Benzo(k)fluoranthene	1.06E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
6	Benzoic Acid	1.77E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Benzyl Alcohol	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Beryllium	1.09E+00	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
6	Bis(2-chloroethoxy)methane	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bis(2-chloroethyl)ether	1.06E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Bis(2-ethylhexyl)phthalate	1.06E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Bromobenzene	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bromochloromethane	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Bromodichloromethane	3.47E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
6	Bromoform	3.47E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Bromomethane	3.47E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
6	Bromophenyl-phenylether[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butanone[2-]	1.74E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Butylbenzene[n-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzene[sec-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzene[tert-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Butylbenzylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Cadmium	1.06E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
6	Calcium	2.86E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
6	Carbon Disulfide	1.74E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
6	Carbon Tetrachloride	3.47E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
6	Chloro-3-methylphenol[4-]	1.42E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chloroaniline[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chlorobenzene	3.47E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
6	Chlorodibromomethane	3.47E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Chloroethane	3.47E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
6	Chloroform	3.47E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
6	Chloromethane	3.47E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
6	Chloronaphthalene[2-]	1.06E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
6	Chlorophenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
6	Chlorophenyl-phenyl[4-] Ether	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chlorotoluene[2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
6	Chlorotoluene[4-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Chromium	1.07E+01	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
6	Chrysene	1.06E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
6	Cobalt	6.41E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
6	Copper	1.03E+01	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
6	Dibenz(a,h)anthracene	1.06E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
6	Dibenzofuran	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dibromo-3-Chloropropane[1,2-]	5.22E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
6	Dibromoethane[1,2-]	3.47E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
6	Dibromomethane	3.47E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
6	Dichlorobenzene[1,2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
6	Dichlorobenzene[1,2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
6	Dichlorobenzene[1,3-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorobenzene[1,3-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorobenzene[1,4-]	3.47E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
6	Dichlorobenzene[1,4-]	1.06E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
6	Dichlorobenzidine[3,3'-]	1.06E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
6	Dichlorodifluoromethane	3.47E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
6	Dichloroethane[1,1-]	3.47E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
6	Dichloroethane[1,2-]	3.47E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Dichloroethene[1,1-]	3.47E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
6	Dichloroethene[cis-1,2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
6	Dichloroethene[trans-1,2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
6	Dichlorophenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
6	Dichloropropane[1,2-]	3.47E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
6	Dichloropropane[1,3-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropane[2,2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropene[1,1-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropene[cis-1,3-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dichloropropene[trans-1,3-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Diethylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
6	Dimethyl Phthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
6	Dimethylphenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Di-n-butylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
6	Dinitro-2-methylphenol[4,6-]	1.06E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
6	Dinitrobenzene[1,3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dinitrophenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.06E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.06E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,4-]	1.50E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
6	Dinitrotoluene[2,6-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Dinitrotoluene[2,6-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Di-n-octylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Diphenylamine	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Ethylbenzene	3.47E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
6	Fluoranthene	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
6	Fluorene	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
6	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	2.05E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Heptachlorodibenzodioxins (Total)	7.23E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorobenzene	1.06E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
6	Hexachlorobutadiene	1.06E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
6	Hexachlorocyclopentadiene	1.06E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Hexachloroethane	1.06E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
6	Hexanone[2-]	1.74E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	HMX	3.00E-01	mg/kg	Y	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
6	Indeno(1,2,3-cd)pyrene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
6	Iodomethane	1.74E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Iron	1.50E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
6	Isophorone	1.06E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
6	Isopropylbenzene	3.47E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
6	Isopropyltoluene[4-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Lead	1.28E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
6	Magnesium	2.62E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
6	Manganese	2.95E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
6	Mercury	3.15E-02	mg/kg	Y	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
6	Methyl-2-pentanone[4-]	1.74E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
6	Methylene Chloride	1.74E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
6	Methylnaphthalene[2-]	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
6	Methylphenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Methylphenol[3-,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Naphthalene	1.06E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
6	Nickel	1.36E+01	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
6	Nitroaniline[2-]	1.17E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitroaniline[3-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitroaniline[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrobenzene	1.06E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
6	Nitrobenzene	1.50E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
6	Nitrophenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrophenol[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrosodimethylamine[N-]	1.06E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
6	Nitroso-di-n-propylamine[N-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Nitrotoluene[2-]	1.50E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
6	Nitrotoluene[3-]	1.50E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
6	Nitrotoluene[4-]	1.50E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
6	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	6.77E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.97E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Oxybis(1-chloropropane)[2,2'-]	1.06E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pentachlorophenol	1.06E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
6	Perchlorate	5.24E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
6	PETN	2.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Phenanthrene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
6	Phenol	1.06E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
6	Potassium	2.38E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
6	Propylbenzene[1-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Pyrene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
6	Pyridine	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	RDX	1.50E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
6	Selenium	1.09E+00	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
6	Silver	7.50E-01	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
6	Sodium	1.23E+02	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
6	Styrene	3.47E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
6	TATB	1.97E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachlorodibenzodioxin[2,3,7,8-]	9.97E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
6	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachlorodibenzofuran[2,3,7,8-]	2.77E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachlorodibenzofurans (Totals)	1.56E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Tetrachloroethane[1,1,1,2-]	3.47E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
6	Tetrachloroethane[1,1,2,2-]	3.47E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
6	Tetrachloroethene	3.47E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
6	Tetryl	1.50E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
6	Thallium	4.06E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
6	Toluene	3.47E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
6	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.74E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
6	Trichlorobenzene[1,2,4-]	1.06E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
6	Trichloroethane[1,1,1-]	3.47E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
6	Trichloroethane[1,1,2-]	3.47E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
6	Trichloroethene	3.47E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
6	Trichlorofluoromethane	3.47E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
6	Trichlorophenol[2,4,5-]	1.06E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
6	Trichlorophenol[2,4,6-]	1.06E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
6	Trichloropropane[1,2,3-]	3.47E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
6	Trimethylbenzene[1,2,4-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trimethylbenzene[1,3,5-]	3.47E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trinitrobenzene[1,3,5-]	1.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Trinitrotoluene[2,4,6-]	2.52E+00	mg/kg	Y	NQ	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
6	Tris (o-cresyl) phosphate	3.00E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
6	Vanadium	2.44E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
6	Vinyl Chloride	3.47E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
6	Xylene[1,2-]	3.47E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
6	Xylene[1,3-]+Xylene[1,4-]	6.96E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
6	Zinc	4.04E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
7	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Acenaphthene	1.06E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
7	Acenaphthylene	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Acetone	1.76E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
7	Aluminum	1.26E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
7	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Aniline	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Anthracene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
7	Antimony	3.25E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
7	Arsenic	5.25E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
7	Azobenzene	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Barium	2.35E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
7	Benzene	3.51E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
7	Benzo(a)anthracene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(a)pyrene	1.06E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
7	Benzo(b)fluoranthene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(g,h,i)perylene	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Benzo(k)fluoranthene	1.06E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Benzoic Acid	1.77E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Benzyl Alcohol	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Beryllium	1.17E+00	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
7	Bis(2-chloroethoxy)methane	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bis(2-chloroethyl)ether	1.06E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Bis(2-ethylhexyl)phthalate	1.06E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Bromobenzene	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bromochloromethane	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Bromodichloromethane	3.51E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
7	Bromoform	3.51E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Bromomethane	3.51E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
7	Bromophenyl-phenylether[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butanone[2-]	1.76E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
7	Butylbenzene[n-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzene[sec-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzene[tert-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Butylbenzylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Cadmium	9.84E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
7	Calcium	3.29E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
7	Carbon Disulfide	1.76E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
7	Carbon Tetrachloride	3.51E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
7	Chloro-3-methylphenol[4-]	1.42E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chloroaniline[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chlorobenzene	3.51E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
7	Chlorodibromomethane	3.51E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Chloroethane	3.51E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
7	Chloroform	3.51E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
7	Chloromethane	3.51E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
7	Chloronaphthalene[2-]	1.06E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
7	Chlorophenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
7	Chlorophenyl-phenyl[4-] Ether	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chlorotoluene[2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
7	Chlorotoluene[4-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Chromium	1.02E+01	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
7	Chrysene	1.06E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
7	Cobalt	5.68E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
7	Copper	8.63E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
7	Dibenz(a,h)anthracene	1.06E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
7	Dibenzofuran	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dibromo-3-Chloropropane[1,2-]	5.27E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
7	Dibromoethane[1,2-]	3.51E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
7	Dibromomethane	3.51E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
7	Dichlorobenzene[1,2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
7	Dichlorobenzene[1,2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
7	Dichlorobenzene[1,3-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Dichlorobenzene[1,3-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorobenzene[1,4-]	3.51E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
7	Dichlorobenzene[1,4-]	1.06E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
7	Dichlorobenzidine[3,3'-]	1.06E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Dichlorodifluoromethane	3.51E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
7	Dichloroethane[1,1-]	3.51E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
7	Dichloroethane[1,2-]	3.51E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
7	Dichloroethene[1,1-]	3.51E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
7	Dichloroethene[cis-1,2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
7	Dichloroethene[trans-1,2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
7	Dichlorophenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
7	Dichloropropane[1,2-]	3.51E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
7	Dichloropropane[1,3-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropane[2,2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[1,1-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[cis-1,3-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dichloropropene[trans-1,3-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Diethylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
7	Dimethyl Phthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
7	Dimethylphenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Di-n-butylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
7	Dinitro-2-methylphenol[4,6-]	1.06E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
7	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dinitrophenol[2,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,4-]	1.06E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
7	Dinitrotoluene[2,6-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Di-n-octylphthalate	1.06E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Diphenylamine	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Ethylbenzene	3.51E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
7	Fluoranthene	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
7	Fluorene	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
7	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	7.45E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Heptachlorodibenzodioxins (Total)	1.98E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorobenzene	1.06E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Hexachlorobutadiene	1.06E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
7	Hexachlorocyclopentadiene	1.06E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Hexachloroethane	1.06E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
7	Hexanone[2-]	1.76E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	HMX	7.72E-01	mg/kg	Y	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
7	Indeno(1,2,3-cd)pyrene	1.06E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
7	Iodomethane	1.76E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Iron	1.75E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
7	Isophorone	1.06E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
7	Isopropylbenzene	3.51E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
7	Isopropyltoluene[4-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Lead	1.12E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
7	Magnesium	2.93E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
7	Manganese	3.10E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
7	Mercury	1.18E-02	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
7	Methyl-2-pentanone[4-]	1.76E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
7	Methylene Chloride	1.76E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
7	Methylnaphthalene[2-]	1.06E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
7	Methylphenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Methylphenol[3-,4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Naphthalene	1.06E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
7	Nickel	1.11E+01	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
7	Nitroaniline[2-]	1.17E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitroaniline[3-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitroaniline[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrobenzene	1.06E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
7	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
7	Nitrophenol[2-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrophenol[4-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrosodimethylamine[N-]	1.06E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Nitroso-di-n-propylamine[N-]	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
7	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
7	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
7	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	4.29E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.00E-06	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Oxybis(1-chloropropane)[2,2'-]	1.06E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofuran[1,2,3,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofuran[2,3,4,7,8-]	5.00E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pentachlorophenol	1.06E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
7	Perchlorate	5.24E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
7	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Phenanthrene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
7	Phenol	1.06E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
7	Potassium	2.66E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
7	Propylbenzene[1-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Pyrene	1.06E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
7	Pyridine	1.06E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
7	Selenium	1.03E+00	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
7	Silver	2.64E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
7	Sodium	1.87E+02	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
7	Styrene	3.51E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
7	TATB	2.33E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
7	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzofuran[2,3,7,8-]	1.33E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Tetrachloroethane[1,1,1,2-]	3.51E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
7	Tetrachloroethane[1,1,2,2-]	3.51E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
7	Tetrachloroethene	3.51E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
7	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
7	Thallium	4.03E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
7	Toluene	3.51E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
7	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.76E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
7	Trichlorobenzene[1,2,4-]	1.06E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
7	Trichloroethane[1,1,1-]	3.51E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
7	Trichloroethane[1,1,2-]	3.51E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
7	Trichloroethene	3.51E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
7	Trichlorofluoromethane	3.51E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
7	Trichlorophenol[2,4,5-]	1.06E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
7	Trichlorophenol[2,4,6-]	1.06E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
7	Trichloropropane[1,2,3-]	3.51E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
7	Trimethylbenzene[1,2,4-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trimethylbenzene[1,3,5-]	3.51E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
7	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
7	Vanadium	2.60E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
7	Vinyl Chloride	3.51E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
7	Xylene[1,2-]	3.51E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
7	Xylene[1,3-]+Xylene[1,4-]	7.04E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
7	Zinc	3.34E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
8	2,4-Diamino-6-nitrotoluene	4.98E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	2,6-Diamino-4-nitrotoluene	6.57E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	3,5-Dinitroaniline	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Acenaphthene	1.05E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
8	Acenaphthylene	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Acetone	1.73E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
8	Aluminum	1.19E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
8	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Aniline	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Anthracene	2.26E-02	mg/kg	Y	J	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
8	Antimony	3.41E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
8	Arsenic	2.56E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
8	Azobenzene	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Barium	1.04E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
8	Benzene	3.45E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
8	Benzo(a)anthracene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Benzo(a)pyrene	1.05E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
8	Benzo(b)fluoranthene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Benzo(g,h,i)perylene	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Benzo(k)fluoranthene	1.05E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Benzoic Acid	1.74E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Benzyl Alcohol	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Beryllium	8.31E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
8	Bis(2-chloroethoxy)methane	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bis(2-chloroethyl)ether	1.05E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Bis(2-ethylhexyl)phthalate	1.05E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Bromobenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bromochloromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Bromodichloromethane	3.45E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
8	Bromoform	3.45E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Bromomethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
8	Bromophenyl-phenylether[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
8	Butylbenzene[n-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzene[sec-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzene[tert-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Butylbenzylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Cadmium	1.03E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
8	Calcium	2.65E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
8	Carbon Disulfide	1.73E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
8	Carbon Tetrachloride	3.45E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
8	Chloro-3-methylphenol[4-]	1.39E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chloroaniline[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chlorobenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
8	Chlorodibromomethane	3.45E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Chloroethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
8	Chloroform	3.45E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
8	Chloromethane	3.45E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
8	Chloronaphthalene[2-]	1.05E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
8	Chlorophenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
8	Chlorophenyl-phenyl[4-] Ether	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chlorotoluene[2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
8	Chlorotoluene[4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Chromium	1.20E+01	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
8	Chrysene	1.05E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
8	Cobalt	7.25E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
8	Copper	1.12E+01	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
8	Dibenz(a,h)anthracene	1.05E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Dibenzofuran	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dibromo-3-Chloropropane[1,2-]	5.17E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
8	Dibromoethane[1,2-]	3.45E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
8	Dibromomethane	3.45E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
8	Dichlorobenzene[1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
8	Dichlorobenzene[1,2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
8	Dichlorobenzene[1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorobenzene[1,3-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorobenzene[1,4-]	3.45E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
8	Dichlorobenzene[1,4-]	1.05E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
8	Dichlorobenzidine[3,3'-]	1.05E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Dichlorodifluoromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
8	Dichloroethane[1,1-]	3.45E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
8	Dichloroethane[1,2-]	3.45E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
8	Dichloroethene[1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
8	Dichloroethene[cis-1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
8	Dichloroethene[trans-1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
8	Dichlorophenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
8	Dichloropropane[1,2-]	3.45E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
8	Dichloropropane[1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropane[2,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[cis-1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dichloropropene[trans-1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Diethylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
8	Dimethyl Phthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
8	Dimethylphenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Di-n-butylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
8	Dinitro-2-methylphenol[4,6-]	1.05E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
8	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dinitrophenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,4-]	1.05E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
8	Dinitrotoluene[2,6-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Di-n-octylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Diphenylamine	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Ethylbenzene	3.45E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
8	Fluoranthene	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Fluorene	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
8	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.90E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzodioxins (Total)	1.53E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	7.08E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Heptachlorodibenzofurans (Total)	7.90E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorobenzene	1.05E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
8	Hexachlorobutadiene	1.05E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
8	Hexachlorocyclopentadiene	1.05E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzodioxins (Total)	3.74E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachlorodibenzofurans (Total)	5.03E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Hexachloroethane	1.05E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
8	Hexanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	HMX	1.84E+00	mg/kg	Y	NQ	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
8	Indeno(1,2,3-cd)pyrene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
8	Iodomethane	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Iron	1.48E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
8	Isophorone	1.05E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
8	Isopropylbenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
8	Isopropyltoluene[4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Lead	1.18E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
8	Magnesium	2.75E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
8	Manganese	2.43E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
8	Mercury	1.50E-02	mg/kg	Y	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
8	Methyl-2-pentanone[4-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
8	Methylene Chloride	1.73E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
8	Methylnaphthalene[2-]	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
8	Methylphenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Methylphenol[3-,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Naphthalene	1.05E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
8	Nickel	1.29E+01	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
8	Nitroaniline[2-]	1.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Nitroaniline[3-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitroaniline[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrobenzene	1.05E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
8	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
8	Nitrophenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrophenol[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrosodimethylamine[N-]	1.05E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
8	Nitroso-di-n-propylamine[N-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
8	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
8	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
8	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.43E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.07E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Oxybis(1-chloropropane)[2,2'-]	1.05E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pentachlorophenol	1.05E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
8	Perchlorate	5.15E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
8	PETN	2.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Phenanthrene	1.05E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
8	Phenol	1.05E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
8	Potassium	2.57E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
8	Propylbenzene[1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Pyrene	1.05E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
8	Pyridine	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
8	Selenium	6.60E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
8	Silver	5.95E-01	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
8	Sodium	7.91E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
8	Styrene	3.45E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
8	TATB	5.79E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetrachlorodibenzodioxin[2,3,7,8-]	9.98E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
8	Tetrachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetrachlorodibenzofuran[2,3,7,8-]	1.62E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
8	Tetrachlorodibenzofurans (Totals)	1.74E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Tetrachloroethane[1,1,1,2-]	3.45E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
8	Tetrachloroethane[1,1,2,2-]	3.45E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
8	Tetrachloroethene	3.45E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
8	Tetryl	1.49E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
8	Thallium	2.46E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
8	Toluene	3.45E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
8	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
8	Trichlorobenzene[1,2,4-]	1.05E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
8	Trichloroethane[1,1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
8	Trichloroethane[1,1,2-]	3.45E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
8	Trichloroethene	3.45E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
8	Trichlorofluoromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
8	Trichlorophenol[2,4,5-]	1.05E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
8	Trichlorophenol[2,4,6-]	1.05E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
8	Trichloropropane[1,2,3-]	3.45E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
8	Trimethylbenzene[1,2,4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trimethylbenzene[1,3,5-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Trinitrotoluene[2,4,6-]	3.80E-01	mg/kg	Y	J	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
8	Tris (o-cresyl) phosphate	2.99E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
8	Vanadium	2.70E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
8	Vinyl Chloride	3.45E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
8	Xylene[1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
8	Xylene[1,3-]+Xylene[1,4-]	6.90E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
8	Zinc	4.22E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
9	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Acenaphthene	1.04E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
9	Acenaphthylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Acetone	1.72E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
9	Aluminum	7.62E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
9	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Aniline	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Anthracene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
9	Antimony	6.61E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+01	FALSE	8.30E-01	TRUE
9	Arsenic	2.25E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Azobenzene	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Barium	4.06E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
9	Benzene	3.43E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
9	Benzo(a)anthracene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(a)pyrene	1.04E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
9	Benzo(b)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(g,h,i)perylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Benzo(k)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Benzoic Acid	1.74E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Benzyl Alcohol	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Beryllium	6.34E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
9	Bis(2-chloroethoxy)methane	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bis(2-chloroethyl)ether	1.04E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Bis(2-ethylhexyl)phthalate	1.04E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Bromobenzene	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bromochloromethane	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Bromodichloromethane	3.43E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
9	Bromoform	3.43E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Bromomethane	3.43E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
9	Bromophenyl-phenylether[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butanone[2-]	1.72E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
9	Butylbenzene[n-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzene[sec-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzene[tert-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Butylbenzylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Cadmium	1.15E-01	mg/kg	Y	J	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
9	Calcium	1.87E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
9	Carbon Disulfide	1.72E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
9	Carbon Tetrachloride	3.43E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
9	Chloro-3-methylphenol[4-]	1.39E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chloroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chlorobenzene	3.43E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
9	Chlorodibromomethane	3.43E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Chloroethane	3.43E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
9	Chloroform	3.43E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
9	Chloromethane	3.43E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
9	Chloronaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
9	Chlorophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
9	Chlorophenyl-phenyl[4-] Ether	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Chlorotoluene[2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
9	Chlorotoluene[4-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Chromium	1.23E+01	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
9	Chrysene	1.04E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
9	Cobalt	6.60E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
9	Copper	2.44E+01	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	TRUE
9	Dibenz(a,h)anthracene	1.04E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
9	Dibenzofuran	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dibromo-3-Chloropropane[1,2-]	5.15E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
9	Dibromoethane[1,2-]	3.43E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
9	Dibromomethane	3.43E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
9	Dichlorobenzene[1,2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
9	Dichlorobenzene[1,2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
9	Dichlorobenzene[1,3-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorobenzene[1,3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorobenzene[1,4-]	3.43E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
9	Dichlorobenzene[1,4-]	1.04E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
9	Dichlorobenzidine[3,3'-]	1.04E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Dichlorodifluoromethane	3.43E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
9	Dichloroethane[1,1-]	3.43E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
9	Dichloroethane[1,2-]	3.43E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
9	Dichloroethene[1,1-]	3.43E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
9	Dichloroethene[cis-1,2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
9	Dichloroethene[trans-1,2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
9	Dichlorophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
9	Dichloropropane[1,2-]	3.43E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
9	Dichloropropane[1,3-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropane[2,2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[1,1-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[cis-1,3-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dichloropropene[trans-1,3-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Diethylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
9	Dimethyl Phthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
9	Dimethylphenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Di-n-butylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
9	Dinitro-2-methylphenol[4,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
9	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dinitrophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
9	Dinitrotoluene[2,4-]	1.04E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
9	Dinitrotoluene[2,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Di-n-octylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Diphenylamine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Ethylbenzene	3.43E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
9	Fluoranthene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
9	Fluorene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
9	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	9.34E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzodioxins (Total)	3.04E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.05E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	9.02E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Heptachlorodibenzofurans (Total)	7.85E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorobenzene	1.04E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
9	Hexachlorobutadiene	1.04E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
9	Hexachlorocyclopentadiene	1.04E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	7.32E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	6.71E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzodioxins (Total)	9.83E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.97E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,6,7,8-]	7.09E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofuran[2,3,4,6,7,8-]	6.27E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachlorodibenzofurans (Total)	4.79E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Hexachloroethane	1.04E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
9	Hexanone[2-]	1.72E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	HMX	4.50E-01	mg/kg	Y	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
9	Indeno(1,2,3-cd)pyrene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
9	Iodomethane	1.72E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Iron	1.15E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
9	Isophorone	1.04E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
9	Isopropylbenzene	3.43E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
9	Isopropyltoluene[4-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Lead	2.67E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	TRUE
9	Magnesium	1.49E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
9	Manganese	2.57E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
9	Mercury	2.54E-02	mg/kg	Y	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
9	Methyl-2-pentanone[4-]	1.72E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Methylene Chloride	1.72E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
9	Methylnaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
9	Methylphenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Methylphenol[3-,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Naphthalene	1.04E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
9	Nickel	5.53E+01	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	TRUE
9	Nitroaniline[2-]	1.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitroaniline[3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrobenzene	1.04E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
9	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
9	Nitrophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrophenol[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrosodimethylamine[N-]	1.04E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
9	Nitroso-di-n-propylamine[N-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
9	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
9	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
9	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3.78E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	8.99E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Oxybis(1-chloropropane)[2,2'-]	1.04E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzodioxins (Total)	8.14E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorodibenzofurans (Totals)	1.84E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pentachlorophenol	1.04E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
9	Perchlorate	5.20E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
9	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Phenanthrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
9	Phenol	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
9	Potassium	1.46E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
9	Propylbenzene[1-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Pyrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
9	Pyridine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	RDX	2.01E-01	mg/kg	Y	J	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
9	Selenium	6.46E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
9	Silver	8.57E+01	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.00E+00	TRUE
9	Sodium	1.06E+02	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
9	Styrene	3.43E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
9	TATB	5.22E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachlorodibenzodioxin[2,3,7,8-]	1.38E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
9	Tetrachlorodibenzodioxins (Total)	1.70E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachlorodibenzofuran[2,3,7,8-]	4.07E-07	mg/kg	Y	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachlorodibenzofurans (Totals)	3.96E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Tetrachloroethane[1,1,1,2-]	3.43E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
9	Tetrachloroethane[1,1,2,2-]	3.43E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
9	Tetrachloroethene	3.43E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
9	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
9	Thallium	1.88E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
9	Toluene	3.43E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
9	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.72E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
9	Trichlorobenzene[1,2,4-]	1.04E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
9	Trichloroethane[1,1,1-]	3.43E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
9	Trichloroethane[1,1,2-]	3.43E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
9	Trichloroethene	3.43E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
9	Trichlorofluoromethane	3.43E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
9	Trichlorophenol[2,4,5-]	1.04E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
9	Trichlorophenol[2,4,6-]	1.04E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
9	Trichloropropane[1,2,3-]	3.43E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
9	Trimethylbenzene[1,2,4-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trimethylbenzene[1,3,5-]	3.43E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
9	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
9	Vanadium	2.16E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
9	Vinyl Chloride	3.43E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
9	Xylene[1,2-]	3.43E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
9	Xylene[1,3-]+Xylene[1,4-]	6.88E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
9	Zinc	3.34E+02	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	TRUE
10	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Acenaphthene	1.29E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
10	Acenaphthylene	1.29E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Acetone	2.11E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Aluminum	1.00E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
10	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Aniline	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Anthracene	1.29E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
10	Antimony	4.25E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
10	Arsenic	1.80E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
10	Azobenzene	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Barium	1.55E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
10	Benzene	4.21E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
10	Benzo(a)anthracene	1.29E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(a)pyrene	1.29E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
10	Benzo(b)fluoranthene	1.29E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(g,h,i)perylene	1.29E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Benzo(k)fluoranthene	1.29E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Benzoic Acid	2.15E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Benzyl Alcohol	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Beryllium	7.19E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
10	Bis(2-chloroethoxy)methane	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bis(2-chloroethyl)ether	1.29E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Bis(2-ethylhexyl)phthalate	1.29E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Bromobenzene	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bromochloromethane	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Bromodichloromethane	4.21E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
10	Bromoform	4.21E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Bromomethane	4.21E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
10	Bromophenyl-phenylether[4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butanone[2-]	2.11E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
10	Butylbenzene[n-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butylbenzene[sec-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butylbenzene[tert-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Butylbenzylphthalate	1.29E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Cadmium	1.29E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
10	Calcium	2.27E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
10	Carbon Disulfide	2.11E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
10	Carbon Tetrachloride	4.21E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
10	Chloro-3-methylphenol[4-]	1.72E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chloroaniline[4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chlorobenzene	4.21E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Chlorodibromomethane	4.21E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Chloroethane	4.21E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
10	Chloroform	4.21E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
10	Chloromethane	4.21E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
10	Chloronaphthalene[2-]	1.29E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
10	Chlorophenol[2-]	1.29E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
10	Chlorophenyl-phenyl[4-] Ether	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chlorotoluene[2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
10	Chlorotoluene[4-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Chromium	8.67E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
10	Chrysene	1.29E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
10	Cobalt	5.43E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
10	Copper	1.14E+01	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
10	Dibenz(a,h)anthracene	1.29E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
10	Dibenzofuran	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dibromo-3-Chloropropane[1,2-]	6.32E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
10	Dibromoethane[1,2-]	4.21E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
10	Dibromomethane	4.21E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
10	Dichlorobenzene[1,2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
10	Dichlorobenzene[1,2-]	1.29E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
10	Dichlorobenzene[1,3-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorobenzene[1,3-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorobenzene[1,4-]	4.21E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
10	Dichlorobenzene[1,4-]	1.29E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
10	Dichlorobenzidine[3,3'-]	1.29E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Dichlorodifluoromethane	4.21E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
10	Dichloroethane[1,1-]	4.21E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
10	Dichloroethane[1,2-]	4.21E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
10	Dichloroethene[1,1-]	4.21E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
10	Dichloroethene[cis-1,2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
10	Dichloroethene[trans-1,2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
10	Dichlorophenol[2,4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
10	Dichloropropane[1,2-]	4.21E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
10	Dichloropropane[1,3-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropane[2,2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[1,1-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[cis-1,3-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dichloropropene[trans-1,3-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Diethylphthalate	1.29E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Dimethyl Phthalate	1.29E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
10	Dimethylphenol[2,4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Di-n-butylphthalate	1.29E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
10	Dinitro-2-methylphenol[4,6-]	1.29E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
10	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dinitrophenol[2,4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,4-]	1.29E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
10	Dinitrotoluene[2,6-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Di-n-octylphthalate	1.29E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Diphenylamine	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Ethylbenzene	4.21E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
10	Fluoranthene	1.29E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
10	Fluorene	1.29E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
10	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	3.24E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzodioxins (Total)	8.67E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.95E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Heptachlorodibenzofurans (Total)	3.35E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorobenzene	1.29E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
10	Hexachlorobutadiene	1.29E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
10	Hexachlorocyclopentadiene	1.29E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzodioxins (Total)	1.84E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Hexachloroethane	1.29E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
10	Hexanone[2-]	2.11E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	HMX	1.66E-01	mg/kg	Y	J	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
10	Indeno(1,2,3-cd)pyrene	1.29E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
10	Iodomethane	2.11E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Iron	1.15E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
10	Isophorone	1.29E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Isopropylbenzene	4.21E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
10	Isopropyltoluene[4-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Lead	1.29E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
10	Magnesium	1.81E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
10	Manganese	2.52E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
10	Mercury	1.57E-02	mg/kg	Y	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
10	Methyl-2-pentanone[4-]	2.11E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
10	Methylene Chloride	2.11E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
10	Methylnaphthalene[2-]	1.29E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
10	Methylphenol[2-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Methylphenol[3-,4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Naphthalene	1.29E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
10	Nickel	6.48E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
10	Nitroaniline[2-]	1.42E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitroaniline[3-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitroaniline[4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrobenzene	1.29E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
10	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
10	Nitrophenol[2-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrophenol[4-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrosodimethylamine[N-]	1.29E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
10	Nitroso-di-n-propylamine[N-]	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
10	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
10	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
10	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.36E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3.81E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Oxybis(1-chloropropane)[2,2'-]	1.29E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorodibenzofurans (Totals)	1.38E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pentachlorophenol	1.29E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
10	Perchlorate	6.37E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
10	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Phenanthrene	1.29E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
10	Phenol	1.29E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
10	Potassium	1.85E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Propylbenzene[1-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Pyrene	1.29E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
10	Pyridine	1.29E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
10	Selenium	5.74E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
10	Silver	6.90E+00	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.00E+00	TRUE
10	Sodium	1.64E+02	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
10	Styrene	4.21E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
10	TATB	7.22E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
10	Tetrachlorodibenzodioxins (Total)	2.47E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachlorodibenzofuran[2,3,7,8-]	2.13E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachlorodibenzofurans (Totals)	1.17E-06	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Tetrachloroethane[1,1,1,2-]	4.21E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
10	Tetrachloroethane[1,1,2,2-]	4.21E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
10	Tetrachloroethene	4.21E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
10	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
10	Thallium	1.78E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
10	Toluene	4.21E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
10	Trichloro-1,2,2-trifluoroethane[1,1,2-]	2.11E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
10	Trichlorobenzene[1,2,4-]	1.29E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
10	Trichloroethane[1,1,1-]	4.21E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
10	Trichloroethane[1,1,2-]	4.21E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
10	Trichloroethene	4.21E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
10	Trichlorofluoromethane	4.21E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
10	Trichlorophenol[2,4,5-]	1.29E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
10	Trichlorophenol[2,4,6-]	1.29E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
10	Trichloropropane[1,2,3-]	4.21E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
10	Trimethylbenzene[1,2,4-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trimethylbenzene[1,3,5-]	4.21E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
10	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
10	Vanadium	2.25E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
10	Vinyl Chloride	4.21E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
10	Xylene[1,2-]	4.21E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
10	Xylene[1,3-]+Xylene[1,4-]	8.44E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
10	Zinc	7.33E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	TRUE
11	2,4-Diamino-6-nitrotoluene	4.93E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	2,6-Diamino-4-nitrotoluene	6.50E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	3,5-Dinitroaniline	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Acenaphthene	1.04E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
11	Acenaphthylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Acetone	1.73E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
11	Aluminum	6.52E+03	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
11	Amino-2,6-dinitrotoluene[4-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Amino-4,6-dinitrotoluene[2-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Aniline	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Anthracene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
11	Antimony	3.20E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
11	Arsenic	4.46E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
11	Azobenzene	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Barium	1.43E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	FALSE
11	Benzene	3.46E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
11	Benzo(a)anthracene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(a)pyrene	1.04E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
11	Benzo(b)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(g,h,i)perylene	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Benzo(k)fluoranthene	1.04E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Benzoic Acid	1.73E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Benzyl Alcohol	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Beryllium	6.64E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
11	Bis(2-chloroethoxy)methane	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bis(2-chloroethyl)ether	1.04E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Bis(2-ethylhexyl)phthalate	1.04E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Bromobenzene	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bromochloromethane	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Bromodichloromethane	3.46E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
11	Bromoform	3.46E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Bromomethane	3.46E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
11	Bromophenyl-phenylether[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
11	Butylbenzene[n-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butylbenzene[sec-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butylbenzene[tert-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Butylbenzylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Cadmium	9.69E-02	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
11	Calcium	1.93E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
11	Carbon Disulfide	1.73E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
11	Carbon Tetrachloride	3.46E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
11	Chloro-3-methylphenol[4-]	1.38E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chloroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chlorobenzene	3.46E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
11	Chlorodibromomethane	3.46E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Chloroethane	3.46E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
11	Chloroform	3.46E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
11	Chloromethane	3.46E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
11	Chloronaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
11	Chlorophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
11	Chlorophenyl-phenyl[4-] Ether	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chlorotoluene[2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
11	Chlorotoluene[4-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Chromium	6.81E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
11	Chrysene	1.04E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
11	Cobalt	1.31E+01	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	TRUE
11	Copper	5.51E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
11	Dibenz(a,h)anthracene	1.04E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
11	Dibenzofuran	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dibromo-3-Chloropropane[1,2-]	5.20E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
11	Dibromoethane[1,2-]	3.46E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
11	Dibromomethane	3.46E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
11	Dichlorobenzene[1,2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
11	Dichlorobenzene[1,2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
11	Dichlorobenzene[1,3-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorobenzene[1,3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorobenzene[1,4-]	3.46E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
11	Dichlorobenzene[1,4-]	1.04E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
11	Dichlorobenzidine[3,3'-]	1.04E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Dichlorodifluoromethane	3.46E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
11	Dichloroethane[1,1-]	3.46E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
11	Dichloroethane[1,2-]	3.46E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
11	Dichloroethene[1,1-]	3.46E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
11	Dichloroethene[cis-1,2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
11	Dichloroethene[trans-1,2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
11	Dichlorophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Dichloropropane[1,2-]	3.46E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
11	Dichloropropane[1,3-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropane[2,2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[1,1-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[cis-1,3-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dichloropropene[trans-1,3-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Diethylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
11	Dimethyl Phthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
11	Dimethylphenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Di-n-butylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
11	Dinitro-2-methylphenol[4,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
11	Dinitrobenzene[1,3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dinitrophenol[2,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,4-]	1.04E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,4-]	1.48E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
11	Dinitrotoluene[2,6-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Dinitrotoluene[2,6-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Di-n-octylphthalate	1.04E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Diphenylamine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Ethylbenzene	3.46E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
11	Fluoranthene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
11	Fluorene	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
11	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	5.15E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Heptachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Heptachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorobenzene	1.04E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
11	Hexachlorobutadiene	1.04E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
11	Hexachlorocyclopentadiene	1.04E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Hexachloroethane	1.04E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
11	Hexanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	HMX	1.48E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
11	Indeno(1,2,3-cd)pyrene	1.04E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
11	Iodomethane	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Iron	9.12E+03	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
11	Isophorone	1.04E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
11	Isopropylbenzene	3.46E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
11	Isopropyltoluene[4-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Lead	1.05E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
11	Magnesium	1.48E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
11	Manganese	2.48E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
11	Mercury	9.77E-03	mg/kg	Y	J	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
11	Methyl-2-pentanone[4-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
11	Methylene Chloride	1.73E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
11	Methylnaphthalene[2-]	1.04E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
11	Methylphenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Methylphenol[3-,4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Naphthalene	1.04E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
11	Nickel	7.10E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
11	Nitroaniline[2-]	1.14E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitroaniline[3-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitroaniline[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrobenzene	1.04E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
11	Nitrobenzene	1.48E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
11	Nitrophenol[2-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrophenol[4-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrosodimethylamine[N-]	1.04E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
11	Nitroso-di-n-propylamine[N-]	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Nitrotoluene[2-]	1.48E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
11	Nitrotoluene[3-]	1.48E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
11	Nitrotoluene[4-]	1.48E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE
11	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3.11E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	9.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Oxybis(1-chloropropane)[2,2'-]	1.04E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzodioxin[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzofuran[1,2,3,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorodibenzofuran[2,3,4,7,8-]	4.99E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pentachlorophenol	1.04E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
11	Perchlorate	5.17E-04	mg/kg	N	U	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
11	PETN	2.46E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Phenanthrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
11	Phenol	1.04E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
11	Potassium	1.52E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
11	Propylbenzene[1-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Pyrene	1.04E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
11	Pyridine	1.04E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	RDX	1.48E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
11	Selenium	7.42E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
11	Silver	1.29E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
11	Sodium	5.40E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
11	Styrene	3.46E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
11	TATB	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Temperature	4.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachlorodibenzodioxin[2,3,7,8-]	9.99E-08	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
11	Tetrachlorodibenzodioxins (Total)	1.42E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachlorodibenzofuran[2,3,7,8-]	1.34E-07	mg/kg	N	U	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Tetrachloroethane[1,1,1,2-]	3.46E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
11	Tetrachloroethane[1,1,2,2-]	3.46E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
11	Tetrachloroethene	3.46E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
11	Tetryl	1.48E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
11	Thallium	2.75E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
11	Toluene	3.46E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
11	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
11	Trichlorobenzene[1,2,4-]	1.04E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
11	Trichloroethane[1,1,1-]	3.46E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
11	Trichloroethane[1,1,2-]	3.46E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
11	Trichloroethene	3.46E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
11	Trichlorofluoromethane	3.46E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
11	Trichlorophenol[2,4,5-]	1.04E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
11	Trichlorophenol[2,4,6-]	1.04E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
11	Trichloropropane[1,2,3-]	3.46E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
11	Trimethylbenzene[1,2,4-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Trimethylbenzene[1,3,5-]	3.46E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
11	Trinitrobenzene[1,3,5-]	1.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Trinitrotoluene[2,4,6-]	1.48E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
11	Tris (o-cresyl) phosphate	2.96E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
11	Vanadium	1.75E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
11	Vinyl Chloride	3.46E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
11	Xylene[1,2-]	3.46E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
11	Xylene[1,3-]+Xylene[1,4-]	6.93E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
11	Zinc	1.91E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
12	2,4-Diamino-6-nitrotoluene	4.95E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	2,6-Diamino-4-nitrotoluene	6.53E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	3,5-Dinitroaniline	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Acenaphthene	1.05E-02	mg/kg	N	U	N/A	FALSE	3.48E+03	FALSE	N/A	FALSE
12	Acenaphthylene	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Acetone	1.73E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
12	Aluminum	1.04E+04	mg/kg	Y	NQ	N/A	FALSE	7.80E+04	FALSE	2.92E+04	FALSE
12	Amino-2,6-dinitrotoluene[4-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Amino-4,6-dinitrotoluene[2-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Aniline	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Anthracene	1.05E-02	mg/kg	N	U	N/A	FALSE	1.74E+04	FALSE	N/A	FALSE
12	Antimony	3.34E-01	mg/kg	N	U	N/A	FALSE	3.13E+01	FALSE	8.30E-01	FALSE
12	Arsenic	1.91E+00	mg/kg	Y	NQ	7.07E+00	FALSE	1.30E+01	FALSE	8.17E+00	FALSE
12	Azobenzene	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Barium	5.69E+02	mg/kg	Y	NQ	N/A	FALSE	1.56E+04	FALSE	2.95E+02	TRUE
12	Benzene	3.45E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
12	Benzo(a)anthracene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(a)pyrene	1.05E-02	mg/kg	N	U	1.12E+02	FALSE	1.74E+01	FALSE	N/A	FALSE
12	Benzo(b)fluoranthene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(g,h,i)perylene	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Benzo(k)fluoranthene	1.05E-02	mg/kg	N	U	1.53E+01	FALSE	N/A	FALSE	N/A	FALSE
12	Benzoic Acid	1.75E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Benzyl Alcohol	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Beryllium	6.89E-01	mg/kg	Y	NQ	6.44E+04	FALSE	1.56E+02	FALSE	1.83E+00	FALSE
12	Bis(2-chloroethoxy)methane	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bis(2-chloroethyl)ether	1.05E-01	mg/kg	N	U	3.11E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Bis(2-ethylhexyl)phthalate	1.05E-02	mg/kg	N	U	3.80E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Bromobenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bromochloromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Bromodichloromethane	3.45E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
12	Bromoform	3.45E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Bromomethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
12	Bromophenyl-phenylether[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
12	Butylbenzene[n-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butylbenzene[sec-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butylbenzene[tert-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Butylbenzylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Cadmium	1.01E-01	mg/kg	N	U	8.59E+04	FALSE	7.05E+01	FALSE	4.00E-01	FALSE
12	Calcium	2.04E+03	mg/kg	Y	NQ	N/A	FALSE	1.30E+07	FALSE	6.12E+03	FALSE
12	Carbon Disulfide	1.73E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
12	Carbon Tetrachloride	3.45E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
12	Chloro-3-methylphenol[4-]	1.40E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chloroaniline[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chlorobenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
12	Chlorodibromomethane	3.45E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Chloroethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
12	Chloroform	3.45E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
12	Chloromethane	3.45E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
12	Chloronaphthalene[2-]	1.05E-02	mg/kg	N	U	N/A	FALSE	6.26E+03	FALSE	N/A	FALSE
12	Chlorophenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	3.91E+02	FALSE	N/A	FALSE
12	Chlorophenyl-phenyl[4-] Ether	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chlorotoluene[2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
12	Chlorotoluene[4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Chromium	8.03E+00	mg/kg	Y	NQ	9.66E+01	FALSE	4.52E+04	FALSE	1.93E+01	FALSE
12	Chrysene	1.05E-02	mg/kg	N	U	1.53E+02	FALSE	N/A	FALSE	N/A	FALSE
12	Cobalt	5.37E+00	mg/kg	Y	NQ	1.72E+04	FALSE	2.34E+01	FALSE	8.64E+00	FALSE
12	Copper	7.30E+00	mg/kg	Y	NQ	N/A	FALSE	3.13E+03	FALSE	1.47E+01	FALSE
12	Dibenz(a,h)anthracene	1.05E-02	mg/kg	N	U	1.53E-01	FALSE	N/A	FALSE	N/A	FALSE
12	Dibenzofuran	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dibromo-3-Chloropropane[1,2-]	5.18E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
12	Dibromoethane[1,2-]	3.45E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
12	Dibromomethane	3.45E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
12	Dichlorobenzene[1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
12	Dichlorobenzene[1,2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE
12	Dichlorobenzene[1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorobenzene[1,3-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichlorobenzene[1,4-]	3.45E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
12	Dichlorobenzene[1,4-]	1.05E-01	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
12	Dichlorobenzidine[3,3'-]	1.05E-01	mg/kg	N	U	1.18E+01	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Dichlorodifluoromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
12	Dichloroethane[1,1-]	3.45E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
12	Dichloroethane[1,2-]	3.45E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
12	Dichloroethene[1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
12	Dichloroethene[cis-1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
12	Dichloroethene[trans-1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
12	Dichlorophenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.85E+02	FALSE	N/A	FALSE
12	Dichloropropane[1,2-]	3.45E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
12	Dichloropropane[1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropane[2,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[cis-1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dichloropropene[trans-1,3-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Diethylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	4.93E+04	FALSE	N/A	FALSE
12	Dimethyl Phthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	6.16E+04	FALSE	N/A	FALSE
12	Dimethylphenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Di-n-butylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
12	Dinitro-2-methylphenol[4,6-]	1.05E-01	mg/kg	N	U	N/A	FALSE	4.93E+00	FALSE	N/A	FALSE
12	Dinitrobenzene[1,3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dinitrophenol[2,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,4-]	1.05E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,4-]	1.49E-01	mg/kg	N	U	1.71E+01	FALSE	1.23E+02	FALSE	N/A	FALSE
12	Dinitrotoluene[2,6-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Dinitrotoluene[2,6-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Di-n-octylphthalate	1.05E-02	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Diphenylamine	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Ethylbenzene	3.45E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
12	Fluoranthene	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
12	Fluorene	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+03	FALSE	N/A	FALSE
12	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.12E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzodioxins (Total)	1.33E-05	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	7.71E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Heptachlorodibenzofurans (Total)	7.73E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorobenzene	1.05E-01	mg/kg	N	U	3.33E+00	FALSE	4.93E+01	FALSE	N/A	FALSE
12	Hexachlorobutadiene	1.05E-01	mg/kg	N	U	6.83E+01	FALSE	6.16E+01	FALSE	N/A	FALSE
12	Hexachlorocyclopentadiene	1.05E-01	mg/kg	N	U	N/A	FALSE	2.30E+00	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzodioxins (Total)	2.61E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachlorodibenzofurans (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Hexachloroethane	1.05E-01	mg/kg	N	U	1.33E+02	FALSE	4.31E+01	FALSE	N/A	FALSE
12	Hexanone[2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	HMX	1.49E-01	mg/kg	N	U	N/A	FALSE	3.85E+03	FALSE	N/A	FALSE
12	Indeno(1,2,3-cd)pyrene	1.05E-02	mg/kg	N	U	1.53E+00	FALSE	N/A	FALSE	N/A	FALSE
12	Iodomethane	1.73E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Iron	1.03E+04	mg/kg	Y	NQ	N/A	FALSE	5.48E+04	FALSE	2.15E+04	FALSE
12	Isophorone	1.05E-01	mg/kg	N	U	5.61E+03	FALSE	1.23E+04	FALSE	N/A	FALSE
12	Isopropylbenzene	3.45E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
12	Isopropyltoluene[4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Lead	1.09E+01	mg/kg	Y	NQ	N/A	FALSE	4.00E+02	FALSE	2.23E+01	FALSE
12	Magnesium	1.59E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	4.61E+03	FALSE
12	Manganese	2.29E+02	mg/kg	Y	NQ	N/A	FALSE	1.05E+04	FALSE	6.71E+02	FALSE
12	Mercury	1.96E-02	mg/kg	Y	NQ	N/A	FALSE	2.38E+01	FALSE	1.00E-01	FALSE
12	Methyl-2-pentanone[4-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
12	Methylene Chloride	1.73E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
12	Methylnaphthalene[2-]	1.05E-02	mg/kg	N	U	N/A	FALSE	2.32E+02	FALSE	N/A	FALSE
12	Methylphenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Methylphenol[3-,4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Naphthalene	1.05E-02	mg/kg	N	U	4.97E+01	FALSE	1.62E+02	FALSE	N/A	FALSE
12	Nickel	6.54E+00	mg/kg	Y	NQ	5.95E+05	FALSE	1.56E+03	FALSE	1.54E+01	FALSE
12	Nitroaniline[2-]	1.16E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitroaniline[3-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitroaniline[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrobenzene	1.05E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
12	Nitrobenzene	1.49E-01	mg/kg	N	U	6.04E+01	FALSE	1.31E+02	FALSE	N/A	FALSE
12	Nitrophenol[2-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrophenol[4-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrosodimethylamine[N-]	1.05E-01	mg/kg	N	U	2.34E-02	TRUE	4.93E-01	FALSE	N/A	FALSE
12	Nitroso-di-n-propylamine[N-]	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Nitrotoluene[2-]	1.49E-01	mg/kg	N	U	3.16E+01	FALSE	7.04E+01	FALSE	N/A	FALSE
12	Nitrotoluene[3-]	1.49E-01	mg/kg	N	U	N/A	FALSE	6.16E+00	FALSE	N/A	FALSE
12	Nitrotoluene[4-]	1.49E-01	mg/kg	N	U	3.33E+02	FALSE	2.47E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.70E-05	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.08E-06	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Oxybis(1-chloropropane)[2,2'-]	1.05E-01	mg/kg	N	U	9.93E+01	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzodioxin[1,2,3,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzodioxins (Total)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofuran[1,2,3,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofuran[2,3,4,7,8-]	5.03E-07	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pentachlorophenol	1.05E-01	mg/kg	N	U	9.85E+00	FALSE	2.34E+02	FALSE	N/A	FALSE
12	Perchlorate	6.05E-04	mg/kg	Y	J	N/A	FALSE	5.48E+01	FALSE	N/A	FALSE
12	PETN	2.48E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Phenanthrene	1.05E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
12	Phenol	1.05E-01	mg/kg	N	U	N/A	FALSE	1.85E+04	FALSE	N/A	FALSE
12	Potassium	1.76E+03	mg/kg	Y	NQ	N/A	FALSE	1.56E+07	FALSE	3.46E+03	FALSE
12	Propylbenzene[1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Pyrene	1.05E-02	mg/kg	N	U	N/A	FALSE	1.74E+03	FALSE	N/A	FALSE
12	Pyridine	1.05E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	RDX	1.49E-01	mg/kg	N	U	8.31E+01	FALSE	3.01E+02	FALSE	N/A	FALSE
12	Selenium	5.14E-01	mg/kg	Y	J	N/A	FALSE	3.91E+02	FALSE	1.52E+00	FALSE
12	Silver	8.98E-01	mg/kg	Y	NQ	N/A	FALSE	3.91E+02	FALSE	1.00E+00	FALSE
12	Sodium	7.44E+01	mg/kg	Y	NQ	N/A	FALSE	7.82E+06	FALSE	9.15E+02	FALSE
12	Styrene	3.45E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
12	TATB	1.79E+00	mg/kg	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Temperature	5.7	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Tetrachlorodibenzodioxin[2,3,7,8-]	1.01E-07	mg/kg	N	U	4.90E-05	FALSE	5.06E-05	FALSE	N/A	FALSE
12	Tetrachlorodibenzodioxins (Total)	1.67E-07	mg/kg	Y	J	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Tetrachlorodibenzofuran[2,3,7,8-]	1.49E-07	mg/kg	Y	J	4.90E-04	FALSE	N/A	FALSE	N/A	FALSE
12	Tetrachlorodibenzofurans (Totals)	0.00E+00	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Tetrachloroethane[1,1,1,2-]	3.45E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
12	Tetrachloroethane[1,1,2,2-]	3.45E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
12	Tetrachloroethene	3.45E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
12	Tetryl	1.49E-01	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
12	Thallium	2.02E-01	mg/kg	Y	J	N/A	FALSE	7.82E-01	FALSE	7.30E-01	FALSE
12	Toluene	3.45E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
12	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.73E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
12	Trichlorobenzene[1,2,4-]	1.05E-01	mg/kg	N	U	2.40E+02	FALSE	8.29E+01	FALSE	N/A	FALSE
12	Trichloroethane[1,1,1-]	3.45E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
12	Trichloroethane[1,1,2-]	3.45E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
12	Trichloroethene	3.45E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
12	Trichlorofluoromethane	3.45E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
12	Trichlorophenol[2,4,5-]	1.05E-01	mg/kg	N	U	N/A	FALSE	6.16E+03	FALSE	N/A	FALSE
12	Trichlorophenol[2,4,6-]	1.05E-01	mg/kg	N	U	4.84E+02	FALSE	6.16E+01	FALSE	N/A	FALSE
12	Trichloropropane[1,2,3-]	3.45E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
12	Trimethylbenzene[1,2,4-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trimethylbenzene[1,3,5-]	3.45E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trinitrobenzene[1,3,5-]	1.49E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Trinitrotoluene[2,4,6-]	1.49E-01	mg/kg	N	U	2.11E+02	FALSE	3.60E+01	FALSE	N/A	FALSE
12	Tris (o-cresyl) phosphate	2.97E-01	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
12	Vanadium	1.99E+01	mg/kg	Y	NQ	N/A	FALSE	3.94E+02	FALSE	3.96E+01	FALSE
12	Vinyl Chloride	3.45E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
12	Xylene[1,2-]	3.45E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
12	Xylene[1,3-]+Xylene[1,4-]	6.91E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE
12	Zinc	2.58E+01	mg/kg	Y	NQ	N/A	FALSE	2.35E+04	FALSE	4.88E+01	FALSE
Trip Blank	Acetone	1.65E-03	mg/kg	N	U	N/A	FALSE	6.63E+04	FALSE	N/A	FALSE
Trip Blank	Benzene	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	1.14E+02	FALSE	N/A	FALSE
Trip Blank	Bromobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Bromochloromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Bromodichloromethane	3.29E-04	mg/kg	N	U	6.19E+02	FALSE	1.56E+03	FALSE	N/A	FALSE
Trip Blank	Bromoform	3.29E-04	mg/kg	N	U	6.74E+02	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Bromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.77E+01	FALSE	N/A	FALSE
Trip Blank	Butanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	3.74E+04	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[n-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[sec-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Butylbenzene[tert-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Carbon Disulfide	1.65E-03	mg/kg	N	U	N/A	FALSE	1.55E+03	FALSE	N/A	FALSE
Trip Blank	Carbon Tetrachloride	3.29E-04	mg/kg	N	U	1.07E+01	FALSE	1.44E+02	FALSE	N/A	FALSE
Trip Blank	Chlorobenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	3.78E+02	FALSE	N/A	FALSE
Trip Blank	Chlorodibromomethane	3.29E-04	mg/kg	N	U	1.39E+01	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Chloroethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.90E+04	FALSE	N/A	FALSE
Trip Blank	Chloroform	3.29E-04	mg/kg	N	U	5.90E+00	FALSE	3.06E+02	FALSE	N/A	FALSE
Trip Blank	Chloromethane	3.29E-04	mg/kg	N	U	4.11E+01	FALSE	2.68E+02	FALSE	N/A	FALSE
Trip Blank	Chlorotoluene[2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+03	FALSE	N/A	FALSE
Trip Blank	Chlorotoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dibromo-3-Chloropropane[1,2-]	4.94E-04	mg/kg	N	U	8.58E-02	FALSE	5.88E+00	FALSE	N/A	FALSE
Trip Blank	Dibromoethane[1,2-]	3.29E-04	mg/kg	N	U	6.72E-01	FALSE	1.35E+02	FALSE	N/A	FALSE
Trip Blank	Dibromomethane	3.29E-04	mg/kg	N	U	N/A	FALSE	5.79E+01	FALSE	N/A	FALSE
Trip Blank	Dichlorobenzene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.15E+03	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Sample Location	Parameter Name	Report Result	Report Units	Detected	Validation Qualifier	Residential Soil, Cancer (mg/kg)	Residential Soil, Cancer Comparison	Residential Soil, Noncancer (mg/kg)	Residential Soil, Noncancer Comparison	Background Concentration	Background Comparison
Trip Blank	Dichlorobenzene[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichlorobenzene[1,4-]	3.29E-04	mg/kg	N	U	1.29E+03	FALSE	5.48E+03	FALSE	N/A	FALSE
Trip Blank	Dichlorodifluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.82E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethane[1,1-]	3.29E-04	mg/kg	N	U	7.86E+01	FALSE	1.56E+04	FALSE	N/A	FALSE
Trip Blank	Dichloroethane[1,2-]	3.29E-04	mg/kg	N	U	8.32E+00	FALSE	5.56E+01	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	4.40E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[cis-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.56E+02	FALSE	N/A	FALSE
Trip Blank	Dichloroethene[trans-1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	2.95E+02	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[1,2-]	3.29E-04	mg/kg	N	U	1.78E+01	FALSE	2.90E+01	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropane[2,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[cis-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Dichloropropene[trans-1,3-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Ethylbenzene	3.29E-04	mg/kg	N	U	7.51E+01	FALSE	3.93E+03	FALSE	N/A	FALSE
Trip Blank	Hexanone[2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Iodomethane	1.65E-03	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Isopropylbenzene	3.29E-04	mg/kg	N	U	N/A	FALSE	2.36E+03	FALSE	N/A	FALSE
Trip Blank	Isopropyltoluene[4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Methyl-2-pentanone[4-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.81E+03	FALSE	N/A	FALSE
Trip Blank	Methylene Chloride	1.65E-03	mg/kg	N	U	7.66E+02	FALSE	4.09E+02	FALSE	N/A	FALSE
Trip Blank	Propylbenzene[1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Styrene	3.29E-04	mg/kg	N	U	N/A	FALSE	7.26E+03	FALSE	N/A	FALSE
Trip Blank	Temperature	3	deg C	Y	NQ	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethane[1,1,1,2-]	3.29E-04	mg/kg	N	U	2.81E+01	FALSE	2.35E+03	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethane[1,1,2,2-]	3.29E-04	mg/kg	N	U	7.98E+00	FALSE	1.56E+03	FALSE	N/A	FALSE
Trip Blank	Tetrachloroethene	3.29E-04	mg/kg	N	U	3.37E+02	FALSE	1.11E+02	FALSE	N/A	FALSE
Trip Blank	Toluene	3.29E-04	mg/kg	N	U	N/A	FALSE	5.23E+03	FALSE	N/A	FALSE
Trip Blank	Trichloro-1,2,2-trifluoroethane[1,1,2-]	1.65E-03	mg/kg	N	U	N/A	FALSE	5.08E+04	FALSE	N/A	FALSE
Trip Blank	Trichloroethane[1,1,1-]	3.29E-04	mg/kg	N	U	N/A	FALSE	1.44E+04	FALSE	N/A	FALSE
Trip Blank	Trichloroethane[1,1,2-]	3.29E-04	mg/kg	N	U	1.88E+01	FALSE	2.61E+00	FALSE	N/A	FALSE
Trip Blank	Trichloroethene	3.29E-04	mg/kg	N	U	1.55E+01	FALSE	6.77E+00	FALSE	N/A	FALSE
Trip Blank	Trichlorofluoromethane	3.29E-04	mg/kg	N	U	N/A	FALSE	1.23E+03	FALSE	N/A	FALSE
Trip Blank	Trichloropropane[1,2,3-]	3.29E-04	mg/kg	N	U	5.10E-02	FALSE	7.09E+00	FALSE	N/A	FALSE
Trip Blank	Trimethylbenzene[1,2,4-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Trimethylbenzene[1,3,5-]	3.29E-04	mg/kg	N	U	N/A	FALSE	N/A	FALSE	N/A	FALSE
Trip Blank	Vinyl Chloride	3.29E-04	mg/kg	N	U	7.42E-01	FALSE	1.13E+02	FALSE	N/A	FALSE
Trip Blank	Xylene[1,2-]	3.29E-04	mg/kg	N	U	N/A	FALSE	8.05E+02	FALSE	N/A	FALSE
Trip Blank	Xylene[1,3-]+Xylene[1,4-]	6.59E-04	mg/kg	N	U	N/A	FALSE	7.64E+02	FALSE	N/A	FALSE

Table 1. TA-16-388 Flash Pad 2018 Analytical Data Summary (continued)

Highlighted “TRUE” value – constituent detected above either the selected soil screening level or above the background value

Supplement 4-15

Technical Area 16 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 16-388 Flash Pad Human Health and Ecological Risk Screening Assessments

TECHNICAL AREA 16
OPEN BURNING UNIT
TA-16-388 FLASH PAD
HUMAN HEALTH AND ECOLOGICAL RISK-SCREENING ASSESSMENTS

April 24, 2023

EXECUTIVE SUMMARY

Open burning hazardous waste treatment operations requiring a permit under the Resource Conservation and Recovery Act (RCRA) are conducted at the Los Alamos National Laboratory (LANL) at Technical Area 16. As part of the application process for a permit to perform hazardous waste treatment operations, and in accordance with the requirements of Title 40 of the Code of Federal Regulations, Part 264.601(b) (40 CFR § 264.601(b)), LANL performed soil monitoring activities to assist with site characterization. The area immediately around the open burning (OB) unit at Technical Area 16-388 (TA-16-388) Flash Pad was investigated in Fall 2018, and additional sampling was conducted in November 2021 following excavation of location 3 (WST16-18-163001 and WST16-18-163002). Currently the TA-16-388 Flash Pad is the only OB treatment unit that is operational. The TA-16-388 unit has been used exclusively for OB treatment of explosive waste streams. The goal of the site characterization and risk assessments are to determine whether hazardous contaminants from ongoing treatment operations are being released to soil at levels that pose an unacceptable risk to human health or the environment.

The study boundary is composed of the Flash Pad unit where past explosives processing activities have occurred, and/or the location of past waste management units. Surface soil samples were collected in September 2018 and November 2021 and analyzed for inorganic and organic chemicals. No radionuclide data were collected. Data from these samples were used to conduct human health and ecological risk-screening assessments for this report.

For the human health risk-screening assessment, residential and industrial exposure scenarios were evaluated by comparing the maximum exposure point concentration (EPC) for each analyte to the New Mexico Environment Department (NMED) soil screening levels (NMSSLs) (NMED 2022a,b). The following conclusions are made:

- There were no hazard quotients (HQs) >1
- There were no hazard indices (HI) >1
- There were no cancer risks >$1x10^{-5}$
- The cumulative cancer risks (CCR) were less than $1x10^{-5}$
- Based on the combined Fall 2018/2021 data set, there was no elevated risk to human health for exposure to soils identified as the result of this screening analysis using maximum detected concentrations.

Potential risk to ecological receptors was evaluated by analyzing different lines of evidence that were weighed to draw a conclusion regarding potential for adverse ecological effects. This included:

- Comparing maximum EPCs to no effect (NE) ecological screening levels (ESLs),
- Comparing refined EPCs based on upper 95th percentile confidence limits (UCL95s) to low effect (LE) ESLs,
- Calculating hazard indices,
- Consideration of site-specific biological sampling, and long term avian and mammalian monitoring data,
- Application of site-specific area use factors to refined EPCs and comparing to NE and LE ESLs.

The following conclusions are made:

Based on the combined Fall 2018/2021 TA-16 388 data set, there is minimal potential risk to ecological receptors for exposure to soils identified as the result of this screening analysis. Maximum concentrations of antimony, barium, silver, TATB, TNT, and dioxin/furans produced HQs greater than 0.1 for comparison to NE ESLs. Barium, silver, and dioxin/furans produced HQs greater than 0.1 for comparison to the LE ESLs. However, HIs by receptor based on a hazard analysis with area use factors, NE ESLs, and refined EPCs were all less than 1 except for earthworms and plants, and HIs by receptor based on a hazard analysis with area use factors, LE ESLs, and refined EPCs were all less than 1 except for plants. Plant populations are controlled in this area and therefore plants are not a likely receptor.

Dioxin/furan maximum concentrations exceeded the NE ESL, but the refined EPC did not exceed the LE ESL, for small mammals or earthworms in the hazard analysis. Barium concentrations in surface soils exceeded both

background and the LE ESL to produce HQs greater than 1 for plants. When a hazard analysis accounting for spatial variation and home range was conducted, only HQs and HIs for plants and earthworms exceeded 1 based on the NE ESL, and only HQs and HIs for plants exceeded 1 based on the LE ESL. Note that habitat is controlled for plants at this site and therefore they are not expected to be current receptors.

Other lines of evidence were evaluated in addition to the measured analytical data. Recent field studies found no adverse impacts to the small mammal population, and field observations made during the site visit revealed the plant community is healthy with no indications of chemical stress where plants are present. Avian surveys were conducted and avian abundance and diversity was comparable to or greater than reference areas. Nonviable eggs were tested for inorganic analytes. Barium concentrations were three to seven times higher than the Regional Statistical Reference Level (RSRL).

With the exception of barium, the contaminants of potential ecological concern (COPECs) identified in this risk assessment were all below the RSRL in eggs collected and analyzed from 2016 to 2019. Hatching success was similar to that previously reported for the area. Dioxin/furans were also identified as COPECs, and one congener was detected in nestling tissue approximately three times higher than the RSRL; however, when adjusted for toxicity relative to TCDD, the concentration was much lower than the TCDD lowest observed adverse effect level (LOAEL) for eggs. Together these results suggest inorganics or dioxin/furans will not adversely affect breeding bird populations.

The ERA concludes that there is no significant risk to ecological receptors.

TABLE OF CONTENTS

Page No.

1. Introduction 1
2. Human Health Risk Assessment 1
2.1. Human Health Conceptual Site Model 1
2.1.1. Receptors 2
2.1.2. Exposure Pathways 2
2.1.3. Calculation of Hazard Index or Cumulative Cancer Risk 2
2.2. Approach for Identification of Chemicals of Potential Concern 3
2.2.1. Sampling and Data Analysis 3
2.2.2. Comparison to Background 3
2.2.3. Comparison of Maximum Exposure Point Concentrations to NMSSLs 4
2.2.4. NMSSLs and Surrogates 4
2.2.5. Evaluation of Refined EPCs 6
2.3. Screening Evaluation 6
2.3.1. Data Analysis 6
2.3.2. Comparison to Background 7
2.3.3. Comparison of Maximum EPCs to NMSSLs 8
2.3.4. Lead 8
2.3.5. Dioxin/Furans 8
2.3.6. Migration to Groundwater 9
2.3.7. Data Analysis Conclusions 9
2.4. Uncertainty Analysis 10
2.4.1. Data and Data Analysis 10
2.4.2. Exposure Assessment 10
2.4.3. Toxicity Values 10
2.4.4. Additive Approach 11
2.5. Conclusions 11
3. ECOLOGICAL SCREENING ASSESSMENT 12
3.1. Introduction 12
3.2. Problem Formulation and conceptual site exposure model 12
3.2.1. Data Summary 13
3.2.2. Site Visit Summary 13
3.2.3. Receptors and Pathways 13
3.2.4. Technical Decision Point and Recommendations 14
3.3. Ecological Screening Evaluation 14
3.3.1. Inorganics 14

3.3.2. Dioxin and Furans 16
3.3.3. Other Organics....16
3.4. Uncertainty Analysis 16
3.4.1. Chemical Form 16
3.4.2. Exposure and Risk Estimates 17
3.4.3. Mixture Toxicity....17
3.4.4. Small-Mammal Field Investigations 17
3.4.5. Avian Studies....18
3.4.6. COPECs without ESLs....19
3.4.7. Area Use Factors (AUFs) and Population Area Use Factors (PAUFs) 19
3.5. Conclusions 20
4. References 21

LIST OF ATTACHMENTS

Attachment A ProUCL Output for Background Hypothesis Testing and Upper Confidence Limit Calculations 57
Attachment B LANL Ecorisk Database 4.2 Soil ESLs 74

LIST OF TABLES

Table 2-1. Summary Statistics for Detected Fall 2018/2021 Analytes 25
Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations to Background....27
Table 2-3. Verification of MDLs for Nondetects for Data Useability 28
Table 2-4. Human Health Screening Results for Detected Analytes Above Background 33
Table 2-5. Fall 2018/2021 Dioxin and Furan Data by Sample....34
Table 2-6. Dioxin/Furan Human Health TEFs and TEQs for the Fall 2018/2021 Samples....36
Table 2-7. Comparison of Maximum and Refined EPCs to Groundwater Protection Screening Levels....38
Table 3-1. Ecological Screening Levels....39
Table 3-2. Ecological Screening Evaluation Based on Maximum EPCs and NE ESLs 41
Table 3-3. Refined Exposure Point Concentrations 42
Table 3-4. Ecological Screening Evaluation Using UCL95 EPCs and LE ESLs....43
Table 3-5. Toxic Equivalency Factors (TEFs) Used for Calculating TCDD Equivalent Concentrations....44
Table 3-6. Dioxin-Furan TECi and TEQs for Mammals by Sample....45
Table 3-7. Dioxin-Furan TECi and TEQs for Birds by Sample....48
Table 3-8. Hazard Analysis by Receptor and Area Use Factors For No Effect ESLs....51
Table 3-9. Hazard Analysis by Receptor and Area Use Factors For Low Effect ESLs 52

LIST OF FIGURES

Figure 1-1. Map of Sampling Locations For TA-16-388 Flash Pad....54
Figure 3-1. Aerial Photograph of Habitat at TA-16-388 and Vicinity 55
Figure 3-2. Preliminary Conceptual Site Exposure Model....56

ACRONYMS AND ABBREVIATIONS

AUF	Area Use Factor
BV	Background Value
CCR	Cumulative Cancer Risk
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
CR	Cancer Risk
CSEM	Conceptual Site Exposure Model
EPA	Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESL	Ecological Screening Level
HI	Hazard Index
HMX	Cyclotetramethylene-tetranitramine
HQ	Hazard Quotient
HR	Home Range
LANL	Los Alamos National Laboratory
LD50	Lethal Dose for Half of the Population
LE	Low Effect
LOAEL	Lowest Observed Adverse Effect Level
MDL	Method Detection Limit
MTGW	Migration to Groundwater
NE	No Effect
NMED	New Mexico Environment Department
NMSSL	New Mexico Soil Screening Levels
NOAEL	No Observed Adverse Effect Level
OB	Open Burn
PAH	Polynuclear Aromatic Hydrocarbon
PAUF	Population Area Use Factor
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethylene-trinitramine
RfD	Reference Dose
RSRL	Regional Statistical Reference Levels
SAP	Sampling and Analysis Plan
SF	Cancer Slope Factor

SL	Screening Level
SSLs	Soil Screening Levels
SL-SSL	Migration to groundwater soil screening level
SVOC	Semi-Volatile Organic Chemical
SWMU	Solid Waste Management Unit
TA	Technical Area
TATB	1,3,5-Triamino-2,4,6-trinitrobenzene
TECi	Toxicity Equivalent Concentration for congener ***i***
TEF	Toxicity Equivalency Factor
TEQ	Toxicity Equivalent Quotient
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
TNT	2,4,6-Trinitrotoluene
UCL95	95% Upper Confidence Limit On The Mean
VOC	Volatile Organic Chemical
WHO	World Health Organization

1. INTRODUCTION

Technical Area (TA) -16 is located in the southwestern portion of Los Alamos National Laboratory (LANL) at the west end of the Pajarito Plateau near the foothills of the Jemez Mountains (Figure 1-1). TA-16 encompasses the open burning (OB) unit and the surrounding solid waste management units (SWMUs) where past explosives processing activities have occurred, and/or the location of past waste management units.

The hazardous waste management unit consists of the TA-16-388 Flash Pad, and the TA-16-388 Flash Pad is the only part of TA-16 addressed by this risk assessment. The TA-16-388 Flash Pad consists of a 22-foot (ft) by 22-ft concrete pad located in the northeast portion of TA-16. The concrete pad measures 12 inches thick at the base and sits atop a 45-milliliter Hypalon secondary containment liner that is situated 6 inches below the bottom of the pad. The pad is also equipped with a retractable steel roof that covers the unit when it is not in use. Dry and wet explosives, and waste that is contaminated with explosives, are treated at the TA-16-388 Flash Pad to destroy the characteristic of reactivity (D003).

An initial site characterization assessment at the TA-16-388 Flash Pad (hereafter referred to as the OB Unit) by soil sampling was performed in June 2009 and a follow-up was conducted in August 2009. Additional soil monitoring events occurred in 2012 and 2013, 2018, and 2021. Only the most recent Fall 2018 and Fall 2021 (Fall 2018/2021) data were used to provide the current site characterization, and aid in establishing whether hazardous contaminants from ongoing treatment operations are being released to soil at levels that pose an unacceptable risk to human health or the environment. The Fall 2018/2021 data are considered to most accurately reflect current site conditions. Sampling events did not include rocks, debris, or vegetation.

Data were collected within the boundaries of the OB Unit and in the surrounding SWMUs where past explosives processing activities occurred. Only surface soil data were collected. Sampling locations were selected based on a defined area where deposition of particulates from air to soil and areas of potential storm water runoff is most likely to occur. Originally, an additional discrete grab sample location northeast of the Flash Pad were included in these assessments where a dioxin/furan contaminated hotspot was identified during previous soil monitoring events was also selected. This judgmental sampling design is considered to be conservative and likely to bias risk results high. In 2021, the area of the suspected dioxin/furan contaminated hotspot was excavated and the soil was disposed of as part of closure of a different site located at TA-16. Analytical data for the soil samples collected after the soil excavation are included within this assessment to provide information on the current site conditions as an update to the Fall 2018 data.

Human health and ecological risk-screening assessments were conducted using the most recent surface soil data. These data were collected in September 2018 and November 2021. Data from historical sampling events were not utilized since the most recent data reflect current conditions at the site. The results of the risk-screening assessments are presented in the following sections.

2. HUMAN HEALTH RISK ASSESSMENT

2.1. HUMAN HEALTH CONCEPTUAL SITE MODEL

The primary land use is industrial because only authorized Laboratory workers currently have access to the area around the Unit. Laboratory workers are the primary human receptors, and the industrial scenario is the appropriate defining scenario for the human health risk-screening assessment (i.e., the scenario on which decisions are based). However, for this human health risk-screening assessment, the residential risk scenario will be utilized.

2.1.1. Receptors

Because the OB Unit is located within the boundaries of an operational facility (TA-16), the reasonably foreseeable future land use will continue to be industrial. A Hypothetical Future Residential exposure was assessed and is provided as a conservative risk scenario, and the industrial worker and construction worker exposure scenarios are provided for comparison purposes.

2.1.2. Exposure Pathways

The release of contaminants from OB operations has occurred for more than 50 years. Releases are transported primarily by wind, which rapidly disperses the material in ambient air. Most material is likely deposited close to the source(s), and fugitive dust concentrations will decrease with distance from the source. Exposure to a receptor may occur through various surface soil contact pathways. Potential human health exposure pathways evaluated in this risk assessment include:

- Incidental ingestion of surface soil,
- Inhalation of fugitive dust or volatiles emanating from surface soil, and
- Dermal contact with surface soil.

Grading for runoff and erosion control has been performed in the area of the OB Unit. Storm water discharges from the OB Unit are regulated under the Clean Water Act by the National Pollutant Discharge Elimination System permit program under the LANL Storm Water Individual Permit. The LANL Storm Water Individual Permit contains nonnumeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program and implementation of corrective actions where necessary, to minimize pollutants in LANL's storm water discharges. Grading for runoff and erosion control has been performed in the area of the OB Unit. In addition, berms and infiltration systems have been installed. This, combined with the distance to the nearest surface water, makes it unlikely that impacts to surface water east of the Unit will occur.

2.1.3. Calculation of Hazard Index or Cumulative Cancer Risk

Noncancer hazard quotients (HQs) are calculated as follows using the NMSSL based on noncancer endpoints:

$$HQ = EPC/NMSSL$$

A Hazard Index (HI) was calculated by summing all of the HQs as follows:

$$HI = \sum HQ1, HQ2, \ldots$$

A cancer risk (CR) was calculated as follows using the cancer-based NMSSL for each receptor and adjusting from a ratio to a cancer risk:

$$CR = \frac{EPC}{NMSSL} * 1 \times 10^{-5}$$

A Cumulative Cancer Risk (CCR) was calculated by summing the cancer risks for each detected analytes as follows:

$$CCR = \sum CR1, CR2, \ldots..$$

If the HI exceeded 1, or the CCR exceeded $1x10^{-5}$, a refined EPC based on the upper 95th percent confidence limit on the mean (UCL95) was calculated for all COPCs with the EPA ProUCL 5.2 software (EPA 2022). The refined EPCs based on UCL95 concentrations were then compared to the NMSSLs.

2.2. APPROACH FOR IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN

2.2.1. Sampling and Data Analysis

Soil samples used in this analysis were collected in September 2018 and November 2021 and combined for use in the risk assessment as the Fall 2018/2021 data set. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 - 2 inches below ground surface or at the bottom of the excavated area. The Fall 2018/2021 sample set was analyzed for the following:

- Volatile Organic Compounds (VOCs) –11 samples
- Semi-Volatile Organic Compounds (SVOCs) –11 samples
- Total Metals –17 samples
- Perchlorate – 11 samples
- Dioxins/Furans –17 samples
- High Explosives –17 samples

In addition, some organics were analyzed by more than one method, resulting in an apparently higher sample count (i.e., 2,4 and 2,6 dinitrotoluene, nitrobenzene, dinitrobenzenes). Figure 1-1 shows a map of the site including the sampling locations from which data were obtained for use in the risk assessment. All J-qualified data were treated as detected values, and all U-qualified data were treated as not detected.

2.2.2. Comparison to Background

The background data used in this evaluation are presented in the report "Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory," (LANL, 1998). The background data are used in the RCRA corrective action process to distinguish between contaminated and uncontaminated media and have been accepted by NMED. As stated in the background report, the background dataset was collected as follows:

> "Twenty-one soil profiles distributed across the Pajarito Plateau were described in the field and were sampled for inorganic chemical analyses. These samples provide information about the varied soils and geomorphic settings that occur on the Pajarito Plateau, allowing for an evaluation of the variability in soil characteristics and chemistry within several of the soil series previously described by Nyhan et al. (1978, 05702). Most sampled soils were collected from mesa tops. Other geomorphic settings sampled include hillslopes and canyon bottoms." (LANL, 1998)

The locations sampled as part of the background study were not impacted by deposition from the historical operation of the OB units or other firing sites. Background values (BVs) were obtained from this document to use in comparison to site data. There are no background data available for perchlorate.

An attribution analysis (NMED 2022a,b) was conducted by comparing the inorganic site data to BVs. Analytes less than BVs were eliminated from further evaluation. Analytes greater than BVs were evaluated with Gehan's statistical hypothesis tests (EPA 2022) to determine whether or not the site data were significantly different from background. No further evaluation is necessary for analytes for which the maximum is less than background, and these data are not compared to NMED (2022) risk-based soil screening levels (NMSSLs). Organic analytes are not compared to background values as a matter of standard practice, although there are naturally occurring sources of organic constituents.

2.2.3. Comparison of Maximum Exposure Point Concentrations to NMSSLs

The maximum concentration of each analyte was used as the initial exposure point concentration (EPC), which is the estimated environmental concentration to which the receptors are potentially exposed. The screening approach used the maximum of all detected data for the initial screening evaluation. The EPC for each analyte was divided by its NMED (2022b) NMSSL, which is a concentration at or below which no adverse effects are expected. For the HHRA, this meant using two screening levels (SLs) based on different toxicity endpoints, one for cancer effects and one for noncancer effects. The cancer and noncancer SL were used to obtain a CR and HQ, respectively, for each analyte and receptor combination. In some cases NMSSLs for both toxicity endpoints are not available, often because an analyte has not been identified as carcinogenic, and then the risk assessment is determined by the available toxicity endpoint.

All analytes that exceeded the NMSSLs were considered to have "failed" the initial screen. These are considered to be contaminants of potential concern (COPCs).

2.2.4. NMSSLs and Surrogates

Where an NMSSL was not available, the U.S. Environmental Protection Agency (EPA) Regional Screening Level (RSL) for residential soils was applied as an SL for residential use, and the RSL for industrial commercial soil was used as the SL for industrial workers. The EPA cancer and noncancer toxicity values and chemical-specific parameters (EPA 2022) were used to derive SLs for construction workers according to equations from NMED (2022a). Consistent with NMED guidance, cancer-based RSLs were adjusted to a CR level of $1x10^{-5}$ by multiplying the RSL by 10; noncancer RSLs were based on a HQ of 1. If an RSL was also not available, a suitable surrogate is proposed if physicochemical data suggest identifying a suitable surrogate. Most of the surrogates are proposed for nondetected analytes in order to verify that method detection limits (MDLs) are suitable for performing risk assessment.

NMSSLs were available for all inorganics. The toxicity values for NMED mercuric salts were used for the SL as this is the form expected in arid soils. Per NMED (2022), lead is evaluated with the EPA toxicity values of 400 mg/kg in soil for residents and 800 mg/kg for workers.

The NMED migration to groundwater (MTGW) SLs (SL-SSLs) are used to assess potential migration to groundwater risks assuming human receptors then consume groundwater. Where MTGW SLs are unavailable, surrogates based on EPA RSLs are proposed. In these cases, the EPA RSL for protection of migration to groundwater was used. The EPA RSL for protection of migration to groundwater is based on a dilution attenuation factor (DAF) of 1, whereas the NMED SL-SSL is based on a DAF of 20. For consistency with NMED, the EPA RSL MTGW values were multiplied by a factor of 20 prior to use in the analysis.

Surrogates were obtained for the following analytes because NMSSLs were not available; and although most are not detected, the SL is needed to verify that the MDL is adequate for use in the risk assessment:

- 2,4-Diamino-6-nitrotoluene – There is no NMSSL or RSL. Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 2,6-Diamino-4-nitrotoluene – Use o-nitrotoluene RSLs, which has both cancer and noncancer RSL values, and the lowest of the nitrotoluene isomer cancer RSLs.
- 3,5-Dinitroaniline – There is no NMSSL. Use the amino-2,6-dinitrotoluene[4-] RSL as surrogate based on structural similarity.
- Acenaphthylene – There is no NMSSL or RSL. The NMSSLs for acenaphthene were used as a surrogate based on structural similarity.
- Aniline - There is no NMSSL. The RSLs were used as a surrogate.

- Azobenzene - There is no NMSSL. The RSLs were used as a surrogate.
- Benzo(g,h,i)perylene – There is no NMSSL or RSL. The NMSSLs for benzo(a)pyrene were used as a surrogate.
- Benzoic Acid - There is no NMSSL. RSLs were used as a surrogate.
- Benzyl Alcohol- There is no NMSSL. RSLs were used as a surrogate.
- Bis(2-chloroethoxy)methane- There is no NMSSL. RSLs were used as a surrogate.
- Bromobenzene - There is no NMSSL. RSLs were used as a surrogate.
- Bromochloromethane - There is no NMSSL. RSLs were used as a surrogate.
- Bromophenyl-phenylether[4-] – There is no NMSSL or RSL. The RSL for pentabromodiphenyl ether was used.
- Butylbenzene isomers – There are no NMSSLs. The RSLs are used as surrogates.
- Butylbenzylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Chloro-3-methylphenol[4-]– There are no NMSSLs. The RSLs are used as surrogates.
- Chloroaniline[4-] – There are no NMSSLs. The RSLs are used as surrogates.
- Chlorophenyl-phenyl[4-] Ether– There is no NMSSL or RSL. No recommendation for a surrogate is made.
- Chlorotoluene[4-] – Use the NMSSLs for the o-chlorotoluene isomer.
- Dibenzofuran – There are no NMSSLs. The RSLs are used as surrogates.
- Dichlorobenzene[1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,4-dichlorobenzene were used as it may be the more toxic isomer considering it has cancer-based as well as noncancer-based endpoints.
- Dichloropropane[2,2-] – There is no NMSSL or RSL. The NMSSLs for 1,2-dichloropropane were used. The RSL is higher for 1,3 than 1,2 dichloropropane, and therefore this is considered conservative.
- Dichloropropane[1,3-] – There is no NMSSL. The NMSSLs for 1,2-dichloropropane were used.
- Dichloropropene[1,1-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[cis-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dichloropropene[trans-1,3-] – There is no NMSSL or RSL. The NMSSLs for 1,3-dichloropropene were used.
- Dimethyl phthalate– There is no NMSSL or RSL. The NMSSLs for diethyl phthalate were used.
- Dinitrobenzene[1,3-] – There are no NMSSLs. The RSLs are used as surrogates.
- Di-n-octylphthalate – There are no NMSSLs. The RSLs are used as surrogates.
- Diphenylamine – There are no NMSSLs. The RSLs are used as surrogates.

- Hexanone[2] – There are no NMSSLs. The RSLs are used as surrogates.
- Iodomethane – There is no NMSSL or RSL. The NMSSLs for bromomethane are used as surrogates.
- 4-Isopropyltoluene – There is no NMSSL. The NMSSL values for toluene were used as a surrogate.
- Methylphenols – There are no NMSSLs for these compounds. The RSLs were applied for 2- methylphenol. The RSLs for 4-methylphenol were used for 3,4-methylphenol as most conservative option.
- Nitroanilines – There are no NMSSLs for these compounds. The RSLs were applied for 2- and 4-nitroaniline. The RSL for 4-nitroaniline was applied to 3-nitroaniline.
- Nitrophenols – There are no NMSSLs or RSLs for these compounds. The NMSSLs for phenol were applied for 2- and 4-nitrophenol.
- Nitroso-di-n-propylamine[N-] – There are no NMSSLs. The RSLs were applied.
- PETN - There is no NMSSL for PETN. RSLs were used as a surrogate.
- Propylbenzene[1-] – There are no NMSSLs. The RSLs are used as surrogates.
- Pyridine– There are no NMSSLs. The RSLs are used as surrogates.
- 1,3,5-Trinitrobenzene – There is no NMSSL. RSLs for 1,3,5-trinitrobenzene were used as a surrogate.
- TATB – There is no NMSSL or RSL for TATB. RSLs for 1,3,5-trinitrobenzene were used as a surrogate because of structural similarity.
- Trimethylbenzenes – There are no NMSSLs. The RSLs are used as surrogates.
- Tris (o-cresyl) phosphate – There is no NMSSL or RSL. The RSL for tris(2-ethylhexyl)phosphate was applied as a similar structure without halogen substitutions.
- Xylene(1,3) and Xylene (1,4) – The NMSSLs for total xylenes were applied.

2.2.5. Evaluation of Refined EPCs

A refinement of the EPCs is performed if the hazard index (HI) or the cumulative cancer risk (CCR) based on maxima exceeds target levels of 1 or $1x10^{-5}$, respectively, or if the maximum concentration exceeds the MTGW SLs. The UCL95 concentrations were compared to SLs, and any analytes above the SLs are qualitatively evaluated further. Per NMED guidance, a UCL95 was not estimated if there were fewer than 5 detected values. For infrequently detected analytes (i.e., number of detections less than 5), a median of the detected values and MDLs was applied.

2.3. SCREENING EVALUATION

The following sections present the human health risk-screening assessment for the OB Unit.

2.3.1. Data Analysis

The summary statistics and maximum values used as EPCs are presented in Table 2-1. The EPC based on the maximum concentration for each detected analyte was compared with the residential and industrial NMSSLs to obtain a HQ or CR, and the HI was calculated by summing the HQs and the CCR was calculated by summing the

CRs (NMED 2022a). The chemical SLs used in the evaluations were obtained from current NMED guidance (NMED 2022b) or the most recent EPA RSLs (EPA 2022) if an NMED value was not available. The NMSSLs for carcinogens are equivalent to a 1×10^{-5} cancer risk, and for noncarcinogens the NMSSLs correlate to a ratio or HQ of 1. The cancer-based EPA RSLs as surrogates were multiplied by 10 to adjust them to a cancer risk level of $1x10^{-5}$, consistent with the NMSSLs. Any detected organic analytes that exceeded the NMSSLs were considered COPCs. Any inorganic analytes that exceeded both background and the NMSSL were also considered COPCs. For this risk assessment, the highest concentration found, regardless of the method used, was used as the basis of the EPC in the screening-level assessment. This is considered conservative for the evaluation of potential risks.

The exposure interval for industrial workers is 0–1 ft bgs and for hypothetical future residents and construction workers the exposure interval is 0–10 ft bgs. Since all data fall within the 0–1 ft depth interval, the available Fall 2018/2021 data set was used for all receptors.

All inorganics were detected in at least one sample. Antimony and cadmium were only detected in one sample each, and perchlorate was only detected in two samples.

Few organics were detected. These are the energetics amino-2,6-dinitrotoluene[4-], cyclotetramethylene-tetranitramine (HMX), cyclotrimethylene-trinitramine (RDX), 1,3,5-triamino-2,4,6-trinitrobenzene (TATB), and 2,4,6-trinitrotoluene (TNT). The polynuclear aromatic hydrocarbon (PAH) anthracene, and the volatile organic compound (VOC) toluene were also detected. Dioxin/furans were frequently detected..

2.3.2. Comparison to Background

The maximum detected result was used as the initial EPC and compared to background (Table 2-2). Background values for the site are from the 1998 background report (LANL 1998). The maximum concentration of the following inorganics exceeded BVs:

- Antimony
- Barium
- Cobalt
- Copper
- Lead
- Nickel
- Silver
- Zinc

Gehan's two sample hypothesis tests were performed on these inorganics with ProUCL (EPA 2022. Gehan's test was considered appropriate due to differing detection limits between samples of several analytes. The ProUCL output is presented in Attachment A.

Barium was statistically significantly higher in the site samples than in the all horizon soils (ALLH) background dataset (LANL 1998). Hypothesis testing indicates antimony was below background, but with only one detection in the data from the OB Unit, the results are not considered robust and antimony was retained for further evaluation. There were no BVs for perchlorate, and so it was retained.

There were no ALLH data for silver in the background data set (LANL 1998), and so the tuff and sediment background values were applied for statistical analysis. Silver was only detected in one background tuff sample and two sediment samples. Silver maxima was higher in the OB Unit data than background, and it was often detected in site data, therefore suggesting that the OB Unit differed from background regardless of significance values. Silver was higher by hypothesis testing and by comparison of the BV to the maximum value and is retained. Cobalt, copper, lead, nickel, and zinc were not retained because they were not statistically different from the background data set. The following inorganics are retained for further evaluation:

- Antimony
- Barium
- Perchlorate
- Silver

2.3.3. Comparison of Maximum EPCs to NMSSLs

None of the inorganics exceeded the residential, general worker, or construction worker NMSSLs (NMED 2022b). There was therefore no elevated cancer risk or noncancer hazard indicated for the OB Unit for any inorganic.

All reporting limits were adequate when compared to risk-based NMSSLs for nondetected inorganics or organics with the exception of nitrosodimethylamine[N-] (Table 2-3), as determined by cancer risks and HQs less than the targets of $1x10^{-5}$ and 1, respectively.

There were few organics detected in any samples. The following organics were detected in one or more samples:

- 4-Amino-2,6-dinitrotoluene[4-]
- Anthracene
- Cyclotetramethylene-tetranitramine (HMX)
- Dioxin/furan congeners
- Cyclotrimethylene-trinitramine (RDX)
- 1,3,5-Triamino-2,4,6-trinitrobenzene (TATB)
- Toluene
- 2,4,6-Trinitrotoluene[2,4,6-] (TNT)

Four of these constituents are energetics or explosives (i.e., HMX, RDX, TNT, and TATB). The analyte 4-amino-2,6-dinitrotoluene is a degradation product of TNT. None of these detected organics exceeded the human health SLs for residential, commercial/industrial workers, or construction workers (Table 2-4).

The cumulative cancer risk (CCR) for the evaluation of maximum detected soil concentrations for cancer-based health effects was less than $1x10^{-5}$ even when the dioxin/furan CRs (Section 2.3.5) were included. The HI did not exceed 1 for hypothetical future residents, industrial workers, or construction workers. Therefore, additional evaluation is not required.

2.3.4. Lead

Maximum lead concentrations exceeded BVs. Hypothesis testing indicated that lead at the OB Unit was less than background. Lead was not evaluated further.

2.3.5. Dioxin/Furans

The dioxin/furans are organics but are evaluated in the analysis differently than other organics. One or more dioxin/furan congeners were detected in several surface soil samples (Table 2-5). The detection status is indicated by a zero for nondetect, and a 1 for a detected value.

The evaluation of the dioxin/furans is summarized in Table 2-6. The measured detected concentration or the MDL for nondetects for each congener in each sample (Table 2-5) is multiplied by the toxicity equivalency factor (TEF) (Table 2-6) to produce the toxicity equivalency concentration (TECi) (Table 2-6). Summing the TECi yields the toxicity equivalent quotient (TEQ). Dividing the maximum TEQ by the residential or industrial NMSSL for TCDD produces a CR (once the quotient is multiplied by $1x10^{-5}$) or HQ. The maximum TEQ and the associated maximum CR and maximum HQ for the TCDD TEQ are shown in Table 2-4 with other maximum EPCs. The CR

and HQ for the TCDD TEQ were less than target levels of $1x10^{-5}$ or 1, respectively. Therefore, the dioxins and furans do not exceed risk-based SLs, and no further evaluation is required.

2.3.6. Migration to Groundwater

The maximum concentrations were compared to the groundwater protection (MTGW) SLs (NMED 2022a,b) (Table 2-7). Maximum concentrations of three detected organics (amino-2,6-dinitrotoluene[4], RDX, and 2,4,6-TNT) and two inorganics greater than background (barium and silver), exceeded the MTGW SLs. There are some reporting limits that exceed MTGW values.

Refined EPCs using UCLs were calculated for each analyte for which the maximum exceeded the MTGW NMSSL per guidance in NMED (2022a) Section 1.3. The ProUCL output is reported in Appendix A. Median values were used as the EPC for organics because detection frequency for the organics was too few to calculate a UCL95 (Table 2-7). The median values of two detected organics exceeded the MTGW SL-SSLs. Because detection frequency is so low (1 or 2 detections in 17 samples), it is unlikely that groundwater would be impacted by these organics.

As required by 40 CFR §264.601(a), the OB Unit is operated in a manner that prevents releases that might have adverse effects to human health or the environment caused by migration of waste constituents through the vadose zone to groundwater. The OB Unit is located in the southwestern portion of LANL in a semiarid, temperate, mountain-climate setting. The TA-16 Burn Ground, where the OB Unit is located, is situated on a mesa top within TA-16. A hydrologic conceptual model for TA-16, including the area of the TA-16 Burning Ground, is presented in the TA-16 Well Network Evaluation and Recommendations (LANL 2012b). That document ranks different sources at TA-16 by their potential to impact groundwater. High- and moderate-ranking sources were characterized by significant hydrologic drivers, i.e., either large outfall volumes released to canyons or ponds located on mesa tops. Sources were also characterized in terms of the release of large inventories or high contaminant concentrations. Both of these conditions are necessary to consider an area to have a high or moderate impact to groundwater. The TA-16 Burn Ground area was ranked as a low-priority source for its potential to impact groundwater because it lacks both a large contaminant inventory and a large volume of water to provide a hydrologic driving force for contaminant infiltration.

From 1981 to 2010, the average annual precipitation in Los Alamos County was 18.97 inches and the average annual snowfall was 57.5 inches (LANL 2012a). The evaporation rate of freestanding water exceeds the average annual precipitation. Infiltration is limited and generally occurs in canyons or on mesas at sites that release large volumes of water (LANL 2012b). Wells showing the highest contaminant concentrations are downgradient of higher priority TA-16 sources. However, those wells are located along infiltration pathways that are not downgradient of the OB Unit. Furthermore, the only aquifer in the Los Alamos area capable of municipal and industrial water supply is the regional aquifer. The regional water table is approximately 1,200 ft. below the TA-16 Burn Ground. This aquifer occurs primarily within the volcaniclastic alluvial sediments of the Puye Formation.

Given that there is no human health risk due to direct contact exposure pathways, that groundwater is very deep, and that groundwater is unlikely to be physically affected by leaching or percolation, contaminants in soil are not considered a potential threat to groundwater.

2.3.7. Data Analysis Conclusions

The initial risk analysis for all inorganic and organic analytes was based on comparison of the maximum detected value as the EPC. There are no individual constituents that exceed NMED residential, commercial/industrial, or construction worker NMSSLs. The CCR does not exceed $1x10^{-5}$ for any receptor, and the HI for all receptors was less than 1. Calculation and application of refined EPCs and evaluation of other lines of evidence indicated that there are no likely impacts to groundwater. The screening evaluation concludes that hypothetical future residents, general workers, or construction workers are not at risk due to exposure to soils at the Unit, and that groundwater is not likely to be affected.

2.4. UNCERTAINTY ANALYSIS

The human health risk assessment has inherent uncertainties associated with data, the analysis process, exposure assessment, and the toxicity values on which the SLs are based. Each or all of these uncertainties may affect the assessment results, biasing the risk assessment results high or low. These uncertainties are discussed in more detail in the following sections.

2.4.1. Data and Data Analysis

Uncertainties in the data and/or its analysis may include errors in sampling, laboratory processing, analysis, and or data evaluation. Data evaluation uncertainties are expected to have little effect on the assessment results because the data have undergone validation to minimize errors, and any errors are not expected to bias the results high or low. The J-flagged (estimated) qualification of detected concentrations of some organic COPCs does not affect the assessment. The data represent deposition from more than 60 years of operations in the area and the OB Unit from 1998 into 2021. Therefore, the data and subsequently the screening assessment results represent current baseline conditions.

The use of a judgmental sampling design biases the risk results high since samples were targeted to locations where contamination was most likely to occur or known to occur from past sampling events. Excavated samples were removed from the risk assessment data set.

The use of the maximum or a UCL95 as the COPC EPC for each COPC is also expected to bias risk estimates high, erring towards being conservative. Use of the maximum as the EPC overestimates exposure, as by definition all other concentrations are below this value. Use of the UCL95 may also result in an overestimation of risk since by definition true mean values are nearly always going to be less than this value. It is unlikely risk results are biased low due to sample collection or data analysis.

2.4.2. Exposure Assessment

The exposure assessment assumptions bias the risk results high (i.e., overestimate risk). Assumptions for the Industrial SLs assume that a potentially exposed individual is a LANL worker who is outside at the site for eight hours/day (h/d) for 225 days/year (d/yr) (NMED 2022a), and who spends the entire time on-site within the contaminated area. Assumptions for the residential SLs are that the potentially exposed individual is a resident who is present 24 h/d for 350 d/yr (NMED 2022a) and spends the entire time on-site within the contaminated area. Because it is unlikely the worker or resident would be within the OB Unit contaminated area for the entire time, the resultant screening assessments overestimate the exposure. As a result, risks may be overestimated or biased high.

Assumptions underlying the exposure parameters, routes of exposure, and intake rates for routes of exposure are consistent with NMED parameters and default values (NMED 2022a). In the absence of site-specific data, several upper-bound values for the assumptions may be combined to estimate exposure for any one pathway, and the resulting risk estimate can exceed the 99th percentile. Therefore, uncertainties in the assumptions underlying the exposure pathways may contribute to risk assessments that overestimate the reasonably expected risk levels.

2.4.3. Toxicity Values

The primary uncertainty associated with the screening values is related to the derivation of toxicity values used in their calculation. Toxicity values (i.e., slope factors [SFs] and reference doses [RfDs]) are used to derive the risk-based screening values used in the screening evaluation (NMED 2022a,b). Uncertainties were identified in four areas with respect to the toxicity values: (1) extrapolation from animals to humans, (2) variability between individuals in the human population, (3) the derivation of RfDs and SFs, and (4) the chemical form of the COPC.

The SFs and RfDs are often determined by extrapolation from animal data to humans, which may result in uncertainties in toxicity values because of differences that exist between animals and humans in chemical absorption, metabolism, excretion, and toxic responses. Differences in body weight, surface area, and pharmacokinetic relationships between animals and humans are taken into account to address these uncertainties in the dose-response relationship. However, conservatism is usually incorporated in development of the SFs and RfDs from the underlying toxicological studies, potentially biasing the estimate high and resulting in the overestimation of potential risk.

For noncarcinogenic effects, the degree of variability in human physical characteristics is important both in determining the risks that can be expected at low exposures and in defining the no observed adverse effect level (NOAEL). An uncertainty factor of 10 is applied to RfDs by EPA (EPA 2022) to reflect individual variability within the human population that can contribute to uncertainty in the risk assessment. This factor of 10 is generally considered to result in a conservative estimate of risk for noncarcinogenic COPCs.

The RfDs and SFs for various chemicals are derived from experiments conducted by different laboratories that may have varying accuracy and precision that could lead to an over- or under-estimation of risk. The uncertainty associated with an RfD is measured by the magnitude of the uncertainty factors, the modifying factor, and the confidence level. For carcinogens, the weight of evidence classification indicates the likelihood that a contaminant is a human carcinogen.

An additional assumption that introduces uncertainty into the risk assessment is that the RfD or SF derived from laboratory animal studies or human health occupational epidemiology studies adequately and accurately represents environmental exposure. Bioavailability from environmental media may not be the same for a given COPC as bioavailability in a laboratory study or occupational exposure. For example, COPCs may be bound to the environmental matrix and not be available for absorption into the human body following ingestion. However, for most COPCs the exposure scenarios typically default to the assumption that the COPCs are fully bioavailable. This assumption can lead to an overestimation of the total exposure and overestimate risk.

2.4.4. Additive Approach

For noncarcinogens, the effects of exposure to multiple chemicals are generally unknown and possible interactions could be synergistic or antagonistic, resulting in either an underestimation or overestimation of the potential risk by assuming additivity. Additionally, RfDs used in the risk calculations typically are not based on the same endpoints with respect to severity, effects, or target organs. Therefore, the potential for noncarcinogenic effects may be overestimated by the HI considering individual COPCs act by different mechanisms and on different target organs but are addressed additively. Cancer risks are typically assumed to be additive.

2.5. CONCLUSIONS

Inorganics were compared to BVs and those that exceeded BVs were evaluated with statistical hypothesis tests relative to the background dataset for LANL. Concentrations for four inorganics exceeded background or had no background value; however, none of the inorganics above background exceeded risk-based NMSSLs.

The few organics that were detected were compared to risk-based SLs. For all of the detected analytes, maximum concentrations were below NMSSLs. The cancer risks and CCR were below the target levels of $1x10^{-5}$. HQs and HIs for each receptor were less than 1. None of the TEQs for dioxin/furans exceeded the TCDD SL. The following interpretation can be made from the analysis:

- For the residential scenario, for those inorganics above background and detected organics, the CCR and the noncancer HI ($4x10^{-6}$ and 1) do not exceed the NMED target level of a CCR of $1x10^{-5}$ or HI above 1, respectively.

- Based on an industrial scenario, for those inorganics above background and detected organics, the CCR ($7x10^{-7}$) and noncancer HI (0.07) are less than the NMED target level of $1x10^{-5}$ or 1, respectively.
- Based on a construction worker scenario, for inorganics above background and detected organics, the CCR ($9x10^{-8}$) and noncancer HI (1) did not exceed the NMED target level of $1x10^{-5}$ or 1, respectively.
- The maximum lead concentration of 26.7 mg/kg at the OB Unit is just slightly above the background value of 22.3 mg/kg but not statistically different from background based on hypothesis tests and is much less than the residential NMSSL (400 mg/kg).
- There are no elevated human health risks for exposure to soils based on this evaluation.

3. ECOLOGICAL SCREENING ASSESSMENT

The ecological risk-screening assessments (ERA) for the OB Unit is presented in the following sections.

3.1. INTRODUCTION

The ERA identifies chemicals of potential ecological concern (COPECs) and is based on the comparison of EPCs with Ecological Screening Levels (ESLs) in accordance with Laboratory guidance (LANL 2012a) and NMED (2017) guidance. The initial ESLs were the no effect (NE) and low effect (LE) ESLs in the 2022 LANL EcoRisk 4.3 database (LANL 2022) for each of the analytes. Site information including ESLs, biological studies, and historical information were reviewed and a site visit was conducted. The OB Unit and surrounding habitat are shown in Figure 3-1. A preliminary conceptual site exposure model (CSEM) was prepared (Figure 3-2).

The ESLs obtained from the ECORISK Database, Version 4.3 (LANL 2022) for detected chemicals and inorganics above background, are presented in Table 3-1. The ESLs are based on toxicity data for laboratory species similar to those expected to occur at the site, and are derived from experimentally determined NOAELs, lowest observed adverse effect levels (LOAELs), or doses determined to be lethal to 50% of the test population (LD50s). Information relevant to the calculation of ESLs, including concentration equations, dose equations, bioconcentration factors, transfer factors, and toxicity reference values, are presented in the ECORISK Database, Versions 2.0, 3.1, 4.1, 4.2, and 4.3 (LANL 2003; LANL 2012d; LANL 2017; LANL 2019; LANL 2020; LANL 2022).

The ecological risk analysis begins with a comparison of the NE ESLs for each receptor to the maximum concentration as the EPC. The maximum EPCs are divided by the NE ESLs to obtain a HQ calculated for each analyte. As a generalization, the higher the contaminant levels relative to the ESLs, the higher the potential risk to receptors. Conversely, the higher the ESLs relative to the contaminant levels, the lower the potential risk to receptors. HQs greater than 0.1 are used to identify COPECs requiring additional evaluation

Individual HQs for a receptor are summed to derive a HI; an HI greater than one is an indication that further assessment is needed to ensure exposure to multiple COPECs at a site will not lead to potential adverse impacts to a given receptor population. The HQ and HI analysis is a conservative indication of potential adverse effects and is designed to minimize the potential of overlooking possible COPECs at the site.

3.2. PROBLEM FORMULATION AND CONCEPTUAL SITE EXPOSURE MODEL

Due to the site history, there is the potential for energetic compounds or their breakdown products to be present in surface soils where terrestrial animals and plants may contact surface soils and be exposed. The Unit is a terrestrial ecosystem. The area is disturbed with little to no vegetation present. Vegetation increases with distance from the OB area and consists of grasses and shrubs. There are likely terrestrial birds and small mammals including deer mice (*Peromyscus maniculatus*) or ground squirrels using the area, although intermittently due to the lack of food or cover. There is not enough vegetation within the Unit to support large herbivores.

Due to the site history, there is the potential for energetic compounds or their breakdown products to be present in surface soils. Terrestrial animals and plants may contact surface soils and be exposed. This possibility led to the collection of data and ecological risk assessment.

3.2.1. Data Summary

Soil samples used in this analysis were collected in September 2018 and November 2021. Surface soil samples were collected as grab samples (independent, discrete samples) from a depth of 0 - 2 inches below ground surface. Each sample set was analyzed for the following:

- VOCs –12 samples
- SVOCs –12 samples
- Perchlorate – 11 samples
- Total Metals –17 samples
- Dioxins/Furans –17 samples
- High Explosives –17 samples

In addition, some organics were analyzed by more than one method, resulting in an apparently higher sample count (i.e., 2,4 and 2,6 dinitrotoluene, nitrobenzene, dinitrobenzenes). Figure 1-1 shows a map of the site including the current sampling locations from which data were obtained for use in the risk assessment, and habitat is shown in Figure 3-1.

3.2.2. Site Visit Summary

A site visit was conducted in March 2019. The area is disturbed by human activity with buildings, roads, and maintained cleared areas to minimize fire danger. The vicinity in and around the TA-16 Burning Ground is a terrestrial ecosystem. Although the area within the fence is disturbed, approximately 50 to 100 feet away from the concrete burn pad it is vegetated with grasses, shrubs, and trees. Elk tracks were observed nearby outside of the fenced area. There are likely terrestrial birds and small mammals including deer mice or ground squirrels using the area; however, there is not enough vegetation within the fenced area to support birds or mammals.

3.2.3. Receptors and Pathways

Exposure pathways are considered complete if all of the following components are present (US EPA, 1989; NMED, 2017):

- A source and mechanism for hazardous waste/constituent release into the environment;
- An environmental transport medium or mechanism;
- A point of contact directly between the receptor and site-related contaminated media, or indirectly via dietary ingestion of prey or forage items contaminated by contact with site related contaminants; and
- An exposure route leading to interaction of the contaminant with target organs within the receptor.

If any of the above components are missing from the exposure pathway, it is not a complete pathway for the site.

A CSEM was developed for the site (Figure 3-2). The primary contaminant source is the burning of munitions waste at the site. Any uncombusted material, if present, could remain in soil or be released to air as fugitive dust. Materials in surface soil could be carried by overland flow or percolate into the subsurface with rain, whereas material in air could be transported by wind. Receptors could contact contaminants within the immediate site area, up to the site boundary, or slightly beyond.

Ingestion of soil, plants, or animals are all potential exposure routes to ecological receptors. Although inhalation is recognized to occur, it is typically considered insignificant relative to ingestion and only quantified for burrowing animals where volatile organics are present in the subsurface. Respirable dust particles are likely ingested rather than inhaled by ecological receptors, and this pathway is considered negligible (EPA 1997; EPA 2003), while non-respirable dust is ingested and accounted for in incidental soil ingestion values for wildlife species (EPA 1993; EPA 2003). Therefore, the exposure pathways considered in the development of the ESLs used in the risk-screening assessment capture the primary exposure pathways for wildlife receptors.

Terrestrial flora (i.e., plants) and fauna (e.g., invertebrates, birds, and mammals) are the general categories of ecological receptors that could be exposed. The specific receptors and feeding guilds for which risk is quantified are listed in Table 3-1. The primary ecological exposure pathways are based on direct or indirect contact with surface soils. These include root uptake, incidental ingestion of soil, and biotic uptake leading to food-web transport. Exposure of plants and soil invertebrates is not evaluated by dietary pathways but is the result of direct contact with, and uptake from, the surrounding medium. For terrestrial wildlife, most exposure is considered to be through the oral pathway from the diet and incidental soil ingestion (Sample et al. 1998). The dermal contact and inhalation pathways are not typically assessed quantitatively in ecological risk assessments, based on guidance indicating the ingestion route is most important to terrestrial animals (EPA 1997; EPA 2003). Dermal exposure to wildlife is mitigated by the fur or feathers covering the bodies of most vertebrates and the incidental soil consumption during grooming is included in the direct soil ingestion estimates. Due to the lack of its preferred moist or riparian and forested habitat, the montane shrew is not considered an appropriate receptor for evaluation at this area.

3.2.4. Technical Decision Point and Recommendations

Because of the ecological habitat near the site boundaries, and because of the potential for exposure, the data were used to perform a quantitative screening level ecological evaluation.

3.3. ECOLOGICAL SCREENING EVALUATION

The summary statistics for the inorganics and detected analytes were presented in Table 2-1. The comparison to background is reported in Table 2-2. Maximum detected concentrations of each analyte are used as the initial EPC. The ESLs are shown in Table 3-1, and the ESL database is reported in Attachment B. The EPCs and the screening results for ecological receptors are presented in Table 3-2. Any analytes for which the measured maximum detected value exceeded the ESL by 0.1 or more were considered COPECs. Additional evaluation is performed by calculating UCL95s and comparing the UCL95s to the LE ESLs.

3.3.1. Inorganics

There are three inorganic analytes that exceed site background, and there were no background data for perchlorate and it was carried forward for comparison to NE ESLs. Most of these inorganics also result in an HQ >0.1 for one or more ecological receptors when the maximum EPC is divided by the NE ESL. The detected analytes that had maximum concentrations that exceeded background were compared to the NE ESLs and the results are as follows (Table 3-2):

- Antimony –HQ for NE ESL>0.1
- Barium – exceeds NE ESLs resulting in HQs>0.1
- Perchlorate – all HQs are less than 0.1
- Silver– exceeds NE resulting in HQs>0.1

UCL95s were calculated with the USEPA ProUCL 5.2 software (EPA 2022). Table 3-3 provides the UCL95s and supporting information, and the ProUCL output is found in Attachment A. The refined EPC based on the UCL95 was then compared to the SLs (Table 3-4) consistent with the NMED (2017) Tier II approach. Note that

comparison to the UCL95s was made prior to incorporating area use factors (AUFs) or population area use factors (PAUFs) into the analysis. Receptor-specific dietary composition is built into the receptor-specific ESLs.

UCL95 values for barium and silver exceeded the LE ESL with HQs above 0.1 for some receptors (Table 3-4). The maximum value of these constituents was detected in the sample collected at grid point 9 (WST16-18-163008) (Figure 1-1).

The analysis suggests some extremely limited potential for adverse ecological effects at OB Unit, and therefore the COPECs for which the UCL95s exceeded the LE ESLs were evaluated in more detail by looking further at supporting lines of evidence as follows:

- The minimum silver ESL is based on potential toxicity to an American robin modeled as an insectivore.
  - Only two out of 17 samples had silver concentrations above both the BV and the NE ESL for the robin. These were WST16-18-163008 and WST16-18-163009 (grid points 9 and 10)
  - Only one sample had silver concentrations above the BV and the LE ESL for the robin modeled as an insectivore and omnivore. This was WST16-18-163008 (grid point 9).
  - Silver is not elevated in bird eggs from TA-16 (LANL 2018a). Egg concentrations are discussed further in Section 3.4.5.
  - This suggests that due to the limited areal extent of elevated silver concentrations that silver does not present an ecological risk.
- The minimum barium ESLs are based on potential toxicity to plants:
  - The NE ESL for plants of 110 mg/kg is well below site background of 295 mg/kg.
  - No toxicity to plants was noted in the field visit (i.e., chlorosis, dead plants).
  - Vegetation is controlled by removal for fire danger around the site, therefore plant receptors are not present within or near the fenced area much of the time.
  - All of the samples exceeded the barium NE ESL for plants, and 10 out of 17 (1, 2, 6, 8, 9, 10, 12, WST16-22-238006, WST16-22-238008, and WST16-22-238009 on Figure 1-1) exceeded the barium LE ESL of 260 mg/kg. These same samples also exceeded the BV of 295 mg/kg, with the exception of WST16-22-238008.
  - For only two samples (sample grid points 9 and 10 on Figure 1-1) was the LE ESL HQ greater than 10 for plants.
  - The barium UCL95 concentration for the TA-16 388 data is 1065 milligrams per kilogram (1065 mg/kg). Sources of toxicity information for plants suggest that it takes concentrations of barium in soils of 2000 mg/kg to cause toxicity (Chaudhry et al. 1977). Chaudhry et al. (1977) found that yield depressions occurred at 2,000 mg/kg and higher barium in soil. At only one sample location (grid point 9, concentration 4060 mg/kg) was the concentration greater than 2000 mg/kg. The next highest concentration was 1550 mg/kg.
  - The data were compared first to site background values, which for barium is 295 mg/kg. However, EPA (2005) indicates barium background concentrations in the Western US range from about 350 mg/kg to about 1100 mg/kg. Only two samples had concentrations higher than 1100 mg/kg. Thus, nine out of 17 samples exceed site-specific background, and only two of 17 exceed the upper bound of background for

the Western US. All samples above Western U.S. background fall within the fenced area (grid point samples 9 and 10).

- All samples with concentrations above 1000 mg/kg (samples 6, 8, 9, and 10) are within the fenced area where vegetation is controlled for fire suppression. The remaining samples with concentrations above site background were not even two times higher than background.

- This analysis suggests that there may be limited toxicity to plant populations at the site due to barium concentrations in surface soils; however, it appears unlikely and very localized to areas where plants as a receptor are removed for fire suppression.

3.3.2. Dioxin and Furans

Dioxin and furans were detected in multiple samples in the Fall 2018/2021 data set. The TEFs (Table 3-5) for birds and mammals were applied to calculate a TEQ for mammals (Table 3-6) and birds (Table 3-7) for each sample. The HQs for the maximum TEQ are shown in Table 3-2. There are no ESLs for birds in the current ESL database (LANL 2022). The HQs based on NE ESLs exceed the target value of 0.1 for some receptors. Note that dioxins and furans were not detected above the sample quantitation limits in small mammal tissue samples (Fresquez et al. 2013), discussed further in Section 3.4.4.

Both the detected and nondetected data were used to obtain the TECi for each congener which were summed to obtain TEQs for each sample (Tables 3-6 and 3-7). A UCL95 TEQ based on the sample-specific data was calculated with ProUCL (EPA 2022) from the TEQs for each sample. The refined EPC HQs based on the LE ESL are above 0.1 for small mammalian omnivores. There are no avian NE or LE ESLs for comparison. The refined EPC for the dioxin/furans exceeded the LE ESL for deer mouse, but no other receptors (Table 3-4).

3.3.3. Other Organics

For this risk assessment, the highest concentration found, regardless of the method used, or whether the sample was a primary sample or a duplicate, was used as the basis of the EPC in the initial screening-level assessment. This is considered conservative for the evaluation of potential risks.

Organic analytes are not compared to any background values, although there are naturally occurring sources of organic constituents. Organics are compared to risk-based ESLs. Where an ESL was not available, a suitable surrogate is proposed (Section 2.2.4). Surrogates were applied for the following analytes:

- TATB - ESLs for 1,3,5-trinitrobenzene were used as a surrogate because of structural similarity.

HQs greater than 0.1 were observed for TNT for the robin modeled as an herbivore and omnivore, and TATB for earthworms, based on comparison of the maximum value to the NE ESL. The highest HQ for these organics was 0.7. The HQs for comparison of the refined EPC to the LE ESL did not exceed 0.1.

The results of the screening evaluation for ecological receptors indicated that no detected VOCs or SVOCs exceeded any of the NE ESLs (Table 3-2). HIs were above 0.1 for all receptors for comparison to NE ESLs (Table 3-2). HIs were above 0.1 for all receptors except the avian and mammalian top carnivores and cottontail for comparison to the LE ESLs (Table 3-4). The explosives, SVOCs, and VOCs were minor contributors to the HIs.

3.4. UNCERTAINTY ANALYSIS

3.4.1. Chemical Form

Inorganic analytes can speciate into different forms with varying degrees of toxicity. The assumptions used in the ESL derivations are conservative and not necessarily representative of actual conditions. These assumptions

include maximum chemical bioavailability, maximum receptor ingestion rates, minimum bodyweight, and additive effects of multiple COPECs. These factors tend to result in conservative ESL estimates, which may lead to an overestimation of the potential risk. Toxicological data are typically based on the most toxic and bioavailable chemical species, which may or may not be typically found in the environment. The ESLs were calculated to ensure a conservative indication of potential risk (LANL 2012c), and the values are biased toward overestimating the potential risk to receptors.

The chemical form of the individual COPECs was not determined as part of the investigation.

3.4.2. Exposure and Risk Estimates

Exposure parameters including the EPC and the intakes are likely to bias risk estimates high since they presume no movement by receptors in and out of source areas. Sampling focused on areas of known or expected contamination which biases the EPC high. Receptors are assumed to spend 100% of their time in the contaminated area, resulting in conservative estimates of exposure. In addition, COPECs may not be 100% bioavailable to receptors in the natural environment because of interference from other natural processes, such as the adsorption of chemical constituents to matrix surfaces (e.g., soil) or rapid oxidation or reduction changes that render harmful chemical forms unavailable to biotic processes.

Another source of uncertainty is inherent in the calculation of exposure and risk estimates. Although the toxicity values are expressed to more than one significant figure, it is unlikely that the toxicity data are this accurate, especially given that the data are extrapolated from laboratory animal studies to wildlife receptors that are mobile in the environment. Likewise, given all the variables inherent in assessing exposure, exposure intakes by ecological receptors also should not be considered more accurate than one significant figure. This means that an HQ identified as 0.8 or 1.2 is actually 1, and an HQ identified as 1.5 is actually 2.

3.4.3. Mixture Toxicity

The assumption of additive effects for multiple COPECs may result in an over- or under-estimation of the potential risk to receptors. Exposure to multiple contaminants may result in other than additive effects.

3.4.4. Small-Mammal Field Investigations

Small mammal trapping and analysis of whole organisms were conducted in the area around the OB Unit in 2011 and 2012. This information was considered useful for the current analysis as an additional line of evidence. Field mice and voles were collected around the open-burn site and analyzed for dioxins and furans as well as metals in 2011, and high explosives and perchlorate in 2012. Small-mammal community and population parameters were also measured across the site in 2012 (Fresquez et al. 2013).

Of the analytes that exceeded SLs, historically only barium and nickel were detected in whole body samples above the regional statistical reference levels (RSRLs), which are the upper bounds of concentrations (mean plus three standard deviations) calculated from field mice collected at regional locations away from the influence of the Laboratory (over 9 miles away) (Fresquez 2009 and 2011). The nickel concentrations were slightly above the RSRLs, while barium concentrations were 3 to 4 times the RSRL, in small mammals from OB Unit. No high explosives were detected in any of the animals collected, and perchlorate concentrations were 1 or 2 orders of magnitude below the RSRL.

Dioxin and furan congeners were not detected above the sample quantitation limit in any of the whole-body samples analyzed. Eight congeners were detected in one deer mouse sample; one congener was detected in one long-tailed vole sample, and no congeners were detected in the other four small mammals (three voles and one deer mouse) (Fresquez et al. 2013). Concentrations in whole body samples were well below those concentrations detected in the soil, and biological samples had fewer congeners detected than in 40% of the soil samples. The

dioxin and furan data are similar to other dioxin/furan field-mouse uptake studies nationally (Krouskop et al. 1991).

The data indicate dioxins and furans at the concentrations found in soil under natural field conditions are not significantly assimilated, either by ingestion and/or by surface contact, by field mice/voles possibly because of the adsorption of the chemical to soil surfaces or because of oxidation/reduction changes. In addition, the samples analyzed included the pelt and carcass so it is not clear whether the congeners detected represent uptake or adherence of soil particles to the pelt. Also, no adverse effect of burning ground operations was found on local small mammal populations based on species richness, capture rate, species diversity, sex ratios, and adult body weights (Fresquez et al. 2013).

The presence of dioxins and furans in soil does not necessarily equate to elevated exposure and risk to receptors even though HQs are above 1. Dioxins and furans are relatively unavailable for uptake by plants and animals because these compounds are tightly bound to soil particles, are immobile, and insoluble (Umbreit et al. 1986). EPA reported that the relative bioavailability of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofuran congeners in soil is less than 100% as compared with a lipid or organic solvent vehicle as the reference material (EPA 2010a). Abiotic constituents, compound aging, and other associated soil factors may influence soil bioavailability (e.g., bioavailability appears to decrease with aging based on comparisons of laboratory spiked soil and soil contaminated in situ [Umbreit et al. 1986]). This relationship is supported by the lack of uptake and impacts to biota around LANL and within TA-16 where dioxin and furan congeners have been detected.

The difference between the toxicity predicted by the ESLs and the lack of adverse effects may be related to the low bioavailability of dioxins and furans in soil, spatially limited contamination, or it may suggest that the ESLs or risk assumptions are overly conservative. Because small mammal populations do not appear impacted, and because the LE ESL is only exceeded by soil samples identified as statistical outliers, risks to ecological receptors due to exposure to dioxins/furans are likely to be minimal.

3.4.5. Avian Studies

Avian surveys were conducted at the TA-16 Burn Ground from 2010 to 2017. Data from May to July 2014 indicated that avian abundance and diversity was greater at TA-16 than at control sites (Hathcock 2014). Data from 2017 indicated that operations were not negatively affecting local bird populations. Species richness and diversity were not different than controls (Hathcock et al. 2018). At TA-16, 17 nests were found of which 13 successfully fledged young, and some nest boxes had double clutches (Hathcock et al. 2018). There was an occupancy rate of 100% with a 76% success rate.

In 2017, nonviable avian eggs and tissue samples from nestlings that died before fledging were opportunistically collected at Los Alamos National Laboratory near open detonation sites near the TA-16 Burning Grounds and were evaluated for metals and other inorganics (LANL 2018a). Western bluebird (*Sialia mexicana*) and ash-throated flycatcher (*Myiarchus cinerascens*) egg samples were collected. Dioxin/furan congeners were detected in one nestling from TA-16 (Hathcock et al. 2018; Gaukler and Stanek 2020).

Most inorganics were not detected in eggs (LANL 2018a). Analyte concentrations in eggs were compared with the upper-level bounds of background concentrations (mean + three standard deviations = 99% confidence interval) known as the RSRL. The COPECs identified in this risk assessment for which the UCL95s for soils exceeded BVs and the NE ESLs were all below the RSRL in eggs with the exception of barium (Gaukler and Stanek 2020), suggesting inorganics will not adversely affect breeding bird populations:

- Barium – maximum and UCL95 in soil exceed NE and LE ESLs with HQs>0.1; egg>RSRL
- Silver– maximum and UCL95 in soil exceed NE and LE ESLs with HQs>0.1; egg<RSRL

The maximum TCDD TEQ in soil exceeds NE ESL for birds for dioxin/furans. There are no ESLs for avian species. In addition, nestling tissue exceeds the RSRL for background concentrations in tissue. However, the TEQ was less than the LOAEL for toxicity (Gaukler and Stanek 2020), and the dioxin/furan concentrations are spatially limited. This suggests that dioxin/furans will not have adverse effects on avian reproduction.

3.4.6. COPECs without ESLs

Several chemicals do not have ESLs for any receptor in release 4.3 of the ECORISK Database (LANL 2022). In the absence of a chemical-specific ESL, concentrations can be compared with the ESLs for a surrogate chemical. Comparison to surrogate ESLs provides an estimate of potential effects of a chemically related compound and a line of evidence to indicate the likelihood that ecological receptors are potentially impacted. Some chemicals without ESLs do not have chemical-specific toxicity data or surrogate chemicals to be used in the screening assessments and cannot be assessed quantitatively for potential ecological risk.

These chemicals are often infrequently detected across the site. In these cases, comparisons with human health NMSSLs are presented as part of a qualitative assessment. The comparison of concentrations to human health NMSSLs is a viable alternative for several reasons. Animal studies are used to infer effects on humans and are the basic premise of modern toxicology (EPA 1989). In addition, toxicity values derived for the calculation of human health NMSSLs are often based on potential effects that are more sensitive than the ones used to derive ESLs (e.g., cellular effects for humans versus survival or reproductive effects for terrestrial animals). EPA also applies uncertainty factors or modifying factors to ensure the toxicity values are protective (i.e., they are adjusted by uncertainty factors to values much lower than the study results). Concentrations compared with these values are frequently an order of magnitude or more below the NMSSLs, which corresponds to uncertainty factors of 10 or more. Therefore, it is assumed the differences in toxicity would not be more than an order of magnitude for any given chemical. The relative difference between values provides a weight of evidence that the potential toxicity of the chemical is likely to be low or very low to the receptor(s). Since there were no predicted adverse effects on human health, chemicals lacking ESLs are unlikely to pose an ecological risk.

There are no avian ESLs for TCDD in the current (2022) LANL EcoRisk 4.3 database. There were no adverse effects noted in population studies of avian species, and therefore the lack of ESLs is not considered to limit the ability to assess risk to birds due to exposure to dioxin/furans.

3.4.7. Area Use Factors (AUFs) and Population Area Use Factors (PAUFs)

The OB Unit is a small unit. The areal extent of the OB Unit is 0.2 acres within the fenceline, and only 1.18 acres (ac) or 0.478 hectares (ha) for the entire sampled area. This is about the size of the home range of an individual robin or a deer mouse (LANL 2018b). The home range (HR) is used to calculate AUFs that are used in the EcoPRG equations (LANL 2018b). Individual AUFs and population area use factors (PAUFs) may be used to modify the estimate of risk to wildlife receptors to allow estimates to be more site-specific. The application of AUFs or PAUFs reduces potential overestimation of risks for those receptors with HRs larger than the area of contamination being evaluated. The estimated ecological risk as indicated by the HQ or HI is multiplied AUF or PAUF. HQs for plants or invertebrates are not adjusted by area use.

Table 3-8 presents the NE area use hazard analysis. The NE ESLs for each receptor for each detected organic and inorganic above background are shown. The site specific AUF and PAUFs are shown for an area equivalent to the fenced area of OB Unit and the additional sampled area outside the fenceline. The UCL95 EPC (Table 3-3) is divided by the ESL and multiplied by the PAUF to obtain revised HQs. The habitat is not suitable for Mexican Spotted Owls or other special status species, and so an AUF evaluation was not conducted. HQs were greater than 1 for plants and invertebrates, which are taxa for which the PAUF does not affect the HQ or HI since they are not mobile in the ecosystem.

Table 3-9 presents the area use hazard analysis based on LE ESLs. The HQ for plants based on the LE ESL is greater than 1 due to exposure to barium. HQs for all other receptors are less than 1.

It is appropriate to use the PAUFs for mobile receptors in order to spatially average overall exposure and obtain a more realistic estimate of potential ecological risk. Barium exceeds background as well as the LE ESL for plants at samples 6, 8, 9, 10 (all within the fenced area) by more than a factor of 2 (Figure 1-1). Barium exceeds background at sample 12 by a factor of 2, and also exceeds the LE ESL there as well. The remainder of the samples had no elevated barium, indicating limited site-related barium contamination outside of the fenced area.

3.5. CONCLUSIONS

For the Fall 2018/2021 sampling data, antimony, barium, and silver were the only inorganics for which the maximum exceeded both background and the NE ESL resulting in HQs above 0.1 for one or more receptors. Barium and silver are the only inorganics for which the UCL95 exceeded the LE ESL with HQs above 0.1. There are HQs above 0.1 based on the LE ESL for robin, deer mouse, earthworm, and plants. Barium, silver, and the dioxin/furans are the COPECs.

Only one sample exceeded the silver minimum LE ESSL, suggesting that any silver contamination is spatially limited and unlikely to have any individual or population-level effects on ecological receptors. The minimum silver ESL is based on the exposure parameters for the American robin.

A hazard analysis incorporating spatial exposure considerations and the NE ESL indicated plants and earthworms were the only receptors potentially at risk at the OB Unit. This was due to barium. A hazard analysis incorporating spatial exposure considerations and the LE ESL indicated only plants were likely at risk at the OB Unit. This was due to barium. Plant habitat is managed within the OB Unit to decrease fire danger, and so within the immediate area plants are not current receptors. Therefore, there is no likely ecological risk at the OB Unit.

Metal COPECs were elevated primarily in one individual sample, WST16-18-163008 (grid point 9). Silver was 85.7 mg/kg in this sample and less than 1 mg/kg in all others. The barium concentrations in the sample from grid point 9 (4060 mg/kg) are producing the majority of the excess potential barium risk, although other samples also exceed the LE ESL for plants. No effects on plants were noted in a site visit, and vegetation is removed and controlled for prevention of fire danger, thereby eliminating plants as a receptor within the fenceline. The barium HQ for the refined EPC for plants was 4, and this was the major contributor to the HI of 4 for plants.

Because of the limited number of COPECs and the low magnitude of estimated HQs and HIs, it is recommended that a baseline risk assessment not be prepared. Small mammal and avian population studies have been performed and evaluated for this report and the data indicate that there are no obvious adverse effects. The ESLs are conservative, and both maximum and UCL95 EPCs were used in comparison to ESLs, and further analysis of the data would not reduce uncertainty or modify predicted ecological risk to any significant extent. The only potential receptor at risk is the plant community, which is managed in the OB Unit to mitigate fire danger and therefore should not be considered a reasonably expected receptor.

4. REFERENCES

Chaudhry, F., Wallace, A., and R.T. Mueller. 1977. *Communications in Soil Science and Plant Analysis*. Vol 8:795-797. (Chaudhry et al. 1977).

EPA (U.S. Environmental Protection Agency), December 1989. *"Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A), Interim Final*," EPA/540/1-89/002, Office of Emergency and Remedial Response, Washington, D.C. (EPA 1989)

EPA (U.S. Environmental Protection Agency), 1993. "*Wildlife Exposure Factors Handbook,*" U.S. Environmental Protection Agency document EPA/600/P93/187A, Office of Research and Development, Washington, D.C. (EPA 1993)

EPA (U.S. Environmental Protection Agency), June 5, 1997. "*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final*," U.S. Environmental Protection Agency, Environmental Response Team, Edison NJ. (EPA 1997)

EPA (U.S. Environmental Protection Agency), November 2003. "*Guidance for Developing Ecological Soil Screening Levels, Evaluation of Dermal Contact and Inhalation Exposure Pathways for the Purpose of Setting Eco-SSLs, Attachment 1-3*, U.S. Environmental Protection Agency document OSWER Directive 92857-55, Office of Solid Waste and Emergency Response. (EPA 2003)

EPA (U.S. Environmental Protection Agency), February 2005. "*Ecological Soil Screening Levels for Barium*". Interim Final OSWER Directive 9285.7- 63. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. (EPA 2005)

EPA (U.S. Environmental Protection Agency), December 2010a. "*Final Report Bioavailability of Dioxins and Dioxin-Like Compounds in Soil*," Office of Superfund Remediation and Technology Innovation, Environmental Response Team, West Las Vegas, Nevada (http://epa.gov/superfund/health/contaminants/dioxin/pdfs/Final_dioxin_RBA_Report_12_20_10.p df). (EPA 2010a)

EPA (U.S. Environmental Protection Agency), December 2010b. "*Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8=Tetrachloro-p-dioxin and Dioxin-Like Compounds*." EPA/100/R 10/005. (EPA 2010b)

EPA (U.S. Environmental Protection Agency), October 2022. "*ProUCL Version 5.2 User Guide. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*." (EPA 2022)

EPA (U.S. Environmental Protection Agency), November 2022. *Regional Screening Levels (RSLs) – Generic Tables* Dated November 2022. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables. (EPA 2022)

Fresquez, P.R., 2009. "*The Concentration of Radionuclides, Heavy Metals, and Polychlorinated Biphenyls in Field Mice collected from Regional Background Areas*" Los Alamos National Laboratory document LA-UR-09-07580, Los Alamos, New Mexico. (Fresquez 2009)

Fresquez, P.R., 2011. "*The Concentration of Radionuclides, Heavy Metals, and Polychlorinated Biphenyls in Field Mice collected from Regional Background Areas: Revision 1*" Los Alamos National Laboratory document LA-UR-11-11687, Los Alamos, New Mexico. (Fresquez 2011a)

Fresquez, P.R., 2013. "*Chemical Concentrations in Field Mice/Voles Collected from an Open-Burn Site at Technical Area 16 at Los Alamos National Laboratory*," Los Alamos National Laboratory document LA-UR-11-10614, Los Alamos, New Mexico. (Fresquez 2013)

Fresquez, P.R., L. Hansen, and C. Hathcock, 2013. "*Chemical Concentrations in Field Mice/Voles Collected from an Open-Burn Site at Technical Area 16 at Los Alamos National Laboratory, Revision 1*," Los Alamos National Laboratory document LA-UR-13-200040, Los Alamos, New Mexico. (Fresquez et al. 2013)

Gaukler S.M. and J.E. Stanek, 2020. *2019 Results for Avian Monitoring of Inorganic and Organic Element Concentrations in Passerine Eggs and a Nestling Collected from Technical Area 16 Burn Grounds, Technical Area 36 Minie, and Technical Area 39 Point 6 at Los Alamos National Laboratory*. LA-UR-20-22529 (Gaukler and Stanek 2020).

Hathcock, C.D. 2014. *Avian Monitoring at the TA-36 Minnie Site, TA-39 Point 6, and TA-16 Burn Ground at Los Alamos National Laboratory.* Los Alamos National Laboratory document LA-UR-14-28161, Los Alamos, New Mexico. (Hathcock 2014).

Hathcock, C.D., A.W. Bartlow, and B.E. Thompson. 2018. *2017 Results for Avian Monitoring at the TA-36 Minie Site, TA-39 Point 6, and TA-16 Burn Ground at Los Alamos National Laboratory*. Los Alamos National Laboratory document LA-UR-18-22897, Los Alamos, New Mexico. (Hathcock 2018).

Krouskop, K.J., K.C. Ayers, and J.L. Proctor. 1991. "*Multimedia Sampling for Dioxin at a Strip Mine Reclaimed with Sludge from Bleached Kraft Wastewater Treatment,*" Tappi Journal, 74(4):235–240. (Krouskop et al. 1991)

LANL (Los Alamos National Laboratory), September 1998. "*Inorganic and Radionuclide Background Data for Soils, Sediments, and Bandelier Tuff at Los Alamos National Laboratory*," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998)

LANL (Los Alamos National Laboratory), November 2003. "*ECORISK Database (Version 2.0),*" on CD, Los Alamos, New Mexico. (LANL 2003)

LANL 2012a. Los Alamos National Laboratory Environmental Report 2011. LA-14461-ENV, Los Alamos National Laboratory, Los Alamos, New Mexico. September 2012. (https://permalink.lanl.gov/object/tr?what=info:lanl-repo/eprr/ERID-228664)

LANL 2012b. Technical Area 16 Well Network Evaluation and Recommendations. Los Alamos National Laboratory report LA-UR-12-1082, EP2012-0064, Los Alamos National Laboratory, Los Alamos, New Mexico, March 2012. (https://permalink.lanl.gov/object/tr?what=info:lanl-repo/eprr/ERID-213572)

LANL (Los Alamos National Laboratory), November 2012c. "*Screening-Level Ecological Risk Assessment Methods, Revision 3*," Los Alamos National Laboratory document LA-UR-12-24152, Los Alamos, New Mexico. (LANL 2012c)

LANL (Los Alamos National Laboratory), October 2012d. "*ECORISK Database (Release 3.1),"* LA-UR-12-24548, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2012d)

LANL (Los Alamos National Laboratory), September 30, 2017. *ECORISK Database (Release),* LA-UR-17-26376, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2017)

LANL (Los Alamos National Laboratory), June 2018a. *Inorganic Element Concentrations in Passerine Eggs Collected at Technical Areas 36, 39, and 16 at Los Alamos National Laboratory*. LA-UR-19-25647. (LANL 2018a)

LANL (Los Alamos National Laboratory), February 2018b. "*Development of Ecological Preliminary Remediation Goals for Los Alamos National Laboratory, Revision 1.1*". Los Alamos National Laboratory, Los Alamos, New Mexico. February 13, 2018. LA-UR-18-20670. EP2018-0017 (LANL 2018b)

LANL (Los Alamos National Laboratory), September 30, 2019. *ECORISK Database (Release 4.1),* LA-UR-17-26376, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2019)

LANL (Los Alamos National Laboratory), 2022. *"ECORISK Database (Release 4.3),"* Updated Database. Environmental Management- Los Alamos Field Office, Los Alamos, New Mexico. September 19, 2022(LANL 2022)

NMED (New Mexico Environment Department). 2017. *Risk Assessment Guidance for Site Investigations and Remediation.* Volume II. Soil Screening Guidance for Ecological Risk Assessments. (NMED 2017)

NMED (New Mexico Environment Department).2022a. *Risk Assessment Guidance for Site Investigations and Remediation.* Volume I. Soil Screening Guidance for Human Health Risk Assessments. June 2022. (NMED 2022a)

NMED (New Mexico Environment Department). 2022b. *New Mexico Soil Screening Levels*. December 2021. (NMED 2022b)

Nyhan, J.W., C. W. Hacker, 7. E. Calhoun, and D. L. Young, June 1978. "*Soil Survey of Los Alamos County, New Mexico,*" Los Alamos Scientific Laboratory Report LA-6779-MS, Los Alamos, New Mexico. ER ID 05702 (Nyhan et al. 1978)

Sample, B.E., Suter III, G.W., Efroymson, R.A., and Jones, D.A., May 1998. "*A Guide to the ORNL Ecotoxicological Screening Benchmarks: Background, Development, and Application*," Oak Ridge National Laboratory, Environmental Sciences Division, Publication No. 4783, ORNL/TM13615, Oak Ridge, TN. May 1998 (Sample et al. 1998)

Umbreit, T.H., Hesse, E.J., and Gallo, M.A., 1986. "*Bioavailability Of Dioxin In Soil From A 2,4,5-T Manufacturing Site*," Science 232:497–499. (Umbreit et al. 1986)

Van den Berg et.al, 2006. *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency factors for Dioxin and Dioxin-like Compounds*. ToxiSci Advance Access, July 7, 2006. (Van den Berg et al. 2006)

WHO (World Health Organization). September 2009. *"Project For The Re-Evaluation Of Human And Mammalian Toxic Equivalency Factors (TEFS) Of Dioxins And Dioxin-Like Compounds*". International Programme on Chemical Safety. http://www.who.int/ipcs/assessment/tef_update/en/ (WHO 2009)

TABLES

Table 2-1. Summary Statistics for Detected Fall 2018/2021 Analytes

Category	Analyte Name	CAS	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
Inorganic	Aluminum	7429-90-5	17	4.66E+03	1.29E+04	8.16E+03	2.85E+03	6.08E+00	8.76E+00	17
	Antimony	7440-36-0	17	2.95E-01	6.61E+00	7.05E-01	1.52E+00	2.95E-01	4.25E-01	1
	Arsenic	7440-38-2	17	1.58E+00	5.25E+00	2.67E+00	9.50E-01	3.08E-01	4.20E-01	17
	Barium	7440-39-3	17	1.43E+02	4.06E+03	6.59E+02	9.59E+02	8.94E-02	1.03E+00	17
	Beryllium	7440-41-7	17	4.07E-01	1.17E+00	7.61E-01	1.91E-01	1.82E-02	2.49E-02	17
	Calcium	Ca	17	1.48E+03	3.36E+03	2.15E+03	5.89E+02	7.15E+00	1.03E+01	17
	Cadmium	7440-43-9	17	8.94E-02	1.29E-01	1.03E-01	8.92E-03	8.94E-02	1.29E-01	1
	Cobalt	7440-48-4	17	2.99E+00	1.31E+01	5.57E+00	2.27E+00	1.34E-01	1.55E+00	17
	Chromium	16065-83-1	17	5.08E+00	1.23E+01	7.91E+00	2.25E+00	1.34E-01	1.93E-01	17
	Copper	7440-50-8	17	3.62E+00	2.44E+01	7.88E+00	4.85E+00	2.68E-01	3.86E-01	17
	Iron	7439-89-6	17	8.31E+03	1.75E+04	1.13E+04	2.42E+03	7.15E+00	1.03E+01	17
	Lead	7439-92-1	17	1.00E+01	2.67E+01	1.23E+01	3.88E+00	2.95E-01	4.25E-01	17
	Mercury	7487-94-7	17	6.81E-03	6.64E-02	1.61E-02	1.47E-02	3.64E-03	8.56E-03	15
	Nickel	7440-02-0	17	3.78E+00	5.53E+01	1.03E+01	1.19E+01	9.11E-02	1.24E-01	17
	Perchlorate	14797-73-0	11	5.09E-04	6.37E-04	5.46E-04	4.87E-05	5.09E-04	6.37E-04	2
	Potassium	K	17	1.10E+03	2.66E+03	1.67E+03	4.83E+02	5.72E+00	8.24E+00	17
	Magnesium	Mg	17	1.04E+03	2.93E+03	1.72E+03	5.62E+02	7.60E+00	1.09E+01	17
	Manganese	7439-96-5	17	2.06E+02	4.09E+02	2.88E+02	5.11E+01	1.79E-01	2.58E-01	17
	Selenium	7782-49-2	17	5.14E-01	1.11E+00	8.26E-01	1.99E-01	3.28E-01	4.47E-01	17
	Silver	7440-22-4	17	8.94E-02	8.57E+01	5.67E+00	2.07E+01	8.94E-02	1.29E-01	10
	Sodium	Na	17	4.86E+01	1.87E+02	8.83E+01	3.86E+01	6.25E+00	9.01E+00	17
	Thallium	7440-28-0	17	1.48E-01	4.06E-01	2.32E-01	7.47E-02	1.28E-01	1.74E-01	17
	Vanadium	7440-62-2	17	1.37E+01	2.70E+01	2.02E+01	3.85E+00	8.94E-02	1.29E-01	17
	Zinc	7440-66-6	17	1.91E+01	3.34E+02	4.93E+01	7.46E+01	3.57E-01	5.15E-01	17
Organic	Amino-2,6-dinitrotoluene[4-]	19406-51-0	17	1.39E-01	6.55E-01	1.76E-01	1.23E-01	1.39E-01	1.50E-01	1
	Anthracene	120-12-7	11	1.03E-02	5.19E-02	1.93E-02	1.64E-02	1.03E-02	5.19E-02	1
	Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	35822-46-9	17	5.15E-07	4.27E-04	5.64E-05	1.13E-04	8.74E-07	1.68E-06	16
	Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	67562-39-4	17	4.99E-07	1.40E-04	1.93E-05	3.74E-05	1.10E-06	1.68E-06	13
	Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	55673-89-7	17	4.45E-07	8.42E-06	1.45E-06	2.08E-06	1.05E-06	1.68E-06	6

Category	Analyte Name	CAS	Sample Size	Minimum (mg/kg)	Maximum (mg/kg)	Mean (mg/kg)	SD (mg/kg)	Minimum MDL (mg/kg)	Maximum MDL (mg/kg)	Number of Detected Values
	Hexachlorodibenzodioxin[1,2,3,4,7,8-]	39227-28-6	17	4.45E-07	7.92E-06	1.42E-06	2.03E-06	1.11E-06	1.75E-06	5
	Hexachlorodibenzodioxin[1,2,3,6,7,8-]	57653-85-7	17	4.45E-07	1.47E-05	2.31E-06	3.85E-06	1.03E-06	1.68E-06	6
	Hexachlorodibenzodioxin[1,2,3,7,8,9-]	19408-74-3	17	4.45E-07	1.70E-05	2.59E-06	4.44E-06	1.20E-06	1.97E-06	6
	Hexachlorodibenzofuran[1,2,3,4,7,8-]	70648-26-9	17	4.45E-07	4.10E-06	9.51E-07	9.78E-07	1.01E-06	1.68E-06	6
	Hexachlorodibenzofuran[1,2,3,6,7,8-]	57117-44-9	17	4.45E-07	4.92E-06	1.07E-06	1.21E-06	8.88E-07	1.68E-06	6
	Hexachlorodibenzofuran[2,3,4,6,7,8-]	60851-34-5	17	4.45E-07	6.83E-06	1.30E-06	1.72E-06	1.07E-06	1.68E-06	6
	HMX	2691-41-0	17	1.39E-01	1.84E+00	3.10E-01	4.27E-01	1.39E-01	1.50E-01	5
	Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	3268-87-9	17	2.78E-06	2.67E-03	3.44E-04	7.01E-04	3.12E-06	3.36E-06	17
	Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	39001-02-0	17	9.97E-07	2.86E-04	3.70E-05	7.44E-05	1.90E-06	3.36E-06	13
	Pentachlorodibenzodioxin[1,2,3,7,8-]	40321-76-4	17	4.45E-07	2.87E-06	7.68E-07	6.49E-07	1.16E-06	1.68E-06	4
	Pentachlorodibenzofuran[1,2,3,7,8-]	57117-41-6	17	4.45E-07	6.14E-07	5.02E-07	4.23E-08	1.02E-06	1.68E-06	2
	Pentachlorodibenzofuran[2,3,4,7,8-]	57117-31-4	17	4.45E-07	6.95E-07	4.98E-07	5.48E-08	1.15E-06	1.78E-06	1
	RDX	121-82-4	17	1.39E-01	2.01E-01	1.50E-01	1.37E-02	1.39E-01	1.50E-01	1
	TATB	3058-38-6	17	2.78E-01	7.22E+00	1.62E+00	2.26E+00	2.78E-01	7.39E-01	6
	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	17	9.97E-08	2.94E-07	1.61E-07	7.22E-08	2.37E-07	3.36E-07	1
	Tetrachlorodibenzofuran[2,3,7,8-]	51207-31-9	17	1.21E-07	4.07E-07	2.29E-07	7.99E-08	3.32E-07	3.83E-07	2
	Toluene	108-88-3	11	3.40E-04	4.83E-04	3.69E-04	4.61E-05	3.35E-04	4.21E-04	2
	Trinitrotoluene[2,4,6-]	118-96-7	17	1.39E-01	2.52E+00	2.99E-01	5.75E-01	1.39E-01	1.50E-01	2

Notes: Data shown are the 2018/2021 risk assessment dataset

CAS – Chemical abstract system number
MDL – Method detection level
mg/kg – milligram per kilogram
SD – Standard deviation

Table 2-2. Comparison of Maximum Detected Exposure Point Concentrations to Background

Name	CAS	Maximum Result (mg/kg)	Number of Detected Values	BV (mg/kg)	Maximum/ BV Ratio	Gehan Hypothesis Test
Aluminum	7429-90-5	1.29E+04	17	29200	0.4	
Antimony	7440-36-0	6.61	1	0.83	8.0	No stats; 1 detect
Arsenic	7440-38-2	5.25E+00	17	8.17	0.6	
Barium	7440-39-3	4060	17	295	13.8	p≤0.05
Beryllium	7440-41-7	1.17E+00	17	1.83	0.6	
Cadmium	7440-43-9	1.29E-01	1	0.4	0.3	
Calcium	Ca	3.36E+03	17	6120	0.5	
Chromium	16065-83-1	1.23E+01	17	19.3	0.6	
Cobalt	7440-48-4	1.31E+01	17	8.64	1.5	p=0.47
Copper	7440-50-8	24.4	17	14.7	1.7	p=0.07
Iron	7439-89-6	1.75E+04	17	21500	0.8	
Lead	7439-92-1	2.67E+01	17	22.3	1.2	p=0.85
Magnesium	Mg	2.93E+03	17	4610	0.6	
Manganese	7439-96-5	4.09E+02	17	671	0.6	
Mercury	7487-94-7	6.64E-02	15	0.1	0.7	
Nickel	7440-02-0	5.53E+01	17	15.4	4	p=0.18
Perchlorate	14797-73-0	0.000637	2	0	NA	No BKG
Potassium	K	2.66E+03	17	3460	0.8	
Selenium	7782-49-2	1.11E+00	17	1.52	0.7	
Silver	7440-22-4	85.7	10	1	86	p≤0.05
Sodium	Na	1.87E+02	17	915	0.2	
Thallium	7440-28-0	4.06E-01	17	0.73	0.6	
Vanadium	7440-62-2	2.70E+01	17	39.6	0.7	
Zinc	7440-66-6	3.34E+02	17	48.8	7	p=0.66

Notes: Inorganics above BVs were statistically evaluated with hypothesis testing. Analytes with p-values less than or equal to 0.05 are considered significantly greater than background. Antimony, barium, perchlorate, and silver carry forward based on hypothesis testing. See Section 2.3.2

Data shown are the 2018/2021 risk assessment dataset
Shaded cells – Maximum > BV
BV – Background threshold value
CAS – Chemical abstract system number
mg/kg- milligram per kilogram
stats – Statistical evaluation with ProUCL 5.2

Table 2-3. Verification of MDLs for Nondetects for Data Useability

Name	Maximum MDL (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
2,4-Diamino-6-nitrotoluene	5.00E-01	3.20E+01	2E-07	1.70E+02	3E-08	1.10E+03	5E-09	6.16E+00	8E-02	9.16E+01	5E-03	2.69E+01	2E-02
2,6-Diamino-4-nitrotoluene	6.60E-01	3.20E+01	2E-07	1.70E+02	4E-08	1.10E+03	6E-09	6.16E+00	1E-01	9.16E+01	7E-03	2.69E+01	2E-02
3,5-Dinitroaniline	3.00E-01	NA	0E+00	NA	0E+00	NA	0E+00	2.50E+01	1E-02	3.30E+02	9E-04	7.50E+01	4E-03
Acenaphthene	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	3.48E+03	1E-05	5.05E+04	1E-06	1.51E+04	3E-06
Acenaphthylene	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	3.48E+03	1E-05	5.05E+04	1E-06	1.51E+04	3E-06
Acetone	2.11E-03	NA	NA	NA	NA	NA	NA	6.63E+04	3E-08	9.60E+05	2E-09	2.42E+05	9E-09
Amino-4,6-dinitrotoluene[2-]	1.50E-01	NA	NA	NA	NA	NA	NA	7.7NA	2E-02	1.27E+02	1E-03	1.73E+01	9E-03
Aniline	5.19E-01	9.50E+02	5E-09	4.00E+03	1E-09	1.77E+04	3E-10	4.40E+02	1E-03	5.70E+03	9E-05	8.30E+01	6E-03
Azobenzene	5.19E-01	5.60E+01	9E-08	2.60E+02	2E-08	1.79E+03	3E-09	NA	NA	NA	NA	NA	NA
Benzene	4.21E-04	1.78E+01	2E-10	8.72E+01	5E-11	4.23E+02	1E-11	1.14E+02	4E-06	7.29E+02	6E-07	1.42E+02	3E-06
Benzo(a)anthracene	5.19E-02	1.53E+00	3E-07	3.23E+01	2E-08	2.40E+02	2E-09	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	5.19E-02	1.12E+00	5E-07	2.36E+01	2E-08	1.73E+02	3E-09	1.74E+01	3E-03	2.51E+02	2E-04	1.50E+01	3E-03
Benzo(b)fluoranthene	5.19E-02	1.53E+00	3E-07	3.23E+01	2E-08	2.40E+02	2E-09	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	5.19E-02	1.12E+00	5E-07	2.36E+01	2E-08	1.73E+02	3E-09	1.74E+01	3E-03	2.51E+02	2E-04	1.50E+01	3E-03
Benzo(k)fluoranthene	5.19E-02	1.53E+01	3E-08	3.23E+02	2E-09	2.31E+03	2E-10	NA	NA	NA	NA	NA	NA
Benzoic Acid	8.66E-01	NA	NA	NA	NA	NA	NA	2.50E+05	3E-06	3.30E+06	3E-07	1.08E+06	8E-07
Benzyl Alcohol	5.19E-01	NA	NA	NA	NA	NA	NA	6.30E+03	8E-05	8.20E+04	6E-06	2.69E+04	2E-05
Bis(2-chloroethoxy)methane	5.19E-01	NA	NA	NA	NA	NA	NA	1.90E+02	3E-03	2.50E+03	2E-04	8.07E+02	6E-04
Bis(2-chloroethyl)ether	5.19E-01	3.11E+00	2E-06	1.57E+01	3E-07	1.95E+00	3E-06	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	5.19E-02	3.80E+02	1E-09	1.83E+03	3E-10	1.34E+04	4E-11	1.23E+03	4E-05	1.83E+04	3E-06	5.38E+03	1E-05
Bromobenzene	4.21E-04	NA	NA	NA	NA	NA	NA	2.90E+02	1E-06	1.80E+03	2E-07	5.47E+02	8E-07
Bromochloromethane	4.21E-04	NA	NA	NA	NA	NA	NA	1.50E+02	3E-06	6.30E+02	7E-07	3.06E+02	1E-06
Bromodichloromethane	4.21E-04	6.19E+00	7E-10	3.02E+01	1E-10	1.43E+02	3E-11	1.56E+03	3E-07	2.60E+04	2E-08	7.08E+03	6E-08
Bromoform	4.21E-04	6.74E+02	6E-12	1.76E+03	2E-12	2.37E+04	2E-13	1.23E+03	3E-07	1.83E+04	2E-08	5.38E+03	8E-08
Bromomethane	4.21E-04	NA	NA	NA	NA	NA	NA	1.77E+01	2E-05	9.45E+01	4E-06	1.79E+01	2E-05
Bromophenyl-phenylether[4-]	5.19E-01	NA	NA	NA	NA	NA	NA	1.60E+02	3E-03	2.30E+03	2E-04	NA	NA
Butanone[2-]	2.11E-03	NA	NA	NA	NA	NA	NA	3.74E+04	6E-08	4.11E+05	5E-09	9.17E+04	2E-08
Butylbenzene[n-]	4.21E-04	NA	NA	NA	NA	NA	NA	3.90E+03	1E-07	5.80E+04	7E-09	1.77E+04	2E-08
Butylbenzene[sec-]	4.21E-04	NA	NA	NA	NA	NA	NA	7.80E+03	5E-08	1.20E+05	4E-09	3.54E+04	1E-08
Butylbenzene[tert-]	4.21E-04	NA	NA	NA	NA	NA	NA	7.80E+03	5E-08	1.20E+05	4E-09	3.54E+04	1E-08
Butylbenzylphthalate	5.19E-02	2.90E+03	2E-10	1.20E+04	4E-11	9.91E+04	5E-12	1.30E+04	4E-06	1.60E+05	3E-07	5.38E+04	1E-06

Name	Maximum MDL (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
Carbon Disulfide	2.11E-03	NA	NA	NA	NA	NA	NA	1.55E+03	1E-06	8.54E+03	2E-07	1.62E+03	1E-06
Carbon Tetrachloride	4.21E-04	1.07E+01	4E-10	5.25E+01	8E-11	2.52E+02	2E-11	1.44E+02	3E-06	1.02E+03	4E-07	2.02E+02	2E-06
Chloro-3-methylphenol[4-]	6.93E-01	NA	NA	NA	NA	NA	NA	6.30E+03	1E-04	8.20E+04	8E-06	2.69E+04	3E-05
Chloroaniline[4-]	5.19E-01	2.70E+01	2E-07	1.10E+02	5E-08	9.42E+02	6E-09	3.20E+01	2E-02	4.10E+02	1E-03	1.35E+02	4E-03
Chlorobenzene	4.21E-04	NA	NA	NA	NA	NA	NA	3.78E+02	1E-06	2.16E+03	2E-07	4.12E+02	1E-06
Chlorodibromomethane	4.21E-04	1.39E+01	3E-10	6.74E+01	6E-11	3.40E+02	1E-11	1.23E+03	3E-07	1.83E+04	2E-08	5.38E+03	8E-08
Chloroethane	4.21E-04	NA	NA	NA	NA	NA	NA	1.90E+04	2E-08	8.95E+04	5E-09	1.66E+04	3E-08
Chloroform	4.21E-04	5.9NA	7E-10	2.87E+01	1E-10	1.34E+02	3E-11	3.06E+02	1E-06	2.00E+03	2E-07	3.91E+02	1E-06
Chloromethane	4.21E-04	4.11E+01	1E-10	2.01E+02	2E-11	9.56E+02	4E-12	2.68E+02	2E-06	1.26E+03	3E-07	2.35E+02	2E-06
Chloronaphthalene[2-]	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	6.26E+03	8E-06	1.04E+05	5E-07	2.83E+04	2E-06
Chlorophenol[2-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	3.91E+02	1E-03	6.49E+03	8E-05	1.77E+03	3E-04
Chlorophenyl-phenyl[4-] Ether	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	NA	0E+00	NA	0E+00	NA	0E+00
Chlorotoluene[2-]	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	1.56E+03	3E-07	2.60E+04	2E-08	7.08E+03	6E-08
Chlorotoluene[4-]	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	1.56E+03	3E-07	2.60E+04	2E-08	7.08E+03	6E-08
Chrysene	5.19E-02	1.53E+02	3E-09	3.23E+03	2E-10	2.31E+04	2E-11	NA	0E+00	NA	0E+00	NA	0E+00
Dibenz(a,h)anthracene	5.19E-02	1.53E-01	3E-06	3.23E+00	2E-07	2.40E+01	2E-08	NA	0E+00	NA	0E+00	NA	0E+00
Dibenzofuran	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	7.80E+01	7E-03	1.20E+03	4E-04	3.54E+02	1E-03
Dibromo-3-Chloropropane[1,2-]	6.32E-04	8.58E-02	7E-08	1.18E+00	5E-09	5.53E+00	1E-09	5.88E+00	1E-04	4.11E+01	2E-05	8.29E+00	8E-05
Dibromoethane[1,2-]	4.21E-04	6.72E-01	6E-09	3.31E+00	1E-09	1.63E+01	3E-10	1.35E+02	3E-06	7.38E+02	6E-07	1.40E+02	3E-06
Dibromomethane	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	5.79E+01	7E-06	2.88E+02	1E-06	5.39E+01	8E-06
Dichlorobenzene[1,2-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	2.15E+03	2E-04	1.30E+04	4E-05	2.50E+03	2E-04
Dichlorobenzene[1,3-]	5.19E-01	1.29E+03	4E-09	6.73E+03	8E-10	4.59E+04	1E-10	5.48E+03	9E-05	9.08E+04	6E-06	2.48E+04	2E-05
Dichlorobenzene[1,4-]	5.19E-01	1.29E+03	4E-09	6.73E+03	8E-10	4.59E+04	1E-10	5.48E+03	9E-05	9.08E+04	6E-06	2.48E+04	2E-05
Dichlorobenzidine[3,3'-]	5.19E-01	1.18E+01	4E-07	5.70E+01	9E-08	4.10E+02	1E-08	NA	0E+00	NA	0E+00	NA	0E+00
Dichlorodifluoromethane	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	1.82E+02	2E-06	8.65E+02	5E-07	1.61E+02	3E-06
Dichloroethane[1,1-]	4.21E-04	7.86E+01	5E-11	3.83E+02	1E-11	1.82E+03	2E-12	1.56E+04	3E-08	2.60E+05	2E-09	7.08E+04	6E-09
Dichloroethane[1,2-]	4.21E-04	8.32E+00	5E-10	4.07E+01	1E-10	1.95E+02	2E-11	5.56E+01	8E-06	2.86E+02	1E-06	5.38E+01	8E-06
Dichloroethene[1,1-]	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	4.40E+02	1E-06	2.26E+03	2E-07	4.24E+02	1E-06
Dichloroethene[cis-1,2-]	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	1.56E+02	3E-06	2.60E+03	2E-07	7.08E+02	6E-07

Name	Maximum MDL (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
Dichloroethene[trans-1,2-]	4.21E-04	NA	0E+00	NA	0E+00	NA	0E+00	2.10E+02	2E-06	1.10E+03	4E-07	2.06E+02	2E-06
Dichlorophenol[2,4-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	1.85E+02	3E-03	2.75E+03	2E-04	8.07E+02	6E-04
Dichloropropane[1,2-]	4.21E-04	1.78E+01	2E-10	8.68E+01	5E-11	4.15E+02	1E-11	2.90E+01	1E-05	1.37E+02	3E-06	2.54E+01	2E-05
Dichloropropane[1,3-]	4.21E-04	1.78E+01	2E-10	8.68E+01	5E-11	4.15E+02	1E-11	2.90E+01	1E-05	1.37E+02	3E-06	2.54E+01	2E-05
Dichloropropane[2,2-]	4.21E-04	1.78E+01	2E-10	8.68E+01	5E-11	4.15E+02	1E-11	2.90E+01	1E-05	1.37E+02	3E-06	2.54E+01	2E-05
Dichloropropene[1,1-]	4.21E-04	2.93E+01	1E-10	1.46E+02	3E-11	7.81E+02	5E-12	1.41E+02	3E-06	6.95E+02	6E-07	1.30E+02	3E-06
Dichloropropene[cis-1,3-]	4.21E-04	2.93E+01	1E-10	1.46E+02	3E-11	7.81E+02	5E-12	1.41E+02	3E-06	6.95E+02	6E-07	1.30E+02	3E-06
Dichloropropene[trans-1,3-]	4.21E-04	2.93E+01	1E-10	1.46E+02	3E-11	7.81E+02	5E-12	1.41E+02	3E-06	6.95E+02	6E-07	1.30E+02	3E-06
Diethylphthalate	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	4.93E+04	1E-06	7.33E+05	7E-08	2.15E+05	2E-07
Dimethyl Phthalate	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	4.93E+04	1E-06	7.33E+05	7E-08	2.15E+05	2E-07
Dimethylphenol[2,4-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	1.23E+03	4E-04	1.83E+04	3E-05	5.38E+03	1E-04
Di-n-butylphthalate	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	6.16E+03	8E-06	9.16E+04	6E-07	2.69E+04	2E-06
Dinitro-2-methylphenol[4,6-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	4.93E+00	1E-01	7.33E+01	7E-03	2.15E+01	2E-02
Dinitrobenzene[1,3-]	1.50E-01	NA	0E+00	NA	0E+00	NA	0E+00	6.30E+00	2E-02	8.20E+01	2E-03	2.69E+01	6E-03
Dinitrophenol[2,4-]	5.19E-01	NA	0E+00	NA	0E+00	NA	0E+00	1.23E+02	4E-03	1.83E+03	3E-04	5.38E+02	1E-03
Dinitrotoluene[2,4-]	5.19E-01	1.71E+01	3E-07	8.23E+01	6E-08	6.00E+02	9E-09	1.23E+02	4E-03	1.82E+03	3E-04	5.36E+02	1E-03
Dinitrotoluene[2,6-]	5.19E-01	3.56E+00	1E-06	1.72E+01	3E-07	1.65E+02	3E-08	1.85E+01	3E-02	2.76E+02	2E-03	8.09E+01	6E-03
Di-n-octylphthalate	5.19E-02	NA	0E+00	NA	0E+00	NA	0E+00	6.30E+02	8E-05	8.20E+03	6E-06	2.69E+03	2E-05
Diphenylamine	5.19E-01	NA	NA	NA	NA	NA	NA	6.30E+03	8E-05	8.20E+04	6E-06	2.69E+04	2E-05
Ethylbenzene	4.21E-04	7.51E+01	6E-11	3.68E+02	1E-11	1.77E+03	2E-12	3.93E+03	1E-07	2.90E+04	1E-08	5.80E+03	7E-08
Fluoranthene	5.19E-02	NA	NA	NA	NA	NA	NA	2.32E+03	2E-05	3.37E+04	2E-06	1.00E+04	5E-06
Fluorene	5.19E-02	NA	NA	NA	NA	NA	NA	2.32E+03	2E-05	3.37E+04	2E-06	1.00E+04	5E-06
Hexachlorobenzene	5.19E-01	3.33E+00	2E-06	1.60E+01	3E-07	1.17E+02	4E-08	4.93E+01	1E-02	7.33E+02	7E-04	2.15E+02	2E-03
Hexachlorobutadiene	5.19E-01	6.83E+01	8E-08	5.21E+01	1E-07	2.40E+03	2E-09	6.16E+01	8E-03	9.16E+02	6E-04	2.69E+02	2E-03
Hexachlorocyclopentadiene	5.19E-01	NA	NA	NA	NA	NA	NA	2.3NA	2E-01	5.49E+03	9E-05	8.67E+02	6E-04
Hexachlorodibenzofuran[1,2,3,7,8,9-]	1.06E-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	5.19E-01	1.33E+02	4E-08	6.41E+02	8E-09	4.67E+03	1E-09	4.31E+01	1E-02	6.41E+02	8E-04	1.88E+02	3E-03
Hexanone[2-]	2.11E-03	NA	NA	NA	NA	NA	NA	2.00E+02	1E-05	1.30E+03	2E-06	5.86E+02	4E-06
Indeno(1,2,3-cd)pyrene	5.19E-02	1.53E+00	3E-07	3.23E+01	2E-08	2.40E+02	2E-09	NA	NA	NA	NA	NA	NA
Iodomethane	2.11E-03	NA	NA	NA	NA	NA	NA	1.77E+01	1E-04	9.45E+01	2E-05	1.79E+01	1E-04
Isophorone	5.19E-01	5.61E+03	9E-10	2.70E+04	2E-10	1.98E+05	3E-11	1.23E+04	4E-05	1.83E+05	3E-06	5.37E+04	1E-05
Isopropylbenzene	4.21E-04	NA	NA	NA	NA	NA	NA	2.36E+03	2E-07	1.42E+04	3E-08	2.74E+03	2E-07
Isopropyltoluene[4-]	4.21E-04	NA	NA	NA	NA	NA	NA	5.23E+03	8E-08	6.13E+04	7E-09	1.40E+04	3E-08
Methyl-2-pentanone[4-]	2.11E-03	NA	NA	NA	NA	NA	NA	5.81E+03	4E-07	8.16E+04	3E-08	2.02E+04	1E-07

Name	Maximum MDL (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
Methylene Chloride	2.11E-03	7.66E+02	3E-11	1.44E+04	1E-12	8.96E+04	2E-13	4.09E+02	5E-06	5.13E+03	4E-07	1.21E+03	2E-06
Methylnaphthalene[2-]	5.19E-02	NA	NA	NA	NA	NA	NA	2.32E+02	2E-04	3.37E+03	2E-05	1.00E+03	5E-05
Methylphenol[2-]	5.19E-01	NA	NA	NA	NA	NA	NA	3.20E+03	2E-04	4.10E+04	1E-05	1.16E+04	4E-05
Methylphenol[3-,4-]	5.19E-01	NA	NA	NA	NA	NA	NA	1.30E+03	4E-04	1.60E+04	3E-05	5.06E+03	1E-04
Naphthalene	5.19E-02	2.26E+01	2E-08	1.08E+02	5E-09	6.33E+02	8E-10	1.62E+02	3E-04	8.43E+02	6E-05	1.59E+02	3E-04
Nitroaniline[2-]	5.71E-01	NA	NA	NA	NA	NA	NA	6.30E+02	9E-04	8.00E+03	7E-05	5.98E+00	1E-01
Nitroaniline[3-]	5.19E-01	2.70E+02	2E-08	1.10E+03	5E-09	9.42E+03	6E-10	2.50E+02	2E-03	3.30E+03	2E-04	3.96E+02	1E-03
Nitroaniline[4-]	5.19E-01	2.70E+02	2E-08	1.10E+03	5E-09	9.42E+03	6E-10	2.50E+02	2E-03	3.30E+03	2E-04	3.96E+02	1E-03
Nitrobenzene	5.19E-01	6.04E+01	9E-08	2.93E+02	2E-08	1.35E+03	4E-09	1.31E+02	4E-03	1.54E+03	3E-04	3.53E+02	1E-03
Nitrophenol[2-]	5.19E-01	NA	NA	NA	NA	NA	NA	1.85E+04	3E-05	2.75E+05	2E-06	7.74E+04	7E-06
Nitrophenol[4-]	5.19E-01	NA	NA	NA	NA	NA	NA	1.85E+04	3E-05	2.75E+05	2E-06	7.74E+04	7E-06
Nitrosodimethylamine [N-]	5.19E-01	2.34E-02	2E-04	5.03E-01	1E-05	3.66E+00	1E-06	4.93E-01	1E+00	7.33E+00	7E-02	2.14E+00	2E-01
Nitroso-di-n-propylamine[N-]	5.19E-01	7.80E-01	7E-06	3.3NA	2E-06	1.70E+01	3E-07	NA	NA	NA	NA	NA	NA
Nitrotoluene[2-]	1.50E-01	3.16E+01	5E-08	1.65E+02	9E-09	1.13E+03	1E-09	7.04E+01	2E-03	1.17E+03	1E-04	3.19E+02	5E-04
Nitrotoluene[3-]	1.50E-01	NA	NA	NA	NA	NA	NA	6.16E+00	2E-02	9.16E+01	2E-03	2.69E+01	6E-03
Nitrotoluene[4-]	1.50E-01	3.33E+02	5E-09	1.60E+03	9E-10	1.18E+04	1E-10	2.47E+02	6E-04	3.67E+03	4E-05	1.08E+03	1E-04
Oxybis(1-chloropropane)[2,2'-]	5.19E-01	9.93E+01	5E-08	5.19E+02	1E-08	3.54E+03	1E-09	NA	NA	NA	NA	NA	NA
Pentachlorophenol	5.19E-01	9.85E+00	5E-07	4.45E+01	1E-07	3.46E+02	2E-08	2.34E+02	2E-03	3.18E+03	2E-04	9.89E+02	5E-04
PETN	2.50E-01	1.30E+03	2E-09	5.30E+03	5E-10	4.38E+04	6E-11	5.70E+02	4E-04	7.40E+03	3E-05	2.42E+03	1E-04
Phenanthrene	5.19E-02	NA	NA	NA	NA	NA	NA	1.85E+03	3E-05	2.75E+04	2E-06	8.07E+03	6E-06
Phenol	5.19E-01	NA	NA	NA	NA	NA	NA	1.85E+04	3E-05	2.75E+05	2E-06	7.74E+04	7E-06
Propylbenzene[1-]	4.21E-04	NA	NA	NA	NA	NA	NA	3.80E+03	1E-07	2.40E+04	2E-08	6.88E+03	6E-08
Pyrene	5.19E-02	NA	NA	NA	NA	NA	NA	1.74E+03	3E-05	2.53E+04	2E-06	7.53E+03	7E-06
Pyridine	5.19E-01	NA	NA	NA	NA	NA	NA	7.80E+01	7E-03	1.20E+03	4E-04	3.54E+02	1E-03
Styrene	4.21E-04	NA	NA	NA	NA	NA	NA	7.26E+03	6E-08	5.13E+04	8E-09	1.02E+04	4E-08
Tetrachloroethane[1,1,1,2-]	4.21E-04	2.81E+01	1E-10	1.37E+02	3E-11	6.59E+02	6E-12	2.35E+03	2E-07	3.89E+04	1E-08	1.06E+04	4E-08
Tetrachloroethane[1,1,2,2-]	4.21E-04	7.98E+00	5E-10	3.94E+01	1E-10	1.97E+02	2E-11	1.56E+03	3E-07	2.60E+04	2E-08	7.08E+03	6E-08
Tetrachloroethene	4.21E-04	3.37E+02	1E-11	1.65E+03	3E-12	7.91E+03	5E-13	1.11E+02	4E-06	6.29E+02	7E-07	1.20E+02	4E-06
Tetryl	1.50E-01	NA	NA	NA	NA	NA	NA	1.56E+02	1E-03	2.59E+03	6E-05	7.06E+02	2E-04
Trichloro-1,2,2-trifluoroethane[1,1,2-]	2.11E-03	NA	NA	NA	NA	NA	NA	5.08E+04	4E-08	2.43E+05	9E-09	4.53E+04	5E-08
Trichlorobenzene[1,2,4-]	5.19E-01	2.40E+02	2E-08	1.25E+03	4E-09	8.54E+03	6E-10	8.29E+01	6E-03	4.23E+02	1E-03	7.91E+01	7E-03
Trichloroethane[1,1,1-]	4.21E-04	NA	NA	NA	NA	NA	NA	1.44E+04	3E-08	7.25E+04	6E-09	1.36E+04	3E-08

Name	Maximum MDL (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
Trichloroethane[1,1,2-]	4.21E-04	1.88E+01	2E-10	9.21E+01	5E-11	4.30E+03	1E-12	2.61E+00	2E-04	1.24E+01	3E-05	2.3NA	2E-04
Trichloroethene	4.21E-04	1.55E+01	3E-10	1.12E+02	4E-11	5.37E+03	8E-13	6.77E+00	6E-05	3.65E+01	1E-05	6.9NA	6E-05
Trichlorofluoromethane	4.21E-04	NA	NA	NA	NA	NA	NA	1.23E+03	3E-07	6.03E+03	7E-08	1.13E+03	4E-07
Trichlorophenol[2,4,5-]	5.19E-01	NA	NA	NA	NA	NA	NA	6.16E+03	8E-05	9.16E+04	6E-06	2.69E+04	2E-05
Trichlorophenol[2,4,6-]	5.19E-01	4.84E+02	1E-08	2.33E+03	2E-09	1.70E+04	3E-10	6.16E+01	8E-03	9.16E+02	6E-04	2.69E+02	2E-03
Trichloropropane[1,2,3-]	4.21E-04	5.10E-02	8E-08	1.21E+00	3E-09	8.26E+00	5E-10	7.09E+00	6E-05	3.40E+01	1E-05	6.31E+00	7E-05
Trimethylbenzene[1,2,4-]	4.21E-04	NA	NA	NA	NA	NA	NA	3.00E+02	1E-06	1.80E+03	2E-07	5.04E+02	8E-07
Trimethylbenzene[1,3,5-]	4.21E-04	NA	NA	NA	NA	NA	NA	2.70E+02	2E-06	1.50E+03	3E-07	4.33E+02	1E-06
Trinitrobenzene[1,3,5-]	1.50E-01	NA	NA	NA	NA	NA	NA	2.20E+03	7E-05	3.20E+04	5E-06	1.00E+04	1E-05
Tris (o-cresyl) phosphate	3.00E-01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride	4.21E-04	7.42E-01	6E-09	2.84E+01	1E-10	1.61E+02	3E-11	1.13E+02	4E-06	8.16E+02	5E-07	1.62E+02	3E-06
Xylene[1,2-]	4.21E-04	NA	NA	NA	NA	NA	NA	8.05E+02	5E-07	3.94E+03	1E-07	7.36E+02	6E-07
Xylene[1,3-]+Xylene[1,4-]	8.44E-04	NA	NA	NA	NA	NA	NA	8.71E+02	1E-06	4.28E+03	2E-07	7.98E+02	1E-06

Notes: All MDLs are adequate for nondetected analytes because CRs are < $1x10^{-5}$ and HQs are <1, with the exception of shaded cells. Data shown are the 2018/2021 risk assessment dataset

CR – Cancer risk (Maximum MDL/Cancer-based NMSSL for a given receptor); unitless
CW – Construction worker; NMSSLs and CR or HQ values are specific to the construction worker scenario
HQ – Hazard quotient (Maximum MDL/Noncancer-based NMSSL for a given receptor); unitless
MDL – Method detection limit for nondetected analytes
mg/kg – Milligram per kilogram
NA – Not applicable; no toxicity value, and therefore no CR or HQ calculated
NC – Noncancer
Res – Resident; NMSSL and CR or HQ values are specific to residential use scenario
NMSSL – New Mexico Environment Department Soil Screening Level
NV – No NMSSL value
Worker – Commercial/Industrial worker; NMSSL and CR or HQ values are specific to the commercial/industrial scenario

Table 2-4. Human Health Screening Results for Detected Analytes Above Background

Category	Parameter Name	Maximum Result (mg/kg)	NMSSL – Res Cancer (mg/kg)	Res CR	NMSSL - Worker Cancer (mg/kg)	Worker CR	NMSSL-CW CR (mg/kg)	CW CR	NMSSL-Res NC (mg/kg)	Res HQ	NMSSL-Worker NC (mg/kg)	Worker HQ	NMSSL-CW NC (mg/kg)	CW HQ
Inorganic	Antimony	6.61	NA	NA	NA	NA	NA	NA	3.13E+01	2E-01	5.19E+02	1E-02	1.42E+02	5E-02
	Barium	4060	NA	NA	NA	NA	NA	NA	1.56E+04	3E-01	2.55E+05	2E-02	4.39E+03	9E-01
	Perchlorate	0.000637	NA	NA	NA	NA	NA	NA	5.48E+01	1E-05	9.08E+02	7E-07	2.48E+02	3E-06
	Silver	85.70	NA	NA	NA	NA	NA	NA	3.91E+02	2E-01	6.49E+03	1E-02	1.77E+03	5E-02
Organic	Amino-2,6-dinitrotoluene[4-]	0.655	NA	NA	NA	NA	NA	NA	7.64E+00	9E-02	1.25E+02	5E-03	1.73E+01	4E-02
	Anthracene	0.0519	NA	NA	NA	NA	NA	NA	1.74E+04	3E-06	2.53E+05	2E-07	7.53E+04	7E-07
	HMX	1.84	NA	NA	NA	NA	NA	NA	3.85E+03	5E-04	6.33E+04	3E-05	1.74E+04	1E-04
	RDX	0.201	8.31E+01	2E-08	4.28E+02	5E-09	2.96E+03	7E-10	3.01E+02	7E-04	4.89E+03	4E-05	1.35E+03	1E-04
	TATB	7.22	NA	NA	NA	NA	NA	NA	2.20E+03	3E-03	3.20E+04	2E-04	1.00E+04	7E-04
	TCDD TEQ	1.57E-05	4.90E-05	3E-06	2.38E-04	7E-07	1.72E-03	9E-08	5.06E-05	3E-01	8.08E-04	2E-02	2.26E-04	7E-02
	Toluene	0.000483	NA	NA	NA	NA	NA	NA	5.23E+03	9E-08	6.13E+04	8E-09	1.40E+04	3E-08
	Trinitrotoluene[2,4,6-]	2.52	2.11E+02	1E-07	1.07E+03	2E-08	7.50E+03	3E-09	3.60E+01	7E-02	5.73E+02	4E-03	1.61E+02	2E-02
Cumulative Cancer Risk or Hazard Index				**3E-06**		**7E-07**		**9E-08**		**1E+00**		**7E-02**		**1E+00**

Notes: Data shown are the 2018/2021 risk assessment dataset

Bold italics indicate a surrogate is used as the basis of the NMSSL (see Section 2.2.4)
CR – Cancer risk (Maximum EPC/Cancer-based NMSSL for a given receptor); unitless
CW – Construction worker; NMSSLs and CR or HQ values are specific to the construction worker scenario
HQ – Hazard quotient (Maximum EPC/Noncancer-based NMSSL for a given receptor); unitless
mg/kg – Milligram per kilogram
NA – Not applicable; no CR or HQ calculated
NC – Noncancer
Res – Resident; NMSSL and CR or HQ values are specific to residential use scenario
NMSSL – New Mexico Environment Department Soil Screening Level
NV – No NMSSL value
Worker – Commercial/Industrial worker; NMSSL and CR or HQ values are specific to the commercial/industrial scenario

Table 2-5. Fall 2018/2021 Dioxin and Furan Data by Sample

Parameter Name	WST16-18-162835		WST16-18-163000		WST16-18-163003		WST16-18-163004		WST16-18-163005		WST16-18-163006		WST16-18-163007		WST16-18-163008	
	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.68E-05	1	6.83E-06	1	5.11E-06	1	5.24E-07	0	2.05E-06	1	7.45E-07	1	4.90E-06	1	9.34E-06	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.08E-05	1	2.15E-06	1	2.39E-06	1	5.00E-07	0	4.99E-07	0	5.00E-07	0	7.08E-07	1	4.05E-06	1
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	6.78E-07	1	4.99E-07	0	7.67E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	9.02E-07	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.11E-06	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	4.99E-07	0
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.95E-06	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	7.32E-07	1
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	2.74E-06	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	6.71E-07	1
Hexachlorodibenzofuran[1,2,3,4,7,8-]	7.82E-07	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	5.97E-07	1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.01E-06	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	7.09E-07	1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.97E-07	0	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	4.99E-07	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.27E-06	1	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	6.27E-07	1
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.62E-04	1	4.92E-05	1	3.34E-05	1	2.78E-06	1	6.77E-06	1	4.29E-06	1	1.43E-05	1	3.78E-05	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.29E-05	1	4.29E-06	1	3.68E-06	1	1.00E-06	0	9.97E-07	0	1.00E-06	0	1.07E-06	1	8.99E-06	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.97E-07	0	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	4.99E-07	0
Pentachlorodibenzofuran[1,2,3,7,8-]	4.97E-07	0	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	4.99E-07	0
Pentachlorodibenzofuran[2,3,4,7,8-]	4.97E-07	0	4.99E-07	0	4.98E-07	0	5.00E-07	0	4.99E-07	0	5.00E-07	0	4.99E-07	0	4.99E-07	0
Tetrachlorodibenzodioxin[2,3,7,8-]	1.21E-07	1	9.99E-08	0	1.20E-07	0	1.52E-07	0	9.97E-08	0	1.00E-07	0	9.98E-08	0	1.38E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	1.79E-07	0	1.21E-07	0	2.15E-07	0	2.12E-07	0	2.77E-07	0	1.33E-07	0	1.62E-07	0	4.07E-07	1

Parameter Name	WST16-18-163009		WST16-18-163010		WST16-18-163011		WST16-22-237994		WST16-22-237995		WST16-22-238006		WST16-22-238007		WST16-22-238008	
	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	3.24E-06	1	5.15E-07	1	4.12E-06	1	6.40E-06	1	1.93E-04	1	6.34E-05	1	3.40E-06	1	1.82E-04	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.95E-06	1	4.99E-07	0	7.71E-07	1	2.90E-06	1	6.95E-05	1	2.11E-05	1	1.35E-06	1	5.76E-05	1
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	3.82E-06	1	1.53E-06	1	4.45E-07	0	3.55E-06	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	4.37E-06	1	1.18E-06	1	4.45E-07	0	3.57E-06	1
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	7.12E-06	1	2.36E-06	1	4.45E-07	0	7.00E-06	1
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	8.59E-06	1	2.49E-06	1	4.45E-07	0	7.10E-06	1
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	2.42E-06	1	1.01E-06	1	4.45E-07	0	1.83E-06	1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	2.80E-06	1	9.38E-07	1	4.45E-07	0	2.34E-06	1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	6.95E-07	0	4.71E-07	0	4.45E-07	0	7.92E-07	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	3.56E-06	1	1.08E-06	1	4.45E-07	0	3.31E-06	1
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.36E-05	1	3.11E-06	1	1.70E-05	1	5.26E-05	1	1.10E-03	1	4.26E-04	1	2.04E-05	1	1.13E-03	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3.81E-06	1	9.99E-07	0	1.08E-06	1	7.40E-06	1	1.12E-04	1	5.41E-05	1	2.21E-06	1	1.18E-04	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	1.70E-06	1	6.24E-07	1	4.45E-07	0	1.44E-06	1
Pentachlorodibenzofuran[1,2,3,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	4.59E-07	0	4.56E-07	0	4.45E-07	0	5.92E-07	1
Pentachlorodibenzofuran[2,3,4,7,8-]	5.02E-07	0	4.99E-07	0	5.03E-07	0	4.77E-07	0	4.59E-07	0	4.56E-07	0	4.45E-07	0	4.46E-07	0
Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	0	9.99E-08	0	1.01E-07	0	2.40E-07	0	2.64E-07	0	2.26E-07	0	2.28E-07	0	2.62E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	2.13E-07	0	1.34E-07	0	1.49E-07	1	2.40E-07	0	2.70E-07	0	2.96E-07	0	2.51E-07	0	3.42E-07	0

Table 2-5. Fall 2018/2021 Dioxin and Furan Data by Sample, Cont.

Parameter Name	WST16-22-238009	
	Result (mg/kg)	DC
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.27E-04	1
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	1.40E-04	1
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	8.42E-06	1
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	7.92E-06	1
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.47E-05	1
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	1.70E-05	1
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.10E-06	1
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.92E-06	1
Hexachlorodibenzofuran[1,2,3,7,8,9-]	1.06E-06	0
Hexachlorodibenzofuran[2,3,4,6,7,8-]	6.83E-06	1
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	2.67E-03	1
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.86E-04	1
Pentachlorodibenzodioxin[1,2,3,7,8-]	2.87E-06	1
Pentachlorodibenzofuran[1,2,3,7,8-]	6.14E-07	1
Pentachlorodibenzofuran[2,3,4,7,8-]	6.95E-07	1
Tetrachlorodibenzodioxin[2,3,7,8-]	2.94E-07	0
Tetrachlorodibenzofuran[2,3,7,8-]	2.96E-07	0

Notes:
Blank cells – data were rejected
DC – Detect code; 0=not detected, 1=detected
mg/kg – milligram per kilogram
NV – No value

Table 2-6. Dioxin/Furan Human Health TEFs and TEQs for the Fall 2018/2021 Samples

Congener Name	TEF	WST16-18-162835 TECi	WST16-18-163000 TECi	WST16-18-163003 TECi	WST16-18-163004 TECi	WST16-18-163005 TECi	WST16-18-163006 TECi	WST16-18-163007 TECi	WST16-18-163008 TECi	WST16-18-163009 TECi	WST16-18-163010 TECi	WST16-18-163011 TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	4.68E-07	6.83E-08	5.11E-08	5.24E-09	2.05E-08	7.45E-09	4.90E-08	9.34E-08	3.24E-08	5.15E-09	4.12E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.08E-07	2.15E-08	2.39E-08	5.00E-09	4.99E-09	5.00E-09	7.08E-09	4.05E-08	1.95E-08	4.99E-09	7.71E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	6.78E-09	4.99E-09	7.67E-09	5.00E-09	4.99E-09	5.00E-09	4.99E-09	9.02E-09	5.02E-09	4.99E-09	5.03E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	1.11E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	1.95E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	7.32E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	2.74E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	6.71E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	7.82E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	5.97E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	1.01E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	7.09E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.97E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	1.27E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08	5.00E-08	4.99E-08	6.27E-08	5.02E-08	4.99E-08	5.03E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	7.86E-08	1.48E-08	1.00E-08	8.34E-10	2.03E-09	1.29E-09	4.29E-09	1.13E-08	4.08E-09	9.33E-10	5.10E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	6.87E-09	1.29E-09	1.10E-09	3.00E-10	2.99E-10	3.00E-10	3.21E-10	2.70E-09	1.14E-09	3.00E-10	3.24E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.97E-07	4.99E-07	4.98E-07	5.00E-07	4.99E-07	5.00E-07	4.99E-07	4.99E-07	5.02E-07	4.99E-07	5.03E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	1.49E-08	1.50E-08	1.49E-08	1.50E-08	1.50E-08	1.50E-08	1.50E-08	1.50E-08	1.51E-08	1.50E-08	1.51E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	1.49E-07	1.50E-07	1.49E-07	1.50E-07	1.50E-07	1.50E-07	1.50E-07	1.50E-07	1.51E-07	1.50E-07	1.51E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	1.21E-07	9.99E-08	1.20E-07	1.52E-07	9.97E-08	1.00E-07	9.98E-08	1.38E-07	1.00E-07	9.99E-08	1.01E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	1.79E-08	1.21E-08	2.15E-08	2.12E-08	2.77E-08	1.33E-08	1.62E-08	4.07E-08	2.13E-08	1.34E-08	1.49E-08
TCDD TEQ		**2.50E-06**	**1.24E-06**	**1.25E-06**	**1.20E-06**	**1.17E-06**	**1.15E-06**	**1.19E-06**	**1.43E-06**	**1.20E-06**	**1.14E-06**	**1.20E-06**

Table 2-6. Dioxin/Furan Human Health TEFs and TEQs, cont.

Congener Name	TEF	WST16-22-237994 TECi	WST16-22-237995 TECi	WST16-22-238006 TECi	WST16-22-238007 TECi	WST16-22-238008 TECi	WST16-22-238009 TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.01	6.40E-08	1.93E-06	6.34E-07	3.40E-08	1.82E-06	4.27E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.90E-08	6.95E-07	2.11E-07	1.35E-08	5.76E-07	1.40E-06
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	4.77E-09	3.82E-08	1.53E-08	4.45E-09	3.55E-08	8.42E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.1	4.77E-08	4.37E-07	1.18E-07	4.45E-08	3.57E-07	7.92E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.1	4.77E-08	7.12E-07	2.36E-07	4.45E-08	7.00E-07	1.47E-06
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	4.77E-08	8.59E-07	2.49E-07	4.45E-08	7.10E-07	1.70E-06
Hexachlorodibenzofuran[1,2,3,4,7,8-]	0.1	4.77E-08	2.42E-07	1.01E-07	4.45E-08	1.83E-07	4.10E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	4.77E-08	2.80E-07	9.38E-08	4.45E-08	2.34E-07	4.92E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.77E-08	6.95E-08	4.71E-08	4.45E-08	7.92E-08	1.06E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	4.77E-08	3.56E-07	1.08E-07	4.45E-08	3.31E-07	6.83E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0003	1.58E-08	3.30E-07	1.28E-07	6.12E-09	3.39E-07	8.01E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0003	2.22E-09	3.36E-08	1.62E-08	6.63E-10	3.54E-08	8.58E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.77E-07	1.70E-06	6.24E-07	4.45E-07	1.44E-06	2.87E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	0.03	1.43E-08	1.38E-08	1.37E-08	1.34E-08	1.78E-08	1.84E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.3	1.43E-07	1.38E-07	1.37E-07	1.34E-07	1.34E-07	2.09E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1	2.40E-07	2.64E-07	2.26E-07	2.28E-07	2.62E-07	2.94E-07
Tetrachlorodibenzofuran[2,3,7,8-]	0.1	2.40E-08	2.70E-08	2.96E-08	2.51E-08	3.42E-08	2.96E-08
TCDD TEQ		**1.35E-06**	**8.12E-06**	**2.99E-06**	**1.22E-06**	**7.29E-06**	**1.57E-05**

Notes: The sample concentrations (Table 2-5) are multiplied by the TEF to obtain the TECi for each congener in each sample. The TECi are summed in each column to obtain the TEQ for each sample. The maximum TEQ is used in Table 2-4 to establish maximum cancer risk and noncancer hazard. A UCL95 of these TEQs is calculated as a refined EPC for TCDD TEQ. If not detected, the reporting limit is shown in Table 2-5 and used to estimate the TECi and TEQ for that sample.
The shaded cell is the maximum TEQ.
TCDD- 2,3,7,8-Tetrachlorodibenzo-p-dioxin
TECi - Toxicity Equivalent Concentration for congener i
TEF - Toxicity Equivalency Factor
TEQ- Toxicity Equivalent Quotient
NV – No value

Table 2-7. Comparison of Maximum and Refined EPCs to Groundwater Protection Screening Levels

Category	Name	MTGW NMSSL (mg/kg)	Maximum Result (mg/kg)	Maximum MTGW Ratio	Refined EPC (mg/kg)	Refined EPC MTGW Ratio	Distribution	UCL Type
Inorganic	Antimony	6.56E+00	6.61E+00	1E+00	NA	NA	NA	NA
	Barium	2.70E+03	4.06E+03	2E+00	1.07E+3	4E-01	NDD	95% Student's t UCL
	Perchlorate	1.17E-01	6.37E-04	5E-03	NA	NA	NA	NA
	Silver	1.38E+01	8.57E+01	6E+00	1.46E+01	1E+00	NDD	95% KM (t) UCL
Organic	Amino-2,6-dinitrotoluene[4-]	2.30E-02	6.55E-01	3E+01	1.48E-01	6E+00	NA - 1 detect	Median
	Anthracene	8.51E+02	5.19E-02	6E-05	NA	NA	NA	NA
	HMX	1.94E+01	1.84E+00	9E-02	NA	NA	NA	NA
	RDX	5.93E-02	2.01E-01	3E+00	1.48E-01	2E+00	NA - 1 detect	Median
	TATB	4.20E+01	7.22E+00	2E-01	NA	NA	NA	NA
	Toluene	1.21E+01	4.83E-04	4E-05	NA	NA	NA	NA
	Trinitrotoluene[2,4,6-]	8.61E-01	2.52E+00	3E+00	1.48E-01	2E-01	NA - 1 detect	Median
	TCDD TEQ	2.24E-04	1.57E-05	7E-02	NA	NA	NA	NA

Notes:
Bold italics - surrogates applied for NMSSLs. See Section 2.2.4
CAS – Chemical abstract system
EPC – Exposure point concentration
mg/kg – milligram,per kilogram
MTGW – Migration to groundwater
NA – Not applicable
NDD – No discernible distribution
TCDD – 2,3,7,8-Tetrachlorodibenzo-p-dioxin
TEQ – Toxicity Equivalent Quotient

Table 3-1. Ecological Screening Levels

Analyte Group	Name	No Effect ESLs									
		American kestrel (Avian top carnivore) (mg/kg)	American kestrel (insectivore / carnivore) (mg/kg)	American robin (Avian herbivore) (mg/kg)	American robin (Avian insectivore) (mg/kg)	American robin (Avian omnivore) (mg/kg)	Deer mouse (Mammalian omnivore) (mg/kg)	Earthworm (Soil-dwelling invertebrate) (mg/kg)	Generic plant (Terrestrial autotroph - producer) (mg/kg)	Gray fox (Mammalian top carnivore) (mg/kg)	Mountain cottontail (Mammalian herbivore) (mg/kg)
Inorganics	Antimony						2.3	78	11	46	2.7
	Barium	24000	7500	720	820	770	1800	330	110	41000	2900
	Perchlorate	2	3.9	0.12	31	0.24	0.21	3.5	40	3.3	0.26
	Silver	600	13	10	2.6	4.1	24		560	4400	150
Dioxin/ Furan	TCDD [2,3,7,8-]						5.80E-07	5		0.0001	0.00004
High Explosive	Amino-2,6-dinitrotoluene [4-]						23	18	33	6700	320
	HMX						290	16	2700	59000	410
	RDX	780	11	2.3	2.4	2.3	16	8.4		7000	38
	TATB						110	10		10000	150
	Trinitrotoluene [2,4,6-]	3100	1300	7.5	120	14	95	32	62	26000	110
PAH	Anthracene						300		6.8	38000	1200
VOC	Toluene						25		200	12000	66

Table 3-1. Ecological Screening Levels, cont.

Analyte Group	Analyte Name	Low Effect ESL									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganic	Antimony						23	780	58	460	27
	Barium	44000	13000	1200	1400	1300	8700	3200	260	190000	14000
	Perchlorate	4	8	0.24	64	0.49	1	35	80	16	1.3
	Silver	6000	130	100	26	41	240		2800	44000	1500
Dioxin/ Furan	TCDD[2,3,7,8-]						3.8E-06	10		0.00068	0.00027
High Explosive	Amino-2,6-dinitrotoluene[4-]						230	180	330	67000	3200
	HMX						790	160	3500	150000	1100
	RDX	1400	22	4.3	4.5	4.4	51	15		22000	120
	TATB						1100	28		100000	1500
	Trinitrotoluene[2,4,6-]	5700	2400	13	220	26	440	58	120	120000	540
PAH	Anthracene						3000		9	380000	12000
VOC	Toluene						250		2000	120000	660

Notes: – ESLs for detected organics and detected inorganics above background are shown. Blank cells indicate no value available.
. See Attachment B for all available ESLs in these analyte groups.
CAS – Chemical abstract system
ESL – Ecological screening level
mg/kg – milligram per kilogram
PAH – Polynuclear aromatic hydrocarbons
TCDD - Tetrachlorodibenzodioxin
VOC – Volatile organic compounds

Table 3-2. Ecological Screening Evaluation Based on Maximum EPCs and NE ESLs

Category	Parameter Name	Maximum Result (mg/kg)	Hazard Quotients									
			Max American kestrel (Avian top carnivore)	Max American kestrel (insectivore / carnivore)	Max American robin (Avian herbivore)	Max American robin (Avian insectivore)	Max American robin (Avian omnivore)	Max Deer mouse (Mammalian omnivore)	Max Earthworm (Soil-dwelling invertebrate)	Max Generic plant (Terrestrial autotroph - producer)	Max Gray fox (Mammalian top carnivore)	Max Mountain cottontail (Mammalian herbivore)
Inorganic	Antimony	6.61	No ESL	No ESL	No ESL	No ESL	No ESL	3E+00	8E-02	6E-01	1E-01	2E+00
	Barium	4060	2E-01	5E-01	6E+00	5E+00	5E+00	2E+00	1E+01	4E+01	1E-01	1E+00
	Perchlorate	0.00062	3E-04	2E-04	5E-03	2E-05	3E-03	3E-03	2E-04	2E-05	2E-04	2E-03
	Silver	85.7	1E-01	7E+00	9E+00	3E+01	2E+01	4E+00	No ESL	2E-01	2E-02	6E-01
Organic	Amino-2,6-dinitrotoluene [4-]	0.655	No ESL	No ESL	No ESL	No ESL	No ESL	3E-02	4E-02	2E-02	1E-04	2E-03
	Anthracene	0.0226	No ESL	No ESL	No ESL	No ESL	No ESL	8E-05	No ESL	3E-03	6E-07	2E-05
	HMX	1.84	No ESL	No ESL	No ESL	No ESL	No ESL	6E-03	1E-01	7E-04	3E-05	4E-03
	RDX	0.201	3E-04	2E-02	9E-02	8E-02	9E-02	1E-02	2E-02	No ESL	3E-05	5E-03
	TATB	7.22	No ESL	No ESL	No ESL	No ESL	No ESL	7E-02	7E-01	No ESL	7E-04	5E-02
	Toluene	0.000483	No ESL	No ESL	No ESL	No ESL	No ESL	2E-05	No ESL	2E-06	4E-08	7E-06
	Trinitrotoluene [2,4,6-]	2.52	8E-04	2E-03	3E-01	2E-02	2E-01	3E-02	8E-02	4E-02	1E-04	2E-02
	TCDD TEQ (mammal)	1.57E-05	NA	NA	NA	NA	NA	3E+01	3E-06	No ESL	2E-01	5E+01
	TCDD TEQ (bird)	1.34E-05	No ESL	No ESL	No ESL	No ESL	No ESL	NA	NA	NA	NA	NA
Hazard Index (HI)			**3E-01**	**7E+00**	**1E+01**	**4E+01**	**3E+01**	**4E+01**	**1E+01**	**4E+01**	**4E-01**	**6E+01**

Notes:
Shaded cells indicate the HQ >0.1
Bold Italics – a surrogate is used as the toxicity value. See Section 2.2.4

EPC –Exposure point concentration
ESL – Ecological screening value
mg/kg – milligram per kilogram
NA – Not applicable
NE– No effect
TEQ – Toxicity equivalent quotient

Table 3-3. Refined Exposure Point Concentrations

Name	CAS	UCL95 (mg/kg)	UCL Type	Distribution
Antimony	7440-36-0	0.337	Median	NA - 1 Detects
Barium	7440-39-3	1065	95% Student's t UCL	NDD
Perchlorate	14797-73-0	0.00052	Median	NA - 2 Detects
Silver	7440-22-4	14.63	95% KM (t) UCL	NDD
Amino-2,6-dinitrotoluene[4-]	19406-51-0	0.148	Median	NA - 1 Detects
Anthracene	120-12-7	0.011	Median	NA - 1 Detects
HMX	2691-41-0	0.503	95% KM (t) UCL	Normal
RDX	121-82-4	0.148	Median	NA
TATB	3058-38-6	2.63	95% KM (t) UCL	Normal
Toluene	108-88-3	0.00035	Median	NA - 2 Detects
Trinitrotoluene[2,4,6-]	118-96-7	0.148	Median	NA
TCDD TEQ - bird	1746-01-6	4.50E-06	95% Student's t UCL	NDD
TCDD TEQ - mammal	1746-01-6	4.68E-06	95% Student's-t UCL	NDD

Notes:
CAS – Chemical abstract system
mg/kg – milligram,per kilogram
NA – Not applicable
NDD – No discernible distribution
TCDD – 2,3,7,8-Tetrachlorodibenzo-p-dioxin
TEQ – Toxicity equivalent quotient

Table 3-4. Ecological Screening Evaluation Using UCL95 EPCs and LE ESLs.

Analyte Name	Refined EPC (mg/kg)	Hazard Quotients for Refined EPCs and LE ESLs									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Antimony	0.337	No ESL	No ESL	No ESL	No ESL	No ESL	1E-02	4E-04	6E-03	7E-04	1E-02
Barium	1065	2E-02	8E-02	9E-01	8E-01	8E-01	1E-01	3E-01	4E+00	6E-03	8E-02
Perchlorate	0.00052	1E-04	7E-05	2E-03	8E-06	1E-03	5E-04	1E-05	7E-06	3E-05	4E-04
Silver	14.63	2E-03	1E-01	1E-01	6E-01	4E-01	6E-02	No ESL	5E-03	3E-04	1E-02
Amino-2,6-dinitrotoluene[4-]	0.148	No ESL	No ESL	No ESL	No ESL	No ESL	6E-04	8E-04	4E-04	2E-06	5E-05
Anthracene	0.011	No ESL	No ESL	No ESL	No ESL	No ESL	4E-06	No ESL	1E-03	3E-08	9E-07
HMX	0.503	No ESL	No ESL	No ESL	No ESL	No ESL	6E-04	3E-03	1E-04	3E-06	5E-04
RDX	0.148	1E-04	7E-03	3E-02	3E-02	3E-02	3E-03	1E-02	No ESL	7E-06	1E-03
TATB	2.63	No ESL	No ESL	No ESL	No ESL	No ESL	2E-03	9E-02	No ESL	3E-05	2E-03
Toluene	0.00035	No ESL	No ESL	No ESL	No ESL	No ESL	1E-06	No ESL	2E-07	3E-09	5E-07
Trinitrotoluene[2,4,6-]	0.148	3E-05	6E-05	1E-02	7E-04	6E-03	3E-04	3E-03	1E-03	1E-06	3E-04
TCDD TEQ-mammals	4.68E-06	No ESL	No ESL	No ESL	No ESL	No ESL	1E+00	5E-07	No ESL	7E-03	2E-02
TCDD TEQ (bird)	4.50E-06	No ESL	No ESL	No ESL	No ESL	No ESL	NA	NA	NA	NA	NA
Hazard Index (HI)		**3E-02**	**2E-01**	**1E+00**	**1E+00**	**1E+00**	**1E+00**	**4E-01**	**4E+00**	**1E-02**	**1E-01**

Per NMED (2022), UCLs were not calculated unless there were ≥5 detected values and 8 or more total samples. EPCs represent all detected analytes and for inorganics, all detected analytes with maxima greater than the BTV
The mammalian TCDD TEQ is applied to estimate HQs for earthworms
Shaded cells represent HQs>0.1
HI is the sum of all HQs

ESL – Ecological Screening Level
HI – Hazard Index
LE – Low Effect
mg/kg – milligram per kilogram
NA – Not applicable
TEQ – Toxicity equivalent quotient
UCL – Upper confidence limit

Table 3-5. Toxic Equivalency Factors (TEFs) Used for Calculating TCDD Equivalent Concentrations

Name	CAS	Mammalian TEF[a]	Avian TEF[b]
Chlorinated dibenzo-p-dioxins			
2,3,7,8-TCDD	1746-01-6	1	1
1,2,3,7,8-PeCDD	40321-76-4	1	1
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01	0.001
OCDD	3268-87-9	0.0003	0.0001
Chlorinated dibenzofurans			
2,3,7,8-TCDF	51207-31-9	0.1	1
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1
2,3,4,7,8-PeCDF	57117-31-4	0.3	0.1
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	1
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01
OCDF	39001-02-0	0.0003	0.0001

[a] EPA (2010b); WHO (2009)
[b] Van den Berg et al. (1998).

Table 3-6. Dioxin-Furan TECi and TEQs for Mammals by Sample

Congener Name	WST16-18-162835	WST16-18-163000	WST16-18-163003	WST16-18-163004	WST16-18-163005
	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	4.68E-07	6.83E-08	5.11E-08	5.24E-09	2.05E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.08E-07	2.15E-08	2.39E-08	5.00E-09	4.99E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	6.78E-09	4.99E-09	7.67E-09	5.00E-09	4.99E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	1.11E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	1.95E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	2.74E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	7.82E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	1.01E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.97E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	1.27E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	7.86E-08	1.48E-08	1.00E-08	8.34E-10	2.03E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	6.87E-09	1.29E-09	1.10E-09	3.00E-10	2.99E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.97E-07	4.99E-07	4.98E-07	5.00E-07	4.99E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.49E-08	1.50E-08	1.49E-08	1.50E-08	1.50E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.49E-07	1.50E-07	1.49E-07	1.50E-07	1.50E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1.21E-07	9.99E-08	1.20E-07	1.52E-07	9.97E-08
Tetrachlorodibenzofuran[2,3,7,8-]	1.79E-08	1.21E-08	2.15E-08	2.12E-08	2.77E-08
TEQ	**2.50E-06**	**1.24E-06**	**1.25E-06**	**1.20E-06**	**1.17E-06**

Table 3-6. Dioxin-Furan TECi and TEQs for Mammals by Sample, cont.

Congener Name	WST16-18-163006	WST16-18-163007	WST16-18-163008	WST16-18-163009	WST16-18-163010	WST16-18-163011
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	7.45E-09	4.90E-08	9.34E-08	3.24E-08	5.15E-09	4.12E-08
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.00E-09	7.08E-09	4.05E-08	1.95E-08	4.99E-09	7.71E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.00E-09	4.99E-09	9.02E-09	5.02E-09	4.99E-09	5.03E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.00E-08	4.99E-08	7.32E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.00E-08	4.99E-08	6.71E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.00E-08	4.99E-08	5.97E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.00E-08	4.99E-08	7.09E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.00E-08	4.99E-08	6.27E-08	5.02E-08	4.99E-08	5.03E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.29E-09	4.29E-09	1.13E-08	4.08E-09	9.33E-10	5.10E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	3.00E-10	3.21E-10	2.70E-09	1.14E-09	3.00E-10	3.24E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	5.00E-07	4.99E-07	4.99E-07	5.02E-07	4.99E-07	5.03E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	1.50E-08	1.50E-08	1.50E-08	1.51E-08	1.50E-08	1.51E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.50E-07	1.50E-07	1.50E-07	1.51E-07	1.50E-07	1.51E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	9.98E-08	1.38E-07	1.00E-07	9.99E-08	1.01E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.33E-08	1.62E-08	4.07E-08	2.13E-08	1.34E-08	1.49E-08
TEQ	**1.15E-06**	**1.19E-06**	**1.43E-06**	**1.20E-06**	**1.14E-06**	**1.20E-06**

Table 3-6. Dioxin-Furan TECi and TEQs for Mammals by Sample, cont.

Congener Name	WST16-22-237994	WST16-22-237995	WST16-22-238006	WST16-22-238007	WST16-22-238008	WST16-22-238009
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	6.40E-08	1.93E-06	6.34E-07	3.40E-08	1.82E-06	4.27E-06
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.90E-08	6.95E-07	2.11E-07	1.35E-08	5.76E-07	1.40E-06

Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.77E-09	3.82E-08	1.53E-08	4.45E-09	3.55E-08	8.42E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	4.77E-08	4.37E-07	1.18E-07	4.45E-08	3.57E-07	7.92E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.77E-08	7.12E-07	2.36E-07	4.45E-08	7.00E-07	1.47E-06
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.77E-08	8.59E-07	2.49E-07	4.45E-08	7.10E-07	1.70E-06
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.77E-08	2.42E-07	1.01E-07	4.45E-08	1.83E-07	4.10E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.77E-08	2.80E-07	9.38E-08	4.45E-08	2.34E-07	4.92E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.77E-08	6.95E-08	4.71E-08	4.45E-08	7.92E-08	1.06E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.77E-08	3.56E-07	1.08E-07	4.45E-08	3.31E-07	6.83E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	1.58E-08	3.30E-07	1.28E-07	6.12E-09	3.39E-07	8.01E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	2.22E-09	3.36E-08	1.62E-08	6.63E-10	3.54E-08	8.58E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.77E-07	1.70E-06	6.24E-07	4.45E-07	1.44E-06	2.87E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	1.43E-08	1.38E-08	1.37E-08	1.34E-08	1.78E-08	1.84E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	1.43E-07	1.38E-07	1.37E-07	1.34E-07	1.34E-07	2.09E-07
Tetrachlorodibenzodioxin[2,3,7,8-]	2.40E-07	2.64E-07	2.26E-07	2.28E-07	2.62E-07	2.94E-07
Tetrachlorodibenzofuran[2,3,7,8-]	2.40E-08	2.70E-08	2.96E-08	2.51E-08	3.42E-08	2.96E-08
TEQ	**1.35E-06**	**8.12E-06**	**2.99E-06**	**1.22E-06**	**7.29E-06**	**1.57E-05**

Notes: The sample data for each congener are reported in Table 2-5.
Shaded cell is the maximum TEQ for mammals
mg/kg – milligram per kilogram
NV – No value
TECi – Toxicity equivalent concentration for congener i; (TECi are in units of mg/kg)
TEF – Toxicity equivalency factor;
TEQ – Toxicity equivalent quotient

Table 3-7. Dioxin-Furan TECi and TEQs for Birds by Sample

Congener Name	TEF	WST16-18-162835 TECi	WST16-18-163000 TECi	WST16-18-163003 TECi	WST16-18-163004 TECi	WST16-18-163005 TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	0.001	4.68E-08	6.83E-09	5.11E-09	5.24E-10	2.05E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	0.01	2.08E-07	2.15E-08	2.39E-08	5.00E-09	4.99E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	0.01	6.78E-09	4.99E-09	7.67E-09	5.00E-09	4.99E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	0.05	5.55E-08	2.50E-08	2.49E-08	2.50E-08	2.50E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	0.01	1.95E-08	4.99E-09	4.98E-09	5.00E-09	4.99E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	0.1	2.74E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	1	7.82E-07	4.99E-07	4.98E-07	5.00E-07	4.99E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	0.1	1.01E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	0.1	4.97E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	0.1	1.27E-07	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	0.0001	2.62E-08	4.92E-09	3.34E-09	2.78E-10	6.77E-10
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	0.0001	2.29E-09	4.29E-10	3.68E-10	1.00E-10	9.97E-11
Pentachlorodibenzodioxin[1,2,3,7,8-]	1	4.97E-07	4.99E-07	4.98E-07	5.00E-07	4.99E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	0.1	4.97E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	0.1	4.97E-08	4.99E-08	4.98E-08	5.00E-08	4.99E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	1	1.21E-07	9.99E-08	1.20E-07	1.52E-07	9.97E-08
Tetrachlorodibenzofuran[2,3,7,8-]	1	1.79E-07	1.21E-07	2.15E-07	2.12E-07	2.77E-07
TEQ		**2.60E-06**	**1.59E-06**	**1.70E-06**	**1.70E-06**	**1.72E-06**

Table 3-7. Dioxin-Furan TECi and TEQs for Birds by Sample, cont.

Congener Name	WST16-18-163006	WST16-18-163007	WST16-18-163008	WST16-18-163009	WST16-18-163010	WST16-18-163011
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	7.45E-10	4.90E-09	9.34E-09	3.24E-09	5.15E-10	4.12E-09
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	5.00E-09	7.08E-09	4.05E-08	1.95E-08	4.99E-09	7.71E-09
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	5.00E-09	4.99E-09	9.02E-09	5.02E-09	4.99E-09	5.03E-09
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	2.50E-08	2.50E-08	2.50E-08	2.51E-08	2.50E-08	2.52E-08
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	5.00E-09	4.99E-09	7.32E-09	5.02E-09	4.99E-09	5.03E-09
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	5.00E-08	4.99E-08	6.71E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,4,7,8-]	5.00E-07	4.99E-07	5.97E-07	5.02E-07	4.99E-07	5.03E-07
Hexachlorodibenzofuran[1,2,3,6,7,8-]	5.00E-08	4.99E-08	7.09E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[1,2,3,7,8,9-]	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Hexachlorodibenzofuran[2,3,4,6,7,8-]	5.00E-08	4.99E-08	6.27E-08	5.02E-08	4.99E-08	5.03E-08
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	4.29E-10	1.43E-09	3.78E-09	1.36E-09	3.11E-10	1.70E-09
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	1.00E-10	1.07E-10	8.99E-10	3.81E-10	9.99E-11	1.08E-10
Pentachlorodibenzodioxin[1,2,3,7,8-]	5.00E-07	4.99E-07	4.99E-07	5.02E-07	4.99E-07	5.03E-07
Pentachlorodibenzofuran[1,2,3,7,8-]	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	5.00E-08	4.99E-08	4.99E-08	5.02E-08	4.99E-08	5.03E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	1.00E-07	9.98E-08	1.38E-07	1.00E-07	9.99E-08	1.01E-07
Tetrachlorodibenzofuran[2,3,7,8-]	1.33E-07	1.62E-07	4.07E-07	2.13E-07	1.34E-07	1.49E-07
TEQ	**1.57E-06**	**1.61E-06**	**2.09E-06**	**1.68E-06**	**1.57E-06**	**1.61E-06**

Table 3-7. Dioxin-Furan TECi and TEQs for Birds by Sample

Congener Name	WST16-22-237994	WST16-22-237995	WST16-22-238006	WST16-22-238007	WST16-22-238008	WST16-22-238009
	TECi	TECi	TECi	TECi	TECi	TECi
Heptachlorodibenzodioxin[1,2,3,4,6,7,8-]	6.40E-09	1.93E-07	6.34E-08	3.40E-09	1.82E-07	4.27E-07
Heptachlorodibenzofuran[1,2,3,4,6,7,8-]	2.90E-08	6.95E-07	2.11E-07	1.35E-08	5.76E-07	1.40E-06
Heptachlorodibenzofuran[1,2,3,4,7,8,9-]	4.77E-09	3.82E-08	1.53E-08	4.45E-09	3.55E-08	8.42E-08
Hexachlorodibenzodioxin[1,2,3,4,7,8-]	2.39E-08	2.19E-07	5.90E-08	2.23E-08	1.79E-07	3.96E-07
Hexachlorodibenzodioxin[1,2,3,6,7,8-]	4.77E-09	7.12E-08	2.36E-08	4.45E-09	7.00E-08	1.47E-07
Hexachlorodibenzodioxin[1,2,3,7,8,9-]	4.77E-08	8.59E-07	2.49E-07	4.45E-08	7.10E-07	1.70E-06
Hexachlorodibenzofuran[1,2,3,4,7,8-]	4.77E-07	2.42E-06	1.01E-06	4.45E-07	1.83E-06	4.10E-06
Hexachlorodibenzofuran[1,2,3,6,7,8-]	4.77E-08	2.80E-07	9.38E-08	4.45E-08	2.34E-07	4.92E-07
Hexachlorodibenzofuran[1,2,3,7,8,9-]	4.77E-08	6.95E-08	4.71E-08	4.45E-08	7.92E-08	1.06E-07
Hexachlorodibenzofuran[2,3,4,6,7,8-]	4.77E-08	3.56E-07	1.08E-07	4.45E-08	3.31E-07	6.83E-07
Octachlorodibenzodioxin[1,2,3,4,6,7,8,9-]	5.26E-09	1.10E-07	4.26E-08	2.04E-09	1.13E-07	2.67E-07
Octachlorodibenzofuran[1,2,3,4,6,7,8,9-]	7.40E-10	1.12E-08	5.41E-09	2.21E-10	1.18E-08	2.86E-08
Pentachlorodibenzodioxin[1,2,3,7,8-]	4.77E-07	1.70E-06	6.24E-07	4.45E-07	1.44E-06	2.87E-06
Pentachlorodibenzofuran[1,2,3,7,8-]	4.77E-08	4.59E-08	4.56E-08	4.45E-08	5.92E-08	6.14E-08
Pentachlorodibenzofuran[2,3,4,7,8-]	4.77E-08	4.59E-08	4.56E-08	4.45E-08	4.46E-08	6.95E-08
Tetrachlorodibenzodioxin[2,3,7,8-]	2.40E-07	2.64E-07	2.26E-07	2.28E-07	2.62E-07	2.94E-07
Tetrachlorodibenzofuran[2,3,7,8-]	2.40E-07	2.70E-07	2.96E-07	2.51E-07	3.42E-07	2.96E-07
TEQ	**1.79E-06**	**7.65E-06**	**3.17E-06**	**1.69E-06**	**6.50E-06**	**1.34E-05**

Notes: Data are the Fall 2018/2021 data set
Shaded cell is the maximum TEQ for birds
mg/kg – milligram per kilogram
NV – No value
TECi – Toxicity equivalent concentration for congener i; (TECi are in units of mg/kg)
TEF – Toxicity equivalency factor
TEQ – Toxicity equivalent quotient

Table 3-8. Hazard Analysis by Receptor and Area Use Factors For No Effect ESLs

COPC Name	CAS	No Effect Ecological Screening Levels (ESLs) for Terrestrial Receptors (mg/kg)									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Antimony	7440-36-0	No ESL	No ESL	No ESL	No ESL	No ESL	2.3	78	11	46	2.7
Barium	7440-39-3	24000	7500	720	820	770	1800	330	110	41000	2900
Perchlorate	14797-73-0	2	3.9	0.12	31	0.24	0.21	3.5	40	3.3	0.26
Silver	7440-22-4	600	13	10	2.6	4.1	24	No ESL	560	4400	150
Amino-2,6-dinitrotoluene[4-]	19406-51-0	No ESL	No ESL	No ESL	No ESL	No ESL	23	18	33	6700	320
Anthracene	120-12-7	No ESL	No ESL	No ESL	No ESL	No ESL	300	No ESL	6.8	38000	1200
HMX	2691-41-0	No ESL	No ESL	No ESL	No ESL	No ESL	290	16	2700	59000	410
RDX	121-82-4	780	11	2.3	2.4	2.3	16	8.4	No ESL	7000	38
TATB	3058-38-6	No ESL	No ESL	No ESL	No ESL	No ESL	110	10	No ESL	10000	150
Toluene	108-88-3	No ESL	No ESL	No ESL	No ESL	No ESL	25	No ESL	200	12000	66
Trinitrotoluene[2,4,6-]	118-96-7	3100	1300	7.5	120	14	95	32	62	26000	110
TCDD TEQ	1746-01-6	No ESL	No ESL	No ESL	No ESL	No ESL	5.80E-07	5	No ESL	0.0001	0.00004
HR (ha)[a]		106	106	0.42	0.42	0.42	0.077	NA	NA	1038	3.1
Population Area[b]		4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	124
PAUF[c]		0.000113	0.000113	0.028	0.028	0.028	0.155	NA	NA	1.15E-05	0.0039
AUF[d]		0.0045	0.0045	1.00	1.00	1.00	1.00	NA	NA	3.34E-07	0.154

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted NE ESL Hazard Quotients									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics											
Antimony	0.337	No ESL	No ESL	No ESL	No ESL	No ESL	2E-02	4E-03	3E-02	8E-08	5E-04
Barium	1065	5E-06	2E-05	4E-02	4E-02	4E-02	9E-02	3E+00	1E+01	3E-07	1E-03
Perchlorate	5.23E-04	3E-08	2E-08	1E-04	5E-07	6E-05	4E-04	1E-04	1E-05	2E-09	8E-06
Silver	14.63	3E-06	1E-04	4E-02	2E-01	1E-01	9E-02	No ESL	3E-02	4E-08	4E-04
Organics											
Amino-2,6-dinitrotoluene[4-]	0.148	No ESL	No ESL	No ESL	No ESL	No ESL	1E-03	8E-03	4E-03	3E-10	2E-06
Anthracene	0.0106	No ESL	No ESL	No ESL	No ESL	No ESL	5E-06	No ESL	2E-03	3E-12	3E-08
HMX	0.503	No ESL	No ESL	No ESL	No ESL	No ESL	3E-04	3E-02	2E-04	1E-10	5E-06
RDX	0.148	2E-08	2E-06	2E-03	2E-03	2E-03	1E-03	2E-02	No ESL	2E-10	2E-05
TATB	2.63	No ESL	No ESL	No ESL	No ESL	No ESL	4E-03	3E-01	No ESL	3E-09	7E-05
Toluene	3.47E-04	No ESL	No ESL	No ESL	No ESL	No ESL	2E-06	No ESL	2E-06	3E-13	2E-08
Trinitrotoluene[2,4,6-]	0.148	5E-09	1E-08	6E-04	4E-05	3E-04	2E-04	5E-03	2E-03	7E-11	5E-06
TCDD TEQ (bird)	4.50E-06	No ESL	No ESL	No ESL	No ESL	No ESL	NA	NA	NA	NA	NA
TCDD (mammal)	4.68E-06	NA	NA	NA	NA	NA	1E+00	9E-07	No ESL	5E-07	5E-04
Hazard Index		8E-06	1E-04	9E-02	2E-01	1E-01	1E+00	4E+00	1E+01	1E-06	3E-03

Notes: the mammal TCDD TEQ is used for earthworms
Area of Site (ha): 0.478

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

Table 3-9. Hazard Analysis by Receptor and Area Use Factors For Low Effect ESLs

COPC Name	CAS	Low Effect Ecological Screening Levels (ESLs) for Terrestrial Receptors (mg/kg)									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Antimony	7440-36-0	No ESL	No ESL	No ESL	No ESL	No ESL	23	780	58	460	27
Barium	7440-39-3	44000	13000	1200	1400	1300	8700	3200	260	190000	14000
Perchlorate	14797-73-0	4	8	0.24	64	0.49	1	35	80	16	1.3
Silver	7440-22-4	6000	130	100	26	41	240	No ESL	2800	44000	1500
Amino-2,6-dinitrotoluene[4-]	19406-51-0	No ESL	No ESL	No ESL	No ESL	No ESL	230	180	330	67000	3200
Anthracene	120-12-7	No ESL	No ESL	No ESL	No ESL	No ESL	3000	No ESL	9	380000	12000
HMX	2691-41-0	No ESL	No ESL	No ESL	No ESL	No ESL	790	160	3500	150000	1100
RDX	121-82-4	1400	22	4.3	4.5	4.4	51	15	No ESL	22000	120
TATB	3058-38-6	No ESL	No ESL	No ESL	No ESL	No ESL	1100	28	No ESL	100000	1500
Toluene	108-88-3	No ESL	No ESL	No ESL	No ESL	No ESL	250	No ESL	2000	120000	660
Trinitrotoluene[2,4,6-]	118-96-7	5700	2400	13	220	26	440	58	120	120000	540
TCDD TEQ	1746-01-6	No ESL	No ESL	No ESL	No ESL	No ESL	3.80E-06	10	No ESL	0.00068	0.00027

HR (ha)[a]	106	106	0.42	0.42	0.42	0.077	NA	NA	1038	3.1
Population Area[b]	4240	4240	16.8	16.8	16.8	3.08	NA	NA	41520	124
PAUF[c]	0.000113	0.000113	0.028	0.028	0.028	0.155	NA	NA	1.15E-05	0.0039
AUF[d]	0.0045	0.0045	1.00	1.00	1.00	1.00	NA	NA	3.34E-07	0.154

COPC Name	UCL95 EPC (mg/kg)	Population Area Use Adjusted NE ESL Hazard Quotients									
		American kestrel (Avian top carnivore)	American kestrel (insectivore / carnivore)	American robin (Avian herbivore)	American robin (Avian insectivore)	American robin (Avian omnivore)	Deer mouse (Mammalian omnivore)	Earthworm (Soil-dwelling invertebrate)	Generic plant (Terrestrial autotroph - producer)	Gray fox (Mammalian top carnivore)	Mountain cottontail (Mammalian herbivore)
Inorganics											
Antimony	0.34	No ESL	No ESL	No ESL	No ESL	No ESL	2E-03	4E-04	6E-03	8E-09	5E-05
Barium	1065.00	3E-06	9E-06	3E-02	2E-02	2E-02	2E-02	3E-01	4E+00	6E-08	3E-04
Perchlorate	0.000523	1E-08	7E-09	6E-05	2E-07	3E-05	8E-05	1E-05	7E-06	4E-10	2E-06
Silver	14.63	3E-07	1E-05	4E-03	2E-02	1E-02	9E-03	No ESL	5E-03	4E-09	4E-05
Organics											
Amino-2,6-dinitrotoluene[4-]	0.148	No ESL	No ESL	No ESL	No ESL	No ESL	1E-04	8E-04	4E-04	3E-11	2E-07
Anthracene	0.0106	No ESL	No ESL	No ESL	No ESL	No ESL	5E-07	No ESL	1E-03	3E-13	3E-09
HMX	0.503	No ESL	No ESL	No ESL	No ESL	No ESL	1E-04	3E-03	1E-04	4E-11	2E-06
RDX	0.148	1E-08	8E-07	1E-03	9E-04	1E-03	5E-04	1E-02	No ESL	8E-11	5E-06
TATB	2.63	No ESL	No ESL	No ESL	No ESL	No ESL	4E-04	9E-02	No ESL	3E-10	7E-06
Toluene	3.47E-04	No ESL	No ESL	No ESL	No ESL	No ESL	2E-07	No ESL	2E-07	3E-14	2E-09
Trinitrotoluene[2,4,6-]	0.148	3E-09	7E-09	3E-04	2E-05	2E-04	5E-05	3E-03	1E-03	1E-11	1E-06
TCDD TEQ (bird)	4.50E-06	No ESL	No ESL	No ESL	No ESL	No ESL	NA	NA	NA	NA	NA
TCDD (mammal)	4.68E-06	NA	NA	NA	NA	NA	2E-01	5E-07	No ESL	8E-08	7E-05
Hazard Index		3E-06	2E-05	3E-02	4E-02	3E-02	2E-01	4E-01	4E+00	2E-07	5E-04

Notes: the mammal TCDD TEQ is used for earthworms
Area of Site (ha): 0.478

NA - Not applicable
ESLs - Ecological screening level
PAUF - Population area use factor
AUF - Area use factor
HR - Home range

a - Values from USEPA (1993)
b - Derived as 40*HR
c - PAUF is the area of site divided by the Population Area
d - AUF is the area of the site divided by the HR; AUF cannot exceed 1 and value is set to 1 if calculation results in a higher value

FIGURES

Figure 1-1. Map of Sampling Locations For TA-16-388 Flash Pad

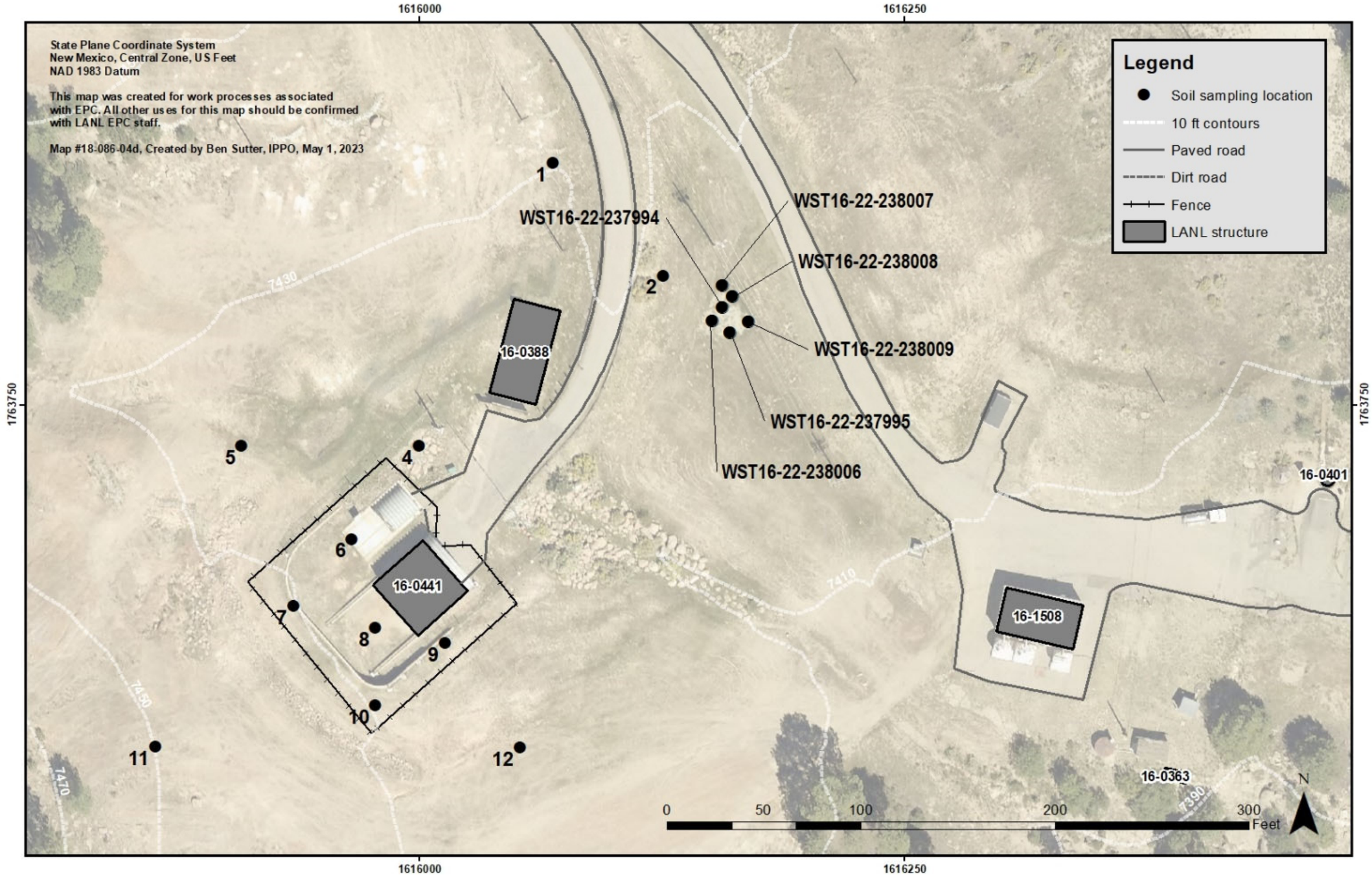


Figure 3-1. Aerial Photograph of Habitat at TA-16-388 and Vicinity

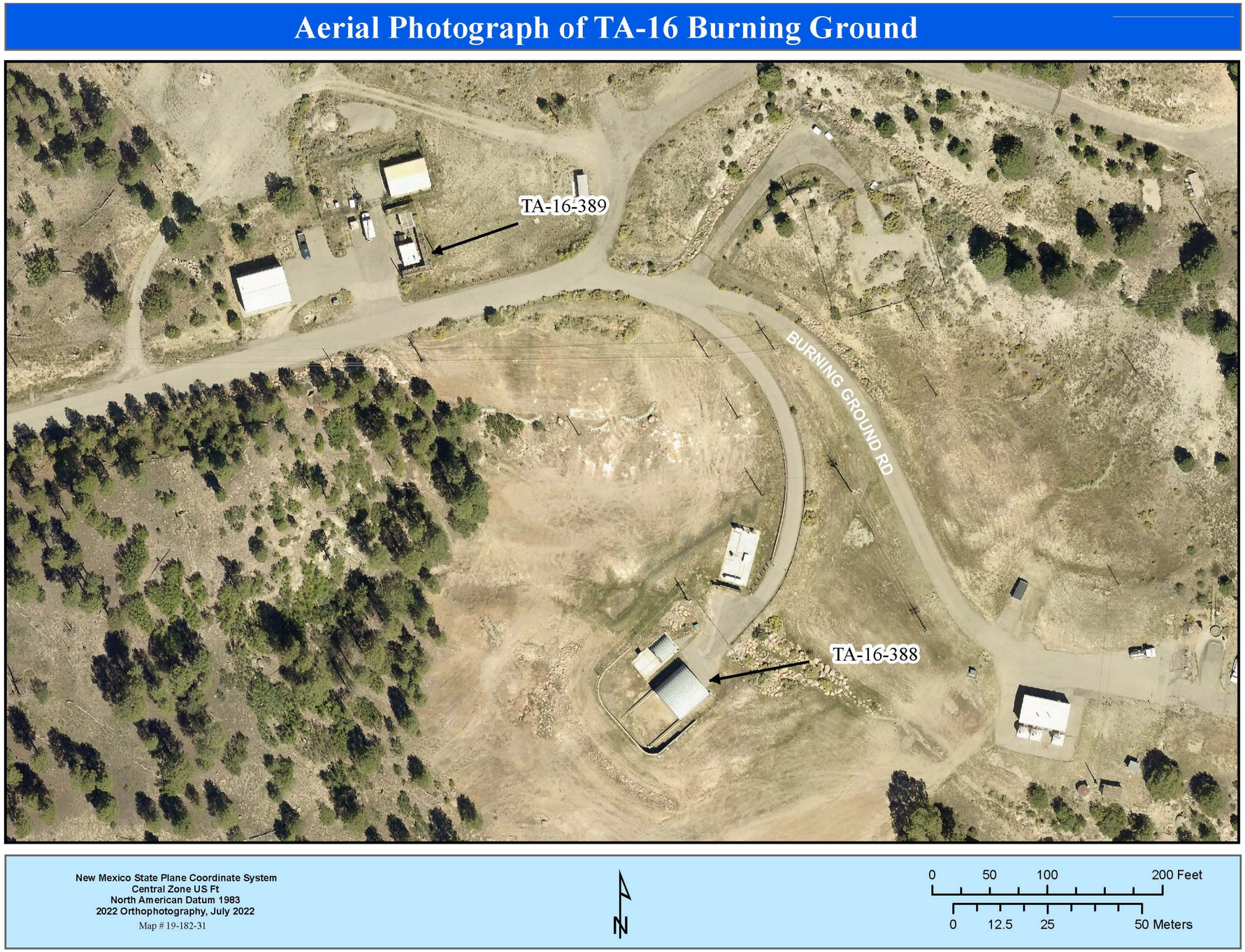
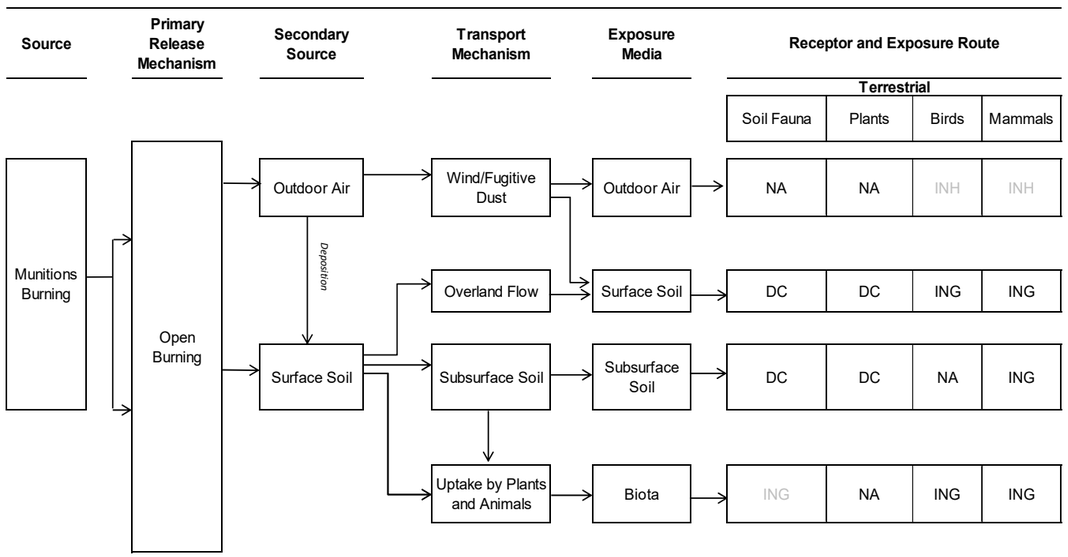


Figure 3-2. Preliminary Conceptual Site Exposure Model



Abbreviations

DC	Direct contact; applies to receptors for which toxic effects are addressed by exposure concentration and not dose
ING	Ingestion; typically quantified as dose for birds and mammals only
INH	Inhalation; recognized to occur, but not typically quantified as standard practice with the exception of evaluating burrow air exposure by burrowing mammals
NA	Pathway considered incomplete; not applicable

Notes:

Grayed text indicates pathways are recognized to potentially exist but are not quantified. Inhalation is considered minimal relative to dietary exposure. Ingestion by invertebrates is not typically quantified due to absence of accurate exposure parameters.

ATTACHMENT A. PROUCL OUTPUT FOR BACKGROUND HYPOTHESIS TESTING AND UPPER CONFIDENCE LIMIT CALCULATIONS

Background Hypothesis Tests 2018/2022 Data					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:48:37 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: ZN(388)					
Sample 2 Data: ZN(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	172		
Number of Missing Observations		0	2		
Number of Non-Detects		0	0		
Number of Detect Data		17	172		
Minimum Non-Detect		N/A	N/A		
Maximum Non-Detect		N/A	N/A		
Percent Non-detects		0.00%	0.00%		
Minimum Detect		19.1	14		
Maximum Detect		334	75.5		
Mean of Detects		49.28	31.52		
Median of Detects		29.7	30.75		
SD of Detects		74.57	9.002		
KM Mean		49.28	31.52		
KM SD		74.57	9.002		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		-0.414			
Critical z (0.05)		1.645			
P-Value		0.66			
Conclusion with Alpha = 0.05					
Do Not Reject H0, Conclude Sample 1 <= Sample 2					
P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:37:36 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: BA(388)					
Sample 2 Data: BA(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	173		
Number of Missing Observations		0	1		
Number of Non-Detects		0	0		

Number of Detect Data		17	173		
Minimum Non-Detect		N/A	N/A		
Maximum Non-Detect		N/A	N/A		
Percent Non-detects		0.00%	0.00%		
Minimum Detect		143	21		
Maximum Detect		4060	410		
Mean of Detects		658.7	142.7		
Median of Detects		325	130		
SD of Detects		959.4	74.1		
KM Mean		658.7	142.7		
KM SD		959.4	74.1		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		5.368			
Critical z (0.05)		1.645			
P-Value		3.97E-08			
Conclusion with Alpha = 0.05					
Reject H0, Conclude Sample 1 > Sample 2					
P-Value < alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:40:56 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: CO(388)					
Sample 2 Data: CO(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	131		
Number of Missing Observations		0	43		
Number of Non-Detects		0	0		
Number of Detect Data		17	131		
Minimum Non-Detect		N/A	N/A		
Maximum Non-Detect		N/A	N/A		
Percent Non-detects		0.00%	0.00%		
Minimum Detect		299.00%	100.00%		
Maximum Detect		13.1	9.5		
Mean of Detects		5.572	5.157		
Median of Detects		5.43	5.3		
SD of Detects		2.269	1.846		
KM Mean		5.572	5.157		
KM SD		2.269	1.846		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		0.0812			
Critical z (0.05)		1.645			
P-Value		0.468			
Conclusion with Alpha = 0.05					
Do Not Reject H0, Conclude Sample 1 <= Sample 2					

P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:42:26 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: CU(388)					
Sample 2 Data: CU(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	174		
Number of Non-Detects		0	2		
Number of Detect Data		17	172		
Minimum Non-Detect		N/A	0.5		
Maximum Non-Detect		N/A	0.5		
Percent Non-detects		0.00%	1.15%		
Minimum Detect		3.62	0.6		
Maximum Detect		24.4	16		
Mean of Detects		7.876	6.125		
Median of Detects		6.11	5.8		
SD of Detects		4.846	2.523		
KM Mean		7.876	6.06		
KM SD		4.846	2.572		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		1.471			
Critical z (0.05)		1.645			
P-Value		0.0707			
Conclusion with Alpha = 0.05					
Do Not Reject H0, Conclude Sample 1 <= Sample 2					
P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:45:20 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: PB(388)					
Sample 2 Data: PB(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	173		
Number of Missing Observations		0	1		
Number of Non-Detects		0	9		
Number of Detect Data		17	164		

Minimum Non-Detect		N/A	4		
Maximum Non-Detect		N/A	4		
Percent Non-detects		0.00%	5.20%		
Minimum Detect		10	4		
Maximum Detect		26.7	28		
Mean of Detects		12.34	13.24		
Median of Detects		11.2	13		
SD of Detects		3.876	4.738		
KM Mean		12.34	12.76		
KM SD		3.876	5.036		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		-1.024			
Critical z (0.05)		1.645			
P-Value		0.847			
Conclusion with Alpha = 0.05					
Do Not Reject H0, Conclude Sample 1 <= Sample 2					
P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:46:25 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: SB(388)					
Sample 2 Data: SB(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	135		
Number of Missing Observations		0	39		
Number of Non-Detects		16	117		
Number of Detect Data		1	18		
Minimum Non-Detect		0.295	0.2		
Maximum Non-Detect		0.425	1.5		
Percent Non-detects		94.12%	86.67%		
Minimum Detect		6.61	0.2		
Maximum Detect		6.61	1		
Mean of Detects		6.61	0.397		
Median of Detects		6.61	0.4		
SD of Detects		N/A	0.213		
KM Mean		0.666	0.341		
KM SD		1.486	0.146		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		-0.736			
Critical z (0.05)		1.645			
P-Value		0.769			
Conclusion with Alpha = 0.05					

Do Not Reject H0, Conclude Sample 1 <= Sample 2					
P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:47:36 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: NI(388)					
Sample 2 Data: NI(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	174		
Number of Non-Detects		0	14		
Number of Detect Data		17	160		
Minimum Non-Detect		N/A	2		
Maximum Non-Detect		N/A	2		
Percent Non-detects		0.00%	8.05%		
Minimum Detect		3.78	2.3		
Maximum Detect		55.3	29		
Mean of Detects		10.34	7.606		
Median of Detects		7.07	7		
SD of Detects		11.89	3.732		
KM Mean		10.34	7.155		
KM SD		11.89	3.879		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		0.901			
Critical z (0.05)		1.645			
P-Value		0.184			
Conclusion with Alpha = 0.05					
Do Not Reject H0, Conclude Sample 1 <= Sample 2					
P-Value >= alpha (0.05)					
Gehan Sample 1 vs Sample 2 Comparison Hypothesis Test for Data Sets with Non-Detects					
User Selected Options					
Date/Time of Computation	ProUCL 5.2 3/9/2023 2:50:32 PM				
From File	ProUCL BKG file.xls				
Full Precision	OFF				
Confidence Coefficient	95%				
Selected Null Hypothesis	Sample 1 Mean/Median <= Sample 2 Mean/Median (Form 1)				
Alternative Hypothesis	Sample 1 Mean/Median > Sample 2 Mean/Median				
Sample 1 Data: AG(388)					
Sample 2 Data: AG(bkg)					
Raw Statistics					
		Sample 1	Sample 2		
Number of Valid Data		17	131		
Number of Missing Observations		0	43		
Number of Non-Detects		7	128		
Number of Detect Data		10	3		

Minimum Non-Detect		0.0894	0.1		
Maximum Non-Detect		10.70%	200.00%		
Percent Non-detects		41.18%	97.71%		
Minimum Detect		0.12	0.11		
Maximum Detect		85.7	1.9		
Mean of Detects		9.571	0.763		
Median of Detects		0.43	0.28		
SD of Detects		26.83	0.988		
KM Mean		5.667	0.125		
KM SD		20.07	0.166		
Sample 1 vs Sample 2 Gehan Test					
H0: Mean/Median of Sample 1 <= Mean/Median of background					
Gehan z Test Value		4.748			
Critical z (0.05)		1.65E+00			
P-Value		1.03E-06			
Conclusion with Alpha = 0.05					
Reject H0, Conclude Sample 1 > Sample 2					
P-Value < alpha (0.05)					

UCL Statistics for Data Sets with Non-Detects

User Selected Options				
Date/Time of Computation			ProUCL 5.2 3/13/2023 11:44:59 AM	
From File			ProUCL UCL FILE.xls	
Full Precision			OFF	
Confidence Coefficient			95%	
Number of Bootstrap Operations			2000	
2018 2021 TCDD TEQ Human and Mammalian				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	17
			Number of Missing Observations	0
Minimum	1.14E-06		Mean	3.02E-06
Maximum	1.57E-05		Median	1.24E-06
SD	3.91E-06		Std. Error of Mean	9.48E-07
Coefficient of Variation	N/A		Skewness	2.596
Normal GOF Test				
Shapiro Wilk Test Statistic	0.557		Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.851		Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.364		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.241		Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level				
Assuming Normal Distribution				
95% Normal UCL			95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4.68E-06		95% Adjusted-CLT UCL (Chen-1995)	5.22E-06
			95% Modified-t UCL (Johnson-1978)	4.78E-06
Gamma GOF Test				
A-D Test Statistic	2.844		Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.76		Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.375		Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.214		Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level				
Gamma Statistics				
k hat (MLE)	1.274		k star (bias corrected MLE)	1.088
Theta hat (MLE)	2.37E-06		Theta star (bias corrected MLE)	2.78E-06

nu hat (MLE)	43.3		nu star (bias corrected)	36.99
MLE Mean (bias corrected)	3.02E-06		MLE Sd (bias corrected)	2.90E-06
			Approximate Chi Square Value (0.05)	24.07
Adjusted Level of Significance	0.0346		Adjusted Chi Square Value	22.98
Assuming Gamma Distribution				
95% Approximate Gamma UCL	4.64E-06		95% Adjusted Gamma UCL	4.86E-06
Lognormal GOF Test				
Shapiro Wilk Test Statistic	0.677		Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.91		Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.349		Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.19		Data Not Lognormal at 10% Significance Level	
Data Not Lognormal at 10% Significance Level				
Lognormal Statistics				
Minimum of Logged Data	-13.68		Mean of logged Data	-13.15
Maximum of Logged Data	-11.06		SD of logged Data	0.829
Assuming Lognormal Distribution				
95% H-UCL	4.51E-06		90% Chebyshev (MVUE) UCL	4.41E-06
95% Chebyshev (MVUE) UCL	5.20E-06		97.5% Chebyshev (MVUE) UCL	6.29E-06
99% Chebyshev (MVUE) UCL	8.44E-06			
Nonparametric Distribution Free UCL Statistics				
Data do not follow a Discernible Distribution				
Nonparametric Distribution Free UCLs				
95% CLT UCL	4.58E-06		95% BCA Bootstrap UCL	5.24E-06
95% Standard Bootstrap UCL	4.53E-06		95% Bootstrap-t UCL	6.51E-06
95% Hall's Bootstrap UCL	5.05E-06		95% Percentile Bootstrap UCL	4.63E-06
90% Chebyshev(Mean, Sd) UCL	5.86E-06		95% Chebyshev(Mean, Sd) UCL	7.15E-06
97.5% Chebyshev(Mean, Sd) UCL	8.94E-06		99% Chebyshev(Mean, Sd) UCL	1.25E-05
Suggested UCL to Use				
95% Student's-t UCL	4.68E-06			
Barium				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	17
			Number of Missing Observations	0
Minimum	143		Mean	658.7
Maximum	4060		Median	325
SD	959.4		Std. Error of Mean	232.7
Coefficient of Variation	1.457		Skewness	3.148
Normal GOF Test				
Shapiro Wilk Test Statistic	0.555		Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.851		Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.333		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.241		Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level				
Assuming Normal Distribution				
95% Normal UCL			95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1065		95% Adjusted-CLT UCL (Chen-1995)	1231
			95% Modified-t UCL (Johnson-1978)	1095
Gamma GOF Test				
A-D Test Statistic	1.521		Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.764		Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.313		Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.215		Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level				

Gamma Statistics				
k hat (MLE)	1.097		k star (bias corrected MLE)	0.943
Theta hat (MLE)	600.4		Theta star (bias corrected MLE)	698.7
nu hat (MLE)	37.3		nu star (bias corrected)	32.05
MLE Mean (bias corrected)	658.7		MLE Sd (bias corrected)	678.4
			Approximate Chi Square Value (0.05)	20.11
Adjusted Level of Significance	0.0346		Adjusted Chi Square Value	19.13
Assuming Gamma Distribution				
95% Approximate Gamma UCL	1050		95% Adjusted Gamma UCL	1104
Lognormal GOF Test				
Shapiro Wilk Test Statistic	0.867		Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.91		Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.258		Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.19		Data Not Lognormal at 10% Significance Level	
Data Not Lognormal at 10% Significance Level				
Lognormal Statistics				
Minimum of Logged Data	4.963		Mean of logged Data	5.97
Maximum of Logged Data	8.309		SD of logged Data	0.916
Assuming Lognormal Distribution				
95% H-UCL	1068		90% Chebyshev (MVUE) UCL	995.8
95% Chebyshev (MVUE) UCL	1186		97.5% Chebyshev (MVUE) UCL	1450
99% Chebyshev (MVUE) UCL	1968			
Nonparametric Distribution Free UCL Statistics				
Data do not follow a Discernible Distribution				
Nonparametric Distribution Free UCLs				
95% CLT UCL	1041		95% BCA Bootstrap UCL	1296
95% Standard Bootstrap UCL	1022		95% Bootstrap-t UCL	1758
95% Hall's Bootstrap UCL	2373		95% Percentile Bootstrap UCL	1069
90% Chebyshev(Mean, Sd) UCL	1357		95% Chebyshev(Mean, Sd) UCL	1673
97.5% Chebyshev(Mean, Sd) UCL	2112		99% Chebyshev(Mean, Sd) UCL	2974
Suggested UCL to Use				
95% Student's-t UCL	1065			
HMX				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	10
Number of Detects	5		Number of Non-Detects	12
Number of Distinct Detects	5		Number of Distinct Non-Detects	5
Minimum Detect	0.166		Minimum Non-Detect	0.139
Maximum Detect	1.84		Maximum Non-Detect	0.149
Variance Detects	0.453		Percent Non-Detects	70.59%
Mean Detects	0.706		SD Detects	0.673
Median Detects	0.45		CV Detects	0.954
Skewness Detects	1.666		Kurtosis Detects	2.791
Mean of Logged Detects	-0.689		SD of Logged Detects	0.918
Normal GOF Test on Detects Only				
Shapiro Wilk Test Statistic	0.83		Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.686		Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.261		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.396		Detected Data appear Normal at 1% Significance Level	
Detected Data appear Normal at 1% Significance Level				
Note GOF tests may be unreliable for small sample sizes				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs				

KM Mean	0.306		KM Standard Error of Mean	0.113
90KM SD	0.416		95% KM (BCA) UCL	0.505
95% KM (t) UCL	0.503		95% KM (Percentile Bootstrap) UCL	0.496
95% KM (z) UCL	0.491		95% KM Bootstrap t UCL	0.696
90% KM Chebyshev UCL	0.644		95% KM Chebyshev UCL	0.798
97.5% KM Chebyshev UCL	1.011		99% KM Chebyshev UCL	1.429
Gamma GOF Tests on Detected Observations Only				
A-D Test Statistic	0.251		Anderson-Darling GOF Test	
5% A-D Critical Value	0.686		Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.202		Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.361		Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level				
Note GOF tests may be unreliable for small sample sizes				
Gamma Statistics on Detected Data Only				
k hat (MLE)	1.614		k star (bias corrected MLE)	0.779
Theta hat (MLE)	0.437		Theta star (bias corrected MLE)	0.906
nu hat (MLE)	16.14		nu star (bias corrected)	7.789
Mean (detects)	0.706			
Gamma ROS Statistics using Imputed Non-Detects				
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs				
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)				
For such situations, GROS method may yield incorrect values of UCLs and BTVs				
This is especially true when the sample size is small.				
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates				
Minimum	0.01		Mean	0.215
Maximum	1.84		Median	0.01
SD	0.469		CV	2.186
k hat (MLE)	0.351		k star (bias corrected MLE)	0.328
Theta hat (MLE)	0.611		Theta star (bias corrected MLE)	0.654
nu hat (MLE)	11.94		nu star (bias corrected)	11.16
Adjusted Level of Significance (β)	0.0346			
Approximate Chi Square Value (11.16, α)	4.681		Adjusted Chi Square Value (11.16, β)	4.249
95% Gamma Approximate UCL	0.512		95% Gamma Adjusted UCL	0.564
Estimates of Gamma Parameters using KM Estimates				
Mean (KM)	0.306		SD (KM)	0.416
Variance (KM)	0.173		SE of Mean (KM)	0.113
k hat (KM)	0.539		k star (KM)	0.483
nu hat (KM)	18.33		nu star (KM)	16.43
theta hat (KM)	0.567		theta star (KM)	0.632
80% gamma percentile (KM)	0.501		90% gamma percentile (KM)	0.833
95% gamma percentile (KM)	1.188		99% gamma percentile (KM)	2.066
Gamma Kaplan-Meier (KM) Statistics				
Approximate Chi Square Value (16.43, α)	8.267		Adjusted Chi Square Value (16.43, β)	7.666
95% KM Approximate Gamma UCL	0.607		95% KM Adjusted Gamma UCL	0.655
Lognormal GOF Test on Detected Observations Only				
Shapiro Wilk Test Statistic	0.989		Shapiro Wilk GOF Test	
10% Shapiro Wilk Critical Value	0.806		Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.147		Lilliefors GOF Test	
10% Lilliefors Critical Value	0.319		Detected Data appear Lognormal at 10% Significance Level	
Detected Data appear Lognormal at 10% Significance Level				

Note GOF tests may be unreliable for small sample sizes				
Lognormal ROS Statistics Using Imputed Non-Detects				
Mean in Original Scale	0.221		Mean in Log Scale	-3.273
SD in Original Scale	0.466		SD in Log Scale	1.953
95% t UCL (assumes normality of ROS data)	0.418		95% Percentile Bootstrap UCL	0.413
95% BCA Bootstrap UCL	0.515		95% Bootstrap t UCL	0.818
95% H-UCL (Log ROS)	2.079			
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution				
KM Mean (logged)	-1.596		KM Geo Mean	0.203
KM SD (logged)	0.735		95% Critical H Value (KM-Log)	2.295
KM Standard Error of Mean (logged)	0.199		95% H-UCL (KM -Log)	0.405
KM SD (logged)	0.735		95% Critical H Value (KM-Log)	2.295
KM Standard Error of Mean (logged)	0.199			
DL/2 Statistics				
DL/2 Normal			DL/2 Log-Transformed	
Mean in Original Scale	0.259		Mean in Log Scale	-2.053
SD in Original Scale	0.449		SD in Log Scale	1.017
95% t UCL (Assumes normality)	0.449		95% H-Stat UCL	0.427
DL/2 is not a recommended method, provided for comparisons and historical reasons				
Nonparametric Distribution Free UCL Statistics				
Detected Data appear Normal Distributed at 1% Significance Level				
Suggested UCL to Use				
95% KM (t) UCL	0.503			
Perchlorate				
General Statistics				
Total Number of Observations	11		Number of Distinct Observations	10
Number of Detects	2		Number of Non-Detects	9
Number of Distinct Detects	2		Number of Distinct Non-Detects	8
Minimum Detect	6.05E-04		Minimum Non-Detect	5.09E-04
Maximum Detect	6.20E-04		Maximum Non-Detect	6.37E-04
Variance Detects	1.13E-10		Percent Non-Detects	81.82%
Mean Detects	6.13E-04		SD Detects	1.06E-05
Median Detects	6.13E-04		CV Detects	0.0173
Skewness Detects	N/A		Kurtosis Detects	N/A
Mean of Logged Detects	-7.398		SD of Logged Detects	0.0173
Warning: Data set has only 2 Detected Values.				
This is not enough to compute meaningful or reliable statistics and estimates.				
Silver				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	16
Number of Detects	10		Number of Non-Detects	7
Number of Distinct Detects	10		Number of Distinct Non-Detects	6
Minimum Detect	0.12		Minimum Non-Detect	0.0894
Maximum Detect	85.7		Maximum Non-Detect	0.107
Variance Detects	719.8		Percent Non-Detects	41.18%
Mean Detects	9.571		SD Detects	26.83
Median Detects	0.43		CV Detects	2.803
Skewness Detects	3.129		Kurtosis Detects	9.835
Mean of Logged Detects	-0.357		SD of Logged Detects	2.094
Normal GOF Test on Detects Only				
Shapiro Wilk Test Statistic	0.411		Shapiro Wilk GOF Test	

1% Shapiro Wilk Critical Value	0.781		Detected Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.44		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.304		Detected Data Not Normal at 1% Significance Level	
Detected Data Not Normal at 1% Significance Level				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs				
KM Mean	5.667		KM Standard Error of Mean	5.131
90KM SD	20.07		95% KM (BCA) UCL	15.36
95% KM (t) UCL	14.63		95% KM (Percentile Bootstrap) UCL	15.45
95% KM (z) UCL	14.11		95% KM Bootstrap t UCL	453.7
90% KM Chebyshev UCL	21.06		95% KM Chebyshev UCL	28.03
97.5% KM Chebyshev UCL	37.71		99% KM Chebyshev UCL	56.72
Gamma GOF Tests on Detected Observations Only				
A-D Test Statistic	1.627		Anderson-Darling GOF Test	
5% A-D Critical Value	0.827		Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.39		Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.29		Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level				
Gamma Statistics on Detected Data Only				
k hat (MLE)	0.268		k star (bias corrected MLE)	0.255
Theta hat (MLE)	35.65		Theta star (bias corrected MLE)	37.59
nu hat (MLE)	5.369		nu star (bias corrected)	5.091
Mean (detects)	9.571			
Gamma ROS Statistics using Imputed Non-Detects				
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs				
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)				
For such situations, GROS method may yield incorrect values of UCLs and BTVs				
This is especially true when the sample size is small.				
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates				
Minimum	0.01		Mean	5.634
Maximum	85.7		Median	0.129
SD	20.7		CV	3.674
k hat (MLE)	0.193		k star (bias corrected MLE)	0.198
Theta hat (MLE)	29.2		Theta star (bias corrected MLE)	28.44
nu hat (MLE)	6.561		nu star (bias corrected)	6.736
Adjusted Level of Significance (β)	0.0346			
Approximate Chi Square Value (6.74, α)	2.027		Adjusted Chi Square Value (6.74, β)	1.768
95% Gamma Approximate UCL	18.72		95% Gamma Adjusted UCL	21.47
Estimates of Gamma Parameters using KM Estimates				
Mean (KM)	5.667		SD (KM)	20.07
Variance (KM)	402.8		SE of Mean (KM)	5.131
k hat (KM)	0.0797		k star (KM)	0.105
nu hat (KM)	2.71		nu star (KM)	3.565
theta hat (KM)	71.09		theta star (KM)	54.04
80% gamma percentile (KM)	4.203		90% gamma percentile (KM)	15.37
95% gamma percentile (KM)	32.79		99% gamma percentile (KM)	87.89
Gamma Kaplan-Meier (KM) Statistics				
Approximate Chi Square Value (3.57, α)	0.558		Adjusted Chi Square Value (3.57, β)	0.452
95% KM Approximate Gamma UCL	36.21		95% KM Adjusted Gamma UCL	44.69
95% KM Adjusted Gamma UCL (use when k<=1 and 15 < n < 50)				
Lognormal GOF Test on Detected Observations Only				
Shapiro Wilk Test Statistic	0.815		Shapiro Wilk GOF Test	

10% Shapiro Wilk Critical Value	0.869		Detected Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.253		Lilliefors GOF Test	
10% Lilliefors Critical Value	0.241		Detected Data Not Lognormal at 10% Significance Level	
Detected Data Not Lognormal at 10% Significance Level				
Lognormal ROS Statistics Using Imputed Non-Detects				
Mean in Original Scale	5.631		Mean in Log Scale	-2.527
SD in Original Scale	20.7		SD in Log Scale	3.117
95% t UCL (assumes normality of ROS data)	14.4		95% Percentile Bootstrap UCL	15.33
95% BCA Bootstrap UCL	20.78		95% Bootstrap t UCL	407.3
95% H-UCL (Log ROS)	1651			
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution				
KM Mean (logged)	-1.204		KM Geo Mean	0.3
KM SD (logged)	1.83		95% Critical H Value (KM-Log)	4.073
KM Standard Error of Mean (logged)	0.468		95% H-UCL (KM -Log)	10.3
KM SD (logged)	1.83		95% Critical H Value (KM-Log)	4.073
KM Standard Error of Mean (logged)	0.468			
DL/2 Statistics				
DL/2 Normal			DL/2 Log-Transformed	
Mean in Original Scale	5.65		Mean in Log Scale	-1.45
SD in Original Scale	20.69		SD in Log Scale	2.069
95% t UCL (Assumes normality)	14.41		95% H-Stat UCL	20.62
DL/2 is not a recommended method, provided for comparisons and historical reasons				
Nonparametric Distribution Free UCL Statistics				
Data do not follow a Discernible Distribution				
Suggested UCL to Use				
95% KM (t) UCL	14.63			
TATB				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	12
Number of Detects	6		Number of Non-Detects	11
Number of Distinct Detects	6		Number of Distinct Non-Detects	6
Minimum Detect	1.79		Minimum Non-Detect	0.278
Maximum Detect	7.22		Maximum Non-Detect	0.299
Variance Detects	5.368		Percent Non-Detects	64.71%
Mean Detects	4.053		SD Detects	2.317
Median Detects	3.775		CV Detects	0.572
Skewness Detects	0.309		Kurtosis Detects	-2.231
Mean of Logged Detects	1.249		SD of Logged Detects	0.614
Normal GOF Test on Detects Only				
Shapiro Wilk Test Statistic	0.865		Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.713		Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.272		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.373		Detected Data appear Normal at 1% Significance Level	
Detected Data appear Normal at 1% Significance Level				
Note GOF tests may be unreliable for small sample sizes				
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs				
KM Mean	1.61		KM Standard Error of Mean	0.584
90KM SD	2.199		95% KM (BCA) UCL	2.529
95% KM (t) UCL	2.63		95% KM (Percentile Bootstrap) UCL	2.534
95% KM (z) UCL	2.571		95% KM Bootstrap t UCL	2.68
90% KM Chebyshev UCL	3.363		95% KM Chebyshev UCL	4.157
97.5% KM Chebyshev UCL	5.258		99% KM Chebyshev UCL	7.422

Gamma GOF Tests on Detected Observations Only				
A-D Test Statistic	0.525		Anderson-Darling GOF Test	
5% A-D Critical Value	0.701		Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.276		Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.334		Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level				
Note GOF tests may be unreliable for small sample sizes				
Gamma Statistics on Detected Data Only				
k hat (MLE)	3.47		k star (bias corrected MLE)	1.846
Theta hat (MLE)	1.168		Theta star (bias corrected MLE)	2.195
nu hat (MLE)	41.64		nu star (bias corrected)	22.16
Mean (detects)	4.053			
Gamma ROS Statistics using Imputed Non-Detects				
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs				
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)				
For such situations, GROS method may yield incorrect values of UCLs and BTVs				
This is especially true when the sample size is small.				
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates				
Minimum	0.01		Mean	1.437
Maximum	7.22		Median	0.01
SD	2.376		CV	1.653
k hat (MLE)	0.245		k star (bias corrected MLE)	0.241
Theta hat (MLE)	5.854		Theta star (bias corrected MLE)	5.953
nu hat (MLE)	8.347		nu star (bias corrected)	8.207
Adjusted Level of Significance (β)	0.0346			
Approximate Chi Square Value (8.21, α)	2.856		Adjusted Chi Square Value (8.21, β)	2.535
95% Gamma Approximate UCL	4.13		95% Gamma Adjusted UCL	4.653
Estimates of Gamma Parameters using KM Estimates				
Mean (KM)	1.61		SD (KM)	2.199
Variance (KM)	4.834		SE of Mean (KM)	0.584
k hat (KM)	0.537		k star (KM)	0.481
nu hat (KM)	18.24		nu star (KM)	16.36
theta hat (KM)	3.001		theta star (KM)	3.348
80% gamma percentile (KM)	2.64		90% gamma percentile (KM)	4.392
95% gamma percentile (KM)	6.272		99% gamma percentile (KM)	10.91
Gamma Kaplan-Meier (KM) Statistics				
Approximate Chi Square Value (16.36, α)	8.215		Adjusted Chi Square Value (16.36, β)	7.615
95% KM Approximate Gamma UCL	3.207		95% KM Adjusted Gamma UCL	3.459
Lognormal GOF Test on Detected Observations Only				
Shapiro Wilk Test Statistic	0.857		Shapiro Wilk GOF Test	
10% Shapiro Wilk Critical Value	0.826		Detected Data appear Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.245		Lilliefors GOF Test	
10% Lilliefors Critical Value	0.298		Detected Data appear Lognormal at 10% Significance Level	
Detected Data appear Lognormal at 10% Significance Level				
Note GOF tests may be unreliable for small sample sizes				
Lognormal ROS Statistics Using Imputed Non-Detects				
Mean in Original Scale	1.747		Mean in Log Scale	-0.0846
SD in Original Scale	2.189		SD in Log Scale	1.134
95% t UCL (assumes normality of ROS data)	2.673		95% Percentile Bootstrap UCL	2.65
95% BCA Bootstrap UCL	2.798		95% Bootstrap t UCL	3.188
95% H-UCL (Log ROS)	3.95			

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution				
KM Mean (logged)	-0.388		KM Geo Mean	0.679
KM SD (logged)	1.253		95% Critical H Value (KM-Log)	3.068
KM Standard Error of Mean (logged)	0.333		95% H-UCL (KM -Log)	3.893
KM SD (logged)	1.253		95% Critical H Value (KM-Log)	3.068
KM Standard Error of Mean (logged)	0.333			
DL/2 Statistics				
DL/2 Normal			DL/2 Log-Transformed	
Mean in Original Scale	1.525		Mean in Log Scale	-0.808
SD in Original Scale	2.32		SD in Log Scale	1.603
95% t UCL (Assumes normality)	2.507		95% H-Stat UCL	6.998
DL/2 is not a recommended method, provided for comparisons and historical reasons				
Nonparametric Distribution Free UCL Statistics				
Detected Data appear Normal Distributed at 1% Significance Level				
Suggested UCL to Use				
95% KM (t) UCL	2.63			
Toluene				
General Statistics				
Total Number of Observations	11		Number of Distinct Observations	10
Number of Detects	2		Number of Non-Detects	9
Number of Distinct Detects	2		Number of Distinct Non-Detects	8
Minimum Detect	3.97E-04		Minimum Non-Detect	3.40E-04
Maximum Detect	4.83E-04		Maximum Non-Detect	4.21E-04
Variance Detects	3.70E-09		Percent Non-Detects	81.82%
Mean Detects	4.40E-04		SD Detects	6.08E-05
Median Detects	4.40E-04		CV Detects	0.138
Skewness Detects	N/A		Kurtosis Detects	N/A
Mean of Logged Detects	-7.734		SD of Logged Detects	0.139
Warning: Data set has only 2 Detected Values.				
This is not enough to compute meaningful or reliable statistics and estimates.				
Trinitrotoluene[2,4,6-]				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	7
Number of Detects	2		Number of Non-Detects	15
Number of Distinct Detects	2		Number of Distinct Non-Detects	5
Minimum Detect	0.38		Minimum Non-Detect	0.139
Maximum Detect	2.52		Maximum Non-Detect	0.149
Variance Detects	2.29		Percent Non-Detects	88.24%
Mean Detects	1.45		SD Detects	1.513
Median Detects	1.45		CV Detects	1.044
Skewness Detects	N/A		Kurtosis Detects	N/A
Mean of Logged Detects	-0.0217		SD of Logged Detects	1.338
Warning: Data set has only 2 Detected Values.				
This is not enough to compute meaningful or reliable statistics and estimates.				
Avian TEQ				
General Statistics				
Total Number of Observations	17		Number of Distinct Observations	14
			Number of Missing Observations	0
Minimum	1.57E-06		Mean	3.16E-06
Maximum	1.34E-05		Median	1.70E-06
SD	3.19E-06		Std. Error of Mean	7.73E-07
Coefficient of Variation	N/A		Skewness	2.549

Normal GOF Test				
Shapiro Wilk Test Statistic	0.57		Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.851		Data Not Normal at 1% Significance Level	
Lilliefors Test Statistic	0.337		Lilliefors GOF Test	
1% Lilliefors Critical Value	0.241		Data Not Normal at 1% Significance Level	
Data Not Normal at 1% Significance Level				
Assuming Normal Distribution				
95% Normal UCL			95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4.50E-06		95% Adjusted-CLT UCL (Chen-1995)	4.94E-06
			95% Modified-t UCL (Johnson-1978)	4.58E-06
Gamma GOF Test				
A-D Test Statistic	2.721		Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.75		Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.332		Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.212		Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level				
Gamma Statistics				
k hat (MLE)	1.983		k star (bias corrected MLE)	1.672
Theta hat (MLE)	1.59E-06		Theta star (bias corrected MLE)	1.89E-06
nu hat (MLE)	67.42		nu star (bias corrected)	56.86
MLE Mean (bias corrected)	3.16E-06		MLE Sd (bias corrected)	2.44E-06
			Approximate Chi Square Value (0.05)	40.52
Adjusted Level of Significance	0.0346		Adjusted Chi Square Value	39.08
Assuming Gamma Distribution				
95% Approximate Gamma UCL	4.43E-06		95% Adjusted Gamma UCL	4.59E-06
Lognormal GOF Test				
Shapiro Wilk Test Statistic	0.684		Shapiro Wilk Lognormal GOF Test	
10% Shapiro Wilk Critical Value	0.91		Data Not Lognormal at 10% Significance Level	
Lilliefors Test Statistic	0.32		Lilliefors Lognormal GOF Test	
10% Lilliefors Critical Value	0.19		Data Not Lognormal at 10% Significance Level	
Data Not Lognormal at 10% Significance Level				
Lognormal Statistics				
Minimum of Logged Data	-13.36		Mean of logged Data	-12.94
Maximum of Logged Data	-11.22		SD of logged Data	0.658
Assuming Lognormal Distribution				
95% H-UCL	4.29E-06		90% Chebyshev (MVUE) UCL	4.42E-06
95% Chebyshev (MVUE) UCL	5.09E-06		97.5% Chebyshev (MVUE) UCL	6.03E-06
99% Chebyshev (MVUE) UCL	7.86E-06			
Nonparametric Distribution Free UCL Statistics				
Data do not follow a Discernible Distribution				
Nonparametric Distribution Free UCLs				
95% CLT UCL	4.43E-06		95% BCA Bootstrap UCL	4.96E-06
95% Standard Bootstrap UCL	4.39E-06		95% Bootstrap-t UCL	6.10E-06
95% Hall's Bootstrap UCL	4.87E-06		95% Percentile Bootstrap UCL	4.46E-06
90% Chebyshev(Mean, Sd) UCL	5.47E-06		95% Chebyshev(Mean, Sd) UCL	6.52E-06
97.5% Chebyshev(Mean, Sd) UCL	7.98E-06		99% Chebyshev(Mean, Sd) UCL	1.08E-05
Suggested UCL to Use				
95% Student's-t UCL	4.50E-06			

ATTACHMENT B. LANL ECORISK DATABASE 4.3 SOIL ESLS

LANL Ecorisk Database 4.3 Soil ESLs for Organics and Inorganics Above Background Values (BVs)

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
D/F	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	SOIL	Deer mouse (Mammalian omnivore)	0.00000058	0.0000038	mg/kg	SOIL_DM(ip)_1746-01-6
D/F	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	SOIL	Earthworm (Soil-dwelling invertebrate)	5	10	mg/kg	SOIL_EW_1746-01-6
D/F	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	SOIL	Gray fox (Mammalian top carnivore)	0.0001	0.00068	mg/kg	SOIL_RF(f)_1746-01-6
D/F	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	SOIL	Montane shrew (Mammalian insectivore)	0.00000029	0.0000019	mg/kg	SOIL_MS(i)_1746-01-6
D/F	Tetrachlorodibenzodioxin[2,3,7,8-]	1746-01-6	SOIL	Mountain cottontail (Mammalian herbivore)	0.00004	0.00027	mg/kg	SOIL_DC(p)_1746-01-6
HE	3,5-Dinitroaniline	618-87-1	SOIL	Deer mouse (Mammalian omnivore)	23	230	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	3,5-Dinitroaniline	618-87-1	SOIL	Earthworm (Soil-dwelling invertebrate)	18	180	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	3,5-Dinitroaniline	618-87-1	SOIL	Generic plant (Terrestrial autotroph - producer)	33	330	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	3,5-Dinitroaniline	618-87-1	SOIL	Gray fox (Mammalian top carnivore)	6700	67000	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	3,5-Dinitroaniline	618-87-1	SOIL	Montane shrew (Mammalian insectivore)	12	120	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	3,5-Dinitroaniline	618-87-1	SOIL	Mountain cottontail (Mammalian herbivore)	320	3200	mg/kg	Use amino-2,6-dinitrotoluene[4-
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Deer mouse (Mammalian omnivore)	23	230	mg/kg	SOIL_DM(ip)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Earthworm (Soil-dwelling invertebrate)	18	180	mg/kg	SOIL_EW_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Generic plant (Terrestrial autotroph - producer)	33	330	mg/kg	SOIL_GP_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Gray fox (Mammalian top carnivore)	6700	67000	mg/kg	SOIL_RF(f)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Montane shrew (Mammalian insectivore)	12	120	mg/kg	SOIL_MS(i)_19406-51-0
HE	Amino-2,6-dinitrotoluene[4-]	19406-51-0	SOIL	Mountain cottontail (Mammalian herbivore)	320	3200	mg/kg	SOIL_DC(p)_19406-51-0
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Deer mouse (Mammalian omnivore)	23	230	mg/kg	SOIL_DM(ip)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Earthworm (Soil-dwelling invertebrate)	43	430	mg/kg	SOIL_EW_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Generic plant (Terrestrial autotroph - producer)	14	140	mg/kg	SOIL_GP_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Gray fox (Mammalian top carnivore)	9700	97000	mg/kg	SOIL_RF(f)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Montane shrew (Mammalian insectivore)	16	160	mg/kg	SOIL_MS(i)_35572-78-2
HE	Amino-4,6-dinitrotoluene[2-]	35572-78-2	SOIL	Mountain cottontail (Mammalian herbivore)	110	1100	mg/kg	SOIL_DC(p)_35572-78-2
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	American kestrel (Avian top carnivore)	120	1200	mg/kg	SOIL_AK(f)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	American kestrel (insectivore / carnivore)	9.3	93	mg/kg	SOIL_AK(fi)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	American robin (Avian herbivore)	0.079	0.79	mg/kg	SOIL_AR(p)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	American robin (Avian insectivore)	1.6	16	mg/kg	SOIL_AR(i)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	American robin (Avian omnivore)	0.15	1.5	mg/kg	SOIL_AR(ip)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	Deer mouse (Mammalian omnivore)	0.072	0.16	mg/kg	SOIL_DM(ip)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	Gray fox (Mammalian top carnivore)	82	190	mg/kg	SOIL_RF(f)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	Montane shrew (Mammalian insectivore)	0.95	2.2	mg/kg	SOIL_MS(i)_99-65-0
HE	Dinitrobenzene[1,3-]	99-65-0	SOIL	Mountain cottontail (Mammalian herbivore)	0.091	0.21	mg/kg	SOIL_DC(p)_99-65-0
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Deer mouse (Mammalian omnivore)	20	200	mg/kg	SOIL_DM(ip)_121-14-2

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Earthworm (Soil-dwelling invertebrate)	18	180	mg/kg	SOIL_EW_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Generic plant (Terrestrial autotroph - producer)	6	60	mg/kg	SOIL_GP_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Gray fox (Mammalian top carnivore)	2000	20000	mg/kg	SOIL_RF(f)_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Montane shrew (Mammalian insectivore)	14	140	mg/kg	SOIL_MS(i)_121-14-2
HE	Dinitrotoluene[2,4-]	121-14-2	SOIL	Mountain cottontail (Mammalian herbivore)	74	740	mg/kg	SOIL_DC(p)_121-14-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	American kestrel (Avian top carnivore)	18000	180000	mg/kg	SOIL_AK(f)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	American kestrel (insectivore / carnivore)	680	6800	mg/kg	SOIL_AK(fi)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	American robin (Avian herbivore)	52	520	mg/kg	SOIL_AR(p)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	American robin (Avian insectivore)	130	1300	mg/kg	SOIL_AR(i)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	American robin (Avian omnivore)	74	740	mg/kg	SOIL_AR(ip)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	Deer mouse (Mammalian omnivore)	4	40	mg/kg	SOIL_DM(ip)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	Earthworm (Soil-dwelling invertebrate)	30	44	mg/kg	SOIL_EW_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	Gray fox (Mammalian top carnivore)	1300	13000	mg/kg	SOIL_RF(f)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	Montane shrew (Mammalian insectivore)	7.6	76	mg/kg	SOIL_MS(i)_606-20-2
HE	Dinitrotoluene[2,6-]	606-20-2	SOIL	Mountain cottontail (Mammalian herbivore)	6.7	67	mg/kg	SOIL_DC(p)_606-20-2
HE	HMX	2691-41-0	SOIL	Deer mouse (Mammalian omnivore)	290	790	mg/kg	SOIL_DM(ip)_2691-41-0
HE	HMX	2691-41-0	SOIL	Earthworm (Soil-dwelling invertebrate)	16	160	mg/kg	SOIL_EW_2691-41-0
HE	HMX	2691-41-0	SOIL	Generic plant (Terrestrial autotroph - producer)	2700	3500	mg/kg	SOIL_GP_2691-41-0
HE	HMX	2691-41-0	SOIL	Gray fox (Mammalian top carnivore)	59000	150000	mg/kg	SOIL_RF(f)_2691-41-0
HE	HMX	2691-41-0	SOIL	Montane shrew (Mammalian insectivore)	1100	2900	mg/kg	SOIL_MS(i)_2691-41-0
HE	HMX	2691-41-0	SOIL	Mountain cottontail (Mammalian herbivore)	410	1100	mg/kg	SOIL_DC(p)_2691-41-0
HE	Nitroglycerine	55-63-0	SOIL	Deer mouse (Mammalian omnivore)	70	740	mg/kg	SOIL_DM(ip)_55-63-0
HE	Nitroglycerine	55-63-0	SOIL	Earthworm (Soil-dwelling invertebrate)	13	130	mg/kg	SOIL_EW_55-63-0
HE	Nitroglycerine	55-63-0	SOIL	Generic plant (Terrestrial autotroph - producer)	21	210	mg/kg	SOIL_GP_55-63-0
HE	Nitroglycerine	55-63-0	SOIL	Gray fox (Mammalian top carnivore)	69000	730000	mg/kg	SOIL_RF(f)_55-63-0
HE	Nitroglycerine	55-63-0	SOIL	Montane shrew (Mammalian insectivore)	1200	13000	mg/kg	SOIL_MS(i)_55-63-0
HE	Nitroglycerine	55-63-0	SOIL	Mountain cottontail (Mammalian herbivore)	88	930	mg/kg	SOIL_DC(p)_55-63-0
HE	Nitrotoluene[2-]	88-72-2	SOIL	Deer mouse (Mammalian omnivore)	9.8	98	mg/kg	SOIL_DM(ip)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	SOIL	Gray fox (Mammalian top carnivore)	6000	60000	mg/kg	SOIL_RF(f)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	SOIL	Montane shrew (Mammalian insectivore)	22	220	mg/kg	SOIL_MS(i)_88-72-2
HE	Nitrotoluene[2-]	88-72-2	SOIL	Mountain cottontail (Mammalian herbivore)	15	150	mg/kg	SOIL_DC(p)_88-72-2
HE	Nitrotoluene[3-]	99-08-1	SOIL	Deer mouse (Mammalian omnivore)	12	120	mg/kg	SOIL_DM(ip)_99-08-1
HE	Nitrotoluene[3-]	99-08-1	SOIL	Gray fox (Mammalian top carnivore)	7000	70000	mg/kg	SOIL_RF(f)_99-08-1
HE	Nitrotoluene[3-]	99-08-1	SOIL	Montane shrew (Mammalian insectivore)	19	190	mg/kg	SOIL_MS(i)_99-08-1

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
HE	Nitrotoluene[3-]	99-08-1	SOIL	Mountain cottontail (Mammalian herbivore)	21	210	mg/kg	SOIL_DC(p)_99-08-1
HE	Nitrotoluene[4-]	99-99-0	SOIL	Deer mouse (Mammalian omnivore)	21	210	mg/kg	SOIL_DM(ip)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	SOIL	Gray fox (Mammalian top carnivore)	13000	130000	mg/kg	SOIL_RF(f)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	SOIL	Montane shrew (Mammalian insectivore)	41	410	mg/kg	SOIL_MS(i)_99-99-0
HE	Nitrotoluene[4-]	99-99-0	SOIL	Mountain cottontail (Mammalian herbivore)	36	360	mg/kg	SOIL_DC(p)_99-99-0
HE	PETN	78-11-5	SOIL	Deer mouse (Mammalian omnivore)	100	1000	mg/kg	SOIL_DM(ip)_78-11-5
HE	PETN	78-11-5	SOIL	Gray fox (Mammalian top carnivore)	47000	470000	mg/kg	SOIL_RF(f)_78-11-5
HE	PETN	78-11-5	SOIL	Montane shrew (Mammalian insectivore)	1000	10000	mg/kg	SOIL_MS(i)_78-11-5
HE	PETN	78-11-5	SOIL	Mountain cottontail (Mammalian herbivore)	120	1200	mg/kg	SOIL_DC(p)_78-11-5
HE	RDX	121-82-4	SOIL	American kestrel (Avian top carnivore)	780	1400	mg/kg	SOIL_AK(f)_121-82-4
HE	RDX	121-82-4	SOIL	American kestrel (insectivore / carnivore)	11	22	mg/kg	SOIL_AK(fi)_121-82-4
HE	RDX	121-82-4	SOIL	American robin (Avian herbivore)	2.3	4.3	mg/kg	SOIL_AR(p)_121-82-4
HE	RDX	121-82-4	SOIL	American robin (Avian insectivore)	2.4	4.5	mg/kg	SOIL_AR(i)_121-82-4
HE	RDX	121-82-4	SOIL	American robin (Avian omnivore)	2.3	4.4	mg/kg	SOIL_AR(ip)_121-82-4
HE	RDX	121-82-4	SOIL	Deer mouse (Mammalian omnivore)	16	51	mg/kg	SOIL_DM(ip)_121-82-4
HE	RDX	121-82-4	SOIL	Earthworm (Soil-dwelling invertebrate)	8.4	15	mg/kg	SOIL_EW_121-82-4
HE	RDX	121-82-4	SOIL	Gray fox (Mammalian top carnivore)	7000	22000	mg/kg	SOIL_RF(f)_121-82-4
HE	RDX	121-82-4	SOIL	Montane shrew (Mammalian insectivore)	16	53	mg/kg	SOIL_MS(i)_121-82-4
HE	RDX	121-82-4	SOIL	Mountain cottontail (Mammalian herbivore)	38	120	mg/kg	SOIL_DC(p)_121-82-4
HE	Tetryl	479-45-8	SOIL	Deer mouse (Mammalian omnivore)	1.5	7.2	mg/kg	SOIL_DM(ip)_479-45-8
HE	Tetryl	479-45-8	SOIL	Gray fox (Mammalian top carnivore)	960	4600	mg/kg	SOIL_RF(f)_479-45-8
HE	Tetryl	479-45-8	SOIL	Montane shrew (Mammalian insectivore)	60	280	mg/kg	SOIL_MS(i)_479-45-8
HE	Tetryl	479-45-8	SOIL	Mountain cottontail (Mammalian herbivore)	1.8	8.9	mg/kg	SOIL_DC(p)_479-45-8
HE	TATB	3058-38-6	SOIL	Deer mouse (Mammalian omnivore)	110	1100	mg/kg	Use 1,3,5-TNB for all
HE	TATB	3058-38-6	SOIL	Earthworm (Soil-dwelling invertebrate)	10	28	mg/kg	Use 1,3,5-TNB for all
HE	TATB	3058-38-6	SOIL	Gray fox (Mammalian top carnivore)	10000	100000	mg/kg	Use 1,3,5-TNB for all
HE	TATB	3058-38-6	SOIL	Montane shrew (Mammalian insectivore)	720	7200	mg/kg	Use 1,3,5-TNB for all
HE	TATB	3058-38-6	SOIL	Mountain cottontail (Mammalian herbivore)	150	1500	mg/kg	Use 1,3,5-TNB for all
HE	Trinitrobenzene[1,3,5-]	99-35-4	SOIL	Deer mouse (Mammalian omnivore)	110	1100	mg/kg	SOIL_DM(ip)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	SOIL	Earthworm (Soil-dwelling invertebrate)	10	28	mg/kg	SOIL_EW_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	SOIL	Gray fox (Mammalian top carnivore)	10000	100000	mg/kg	SOIL_RF(f)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	SOIL	Montane shrew (Mammalian insectivore)	720	7200	mg/kg	SOIL_MS(i)_99-35-4
HE	Trinitrobenzene[1,3,5-]	99-35-4	SOIL	Mountain cottontail (Mammalian herbivore)	150	1500	mg/kg	SOIL_DC(p)_99-35-4

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	American kestrel (Avian top carnivore)	3100	5700	mg/kg	SOIL_AK(f)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	American kestrel (insectivore / carnivore)	1300	2400	mg/kg	SOIL_AK(fi)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	American robin (Avian herbivore)	7.5	13	mg/kg	SOIL_AR(p)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	American robin (Avian insectivore)	120	220	mg/kg	SOIL_AR(i)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	American robin (Avian omnivore)	14	26	mg/kg	SOIL_AR(ip)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Deer mouse (Mammalian omnivore)	95	440	mg/kg	SOIL_DM(ip)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Earthworm (Soil-dwelling invertebrate)	32	58	mg/kg	SOIL_EW_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Generic plant (Terrestrial autotroph - producer)	62	120	mg/kg	SOIL_GP_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Gray fox (Mammalian top carnivore)	26000	120000	mg/kg	SOIL_RF(f)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Montane shrew (Mammalian insectivore)	1900	9100	mg/kg	SOIL_MS(i)_118-96-7
HE	Trinitrotoluene[2,4,6-]	118-96-7	SOIL	Mountain cottontail (Mammalian herbivore)	110	540	mg/kg	SOIL_DC(p)_118-96-7
INORG	Antimony	7440-36-0	SOIL	Deer mouse (Mammalian omnivore)	2.3	23	mg/kg	SOIL_DM(ip)_SB
INORG	Antimony	7440-36-0	SOIL	Earthworm (Soil-dwelling invertebrate)	78	780	mg/kg	SOIL_EW_SB
INORG	Antimony	7440-36-0	SOIL	Generic plant (Terrestrial autotroph - producer)	11	58	mg/kg	SOIL_GP_SB
INORG	Antimony	7440-36-0	SOIL	Gray fox (Mammalian top carnivore)	46	460	mg/kg	SOIL_RF(f)_SB
INORG	Antimony	7440-36-0	SOIL	Montane shrew (Mammalian insectivore)	7.9	79	mg/kg	SOIL_MS(i)_SB
INORG	Antimony	7440-36-0	SOIL	Mountain cottontail (Mammalian herbivore)	2.7	27	mg/kg	SOIL_DC(p)_SB
INORG	Barium	7440-39-3	SOIL	American kestrel (Avian top carnivore)	24000	44000	mg/kg	SOIL_AK(f)_BA
INORG	Barium	7440-39-3	SOIL	American kestrel (insectivore / carnivore)	7500	13000	mg/kg	SOIL_AK(fi)_BA
INORG	Barium	7440-39-3	SOIL	American robin (Avian herbivore)	720	1200	mg/kg	SOIL_AR(p)_BA
INORG	Barium	7440-39-3	SOIL	American robin (Avian insectivore)	820	1400	mg/kg	SOIL_AR(i)_BA
INORG	Barium	7440-39-3	SOIL	American robin (Avian omnivore)	770	1300	mg/kg	SOIL_AR(ip)_BA
INORG	Barium	7440-39-3	SOIL	Deer mouse (Mammalian omnivore)	1800	8700	mg/kg	SOIL_DM(ip)_BA
INORG	Barium	7440-39-3	SOIL	Earthworm (Soil-dwelling invertebrate)	330	3200	mg/kg	SOIL_EW_BA
INORG	Barium	7440-39-3	SOIL	Generic plant (Terrestrial autotroph - producer)	110	260	mg/kg	SOIL_GP_BA
INORG	Barium	7440-39-3	SOIL	Gray fox (Mammalian top carnivore)	41000	190000	mg/kg	SOIL_RF(f)_BA
INORG	Barium	7440-39-3	SOIL	Montane shrew (Mammalian insectivore)	2100	10000	mg/kg	SOIL_MS(i)_BA
INORG	Barium	7440-39-3	SOIL	Mountain cottontail (Mammalian herbivore)	2900	14000	mg/kg	SOIL_DC(p)_BA
INORG	Cobalt	CO	SOIL	American kestrel (Avian top carnivore)	2300	5200	mg/kg	SOIL_AK(f)_CO
INORG	Cobalt	CO	SOIL	American kestrel (insectivore / carnivore)	620	1400	mg/kg	SOIL_AK(fi)_CO
INORG	Cobalt	CO	SOIL	American robin (Avian herbivore)	130	300	mg/kg	SOIL_AR(p)_CO
INORG	Cobalt	CO	SOIL	American robin (Avian insectivore)	76	170	mg/kg	SOIL_AR(i)_CO
INORG	Cobalt	CO	SOIL	American robin (Avian omnivore)	97	210	mg/kg	SOIL_AR(ip)_CO
INORG	Cobalt	CO	SOIL	Deer mouse (Mammalian omnivore)	400	1000	mg/kg	SOIL_DM(ip)_CO

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
INORG	Cobalt	CO	SOIL	Generic plant (Terrestrial autotroph - producer)	13	130	mg/kg	SOIL_GP_CO
INORG	Cobalt	CO	SOIL	Gray fox (Mammalian top carnivore)	5400	14000	mg/kg	SOIL_RF(f)_CO
INORG	Cobalt	CO	SOIL	Montane shrew (Mammalian insectivore)	240	640	mg/kg	SOIL_MS(i)_CO
INORG	Cobalt	CO	SOIL	Mountain cottontail (Mammalian herbivore)	1000	2800	mg/kg	SOIL_DC(p)_CO
INORG	Copper	CU	SOIL	American kestrel (Avian top carnivore)	1100	3500	mg/kg	SOIL_AK(f)_CU
INORG	Copper	CU	SOIL	American kestrel (insectivore / carnivore)	80	240	mg/kg	SOIL_AK(fi)_CU
INORG	Copper	CU	SOIL	American robin (Avian herbivore)	34	100	mg/kg	SOIL_AR(p)_CU
INORG	Copper	CU	SOIL	American robin (Avian insectivore)	14	43	mg/kg	SOIL_AR(i)_CU
INORG	Copper	CU	SOIL	American robin (Avian omnivore)	20	60	mg/kg	SOIL_AR(ip)_CU
INORG	Copper	CU	SOIL	Deer mouse (Mammalian omnivore)	63	100	mg/kg	SOIL_DM(ip)_CU
INORG	Copper	CU	SOIL	Earthworm (Soil-dwelling invertebrate)	80	530	mg/kg	SOIL_EW_CU
INORG	Copper	CU	SOIL	Generic plant (Terrestrial autotroph - producer)	70	490	mg/kg	SOIL_GP_CU
INORG	Copper	CU	SOIL	Gray fox (Mammalian top carnivore)	4000	6700	mg/kg	SOIL_RF(f)_CU
INORG	Copper	CU	SOIL	Montane shrew (Mammalian insectivore)	42	70	mg/kg	SOIL_MS(i)_CU
INORG	Copper	CU	SOIL	Mountain cottontail (Mammalian herbivore)	260	430	mg/kg	SOIL_DC(p)_CU
INORG	Lead	PB	SOIL	American kestrel (Avian top carnivore)	540	1000	mg/kg	SOIL_AK(f)_PB
INORG	Lead	PB	SOIL	American kestrel (insectivore / carnivore)	83	160	mg/kg	SOIL_AK(fi)_PB
INORG	Lead	PB	SOIL	American robin (Avian herbivore)	18	36	mg/kg	SOIL_AR(p)_PB
INORG	Lead	PB	SOIL	American robin (Avian insectivore)	11	23	mg/kg	SOIL_AR(i)_PB
INORG	Lead	PB	SOIL	American robin (Avian omnivore)	14	28	mg/kg	SOIL_AR(ip)_PB
INORG	Lead	PB	SOIL	Deer mouse (Mammalian omnivore)	120	230	mg/kg	SOIL_DM(ip)_PB
INORG	Lead	PB	SOIL	Earthworm (Soil-dwelling invertebrate)	1700	8400	mg/kg	SOIL_EW_PB
INORG	Lead	PB	SOIL	Generic plant (Terrestrial autotroph - producer)	120	570	mg/kg	SOIL_GP_PB
INORG	Lead	PB	SOIL	Gray fox (Mammalian top carnivore)	3700	7000	mg/kg	SOIL_RF(f)_PB
INORG	Lead	PB	SOIL	Montane shrew (Mammalian insectivore)	93	170	mg/kg	SOIL_MS(i)_PB
INORG	Lead	PB	SOIL	Mountain cottontail (Mammalian herbivore)	310	600	mg/kg	SOIL_DC(p)_PB
INORG	Nickel	NI	SOIL	American kestrel (Avian top carnivore)	2000	8100	mg/kg	SOIL_AK(f)_NI
INORG	Nickel	NI	SOIL	American kestrel (insectivore / carnivore)	110	440	mg/kg	SOIL_AK(fi)_NI
INORG	Nickel	NI	SOIL	American robin (Avian herbivore)	120	500	mg/kg	SOIL_AR(p)_NI
INORG	Nickel	NI	SOIL	American robin (Avian insectivore)	20	81	mg/kg	SOIL_AR(i)_NI
INORG	Nickel	NI	SOIL	American robin (Avian omnivore)	35	130	mg/kg	SOIL_AR(ip)_NI
INORG	Nickel	NI	SOIL	Deer mouse (Mammalian omnivore)	20	40	mg/kg	SOIL_DM(ip)_NI
INORG	Nickel	NI	SOIL	Earthworm (Soil-dwelling invertebrate)	280	1300	mg/kg	SOIL_EW_NI
INORG	Nickel	NI	SOIL	Generic plant (Terrestrial autotroph - producer)	38	270	mg/kg	SOIL_GP_NI

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
INORG	Nickel	NI	SOIL	Gray fox (Mammalian top carnivore)	1200	2500	mg/kg	SOIL_RF(f)_NI
INORG	Nickel	NI	SOIL	Montane shrew (Mammalian insectivore)	10	21	mg/kg	SOIL_MS(i)_NI
INORG	Nickel	NI	SOIL	Mountain cottontail (Mammalian herbivore)	270	540	mg/kg	SOIL_DC(p)_NI
INORG	Perchlorate Ion	14797-73-0	SOIL	American kestrel (Avian top carnivore)	2	4	mg/kg	SOIL_AK(f)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	American kestrel (insectivore / carnivore)	3.9	8	mg/kg	SOIL_AK(fi)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	American robin (Avian herbivore)	0.12	0.24	mg/kg	SOIL_AR(p)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	American robin (Avian insectivore)	31	64	mg/kg	SOIL_AR(i)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	American robin (Avian omnivore)	0.24	0.49	mg/kg	SOIL_AR(ip)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Deer mouse (Mammalian omnivore)	0.21	1	mg/kg	SOIL_DM(ip)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Earthworm (Soil-dwelling invertebrate)	3.5	35	mg/kg	SOIL_EW_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Generic plant (Terrestrial autotroph - producer)	40	80	mg/kg	SOIL_GP_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Gray fox (Mammalian top carnivore)	3.3	16	mg/kg	SOIL_RF(f)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Montane shrew (Mammalian insectivore)	31	150	mg/kg	SOIL_MS(i)_ClO4(-1)
INORG	Perchlorate Ion	14797-73-0	SOIL	Mountain cottontail (Mammalian herbivore)	0.26	1.3	mg/kg	SOIL_DC(p)_ClO4(-1)
INORG	Silver	7440-22-4	SOIL	American kestrel (Avian top carnivore)	600	6000	mg/kg	SOIL_AK(f)_AG
INORG	Silver	7440-22-4	SOIL	American kestrel (insectivore / carnivore)	13	130	mg/kg	SOIL_AK(fi)_AG
INORG	Silver	7440-22-4	SOIL	American robin (Avian herbivore)	10	100	mg/kg	SOIL_AR(p)_AG
INORG	Silver	7440-22-4	SOIL	American robin (Avian insectivore)	2.6	26	mg/kg	SOIL_AR(i)_AG
INORG	Silver	7440-22-4	SOIL	American robin (Avian omnivore)	4.1	41	mg/kg	SOIL_AR(ip)_AG
INORG	Silver	7440-22-4	SOIL	Deer mouse (Mammalian omnivore)	24	240	mg/kg	SOIL_DM(ip)_AG
INORG	Silver	7440-22-4	SOIL	Generic plant (Terrestrial autotroph - producer)	560	2800	mg/kg	SOIL_GP_AG
INORG	Silver	7440-22-4	SOIL	Gray fox (Mammalian top carnivore)	4400	44000	mg/kg	SOIL_RF(f)_AG
INORG	Silver	7440-22-4	SOIL	Montane shrew (Mammalian insectivore)	14	140	mg/kg	SOIL_MS(i)_AG
INORG	Silver	7440-22-4	SOIL	Mountain cottontail (Mammalian herbivore)	150	1500	mg/kg	SOIL_DC(p)_AG
INORG	Zinc	ZN	SOIL	American kestrel (Avian top carnivore)	2600	7000	mg/kg	SOIL_AK(f)_ZN
INORG	Zinc	ZN	SOIL	American kestrel (insectivore / carnivore)	220	590	mg/kg	SOIL_AK(fi)_ZN
INORG	Zinc	ZN	SOIL	American robin (Avian herbivore)	330	870	mg/kg	SOIL_AR(p)_ZN
INORG	Zinc	ZN	SOIL	American robin (Avian insectivore)	47	120	mg/kg	SOIL_AR(i)_ZN
INORG	Zinc	ZN	SOIL	American robin (Avian omnivore)	83	220	mg/kg	SOIL_AR(ip)_ZN
INORG	Zinc	ZN	SOIL	Deer mouse (Mammalian omnivore)	170	1700	mg/kg	SOIL_DM(ip)_ZN
INORG	Zinc	ZN	SOIL	Earthworm (Soil-dwelling invertebrate)	120	930	mg/kg	SOIL_EW_ZN
INORG	Zinc	ZN	SOIL	Generic plant (Terrestrial autotroph - producer)	160	810	mg/kg	SOIL_GP_ZN
INORG	Zinc	ZN	SOIL	Gray fox (Mammalian top carnivore)	9600	94000	mg/kg	SOIL_RF(f)_ZN
INORG	Zinc	ZN	SOIL	Montane shrew (Mammalian insectivore)	99	980	mg/kg	SOIL_MS(i)_ZN

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
INORG	Zinc	ZN	SOIL	Mountain cottontail (Mammalian herbivore)	1800	18000	mg/kg	SOIL_DC(p)_ZN
ORG	5H 4:1 fluorotelomer alcohol (5H 4:1 FTOH)	5H 4:1 FTOH	SOIL	Generic plant (Terrestrial autotroph - producer)	23		mg/kg	SOIL_GP_5H 4:1 FTOH
ORG	6:2 fluorotelomer alcohol (6:2 FTOH)	6:2 FTOH	SOIL	Deer mouse (Mammalian omnivore)	10000	16000	mg/kg	SOIL_DM(ip)_6:2 FTOH
ORG	6:2 fluorotelomer alcohol (6:2 FTOH)	6:2 FTOH	SOIL	Gray fox (Mammalian top carnivore)	34000	79000	mg/kg	SOIL_RF(f)_6:2 FTOH
ORG	6:2 fluorotelomer alcohol (6:2 FTOH)	6:2 FTOH	SOIL	Montane shrew (Mammalian insectivore)	7200	16000	mg/kg	SOIL_MS(i)_6:2 FTOH
ORG	6:2 fluorotelomer alcohol (6:2 FTOH)	6:2 FTOH	SOIL	Mountain cottontail (Mammalian herbivore)	8300	19000	mg/kg	SOIL_DC(p)_6:2 FTOH
ORG	Hexafluoropropylene oxide dimer acid (GenX)	GenX	SOIL	Deer mouse (Mammalian omnivore)	120	840	mg/kg	SOIL_DM(ip)_GenX
ORG	Hexafluoropropylene oxide dimer acid (GenX)	GenX	SOIL	Gray fox (Mammalian top carnivore)	390	3900	mg/kg	SOIL_RF(f)_GenX
ORG	Hexafluoropropylene oxide dimer acid (GenX)	GenX	SOIL	Montane shrew (Mammalian insectivore)	84	840	mg/kg	SOIL_MS(i)_GenX
ORG	Hexafluoropropylene oxide dimer acid (GenX)	GenX	SOIL	Mountain cottontail (Mammalian herbivore)	97	970	mg/kg	SOIL_DC(p)_GenX
ORG	N-ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	N-EtFOSE	SOIL	Deer mouse (Mammalian omnivore)	25	160	mg/kg	SOIL_DM(ip)_N-EtFOSE
ORG	N-ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	N-EtFOSE	SOIL	Gray fox (Mammalian top carnivore)	79	790	mg/kg	SOIL_RF(f)_N-EtFOSE
ORG	N-ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	N-EtFOSE	SOIL	Montane shrew (Mammalian insectivore)	16	160	mg/kg	SOIL_MS(i)_N-EtFOSE
ORG	N-ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE)	N-EtFOSE	SOIL	Mountain cottontail (Mammalian herbivore)	19	190	mg/kg	SOIL_DC(p)_N-EtFOSE
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	American kestrel (Avian top carnivore)	56	93	mg/kg	SOIL_AK(f)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	American kestrel (insectivore / carnivore)	29	49	mg/kg	SOIL_AK(fi)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	American robin (Avian herbivore)	70	110	mg/kg	SOIL_AR(p)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	American robin (Avian insectivore)	8.4	14	mg/kg	SOIL_AR(i)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	American robin (Avian omnivore)	15	25	mg/kg	SOIL_AR(ip)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	Deer mouse (Mammalian omnivore)	14	32	mg/kg	SOIL_DM(ip)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	Earthworm (Soil-dwelling invertebrate)	10		mg/kg	SOIL_EW_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	Gray fox (Mammalian top carnivore)	100	400	mg/kg	SOIL_RF(f)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	Montane shrew (Mammalian insectivore)	8.1	32	mg/kg	SOIL_MS(i)_375-73-5
ORG	Perfluorobutanesulfonic acid (PFBS)	375-73-5	SOIL	Mountain cottontail (Mammalian herbivore)	160	660	mg/kg	SOIL_DC(p)_375-73-5
ORG	Perfluorobutanoic acid (PFBA)	375-22-4	SOIL	Deer mouse (Mammalian omnivore)	48	120	mg/kg	SOIL_DM(ip)_375-22-4
ORG	Perfluorobutanoic acid (PFBA)	375-22-4	SOIL	Generic plant (Terrestrial autotroph - producer)	640		mg/kg	SOIL_GP_375-22-4
ORG	Perfluorobutanoic acid (PFBA)	375-22-4	SOIL	Gray fox (Mammalian top carnivore)	140	350	mg/kg	SOIL_RF(f)_375-22-4
ORG	Perfluorobutanoic acid (PFBA)	375-22-4	SOIL	Montane shrew (Mammalian insectivore)	51	120	mg/kg	SOIL_MS(i)_375-22-4
ORG	Perfluorobutanoic acid (PFBA)	375-22-4	SOIL	Mountain cottontail (Mammalian herbivore)	110	260	mg/kg	SOIL_DC(p)_375-22-4
ORG	Perfluorodecanoic acid (PFDA)	335-76-2	SOIL	Generic plant (Terrestrial autotroph - producer)	51		mg/kg	SOIL_GP_335-76-2
ORG	Perfluoroheptanoic acid (PFHpA)	375-85-9	SOIL	Earthworm (Soil-dwelling invertebrate)	1	100	mg/kg	SOIL_EW_375-85-9
ORG	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	SOIL	Earthworm (Soil-dwelling invertebrate)	1	100	mg/kg	SOIL_EW_355-46-4
ORG	Perfluorohexanoic acid (PFHxA)	307-24-4	SOIL	Deer mouse (Mammalian omnivore)	200	450	mg/kg	SOIL_DM(ip)_307-24-4
ORG	Perfluorohexanoic acid (PFHxA)	307-24-4	SOIL	Gray fox (Mammalian top carnivore)	170	350	mg/kg	SOIL_RF(f)_307-24-4

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
ORG	Perfluorohexanoic acid (PFHxA)	307-24-4	SOIL	Montane shrew (Mammalian insectivore)	210	450	mg/kg	SOIL_MS(i)_307-24-4
ORG	Perfluorohexanoic acid (PFHxA)	307-24-4	SOIL	Mountain cottontail (Mammalian herbivore)	450	940	mg/kg	SOIL_DC(p)_307-24-4
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Deer mouse (Mammalian omnivore)	1.4	1.9	mg/kg	SOIL_DM(ip)_375-95-1
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Earthworm (Soil-dwelling invertebrate)	1	100	mg/kg	SOIL_EW_375-95-1
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Generic plant (Terrestrial autotroph - producer)	46		mg/kg	SOIL_GP_375-95-1
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Gray fox (Mammalian top carnivore)	1.6	2.2	mg/kg	SOIL_RF(f)_375-95-1
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Montane shrew (Mammalian insectivore)	0.9	1.1	mg/kg	SOIL_MS(i)_375-95-1
ORG	Perfluorononanoic acid (PFNA)	375-95-1	SOIL	Mountain cottontail (Mammalian herbivore)	8.7	11	mg/kg	SOIL_DC(p)_375-95-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	American kestrel (Avian top carnivore)	0.048	0.48	mg/kg	SOIL_AK(f)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	American kestrel (insectivore / carnivore)	0.035	0.35	mg/kg	SOIL_AK(fi)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	American robin (Avian herbivore)	0.28	2.8	mg/kg	SOIL_AR(p)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	American robin (Avian insectivore)	0.011	0.11	mg/kg	SOIL_AR(i)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	American robin (Avian omnivore)	0.022	0.22	mg/kg	SOIL_AR(ip)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Deer mouse (Mammalian omnivore)	0.051	0.085	mg/kg	SOIL_DM(ip)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Earthworm (Soil-dwelling invertebrate)	7.7	140	mg/kg	SOIL_EW_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Generic plant (Terrestrial autotroph - producer)	11	33	mg/kg	SOIL_GP_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Gray fox (Mammalian top carnivore)	0.2	0.33	mg/kg	SOIL_RF(f)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Montane shrew (Mammalian insectivore)	0.026	0.044	mg/kg	SOIL_MS(i)_1763-23-1
ORG	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	SOIL	Mountain cottontail (Mammalian herbivore)	1.6	2.8	mg/kg	SOIL_DC(p)_1763-23-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Deer mouse (Mammalian omnivore)	1.4	1.4	mg/kg	SOIL_DM(ip)_335-67-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Earthworm (Soil-dwelling invertebrate)	50		mg/kg	SOIL_EW_335-67-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Generic plant (Terrestrial autotroph - producer)	0.084	0.84	mg/kg	SOIL_GP_335-67-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Gray fox (Mammalian top carnivore)	0.6	1.2	mg/kg	SOIL_RF(f)_335-67-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Montane shrew (Mammalian insectivore)	0.74	1.4	mg/kg	SOIL_MS(i)_335-67-1
ORG	Perfluorooctanoic acid (PFOA)	335-67-1	SOIL	Mountain cottontail (Mammalian herbivore)	21	42	mg/kg	SOIL_DC(p)_335-67-1
ORG	Total Petroleum Hydrocarbon DRO	TPH-DRO	SOIL	Earthworm (Soil-dwelling invertebrate)	198	1977	mg/kg	use TPH F2F3 as surrogate
ORG	Total Petroleum Hydrocarbon DRO	TPH-DRO	SOIL	Generic plant (Terrestrial autotroph - producer)	81.2	419	mg/kg	use TPH F2F3 as surrogate
ORG	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	SOIL	Earthworm (Soil-dwelling invertebrate)	198	1977	mg/kg	SOIL_EW_TPH F2F3
ORG	Total Petroleum Hydrocarbon (Fraction 2, Fraction 3)	TPH F2F3	SOIL	Generic plant (Terrestrial autotroph - producer)	81.2	419	mg/kg	SOIL_GP_TPH F2F3
PAH	Acenaphthene	83-32-9	SOIL	Deer mouse (Mammalian omnivore)	160	1600	mg/kg	SOIL_DM(ip)_83-32-9
PAH	Acenaphthene	83-32-9	SOIL	Generic plant (Terrestrial autotroph - producer)	0.25	2	mg/kg	SOIL_GP_83-32-9
PAH	Acenaphthene	83-32-9	SOIL	Gray fox (Mammalian top carnivore)	29000	290000	mg/kg	SOIL_RF(f)_83-32-9
PAH	Acenaphthene	83-32-9	SOIL	Montane shrew (Mammalian insectivore)	130	1300	mg/kg	SOIL_MS(i)_83-32-9
PAH	Acenaphthene	83-32-9	SOIL	Mountain cottontail (Mammalian herbivore)	530	5300	mg/kg	SOIL_DC(p)_83-32-9

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
PAH	Acenaphthylene	208-96-8	SOIL	Deer mouse (Mammalian omnivore)	160	1600	mg/kg	SOIL_DM(ip)_208-96-8
PAH	Acenaphthylene	208-96-8	SOIL	Gray fox (Mammalian top carnivore)	28000	280000	mg/kg	SOIL_RF(f)_208-96-8
PAH	Acenaphthylene	208-96-8	SOIL	Montane shrew (Mammalian insectivore)	120	1200	mg/kg	SOIL_MS(i)_208-96-8
PAH	Acenaphthylene	208-96-8	SOIL	Mountain cottontail (Mammalian herbivore)	540	5400	mg/kg	SOIL_DC(p)_208-96-8
PAH	Anthracene	120-12-7	SOIL	Deer mouse (Mammalian omnivore)	300	3000	mg/kg	SOIL_DM(ip)_120-12-7
PAH	Anthracene	120-12-7	SOIL	Generic plant (Terrestrial autotroph - producer)	6.8	9	mg/kg	SOIL_GP_120-12-7
PAH	Anthracene	120-12-7	SOIL	Gray fox (Mammalian top carnivore)	38000	380000	mg/kg	SOIL_RF(f)_120-12-7
PAH	Anthracene	120-12-7	SOIL	Montane shrew (Mammalian insectivore)	210	2100	mg/kg	SOIL_MS(i)_120-12-7
PAH	Anthracene	120-12-7	SOIL	Mountain cottontail (Mammalian herbivore)	1200	12000	mg/kg	SOIL_DC(p)_120-12-7
PAH	Benzo(a)anthracene	56-55-3	SOIL	American kestrel (Avian top carnivore)	28	280	mg/kg	SOIL_AK(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	American kestrel (insectivore / carnivore)	6.4	64	mg/kg	SOIL_AK(fi)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	American robin (Avian herbivore)	0.73	7.3	mg/kg	SOIL_AR(p)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	American robin (Avian insectivore)	0.88	8.8	mg/kg	SOIL_AR(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	American robin (Avian omnivore)	0.8	8	mg/kg	SOIL_AR(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	Deer mouse (Mammalian omnivore)	3.4	34	mg/kg	SOIL_DM(ip)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	Generic plant (Terrestrial autotroph - producer)	18	180	mg/kg	SOIL_GP_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	Gray fox (Mammalian top carnivore)	110	1100	mg/kg	SOIL_RF(f)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	Montane shrew (Mammalian insectivore)	4	40	mg/kg	SOIL_MS(i)_56-55-3
PAH	Benzo(a)anthracene	56-55-3	SOIL	Mountain cottontail (Mammalian herbivore)	6.1	61	mg/kg	SOIL_DC(p)_56-55-3
PAH	Benzo(a)pyrene	50-32-8	SOIL	Deer mouse (Mammalian omnivore)	84	260	mg/kg	SOIL_DM(ip)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	SOIL	Gray fox (Mammalian top carnivore)	3400	11000	mg/kg	SOIL_RF(f)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	SOIL	Montane shrew (Mammalian insectivore)	62	190	mg/kg	SOIL_MS(i)_50-32-8
PAH	Benzo(a)pyrene	50-32-8	SOIL	Mountain cottontail (Mammalian herbivore)	260	830	mg/kg	SOIL_DC(p)_50-32-8
PAH	Benzo(b)fluoranthene	205-99-2	SOIL	Deer mouse (Mammalian omnivore)	51	510	mg/kg	SOIL_DM(ip)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	SOIL	Generic plant (Terrestrial autotroph - producer)	18	180	mg/kg	SOIL_GP_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	SOIL	Gray fox (Mammalian top carnivore)	2400	24000	mg/kg	SOIL_RF(f)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	SOIL	Montane shrew (Mammalian insectivore)	44	440	mg/kg	SOIL_MS(i)_205-99-2
PAH	Benzo(b)fluoranthene	205-99-2	SOIL	Mountain cottontail (Mammalian herbivore)	130	1300	mg/kg	SOIL_DC(p)_205-99-2
PAH	Benzo(g,h,i)perylene	191-24-2	SOIL	Deer mouse (Mammalian omnivore)	46	460	mg/kg	SOIL_DM(ip)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	SOIL	Gray fox (Mammalian top carnivore)	3600	36000	mg/kg	SOIL_RF(f)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	SOIL	Montane shrew (Mammalian insectivore)	25	250	mg/kg	SOIL_MS(i)_191-24-2
PAH	Benzo(g,h,i)perylene	191-24-2	SOIL	Mountain cottontail (Mammalian herbivore)	470	4700	mg/kg	SOIL_DC(p)_191-24-2
PAH	Benzo(k)fluoranthene	207-08-9	SOIL	Deer mouse (Mammalian omnivore)	99	990	mg/kg	SOIL_DM(ip)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	SOIL	Gray fox (Mammalian top carnivore)	4300	43000	mg/kg	SOIL_RF(f)_207-08-9

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
PAH	Benzo(k)fluoranthene	207-08-9	SOIL	Montane shrew (Mammalian insectivore)	71	710	mg/kg	SOIL_MS(i)_207-08-9
PAH	Benzo(k)fluoranthene	207-08-9	SOIL	Mountain cottontail (Mammalian herbivore)	330	3300	mg/kg	SOIL_DC(p)_207-08-9
PAH	Chrysene	218-01-9	SOIL	Deer mouse (Mammalian omnivore)	3.1	31	mg/kg	SOIL_DM(ip)_218-01-9
PAH	Chrysene	218-01-9	SOIL	Gray fox (Mammalian top carnivore)	110	1100	mg/kg	SOIL_RF(f)_218-01-9
PAH	Chrysene	218-01-9	SOIL	Montane shrew (Mammalian insectivore)	3.1	31	mg/kg	SOIL_MS(i)_218-01-9
PAH	Chrysene	218-01-9	SOIL	Mountain cottontail (Mammalian herbivore)	6.3	63	mg/kg	SOIL_DC(p)_218-01-9
PAH	Dibenzo(a,h)anthracene	53-70-3	SOIL	Deer mouse (Mammalian omnivore)	22	220	mg/kg	SOIL_DM(ip)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	SOIL	Gray fox (Mammalian top carnivore)	850	8500	mg/kg	SOIL_RF(f)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	SOIL	Montane shrew (Mammalian insectivore)	14	140	mg/kg	SOIL_MS(i)_53-70-3
PAH	Dibenzo(a,h)anthracene	53-70-3	SOIL	Mountain cottontail (Mammalian herbivore)	84	840	mg/kg	SOIL_DC(p)_53-70-3
PAH	Fluoranthene	206-44-0	SOIL	Deer mouse (Mammalian omnivore)	38	380	mg/kg	SOIL_DM(ip)_206-44-0
PAH	Fluoranthene	206-44-0	SOIL	Earthworm (Soil-dwelling invertebrate)	10	23	mg/kg	SOIL_EW_206-44-0
PAH	Fluoranthene	206-44-0	SOIL	Gray fox (Mammalian top carnivore)	3900	39000	mg/kg	SOIL_RF(f)_206-44-0
PAH	Fluoranthene	206-44-0	SOIL	Montane shrew (Mammalian insectivore)	22	220	mg/kg	SOIL_MS(i)_206-44-0
PAH	Fluoranthene	206-44-0	SOIL	Mountain cottontail (Mammalian herbivore)	270	2700	mg/kg	SOIL_DC(p)_206-44-0
PAH	Fluorene	86-73-7	SOIL	Deer mouse (Mammalian omnivore)	340	680	mg/kg	SOIL_DM(ip)_86-73-7
PAH	Fluorene	86-73-7	SOIL	Earthworm (Soil-dwelling invertebrate)	3.7	19	mg/kg	SOIL_EW_86-73-7
PAH	Fluorene	86-73-7	SOIL	Gray fox (Mammalian top carnivore)	50000	100000	mg/kg	SOIL_RF(f)_86-73-7
PAH	Fluorene	86-73-7	SOIL	Montane shrew (Mammalian insectivore)	250	510	mg/kg	SOIL_MS(i)_86-73-7
PAH	Fluorene	86-73-7	SOIL	Mountain cottontail (Mammalian herbivore)	1100	2300	mg/kg	SOIL_DC(p)_86-73-7
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	SOIL	Deer mouse (Mammalian omnivore)	110	1100	mg/kg	SOIL_DM(ip)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	SOIL	Gray fox (Mammalian top carnivore)	4600	46000	mg/kg	SOIL_RF(f)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	SOIL	Montane shrew (Mammalian insectivore)	71	710	mg/kg	SOIL_MS(i)_193-39-5
PAH	Indeno(1,2,3-cd)pyrene	193-39-5	SOIL	Mountain cottontail (Mammalian herbivore)	510	5100	mg/kg	SOIL_DC(p)_193-39-5
PAH	Methylnaphthalene[2-]	91-57-6	SOIL	Deer mouse (Mammalian omnivore)	24	240	mg/kg	SOIL_DM(ip)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	SOIL	Gray fox (Mammalian top carnivore)	4900	49000	mg/kg	SOIL_RF(f)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	SOIL	Montane shrew (Mammalian insectivore)	16	160	mg/kg	SOIL_MS(i)_91-57-6
PAH	Methylnaphthalene[2-]	91-57-6	SOIL	Mountain cottontail (Mammalian herbivore)	110	1100	mg/kg	SOIL_DC(p)_91-57-6
PAH	Naphthalene	91-20-3	SOIL	American kestrel (Avian top carnivore)	2100	21000	mg/kg	SOIL_AK(f)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	American kestrel (insectivore / carnivore)	78	780	mg/kg	SOIL_AK(fi)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	American robin (Avian herbivore)	3.4	34	mg/kg	SOIL_AR(p)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	American robin (Avian insectivore)	15	150	mg/kg	SOIL_AR(i)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	American robin (Avian omnivore)	5.7	57	mg/kg	SOIL_AR(ip)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	Deer mouse (Mammalian omnivore)	9.6	27	mg/kg	SOIL_DM(ip)_91-20-3

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
PAH	Naphthalene	91-20-3	SOIL	Generic plant (Terrestrial autotroph - producer)	1	10	mg/kg	SOIL_GP_91-20-3
PAH	Naphthalene	91-20-3	SOIL	Gray fox (Mammalian top carnivore)	5800	16000	mg/kg	SOIL_RF(f)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	Montane shrew (Mammalian insectivore)	28	79	mg/kg	SOIL_MS(i)_91-20-3
PAH	Naphthalene	91-20-3	SOIL	Mountain cottontail (Mammalian herbivore)	14	40	mg/kg	SOIL_DC(p)_91-20-3
PAH	Phenanthrene	85-01-8	SOIL	Deer mouse (Mammalian omnivore)	15	150	mg/kg	SOIL_DM(ip)_85-01-8
PAH	Phenanthrene	85-01-8	SOIL	Earthworm (Soil-dwelling invertebrate)	5.5	12	mg/kg	SOIL_EW_85-01-8
PAH	Phenanthrene	85-01-8	SOIL	Gray fox (Mammalian top carnivore)	1900	19000	mg/kg	SOIL_RF(f)_85-01-8
PAH	Phenanthrene	85-01-8	SOIL	Montane shrew (Mammalian insectivore)	11	110	mg/kg	SOIL_MS(i)_85-01-8
PAH	Phenanthrene	85-01-8	SOIL	Mountain cottontail (Mammalian herbivore)	62	620	mg/kg	SOIL_DC(p)_85-01-8
PAH	Pyrene	129-00-0	SOIL	American kestrel (Avian top carnivore)	3000	30000	mg/kg	SOIL_AK(f)_129-00-0
PAH	Pyrene	129-00-0	SOIL	American kestrel (insectivore / carnivore)	160	1600	mg/kg	SOIL_AK(fi)_129-00-0
PAH	Pyrene	129-00-0	SOIL	American robin (Avian herbivore)	68	680	mg/kg	SOIL_AR(p)_129-00-0
PAH	Pyrene	129-00-0	SOIL	American robin (Avian insectivore)	33	330	mg/kg	SOIL_AR(i)_129-00-0
PAH	Pyrene	129-00-0	SOIL	American robin (Avian omnivore)	44	440	mg/kg	SOIL_AR(ip)_129-00-0
PAH	Pyrene	129-00-0	SOIL	Deer mouse (Mammalian omnivore)	31	310	mg/kg	SOIL_DM(ip)_129-00-0
PAH	Pyrene	129-00-0	SOIL	Earthworm (Soil-dwelling invertebrate)	10	20	mg/kg	SOIL_EW_129-00-0
PAH	Pyrene	129-00-0	SOIL	Gray fox (Mammalian top carnivore)	3100	31000	mg/kg	SOIL_RF(f)_129-00-0
PAH	Pyrene	129-00-0	SOIL	Montane shrew (Mammalian insectivore)	23	230	mg/kg	SOIL_MS(i)_129-00-0
PAH	Pyrene	129-00-0	SOIL	Mountain cottontail (Mammalian herbivore)	110	1100	mg/kg	SOIL_DC(p)_129-00-0
SVOC	Benzoic Acid	65-85-0	SOIL	Deer mouse (Mammalian omnivore)	1.3	13	mg/kg	SOIL_DM(ip)_65-85-0
SVOC	Benzoic Acid	65-85-0	SOIL	Gray fox (Mammalian top carnivore)	2000	20000	mg/kg	SOIL_RF(f)_65-85-0
SVOC	Benzoic Acid	65-85-0	SOIL	Montane shrew (Mammalian insectivore)	1	10	mg/kg	SOIL_MS(i)_65-85-0
SVOC	Benzoic Acid	65-85-0	SOIL	Mountain cottontail (Mammalian herbivore)	4.6	46	mg/kg	SOIL_DC(p)_65-85-0
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	American kestrel (Avian top carnivore)	9.3	93	mg/kg	SOIL_AK(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	American kestrel (insectivore / carnivore)	0.096	0.96	mg/kg	SOIL_AK(fi)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	American robin (Avian herbivore)	16	160	mg/kg	SOIL_AR(p)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	American robin (Avian insectivore)	0.02	0.2	mg/kg	SOIL_AR(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	American robin (Avian omnivore)	0.04	0.4	mg/kg	SOIL_AR(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	Deer mouse (Mammalian omnivore)	1.1	11	mg/kg	SOIL_DM(ip)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	Gray fox (Mammalian top carnivore)	500	5000	mg/kg	SOIL_RF(f)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	Montane shrew (Mammalian insectivore)	0.6	6	mg/kg	SOIL_MS(i)_117-81-7
SVOC	Bis(2-ethylhexyl)phthalate	117-81-7	SOIL	Mountain cottontail (Mammalian herbivore)	1900	19000	mg/kg	SOIL_DC(p)_117-81-7
SVOC	Butyl Benzyl Phthalate	85-68-7	SOIL	Deer mouse (Mammalian omnivore)	160	1600	mg/kg	SOIL_DM(ip)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	SOIL	Gray fox (Mammalian top carnivore)	23000	230000	mg/kg	SOIL_RF(f)_85-68-7

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
SVOC	Butyl Benzyl Phthalate	85-68-7	SOIL	Montane shrew (Mammalian insectivore)	90	900	mg/kg	SOIL_MS(i)_85-68-7
SVOC	Butyl Benzyl Phthalate	85-68-7	SOIL	Mountain cottontail (Mammalian herbivore)	2400	24000	mg/kg	SOIL_DC(p)_85-68-7
SVOC	Carbazole	86-74-8	SOIL	Deer mouse (Mammalian omnivore)	79	790	mg/kg	SOIL_DM(ip)_86-74-8
SVOC	Carbazole	86-74-8	SOIL	Gray fox (Mammalian top carnivore)	13000	130000	mg/kg	SOIL_RF(f)_86-74-8
SVOC	Carbazole	86-74-8	SOIL	Montane shrew (Mammalian insectivore)	110	1100	mg/kg	SOIL_MS(i)_86-74-8
SVOC	Carbazole	86-74-8	SOIL	Mountain cottontail (Mammalian herbivore)	140	1400	mg/kg	SOIL_DC(p)_86-74-8
SVOC	Chlorobenzene	108-90-7	SOIL	Deer mouse (Mammalian omnivore)	53	530	mg/kg	SOIL_DM(ip)_108-90-7
SVOC	Chlorobenzene	108-90-7	SOIL	Earthworm (Soil-dwelling invertebrate)	2.4	24	mg/kg	SOIL_EW_108-90-7
SVOC	Chlorobenzene	108-90-7	SOIL	Gray fox (Mammalian top carnivore)	25000	250000	mg/kg	SOIL_RF(f)_108-90-7
SVOC	Chlorobenzene	108-90-7	SOIL	Montane shrew (Mammalian insectivore)	43	430	mg/kg	SOIL_MS(i)_108-90-7
SVOC	Chlorobenzene	108-90-7	SOIL	Mountain cottontail (Mammalian herbivore)	170	1700	mg/kg	SOIL_DC(p)_108-90-7
SVOC	Chlorophenol[2-]	95-57-8	SOIL	American kestrel (Avian top carnivore)	310	3100	mg/kg	SOIL_AK(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	American kestrel (insectivore / carnivore)	14	140	mg/kg	SOIL_AK(fi)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	American robin (Avian herbivore)	0.39	3.9	mg/kg	SOIL_AR(p)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	American robin (Avian insectivore)	2.6	26	mg/kg	SOIL_AR(i)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	American robin (Avian omnivore)	0.68	6.8	mg/kg	SOIL_AR(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	Deer mouse (Mammalian omnivore)	0.54	5.4	mg/kg	SOIL_DM(ip)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	Gray fox (Mammalian top carnivore)	340	3400	mg/kg	SOIL_RF(f)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	Montane shrew (Mammalian insectivore)	2.3	23	mg/kg	SOIL_MS(i)_95-57-8
SVOC	Chlorophenol[2-]	95-57-8	SOIL	Mountain cottontail (Mammalian herbivore)	0.74	7.4	mg/kg	SOIL_DC(p)_95-57-8
SVOC	Dibenzofuran	132-64-9	SOIL	Generic plant (Terrestrial autotroph - producer)	6.1	61	mg/kg	SOIL_GP_132-64-9
SVOC	Diethyl Phthalate	84-66-2	SOIL	Deer mouse (Mammalian omnivore)	3600	36000	mg/kg	SOIL_DM(ip)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	SOIL	Generic plant (Terrestrial autotroph - producer)	100	1000	mg/kg	SOIL_GP_84-66-2
SVOC	Diethyl Phthalate	84-66-2	SOIL	Gray fox (Mammalian top carnivore)	2500000	25000000	mg/kg	SOIL_RF(f)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	SOIL	Montane shrew (Mammalian insectivore)	3600	36000	mg/kg	SOIL_MS(i)_84-66-2
SVOC	Diethyl Phthalate	84-66-2	SOIL	Mountain cottontail (Mammalian herbivore)	8800	88000	mg/kg	SOIL_DC(p)_84-66-2
SVOC	Dimethyl Phthalate	131-11-3	SOIL	Deer mouse (Mammalian omnivore)	38	460	mg/kg	SOIL_DM(ip)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	SOIL	Earthworm (Soil-dwelling invertebrate)	10	100	mg/kg	SOIL_EW_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	SOIL	Gray fox (Mammalian top carnivore)	48000	590000	mg/kg	SOIL_RF(f)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	SOIL	Montane shrew (Mammalian insectivore)	80	980	mg/kg	SOIL_MS(i)_131-11-3
SVOC	Dimethyl Phthalate	131-11-3	SOIL	Mountain cottontail (Mammalian herbivore)	60	740	mg/kg	SOIL_DC(p)_131-11-3
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	American kestrel (Avian top carnivore)	2	20	mg/kg	SOIL_AK(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	American kestrel (insectivore / carnivore)	0.052	0.52	mg/kg	SOIL_AK(fi)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	American robin (Avian herbivore)	0.38	3.8	mg/kg	SOIL_AR(p)_84-74-2

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	American robin (Avian insectivore)	0.011	0.11	mg/kg	SOIL_AR(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	American robin (Avian omnivore)	0.021	0.21	mg/kg	SOIL_AR(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	Deer mouse (Mammalian omnivore)	360	860	mg/kg	SOIL_DM(ip)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	Generic plant (Terrestrial autotroph - producer)	160	600	mg/kg	SOIL_GP_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	Gray fox (Mammalian top carnivore)	62000	140000	mg/kg	SOIL_RF(f)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	Montane shrew (Mammalian insectivore)	180	450	mg/kg	SOIL_MS(i)_84-74-2
SVOC	Di-n-Butyl Phthalate	84-74-2	SOIL	Mountain cottontail (Mammalian herbivore)	17000	40000	mg/kg	SOIL_DC(p)_84-74-2
SVOC	Di-n-octylphthalate	117-84-0	SOIL	Deer mouse (Mammalian omnivore)	1.8	18	mg/kg	SOIL_DM(ip)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	SOIL	Gray fox (Mammalian top carnivore)	1300	13000	mg/kg	SOIL_RF(f)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	SOIL	Montane shrew (Mammalian insectivore)	0.91	9.1	mg/kg	SOIL_MS(i)_117-84-0
SVOC	Di-n-octylphthalate	117-84-0	SOIL	Mountain cottontail (Mammalian herbivore)	8400	84000	mg/kg	SOIL_DC(p)_117-84-0
SVOC	Methylphenol[2-]	95-48-7	SOIL	Deer mouse (Mammalian omnivore)	580	5800	mg/kg	SOIL_DM(ip)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	SOIL	Generic plant (Terrestrial autotroph - producer)	0.67	7	mg/kg	SOIL_GP_95-48-7
SVOC	Methylphenol[2-]	95-48-7	SOIL	Gray fox (Mammalian top carnivore)	160000	1600000	mg/kg	SOIL_RF(f)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	SOIL	Montane shrew (Mammalian insectivore)	1500	15000	mg/kg	SOIL_MS(i)_95-48-7
SVOC	Methylphenol[2-]	95-48-7	SOIL	Mountain cottontail (Mammalian herbivore)	880	8800	mg/kg	SOIL_DC(p)_95-48-7
SVOC	Methylphenol[3-]	108-39-4	SOIL	Generic plant (Terrestrial autotroph - producer)	0.69	7	mg/kg	SOIL_GP_108-39-4
SVOC	Nitroaniline[2-]	88-74-4	SOIL	Deer mouse (Mammalian omnivore)	5.3	10	mg/kg	SOIL_DM(ip)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	SOIL	Gray fox (Mammalian top carnivore)	2200	4400	mg/kg	SOIL_RF(f)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	SOIL	Montane shrew (Mammalian insectivore)	6.5	13	mg/kg	SOIL_MS(i)_88-74-4
SVOC	Nitroaniline[2-]	88-74-4	SOIL	Mountain cottontail (Mammalian herbivore)	11	22	mg/kg	SOIL_DC(p)_88-74-4
SVOC	Nitrobenzene	98-95-3	SOIL	Deer mouse (Mammalian omnivore)	4.8	48	mg/kg	SOIL_DM(ip)_98-95-3
SVOC	Nitrobenzene	98-95-3	SOIL	Earthworm (Soil-dwelling invertebrate)	2.2	22	mg/kg	SOIL_EW_98-95-3
SVOC	Nitrobenzene	98-95-3	SOIL	Gray fox (Mammalian top carnivore)	4100	41000	mg/kg	SOIL_RF(f)_98-95-3
SVOC	Nitrobenzene	98-95-3	SOIL	Montane shrew (Mammalian insectivore)	21	210	mg/kg	SOIL_MS(i)_98-95-3
SVOC	Nitrobenzene	98-95-3	SOIL	Mountain cottontail (Mammalian herbivore)	6.7	67	mg/kg	SOIL_DC(p)_98-95-3
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	American kestrel (Avian top carnivore)	110	1100	mg/kg	SOIL_AK(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	American kestrel (insectivore / carnivore)	3.3	33	mg/kg	SOIL_AK(fi)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	American robin (Avian herbivore)	21	210	mg/kg	SOIL_AR(p)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	American robin (Avian insectivore)	0.7	7	mg/kg	SOIL_AR(i)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	American robin (Avian omnivore)	1.3	13	mg/kg	SOIL_AR(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	Deer mouse (Mammalian omnivore)	22	220	mg/kg	SOIL_DM(ip)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	Gray fox (Mammalian top carnivore)	3500	35000	mg/kg	SOIL_RF(f)_82-68-8
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	Montane shrew (Mammalian insectivore)	11	110	mg/kg	SOIL_MS(i)_82-68-8

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
SVOC	Pentachloronitrobenzene	82-68-8	SOIL	Mountain cottontail (Mammalian herbivore)	930	9300	mg/kg	SOIL_DC(p)_82-68-8
SVOC	Pentachlorophenol	87-86-5	SOIL	American kestrel (Avian top carnivore)	57	570	mg/kg	SOIL_AK(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	American kestrel (insectivore / carnivore)	1.7	17	mg/kg	SOIL_AK(fi)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	American robin (Avian herbivore)	29	290	mg/kg	SOIL_AR(p)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	American robin (Avian insectivore)	0.36	3.6	mg/kg	SOIL_AR(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	American robin (Avian omnivore)	0.72	7.2	mg/kg	SOIL_AR(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Deer mouse (Mammalian omnivore)	1.5	15	mg/kg	SOIL_DM(ip)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Earthworm (Soil-dwelling invertebrate)	31	150	mg/kg	SOIL_EW_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Generic plant (Terrestrial autotroph - producer)	5	50	mg/kg	SOIL_GP_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Gray fox (Mammalian top carnivore)	230	2300	mg/kg	SOIL_RF(f)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Montane shrew (Mammalian insectivore)	0.81	8.1	mg/kg	SOIL_MS(i)_87-86-5
SVOC	Pentachlorophenol	87-86-5	SOIL	Mountain cottontail (Mammalian herbivore)	180	1800	mg/kg	SOIL_DC(p)_87-86-5
SVOC	Phenol	108-95-2	SOIL	Deer mouse (Mammalian omnivore)	37	370	mg/kg	SOIL_DM(ip)_108-95-2
SVOC	Phenol	108-95-2	SOIL	Earthworm (Soil-dwelling invertebrate)	1.8	18	mg/kg	SOIL_EW_108-95-2
SVOC	Phenol	108-95-2	SOIL	Generic plant (Terrestrial autotroph - producer)	0.79	8	mg/kg	SOIL_GP_108-95-2
SVOC	Phenol	108-95-2	SOIL	Gray fox (Mammalian top carnivore)	43000	430000	mg/kg	SOIL_RF(f)_108-95-2
SVOC	Phenol	108-95-2	SOIL	Montane shrew (Mammalian insectivore)	640	6400	mg/kg	SOIL_MS(i)_108-95-2
SVOC	Phenol	108-95-2	SOIL	Mountain cottontail (Mammalian herbivore)	47	470	mg/kg	SOIL_DC(p)_108-95-2
VOC	Acetone	67-64-1	SOIL	American kestrel (Avian top carnivore)	66000	660000	mg/kg	SOIL_AK(f)_67-64-1
VOC	Acetone	67-64-1	SOIL	American kestrel (insectivore / carnivore)	840	8400	mg/kg	SOIL_AK(fi)_67-64-1
VOC	Acetone	67-64-1	SOIL	American robin (Avian herbivore)	7.5	75	mg/kg	SOIL_AR(p)_67-64-1
VOC	Acetone	67-64-1	SOIL	American robin (Avian insectivore)	170	1700	mg/kg	SOIL_AR(i)_67-64-1
VOC	Acetone	67-64-1	SOIL	American robin (Avian omnivore)	14	140	mg/kg	SOIL_AR(ip)_67-64-1
VOC	Acetone	67-64-1	SOIL	Deer mouse (Mammalian omnivore)	1.2	6.3	mg/kg	SOIL_DM(ip)_67-64-1
VOC	Acetone	67-64-1	SOIL	Gray fox (Mammalian top carnivore)	7800	39000	mg/kg	SOIL_RF(f)_67-64-1
VOC	Acetone	67-64-1	SOIL	Montane shrew (Mammalian insectivore)	15	79	mg/kg	SOIL_MS(i)_67-64-1
VOC	Acetone	67-64-1	SOIL	Mountain cottontail (Mammalian herbivore)	1.6	8	mg/kg	SOIL_DC(p)_67-64-1
VOC	Benzene	71-43-2	SOIL	Deer mouse (Mammalian omnivore)	24	240	mg/kg	SOIL_DM(ip)_71-43-2
VOC	Benzene	71-43-2	SOIL	Gray fox (Mammalian top carnivore)	18000	180000	mg/kg	SOIL_RF(f)_71-43-2
VOC	Benzene	71-43-2	SOIL	Montane shrew (Mammalian insectivore)	49	490	mg/kg	SOIL_MS(i)_71-43-2
VOC	Benzene	71-43-2	SOIL	Mountain cottontail (Mammalian herbivore)	38	380	mg/kg	SOIL_DC(p)_71-43-2
VOC	Benzyl Alcohol	100-51-6	SOIL	Deer mouse (Mammalian omnivore)	120	1200	mg/kg	SOIL_DM(ip)_100-51-6
VOC	Benzyl Alcohol	100-51-6	SOIL	Gray fox (Mammalian top carnivore)	110000	1100000	mg/kg	SOIL_RF(f)_100-51-6
VOC	Benzyl Alcohol	100-51-6	SOIL	Montane shrew (Mammalian insectivore)	270	2700	mg/kg	SOIL_MS(i)_100-51-6

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
VOC	Benzyl Alcohol	100-51-6	SOIL	Mountain cottontail (Mammalian herbivore)	190	1900	mg/kg	SOIL_DC(p)_100-51-6
VOC	Butanone[2-]	78-93-3	SOIL	Deer mouse (Mammalian omnivore)	350	920	mg/kg	SOIL_DM(ip)_78-93-3
VOC	Butanone[2-]	78-93-3	SOIL	Gray fox (Mammalian top carnivore)	1300000	3500000	mg/kg	SOIL_RF(f)_78-93-3
VOC	Butanone[2-]	78-93-3	SOIL	Montane shrew (Mammalian insectivore)	2700	6900	mg/kg	SOIL_MS(i)_78-93-3
VOC	Butanone[2-]	78-93-3	SOIL	Mountain cottontail (Mammalian herbivore)	470	1200	mg/kg	SOIL_DC(p)_78-93-3
VOC	Carbon Disulfide	75-15-0	SOIL	Deer mouse (Mammalian omnivore)	0.81	8.1	mg/kg	SOIL_DM(ip)_75-15-0
VOC	Carbon Disulfide	75-15-0	SOIL	Gray fox (Mammalian top carnivore)	190	1900	mg/kg	SOIL_RF(f)_75-15-0
VOC	Carbon Disulfide	75-15-0	SOIL	Montane shrew (Mammalian insectivore)	1.2	12	mg/kg	SOIL_MS(i)_75-15-0
VOC	Carbon Disulfide	75-15-0	SOIL	Mountain cottontail (Mammalian herbivore)	1.4	14	mg/kg	SOIL_DC(p)_75-15-0
VOC	Chloroaniline[4-]	106-47-8	SOIL	Earthworm (Soil-dwelling invertebrate)	1.8	18	mg/kg	SOIL_EW_106-47-8
VOC	Chloroaniline[4-]	106-47-8	SOIL	Generic plant (Terrestrial autotroph - producer)	1	10	mg/kg	SOIL_GP_106-47-8
VOC	Chloroform	67-66-3	SOIL	Deer mouse (Mammalian omnivore)	8	21	mg/kg	SOIL_DM(ip)_67-66-3
VOC	Chloroform	67-66-3	SOIL	Gray fox (Mammalian top carnivore)	8900	24000	mg/kg	SOIL_RF(f)_67-66-3
VOC	Chloroform	67-66-3	SOIL	Montane shrew (Mammalian insectivore)	8.2	22	mg/kg	SOIL_MS(i)_67-66-3
VOC	Chloroform	67-66-3	SOIL	Mountain cottontail (Mammalian herbivore)	19	52	mg/kg	SOIL_DC(p)_67-66-3
VOC	Dichlorobenzene[1,2-]	95-50-1	SOIL	Deer mouse (Mammalian omnivore)	1.5	15	mg/kg	SOIL_DM(ip)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	SOIL	Gray fox (Mammalian top carnivore)	480	4800	mg/kg	SOIL_RF(f)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	SOIL	Montane shrew (Mammalian insectivore)	0.92	9.2	mg/kg	SOIL_MS(i)_95-50-1
VOC	Dichlorobenzene[1,2-]	95-50-1	SOIL	Mountain cottontail (Mammalian herbivore)	12	120	mg/kg	SOIL_DC(p)_95-50-1
VOC	Dichlorobenzene[1,3-]	541-73-1	SOIL	Deer mouse (Mammalian omnivore)	1.2	12	mg/kg	SOIL_DM(ip)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	SOIL	Gray fox (Mammalian top carnivore)	380	3800	mg/kg	SOIL_RF(f)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	SOIL	Montane shrew (Mammalian insectivore)	0.74	7.4	mg/kg	SOIL_MS(i)_541-73-1
VOC	Dichlorobenzene[1,3-]	541-73-1	SOIL	Mountain cottontail (Mammalian herbivore)	13	130	mg/kg	SOIL_DC(p)_541-73-1
VOC	Dichlorobenzene[1,4-]	106-46-7	SOIL	Deer mouse (Mammalian omnivore)	1.5	6	mg/kg	SOIL_DM(ip)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	SOIL	Earthworm (Soil-dwelling invertebrate)	1.2	12	mg/kg	SOIL_EW_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	SOIL	Gray fox (Mammalian top carnivore)	470	1800	mg/kg	SOIL_RF(f)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	SOIL	Montane shrew (Mammalian insectivore)	0.89	3.5	mg/kg	SOIL_MS(i)_106-46-7
VOC	Dichlorobenzene[1,4-]	106-46-7	SOIL	Mountain cottontail (Mammalian herbivore)	12	49	mg/kg	SOIL_DC(p)_106-46-7
VOC	Dichloroethane[1,1-]	75-34-3	SOIL	Deer mouse (Mammalian omnivore)	210	2100	mg/kg	SOIL_DM(ip)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	SOIL	Gray fox (Mammalian top carnivore)	250000	2500000	mg/kg	SOIL_RF(f)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	SOIL	Montane shrew (Mammalian insectivore)	290	2900	mg/kg	SOIL_MS(i)_75-34-3
VOC	Dichloroethane[1,1-]	75-34-3	SOIL	Mountain cottontail (Mammalian herbivore)	410	4100	mg/kg	SOIL_DC(p)_75-34-3
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	American kestrel (Avian top carnivore)	1300	2700	mg/kg	SOIL_AK(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	American kestrel (insectivore / carnivore)	22	44	mg/kg	SOIL_AK(fi)_107-06-2

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	American robin (Avian herbivore)	0.85	1.6	mg/kg	SOIL_AR(p)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	American robin (Avian insectivore)	4.5	9	mg/kg	SOIL_AR(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	American robin (Avian omnivore)	1.4	2.8	mg/kg	SOIL_AR(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	Deer mouse (Mammalian omnivore)	27	270	mg/kg	SOIL_DM(ip)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	Gray fox (Mammalian top carnivore)	36000	360000	mg/kg	SOIL_RF(f)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	Montane shrew (Mammalian insectivore)	91	910	mg/kg	SOIL_MS(i)_107-06-2
VOC	Dichloroethane[1,2-]	107-06-2	SOIL	Mountain cottontail (Mammalian herbivore)	39	390	mg/kg	SOIL_DC(p)_107-06-2
VOC	Dichloroethene[1,1-]	75-35-4	SOIL	Deer mouse (Mammalian omnivore)	14	140	mg/kg	SOIL_DM(ip)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	SOIL	Gray fox (Mammalian top carnivore)	14000	140000	mg/kg	SOIL_RF(f)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	SOIL	Montane shrew (Mammalian insectivore)	11	110	mg/kg	SOIL_MS(i)_75-35-4
VOC	Dichloroethene[1,1-]	75-35-4	SOIL	Mountain cottontail (Mammalian herbivore)	44	440	mg/kg	SOIL_DC(p)_75-35-4
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	SOIL	Deer mouse (Mammalian omnivore)	25	250	mg/kg	SOIL_DM(ip)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	SOIL	Gray fox (Mammalian top carnivore)	25000	250000	mg/kg	SOIL_RF(f)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	SOIL	Montane shrew (Mammalian insectivore)	24	240	mg/kg	SOIL_MS(i)_540-59-0
VOC	Dichloroethene[cis/trans-1,2-]	540-59-0	SOIL	Mountain cottontail (Mammalian herbivore)	64	640	mg/kg	SOIL_DC(p)_540-59-0
VOC	Diphenylamine	122-39-4	SOIL	American kestrel (Avian top carnivore)	3900	6500	mg/kg	SOIL_AK(f)_122-39-4
VOC	Diphenylamine	122-39-4	SOIL	American kestrel (insectivore / carnivore)	49	81	mg/kg	SOIL_AK(fi)_122-39-4
VOC	Diphenylamine	122-39-4	SOIL	American robin (Avian herbivore)	78	130	mg/kg	SOIL_AR(p)_122-39-4
VOC	Diphenylamine	122-39-4	SOIL	American robin (Avian insectivore)	10	16	mg/kg	SOIL_AR(i)_122-39-4
VOC	Diphenylamine	122-39-4	SOIL	American robin (Avian omnivore)	17	29	mg/kg	SOIL_AR(ip)_122-39-4
VOC	Hexachlorobenzene	118-74-1	SOIL	American kestrel (Avian top carnivore)	12	120	mg/kg	SOIL_AK(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	American kestrel (insectivore / carnivore)	0.37	3.7	mg/kg	SOIL_AK(fi)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	American robin (Avian herbivore)	83	830	mg/kg	SOIL_AR(p)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	American robin (Avian insectivore)	0.079	0.79	mg/kg	SOIL_AR(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	American robin (Avian omnivore)	0.15	1.5	mg/kg	SOIL_AR(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Deer mouse (Mammalian omnivore)	0.39	3.9	mg/kg	SOIL_DM(ip)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Earthworm (Soil-dwelling invertebrate)	10	100	mg/kg	SOIL_EW_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Generic plant (Terrestrial autotroph - producer)	10	100	mg/kg	SOIL_GP_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Gray fox (Mammalian top carnivore)	59	590	mg/kg	SOIL_RF(f)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Montane shrew (Mammalian insectivore)	0.2	2	mg/kg	SOIL_MS(i)_118-74-1
VOC	Hexachlorobenzene	118-74-1	SOIL	Mountain cottontail (Mammalian herbivore)	910	9100	mg/kg	SOIL_DC(p)_118-74-1
VOC	Hexanone[2-]	591-78-6	SOIL	American kestrel (Avian top carnivore)	290	2900	mg/kg	SOIL_AK(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	American kestrel (insectivore / carnivore)	1.7	17	mg/kg	SOIL_AK(fi)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	American robin (Avian herbivore)	0.47	4.7	mg/kg	SOIL_AR(p)_591-78-6

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
VOC	Hexanone[2-]	591-78-6	SOIL	American robin (Avian insectivore)	0.36	3.6	mg/kg	SOIL_AR(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	American robin (Avian omnivore)	0.41	4.1	mg/kg	SOIL_AR(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	Deer mouse (Mammalian omnivore)	6.1	23	mg/kg	SOIL_DM(ip)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	Gray fox (Mammalian top carnivore)	5900	22000	mg/kg	SOIL_RF(f)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	Montane shrew (Mammalian insectivore)	5.4	20	mg/kg	SOIL_MS(i)_591-78-6
VOC	Hexanone[2-]	591-78-6	SOIL	Mountain cottontail (Mammalian herbivore)	17	65	mg/kg	SOIL_DC(p)_591-78-6
VOC	Iodomethane	74-88-4	SOIL	American kestrel (Avian top carnivore)	46	92	mg/kg	SOIL_AK(f)_74-88-4
VOC	Iodomethane	74-88-4	SOIL	American kestrel (insectivore / carnivore)	0.29	0.59	mg/kg	SOIL_AK(fi)_74-88-4
VOC	Iodomethane	74-88-4	SOIL	American robin (Avian herbivore)	0.038	0.076	mg/kg	SOIL_AR(p)_74-88-4
VOC	Iodomethane	74-88-4	SOIL	American robin (Avian insectivore)	0.062	0.12	mg/kg	SOIL_AR(i)_74-88-4
VOC	Iodomethane	74-88-4	SOIL	American robin (Avian omnivore)	0.047	0.095	mg/kg	SOIL_AR(ip)_74-88-4
VOC	Methyl-2-pentanone[4-]	108-10-1	SOIL	Deer mouse (Mammalian omnivore)	9.7	97	mg/kg	SOIL_DM(ip)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	SOIL	Gray fox (Mammalian top carnivore)	18000	180000	mg/kg	SOIL_RF(f)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	SOIL	Montane shrew (Mammalian insectivore)	15	150	mg/kg	SOIL_MS(i)_108-10-1
VOC	Methyl-2-pentanone[4-]	108-10-1	SOIL	Mountain cottontail (Mammalian herbivore)	17	170	mg/kg	SOIL_DC(p)_108-10-1
VOC	Methylene Chloride	75-09-2	SOIL	Deer mouse (Mammalian omnivore)	2.6	22	mg/kg	SOIL_DM(ip)_75-09-2
VOC	Methylene Chloride	75-09-2	SOIL	Generic plant (Terrestrial autotroph - producer)	1600	16000	mg/kg	SOIL_GP_75-09-2
VOC	Methylene Chloride	75-09-2	SOIL	Gray fox (Mammalian top carnivore)	4300	36000	mg/kg	SOIL_RF(f)_75-09-2
VOC	Methylene Chloride	75-09-2	SOIL	Montane shrew (Mammalian insectivore)	9.2	79	mg/kg	SOIL_MS(i)_75-09-2
VOC	Methylene Chloride	75-09-2	SOIL	Mountain cottontail (Mammalian herbivore)	3.8	32	mg/kg	SOIL_DC(p)_75-09-2
VOC	Styrene	100-42-5	SOIL	Earthworm (Soil-dwelling invertebrate)	1.2	12	mg/kg	SOIL_EW_100-42-5
VOC	Styrene	100-42-5	SOIL	Generic plant (Terrestrial autotroph - producer)	3.2	32	mg/kg	SOIL_GP_100-42-5
VOC	Tetrachloroethene	127-18-4	SOIL	Deer mouse (Mammalian omnivore)	0.35	1.7	mg/kg	SOIL_DM(ip)_127-18-4
VOC	Tetrachloroethene	127-18-4	SOIL	Generic plant (Terrestrial autotroph - producer)	10	100	mg/kg	SOIL_GP_127-18-4
VOC	Tetrachloroethene	127-18-4	SOIL	Gray fox (Mammalian top carnivore)	120	630	mg/kg	SOIL_RF(f)_127-18-4
VOC	Tetrachloroethene	127-18-4	SOIL	Montane shrew (Mammalian insectivore)	0.18	0.94	mg/kg	SOIL_MS(i)_127-18-4
VOC	Tetrachloroethene	127-18-4	SOIL	Mountain cottontail (Mammalian herbivore)	9.5	47	mg/kg	SOIL_DC(p)_127-18-4
VOC	Isopropyltoluene[4-]	99-87-6	SOIL	Deer mouse (Mammalian omnivore)	25	250	mg/kg	Use toluene
VOC	Isopropyltoluene[4-]	99-87-6	SOIL	Generic plant (Terrestrial autotroph - producer)	200	2000	mg/kg	Use toluene
VOC	Isopropyltoluene[4-]	99-87-6	SOIL	Gray fox (Mammalian top carnivore)	12000	120000	mg/kg	Use toluene
VOC	Isopropyltoluene[4-]	99-87-6	SOIL	Montane shrew (Mammalian insectivore)	23	230	mg/kg	Use toluene
VOC	Isopropyltoluene[4-]	99-87-6	SOIL	Mountain cottontail (Mammalian herbivore)	66	660	mg/kg	Use toluene
VOC	Toluene	108-88-3	SOIL	Deer mouse (Mammalian omnivore)	25	250	mg/kg	SOIL_DM(ip)_108-88-3

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
VOC	Toluene	108-88-3	SOIL	Generic plant (Terrestrial autotroph - producer)	200	2000	mg/kg	SOIL_GP_108-88-3
VOC	Toluene	108-88-3	SOIL	Gray fox (Mammalian top carnivore)	12000	120000	mg/kg	SOIL_RF(f)_108-88-3
VOC	Toluene	108-88-3	SOIL	Montane shrew (Mammalian insectivore)	23	230	mg/kg	SOIL_MS(i)_108-88-3
VOC	Toluene	108-88-3	SOIL	Mountain cottontail (Mammalian herbivore)	66	660	mg/kg	SOIL_DC(p)_108-88-3
VOC	Trichlorobenzene[1,2,4-]	120-82-1	SOIL	Deer mouse (Mammalian omnivore)	0.51	5.1	mg/kg	SOIL_DM(ip)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	SOIL	Earthworm (Soil-dwelling invertebrate)	1.2	12	mg/kg	SOIL_EW_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	SOIL	Gray fox (Mammalian top carnivore)	110	1100	mg/kg	SOIL_RF(f)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	SOIL	Montane shrew (Mammalian insectivore)	0.27	2.7	mg/kg	SOIL_MS(i)_120-82-1
VOC	Trichlorobenzene[1,2,4-]	120-82-1	SOIL	Mountain cottontail (Mammalian herbivore)	12	120	mg/kg	SOIL_DC(p)_120-82-1
VOC	Trichloroethane[1,1,1-]	71-55-6	SOIL	Deer mouse (Mammalian omnivore)	400	4000	mg/kg	SOIL_DM(ip)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	SOIL	Gray fox (Mammalian top carnivore)	310000	3100000	mg/kg	SOIL_RF(f)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	SOIL	Montane shrew (Mammalian insectivore)	260	2600	mg/kg	SOIL_MS(i)_71-55-6
VOC	Trichloroethane[1,1,1-]	71-55-6	SOIL	Mountain cottontail (Mammalian herbivore)	2000	20000	mg/kg	SOIL_DC(p)_71-55-6
VOC	Trichloroethene	79-01-6	SOIL	Deer mouse (Mammalian omnivore)	54	540	mg/kg	SOIL_DM(ip)_79-01-6
VOC	Trichloroethene	79-01-6	SOIL	Gray fox (Mammalian top carnivore)	42000	420000	mg/kg	SOIL_RF(f)_79-01-6
VOC	Trichloroethene	79-01-6	SOIL	Montane shrew (Mammalian insectivore)	42	420	mg/kg	SOIL_MS(i)_79-01-6
VOC	Trichloroethene	79-01-6	SOIL	Mountain cottontail (Mammalian herbivore)	190	1900	mg/kg	SOIL_DC(p)_79-01-6
VOC	Trichlorofluoromethane	75-69-4	SOIL	Deer mouse (Mammalian omnivore)	97	650	mg/kg	SOIL_DM(ip)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	SOIL	Gray fox (Mammalian top carnivore)	62000	420000	mg/kg	SOIL_RF(f)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	SOIL	Montane shrew (Mammalian insectivore)	52	350	mg/kg	SOIL_MS(i)_75-69-4
VOC	Trichlorofluoromethane	75-69-4	SOIL	Mountain cottontail (Mammalian herbivore)	1800	12000	mg/kg	SOIL_DC(p)_75-69-4
VOC	Vinyl Chloride	75-01-4	SOIL	Deer mouse (Mammalian omnivore)	0.13	1.3	mg/kg	SOIL_DM(ip)_75-01-4
VOC	Vinyl Chloride	75-01-4	SOIL	Gray fox (Mammalian top carnivore)	110	1100	mg/kg	SOIL_RF(f)_75-01-4
VOC	Vinyl Chloride	75-01-4	SOIL	Montane shrew (Mammalian insectivore)	0.12	1.2	mg/kg	SOIL_MS(i)_75-01-4
VOC	Vinyl Chloride	75-01-4	SOIL	Mountain cottontail (Mammalian herbivore)	0.34	3.4	mg/kg	SOIL_DC(p)_75-01-4
VOC	Xylene (Total)	1330-20-7	SOIL	American kestrel (Avian top carnivore)	13000	130000	mg/kg	SOIL_AK(f)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	American kestrel (insectivore / carnivore)	190	1900	mg/kg	SOIL_AK(fi)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	American robin (Avian herbivore)	89	890	mg/kg	SOIL_AR(p)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	American robin (Avian insectivore)	41	410	mg/kg	SOIL_AR(i)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	American robin (Avian omnivore)	56	560	mg/kg	SOIL_AR(ip)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	Deer mouse (Mammalian omnivore)	1.9	2.4	mg/kg	SOIL_DM(ip)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	Generic plant (Terrestrial autotroph - producer)	100	1000	mg/kg	SOIL_GP_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	Gray fox (Mammalian top carnivore)	750	930	mg/kg	SOIL_RF(f)_1330-20-7
VOC	Xylene (Total)	1330-20-7	SOIL	Montane shrew (Mammalian insectivore)	1.4	1.8	mg/kg	SOIL_MS(i)_1330-20-7

Analyte Group	Analyte Name	Analyte Code	ESL Medium	ESL Receptor	No Effect ESL	Low Effect ESL	Units	Note
VOC	Xylene (Total)	1330-20-7	SOIL	Mountain cottontail (Mammalian herbivore)	7.6	9.5	mg/kg	SOIL_DC(p)_1330-20-7
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	American kestrel (Avian top carnivore)	13000	130000	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	American kestrel (insectivore / carnivore)	190	1900	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	American robin (Avian herbivore)	89	890	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	American robin (Avian insectivore)	41	410	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	American robin (Avian omnivore)	56	560	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	Deer mouse (Mammalian omnivore)	1.9	2.4	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	Generic plant (Terrestrial autotroph - producer)	100	1000	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	Gray fox (Mammalian top carnivore)	750	930	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	Montane shrew (Mammalian insectivore)	1.4	1.8	mg/kg	use Xylene tot
VOC	Xylene[1,3-]+Xylene[1,4-]	Xylene[m+p]	SOIL	Mountain cottontail (Mammalian herbivore)	7.6	9.5	mg/kg	use Xylene tot

Supplement 4-16

Revision 1: Seismic Location Standards Evaluation for Three Open Burning/Open Detonation Locations under Consideration for Permitting under the Resource Conservation and Recovery Act at Los Alamos National Laboratory: Technical Areas 16, 36, and 39

To: Oral Saulters, EPC-WMP
Luciana Vigil-Holterman, EPC-WMP
Patrick Padilla, EPC-WMP
From: Emily Schultz-Fellenz, EES-14
Anita Lavadie-Bulnes, EES-14
Elizabeth Miller, EES-14
Date: May 21, 2021

SEISMIC LOCATION STANDARDS EVALUATION FOR THREE OPEN BURNING / OPEN DETONATION LOCATIONS UNDER CONSIDERATION FOR PERMITTING UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT AT LOS ALAMOS NATIONAL LABORATORY: TECHNICAL AREAS 16, 36, AND 39

1 Introduction

To address the New Mexico Environment Department's comments to the Resource Conservation and Recovery Act (RCRA) permit renewal application, incorporating three long-standing open burning and open detonation units at the facility, this memorandum summarizes geologic investigations at and around three separate sites of the Los Alamos National Laboratory (LANL or "the Laboratory") in Los Alamos County, New Mexico. These sites include:

- an open burning treatment unit - the "Flash Pad" site at Technical Area (TA) 16 (TA-16-388);
- an open detonation unit - Minie Site at TA-36 (TA-36-8); and
- a second open detonation unit - Point 6 at TA-39 (TA-39-6).

Portions of new facilities where treatment of hazardous waste occur must adhere to seismic location standards as identified in the Code of Federal Regulations, Title 40 (40 CFR), Part 264.18. Part of these requirements include that such facilities will not be located within 200 ft (61 m) of a fault that has experienced displacement in the Holocene time period, i.e., within the last 11,700 years. The guidelines used to demonstrate compliance with the aforementioned location standard are presented in 40 CFR, Part 270.14(b)(11).

Context and details on the construction, relevant operational history, and intended use under RCRA permit guidelines can be found in the Permittees Permit Renewal Application, consisting of the *Los Alamos National Laboratory (LANL) General Part A Permit Application, Revision 10.0*; and Volumes 1 and 2 of the *Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit.*

In this memorandum, we address the three sites' adherence to the seismic location standard through presentation and summarization of published geologic data. We begin with a brief overview of the general geologic setting of the Laboratory, including a Pajarito Plateau-scale map of faults and lineaments to provide context for the geologic structural (faults) setting at each of the three sites. Next, we summarize pertinent regional-scale geologic studies and lineament mapping from the mid-1980s to the early 1990s; these studies provided important control on the known extent of possible faults in the TA-16, TA-36, and TA-39 areas. Then

we present regional- and local-scale geologic studies near each of the three sites from best available published studies for purposes of evaluating Holocene seismic surface rupture potential at the three sites. In the case of more recent geologic investigations at TA-16 in particular, these studies examined whether previously mapped lineaments were surface-rupturing faults or fractures. We also include geospatial analyses of aerial photography covering a 5-mile (8 km), 3000 ft (915 m), and 200 ft (61 m) radius of each facility and conclude with a brief summary of observations and geologic site characteristics.

1.1 Definitions

The following technical terms are used frequently throughout this document, and merit consistency in their definition and use. Definitions are taken from The Dictionary of Geological Terms (Bates and Jackson, eds., 1984).

Displacement: a general term for the relative movement of the two sides of a fault, measured in any chosen direction; also, the specific amount of such movement. Within this report, "displacement" and "offset" are interchangeable terms.

Holocene: an epoch or time interval of the Quaternary period, from the end of the Pleistocene, approximately 8 thousand years ago (ka) (*sic*; Ogg et al. (2008) have updated the beginning of the Holocene to 11.7 ka) to the present time.

Fracture: a crack, joint, fault, or other break in rocks.

Fault: a fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture.

Lineament: a linear topographic feature of regional extent that is believed to reflect crustal structure. Examples are fault lines, aligned volcanoes, and straight stream courses.

Note: the definition of "lineament" does not imply that such an identified feature is actually a surficial manifestation of crustal structure with recent tectonic activity (e.g., a fault) until the local geology is evaluated. Additionally, unless otherwise clarified through detailed field examination or other means, the definition of "fault" does not imply a tectonic mechanism for genesis and/or growth; the definition also does not imply that each "fault" is independently seismogenic. Features defined as faults through geologic mapping must be considered in the context of the surrounding geology before their mechanism of formation is determined.

2 General Geologic Setting of the Laboratory

The Pajarito Plateau is a high volcanic tableland in north-central New Mexico, bounded on its western edge by the Pajarito fault system (PFS). The PFS is a 30-mile-long (50-km-long) system of normal faults, including the down-to-the-east Pajarito fault (the master fault) and subsidiary down-to-the-west Rendija Canyon, Guaje Mountain, and Sawyer Canyon faults (Figure 1). This fault system is thought to form the local active western margin of the Rio Grande rift near Los Alamos. The Pajarito fault system is thought to have been active since approximately the middle Miocene epoch, or approximately 14 ka (Kelley, 1979; Lewis et al.,

2009). The Pajarito, Rendija Canyon, and Guaje Mountain faults of the PFS exhibit evidence of at least one earthquake (or probable movement) during the Holocene (Gardner et al., 1990; Wong et al. 1995; Kelson et al. 1996; McCalpin 1998, Wong et al., 2007; Lewis et al., 2009; Lettis Consultants International, 2019). It should be noted that data are lacking across the PFS that temporally correlates paleoearthquake activity across multiple segments (LCI, 2020).

The local bedrock at LANL is the Bandelier Tuff, which formed in two eruptive pulses from the Valles caldera, located approximately 4.67 miles (7.5 km) west of TA-16-388 at LANL. The older member of the Bandelier Tuff, the Otowi Member (Qbo), has been dated at 1.61 million years (Ma) (age from Izett and Obradovich 1994). The younger member of the Bandelier Tuff, the Tshirege Member (Qbt), has been dated at 1.256 Ma (age from Phillips et al. 2007) and is widely exposed as the mesa-forming unit around Los Alamos. Tephras and volcaniclastic sediments of the Cerro Toledo interval (Qct) separate the two members of the Bandelier Tuff. Several discrete subunits comprise the Tshirege Member of the Bandelier Tuff (Figure 2); these subunit contacts have been used by LANL geologists to confirm the presence or absence of faults in specific areas. Broxton and Reneau (1995) and Lewis et al. (2009) describe in detail the commonly accepted stratigraphic nomenclature of the Tshirege Member of the Bandelier Tuff. Since the Pajarito fault system has been active since approximately 14 ka, the Pajarito fault system predates the deposition of the Bandelier Tuff (Kelley, 1979; Lewis et al., 2009).

2.1 Geologic Setting of TA-16

TA-16 sits between Cañon de Valle and Water Canyons in the southwestern portion of LANL (Figure 1). The Qbt subunits exposed in the TA-16 area are predominantly Qbt3, Qbt3T, and Qbt4. Much of the mesa tops within TA-16 also include younger geomorphic units, such as older alluvium. Select areas of these mesa-top regions of TA-16 also preserve primary and reworked deposits of the El Cajete pumice, or Qec. Qec is the youngest known eruptive unit produced by the Valles-Toledo caldera complex , and its age has been most recently constrained at 74 ka (Zimmerer et al., 2016). Based on subsurface geologic analysis, the presence and position of these major canyons is thought to pre-date the deposition of the Bandelier Tuff (D. Broxton, unpublished data).

At the southwestern corner of the Laboratory, at the western side of TA-16 adjacent to West Jemez Road (NM State Road 501), the Pajarito fault and its subsidiary faults are prominent. TA-16 lies at the base of the main, 400-foot (122-m) high escarpment formed by the Pajarito fault. From the escarpment, faulting and related deformation extend at least 5000 ft (1,524 m) to the east. However, most of the structural deformation east of the main escarpment occurs within a zone that is about 2000 ft (610 m) wide. Much of the TA-16 region has been mapped at 1:1200 scale by LANL geologists (Gardner et al., 2001; Lewis et al., 2009).

The TA-16-388 site is adjacent to Material Disposal Area (MDA) P. This region, along with the TA-16-260 outfall area (a site not under consideration within this memorandum) have been geologically characterized in detail by a number of studies undertaken by the former LANL Environmental Restoration (ER) program (e.g., Broxton et al., 1996, 2002; Warren et al., 1997; LANL ER Project, 1998). These studies focused on constraining subsurface geologic parameters for the purpose of constructing a three-dimensional subsurface stratigraphic model in support of removal of waste items and clean-up

activities. These studies did not focus on identification of faults, their ages of activity, or surface rupture potential.

2.2 Geologic Setting of TA-36

TA-36 sits within Fence Canyon, between Potrillo Canyon to the north and Water Canyon to the south, in the south-central part of LANL (Figure 1). The site is situated near the Fence Canyon headwaters region. The local bedrock is the Bandelier Tuff, with primary exposures of units Qbt3 and Qbt2. This technical area is included within 1:24,000 scale geologic quadrangle mapping. This site is located 2.4 mi (3.8 km) E of the main Pajarito fault, and approximately 3.1 miles (5 km) SSE of the southernmost mapped extent of the antithetic Guaje Mountain fault (Figure 1).

2.3 Geologic Setting of TA-39

TA-39 sits within Ancho Canyon in the southeastern portion of LANL (Figure 1). The local bedrock is the Bandelier Tuff, with primary exposures of units Qbt1 and Qbt2. This technical area is included within 1:24,000 scale geologic quadrangle mapping. TA-39-6 is the easternmost site within LANL considered for possible RCRA permit, located 2.5 mi (4 km) east of the main Pajarito fault, and approximately 4.67 mi (7.5 km) SSW of the southernmost mapped extent of the antithetic Sawyer Canyon fault (Figure 1).

3 Regional-Scale Geologic Studies, mid-1980s to early 1990s

This section reviews pertinent regional-scale geologic studies and lineament mapping that have been conducted on the Pajarito Plateau in order to provide context for site-specific studies discussed later in this memorandum.

3.1 Geologic Quadrangle Mapping

Goff et al. (2001) completed geologic and structural mapping of the Frijoles quadrangle at 1:24,000 scale. The Frijoles quadrangle covers much of the LANL campus, except for the easternmost regions. Goff et al. (2001) identified no surficial geologic faults in the vicinity of TA-16-388 or TA-36-8. From the mapping at this scale, the geology of TA-16-388 includes Qbt, older Quaternary alluvium, and the El Cajete pumice. At TA-36-8, the site geology at the site includes Qbt and Quaternary alluvium.

Dethier (1997) completed geologic and structural mapping of the White Rock quadrangle at 1:24,000 scale. The White Rock quadrangle covers the easternmost portions of LANL. The map identifies approximately three small faults on the southern side of Ancho Canyon near its intersection with the Rio Grande Gorge at White Rock Canyon. However, it must be noted that due to edge effects between the quadrangle boundaries, portions of TA-39, including the specific TA-39-6 site, are not included on either the Frijoles or White Rock geologic quadrangle maps.

3.2 Lineament Mapping via Aerial Photographs

Early geologic studies, performed before the fine detail of the Bandelier Tuff subunits were well-understood and before any high-resolution geologic mapping was performed, noted prominent lineaments identified through aerial photographic analysis (Dransfield and Gardner, 1985; Vaniman and Wohletz 1990; Wong et al. 1995; Olig et al. 1996; Rogers et al. 1996). These aerial photographic

lineaments project through the central and eastern sectors of LANL. It is not clear whether these lineaments correlate with surface exposures or subsurface projections of the Rendija Canyon, Guaje Mountain, and Sawyer Canyon faults. Dransfield and Gardner (1985) hypothesizes that the lineaments could correlate to surficial manifestations of eroded fracture zones propagating upward from the subsurface trace of the faults. At the time of Dransfield and Gardner's publication, LANL had not yet undertaken a detailed surficial mapping campaign to verify the southern extent of surface traces of these antithetic components of the Pajarito fault system. It has also been hypothesized that these lineaments may be subsurface paleotopographic features related to either old faulting (cf. Lewis et al., 2002) or deposition of geologic units, e.g., the Cerros del Rio basalts in the eastern and central portions of LANL, that predate the deposition of Qbt and Qbo (cf. WoldeGabriel et al., 2001) and are unrelated to recent fault activity.

4 Regional- and Local-Scale Geologic Studies, early 1990s to present

Site-specific geologic studies provide important constraints on the location, size, distribution, and implications of known faults located proximal to TA-16, TA-36, and TA-39. However, the presence of high-hazard category facilities in select areas of LANL have resulted in detailed site-specific local geologic studies only within certain LANL technical areas. As such, detailed geologic investigations have taken place at TA-16 but geologic investigations focused specifically at TA-36 and TA-39 are minimal. This section summarizes key results from local geologic studies that are pertinent to these three sites. Given TA-16's proximal location to the main Pajarito fault, the following summaries focus on fault presence and rupture potential within this zone.

4.1 Kolbe et al. (1994): Evaluation of the Potential for Surface Faulting at the Proposed Mixed Waste Disposal Facility, TA-67

This study's detailed investigations at this site are the closest site-specific studies conducted to TA-36-8 (2.2 mi/3.6 km SSE from TA-67) and TA-39-6 (4.3 mi/6.9 km ESE from TA-67). This study excavated numerous trenches on Pajarito Mesa across the southern extent of the Rendija Canyon fault near TA-67. These trenches show evidence for several near vertical faults within a zone 100 ft (30 m) wide roughly coincident with an aerial photographic lineament along the strike of the easternmost trace of the southern Rendija Canyon fault; displacement is less than 2 ft (0.6 m) down-to-the-west and does not offset the most recent Valles caldera eruptive deposits (e.g. El Cajete pumice). Kolbe et al. (1994) concluded that active faulting on Pajarito Mesa near TA-67 has been absent for at least the last 50-60 ka.

4.2 Reneau et al. (1995): Surficial Materials and Structure at Pajarito Mesa

Similar to the study by Kolbe et al. (1994), the investigations of Reneau et al. (1995) at TA-67 are the closest site-specific studies conducted to TA-36-8 (2.2 mi/3.6 km SSE from TA-67) and TA-39-6 (4.3 mi/6.9 km ESE from TA-67). A proposed mixed waste disposal facility at Pajarito Mesa prompted geologic surface mapping, high-precision total station mapping, and exploratory trenching around TA-67. At the time of this study, it was postulated that young surface faulting associated with the Rendija Canyon fault might trend southward from the Los Alamos townsite, directly through TA-60, TA-48, and TA-64. Previous studies (including Dransfield and Gardner, 1985) had shown southern projections of the Rendija Canyon and Guaje Mountain faults through Pajarito Mesa. The geological mapping and trenching of

Reneau et al. (1995) showed that faulting had affected Pajarito Mesa in the past, but the faulting is more complicated than previously inferred by Dransfield and Gardner (1985). Both down-to-the-east and down-to-the-west faulting is seen at Pajarito Mesa. These small faults were identified through conventional geologic mapping and mesa-edge investigations. Their lateral continuity could not be constrained, so these small faults are identified on maps as point-locations of offset on Tshirege Member subunits (cf. Plate 1). A full paleoseismic history was not determined through the trenching investigations of this study, but it was determined that faults did not affect geologic units younger than 50-60 ka. No increase in fracture density across the projections of the Rendija Canyon or Guaje Mountain faults was seen, and a detailed geodetic survey of pyroclastic surge beds showed no displacement of the Bandelier Tuff subunits along the Rendija Canyon fault projection.

4.3 Self et al. (1996): Field excursions to the Jemez Mountains, New Mexico

The bulletin report of Self et al. (1996) compiles information from two separate but interrelated field guides of the Jemez Mountains into a single document. Information presented in Self et al. (1996) includes a field guide developed to support the 1989 International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), complete with stop locations and information on geologic observations and conditions at those locations. This road log included three specific stops along NM Highway 4 at and near Ancho Canyon, and adjacent to the public highway access to LANL's TA-39. These road logs indicate that in this area, Qbt thickens from a few meters to over 200 m thick over a lateral distance of less than 1 km, due to paleotopography. At the NM Highway 4 road cut south of the TA-39 access road, correlative with IAVCEI's Stop 21, the oldest Qbt subunit is exposed, which is expressed as a bedded, crystal-rich tuff occurring between welded and vapor-phase altered horizons. The road log neither notes nor describes any faults or related geologic structures at the Ancho Canyon locations.

4.4 Reneau and McDonald (1996): Landscape History and Processes on the Pajarito Plateau, Northern New Mexico

Reneau and McDonald (1996) developed a guidebook in support of a field trip organized by the Friends of the Pleistocene. This guidebook offers a broad summary of studies related to the recent geologic and geomorphic history of the Pajarito Plateau. Within the Day 1 road log, a number of stops describe details of the geology and geomorphology near Ancho Canyon and TA-39. The field guide notes that Ancho Canyon within TA-39 exposes both the Tshirege and Otowi Members of the Bandelier Tuff, and dacite-rich alluvial deposits exist between those units in some canyon wall exposures. Similar to that reported by Self et al. (1996), Reneau and McDonald (1996) describe in additional detail the paleodrainage systems preserved in outcrop, as well as the classic roadcut exposure of Qbo, a thin colluvial soil, the Tsankawi Pumice, and the nonwelded Tshirege Member subunit Qbt1-g. Within Qbt1-g at this location are distinct zeolitized zones, thought to have formed due to hydrolysis of the vitric ash in a saturated environment shortly after deposition. The zeolitization expressed at this particular roadcut is not isolated to this location, but is thought to be prevalent across the Pajarito Plateau. The road log neither notes nor describes any faults or related geologic structures at the Ancho Canyon locations; other portions of the road log and field guidebook include extensive discussions on faults in other locations.

4.5 Gardner et al. (2001): Geology of the Pajarito fault zone in the vicinity of S-Site (TA-16), Los Alamos National Laboratory, Rio Grande rift, New Mexico

Gardner et al. (2001) gathered structural geologic data for the TA-16 region of LANL using high-precision geologic mapping, conventional geologic mapping, stratigraphic studies, drilling, and petrologic studies. This study found that in the TA-16 region, the Pajarito fault is comprised of four clearly definable sets of structures: north trending faults and one large monocline marking the main zone of deformation of the Pajarito fault system, and defining a graben in the southwestern corner of the technical area; north-northeast trending faults and fissures which bound the eastern side of the graben; northeast trending structures, dominated by two down-to-the-west monoclines; and an east-southeast trending fault. These structural elements are similar to those identified and mapped farther north along the Pajarito fault system by Gardner et al. (1999). In addition, the study recognized similar variable styles of deformation on structures as reported by Gardner et al. (1999), and as such, Gardner et al. (2001) interpreted all structures in the study area to be related to deeper seated normal faulting. In general, the structural setting of TA-16 appears similar in many respects to the setting of TA-3 to the north (Gardner et al., 1999). At both locations a relatively narrow graben, about 1000 feet wide, lies at the base of and parallel to the main escarpment of the Pajarito fault. Structure to the east of the narrow graben is dominated by north-northeast and northeast trending normal faults and monoclines, all of which show significant net down-to-the-west displacements on Bandelier Tuff. To the west of TA-16, the main Pajarito fault exhibits evidence for approximately 400 ft (122 m) of displacement in the last 1.256 million years.

4.6 Lewis et al. (2002), Geology of the Western Part of Los Alamos National Laboratory (TA-3 to TA-16), Rio Grande Rift, New Mexico

Lewis et al. (2002) collected data to improve the understanding of the geology, stratigraphy, geomorphology, and geologic structure of LANL from TA-3 to TA-16 using similar methods to those employed by Gardner et al. (2001), including high-precision geologic mapping, conventional geologic mapping, stratigraphic studies, drilling, and petrologic studies. This study also included logging of a gas pipeline trench at TA-9, on the north side of Canon del Valle from TA-16-388. This study produced a detailed geologic and structural map of the TA-3 to TA-16 area, and found that in northern TA-16, faulting is present but distributed, and includes short-length, small-displacement subparallel segments oriented predominantly north-south.

4.7 Lewis et al. (2009), Fault interaction and along-strike variation in throw in the Pajarito fault system, Rio Grande rift, New Mexico

This study aggregated, synthesized, and published in a peer-reviewed journal the detailed geologic mapping performed by Gardner et al. (1999, 2001), Lewis et al. (2002), and others. Furthermore, the study analyzed the variation in fault displacement, or throw, at different locations along the fault's length from its southern termination near Cochiti to its northern boundary near Santa Clara Canyon, in order to assess the interaction of the Pajarito fault system with neighboring fault systems within the Rio Grande rift. The paper also presented previously unpublished analyses on past earthquake timing and recurrence on the Pajarito fault system.

4.8 Lettis Consultants International, Inc. (2019), Pajarito Fault System Paleoseismic Trenching Project: Phase 1 Report, Los Alamos, New Mexico

Under subcontract to LANL, Lettis Consultants International Inc. conducted a paleoseismic trenching project that involved detailed geologic and geomorphic mapping for trench siting, trench excavation and logging, and detailed post-fielding analysis including samples to establish ages of paleoseismic events identified in the trenches. The report includes discussion on two trenches excavated in the extreme western portions of TA-16, approximately 8,200 ft (2.5 km) SSW of TA-16-388, on an antithetic down-to-the-west fault facing the main Pajarito fault. Both trenches at the TA-16 site contained evidence for a single Holocene paleoearthquake at this site, but the timing of this most recent event (MRE) at this site is poorly constrained using optically-stimulated luminescence age dating techniques on quartz grains taken from within and above the fault plane. The stratigraphic and relative age data developed within the two trenches at the TA-16 site suggest the MRE occurred less than 5.7 ka, and involved approximately 5.9 - 7.9 in (15-20 cm) of dip displacement across the fault at this location. The study also includes discussion of scientific analyses and assessments from four additional trenches in two separate sites west of West Jemez Road/NM Highway 501. In contrast to the conclusions of Lewis et al. (2009), the work of Lettis Consultants International Inc. concludes that paleoseismic analyses from modern trenches on multiple strands of the main Pajarito fault shows evidence for only one Holocene earthquake.

4.9 Microseismic Monitoring and Analyses

The Los Alamos Seismic Network (LASN), owned and operated by Los Alamos National Laboratory's Seismic Hazards Program, maintains 14 seismic stations in and around Los Alamos County (Figure 3). The most recent update to the LASN catalogue includes events recorded through 2013 (ref?). All earthquakes identified in the LANL area via the LASN have magnitudes of 3 or less, and most appear to cluster in two zones: (1) the northern part of the Pajarito fault system, where the fault becomes broadly distributed into a "horsetail" splay of small-displacement subparallel segments, and (2) east of Los Alamos through the Rio Grande Basin, possibly associated with the Rio Grande rift. No earthquake epicenters are mapped within 3000 ft (914 m) of any of the three locations considered for permit within this memorandum. The closest earthquake epicenter to any of the three sites is located approximately 8,200 ft (1.6 mi; 2.5 km) WSW of TA-39-6. This event, recorded on 29 July 2013, was a M 0.2 at 7.1 mi (11.4 km) depth, and is not correlated to a mapped geologic fault.

5 Local Geologic and Faulting Conditions at TA-16, TA-36, and TA-39

This section describes a series of figures [plates] focused around each of the three facilities under consideration. These figures [plates] include the facility intended for permitting, mapped surface faults, and various distance buffers around the facility per 40 CFR 270.14(b)(11)(A)(2). Facility-specific discussions on the information shown in these figures are included below.

Plate 1 shows the three sites proposed for permit with 5-mile (8 km) buffers plus mapped surficial faults (Lewis et al. 2009). The surficial faults shown on Plate 1, published by Lewis et al. (2009), represent the most recent and detailed state of knowledge of the surficial expression of the Pajarito fault system near LANL. Mapping of the Pajarito fault system was done at 1:1,200 scale by personnel with a detailed knowledge of structural geology and Bandelier Tuff Tshirege Member subunits, and represents a culmination of many years of research, verification, and updating by the LANL Seismic Hazards Geology Team. Large portions of the Pajarito fault system fall within five miles of TA-16-388 and TA-36-8, according to the buffers

shown on Plate 1. Fewer faults fall within the five-mile buffer surrounding TA-39-6. Lineaments identified by Vaniman and Wohletz (1990) and Wong et al. (1995) fall within 3000 ft (914 m) of each site (Plates 2, 3, and 4).

5.1 Local Geologic and Faulting Conditions at TA-16-388

Plate 2 presents TA-16-388 with a 3000 ft (914 m) and 200 ft (61 m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Gardner et al., 2001; Lewis et al., 2002; Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets on geologic contacts. The data are shown atop both orthoimagery and digital elevation model base data. Numerous faults, a mapped lineament, and point-location offsets fall within the 3000 ft (914 m) buffer; no lineaments, faults, or offsets are mapped within the 200 ft (61 m) buffer. The local geology consists of the uppermost subunits of Qbt and old alluvium (Qoal), as well as regions of colluvium (Qc) and disturbed lands..

The faults mapped by Lewis et al. (2002) that fall within the 3,000 ft buffer have varying displacement directions, with some faults expressing down-to-the-west motion while others express down-to-the-east motion. Maximum displacement of any fault within the 3,000-ft buffer is 5 ft (1.5 m). The 3,000-ft buffer region also includes an observed synclinal hinge, a small U-shaped fold or geostructural low with linear continuity that rocks on either side dip toward.

Identified point-location offsets on Bandelier Tuff Tshirege Member subunits from Lewis et al. (2002) fall within the 3,000 ft buffer. These identified offsets were measured using the high-precision geologic contact mapping methods described in that study, and are shown as point-locations because those particular faults were found to have trace lengths of 16 ft (5 m) or less, and lacked stratigraphic observations to estimate displacement and lateral continuity. The faults have various senses of displacement (both down-to-the-east and down -to-the-west), but the majority of faults within the 3,000-ft buffer have down-to-the-west displacement. The greatest amount of displacement (in any sense) within the 3,000-ft buffer is 3 ft. This map shows no mapped faults within the 200-ft buffer.

5.2 Local Geologic and Faulting Conditions at TA-36-8

Plate 3 presents TA-36-8 with a 3000-ft (914-m) and 200-ft (61-m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets of geologic contacts. Three mapped lineaments fall within the 3000 ft (914 m) buffer; these lineaments trend primarily NNW-SSE and are located to the north and east of TA-36-8. No lineaments, faults, or offsets are identified or mapped within the 200 ft (61 m) buffer. This technical area has not been mapped in detail by LANL geologists.

5.3 Local Geologic and Faulting Conditions at TA-39-6

Plate 4 presents TA-39-6 with a 3000-ft (914-m) and 200-ft (61-m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets of geologic contacts. Only a single mapped lineament falls within the 3000 ft (914 m) buffer; this

lineament is west of TA-39-6 and oriented predominantly N-S. No lineaments, faults, or offsets are mapped within the 200 ft (61 m) buffer. This technical area has not been mapped in detail by LANL geologists.

5.4 Summary

Based on the available data presented here, small faults are present within 3,000 ft of TA-16-388 (Plate 2). The fault segments within this 3,000 ft buffer have short along-strike lengths, and as such they empirically are not independently seismogenic (*cf*. Wells and Coppersmith, 1994). No earthquake epicenters have been identified on those fault segments (Figure 3). The detailed geologic mapping data from Lewis et al. (2002; 2009) suggests that the undisturbed geologic materials present at the TA-16-388 site are much older than the Holocene time period, and as such the determination of Holocene fault activity on the fault strands within the 3,000 ft buffer would be difficult to impossible to achieve through further field investigations.

It does not appear that faults, or lineations that suggest the presence of a fault, are present within 3,000 feet of TA-36-8 and TA-39-6.

We emphasize that for determining the presence of Holocene faults, conventional field geologic mapping must be employed or consulted to confirm (1) that a lineament is truly a fault, and (2) that it has recent tectonic movement. This validation of regionally-mapped or remotely-observed lineaments in finer scale mapping products is, writ large, the objective of field-based fault investigations, and is underscored locally by Olig et al. (1998) when discussing lineament mapping done by Wong et al. (1995): "The lineaments were identified on aerial photographs or observed during an aerial reconnaissance and field-checked at a reconnaissance level. However, this generalized map [by Wong et al, 1995] …should be considered preliminary in nature until a more comprehensive and detailed surficial mapping of LANL is completed." Therefore, the comprehensive geologic observations of Reneau and McDonald (1996), Self et al. (1996), and the detailed geologic mapping of Gardner et al. (2001), Lewis et al. (2002), and Lewis et al. (2009) clarify the geologic and faulting conditions of the area.

6 Field Reconnaissance at TA-16, TA-36, and TA-39

As of the production of this technical memorandum, no site-specific geologic field-based reconnaissance has been performed at TA-16-388, TA-36-8, or TA-39-6, due to staff availability and COVID fieldwork limitations. It is understood that reporting on field reconnaissance for sites to be permitted may be required to clarify the published geologic data, aerial reconnaissance, and aerial photographic analysis (per 40 CFR 270.14(b)(11)(A)(2)) presented earlier in this memorandum. It is expected that future easing of COVID restrictions will allow these field reconnaissance activities to take place at a later time if required, with a summary to be provided following that activity.

The reconnaissance at these sites will consist of a traverse around the site perimeter and specifically along any identified faults or lineaments, in order to observe geologic features in the area. The reconnaissance will look for surficial disturbances or modifications that may have removed or otherwise altered any geologic units younger than the Bandelier Tuff. Pristine preservation of young geologic deposits are required to directly assess whether faults have Holocene-age activity. At LANL, such young geologic materials that could

preserve evidence of Holocene fault activity, in sufficient quantities to be observed along faults, are extremely sparse and rarely preserved.

7 Discussion

Geologic investigations show the greatest amount of faults and geologic complexity is present near TA-16-388. Several small (both in length and total displacement) fault segments and lineaments are identified within the 3000 ft (914 m) buffer around TA-16-388 (Gardner et al., 2001; Lewis et al., 2002; Lewis et al., 2009), which represents distributed deformation within the hanging-wall east of the main Pajarito fault. Overall displacement across all structures within 3000 ft of TA-16-388 is approximately a net of zero; the region includes both down-to-the-west and down-to-the-east faults of nearly identical displacement, with a maximum of 5 ft (1.5 m) offset on single segments. Displacements mapped as discrete point-locations are present within 3,000 ft of TA-16-388; these are represented as such because they cannot be traced through the stratigraphic section, they cannot be traced laterally across mesa-tops through conventional geologic mapping, and are not found to displace geologic units younger than the Bandelier Tuff. The closest mapped lineament (from Vaniman and Wohletz, 1990) is located northwest of TA-16-388 within the 3000 ft buffer, and projects southwest, away from the facility. No faults or offsets have been mapped within the 200 ft buffer. Most post-Bandelier Tuff sediments have been stripped from the mesa-top within the technical area. The absence of undisturbed post-Bandelier Tuff sediments makes it difficult to assess Holocene surface rupture at this location.

While neither TA-36-8 nor TA-39-6 have mapped faults within 3000 ft of those locations, the sites have not been mapped at the same level of detail as TA-16, but other nearby geologic investigations provide descriptions of the geologic settings that can apply to those locations (e.g., . While TA-39-6 falls in a gap area not covered by larger-scale geologic quadrangle mapping, published geological field trip guidebooks and road logs (Self et al., 1996; Reneau and McDonald, 1996) describe the geology of Ancho Canyon, including within TA-39. The detailed geologic information from these road logs and trip stops in the Ancho Canyon region neither mention nor note the presence of faults or geologic structure in the vicinity of TA-39.
Both sites have mapped lineaments that project within 3000 ft of the facility, but no geologic faults or lineaments are present within 200 ft of the facilities. The positions of TA-36 and TA-39 several miles east of the Pajarito fault system significantly reduces the likelihood that faults with Holocene seismic surface rupture are present at either of those two locations.

8 Conclusions

Geologic structures, including segments of the Pajarito fault, have been identified near TA-16-388 by previous geologic studies of the LANL site. Within the 3000 ft (914 m) buffer and northwest of the facility, the Pajarito fault segments exhibit evidence of approximately 3-5 ft (1 - 1.5 m) of variable down-to-the-east and down-to-the-west displacement; however, total net displacement of the faults in this area is approximately zero, as the sum of the down-to-the-east and down-to-the-west displacement is nearly equal. A small synclinal axis is present northwest of TA-16-388 and south of Cañon del Valle. Surrounding the TA-16-388 facility and within the 3000 ft (914 m) buffer, subunit offsets of less than 5 ft (1.5 m) were measured by Lewis et al. (2002). The detailed geologic mapping of Lewis et al. (2002) suggests that the geologic materials near TA-16-388 are old, and would not contain the types of materials necessary to determine Holocene activity on the fault segments within some of the most recent paleoseismic analyses of the Pajarito fault

system have occurred in other portions of TA-16. In far western TA-16, near NM Highway 501, paleoseismic trenching analyses suggest that a single Holocene paleoearthquake has occurred on at least one segment of the Pajarito fault. However, these paleoseismically-investigated faults fall outside of the 3,000 ft buffer region for TA-16-388.

No mapped faults are identified near TA-36-8 or TA-39-6. Previous geologic studies as well as aerial reconnaissance and aerial photographic analysis do not suggest the presence of faults in these areas. Detailed-scale geologic investigations and field reconnaissance have not yet been performed at these sites.

9 Figure and Plate Captions

Figure 1. Overview of the Pajarito fault system in the vicinity of LANL (gray outline). Technical Areas (TA) 16, 36, and 39 are highlighted. The locations of the TA-16-388, TA-36-8, and TA-39-6 sites proposed for permitting are shown as red polygons. PF = Pajarito fault; RCF = Rendija Canyon fault; GMF = Guaje Mountain fault; SCF = Sawyer Canyon fault. Mapped geologic structures (faults; bold purple lines) from Lewis et al. (2009).

Figure 2. Generalized, schematic cross section of the Bandelier Tuff (modified from Broxton and Reneau, 1995).

Figure 3. Overview of the Los Alamos Seismic Network (green triangles) and local earthquakes (1973-2013) relative to the three locations considered for permit within this memorandum. The vicinity of Los Alamos National Laboratory is represented by the gray outline. TA-16-388, TA-36-8, and TA-39-6 are highlighted. PF = Pajarito fault; RCF = Rendija Canyon fault; GMF = Guaje Mountain fault; SCF = Sawyer Canyon fault. Structural mapping (bold purple lines) from Lewis et al. (2009).

Plate 1. Color orthophotography, mapped fault, and mapped lineaments within a 5-mile (8 km) and 3000 ft (914 m) buffer of the three facilities. Structural mapping (purple lines) from Lewis et al. (2009). Mapped lineaments from Vaniman and Wohletz (1990; pink lines) and Wong et al. (1995; blue lines). While TA-36 and TA-39 are east of the main trace of the Pajarito fault system, TA-16 falls within the hanging-wall (downthrown block) of the main Pajarito fault. See text for further discussion.

Plate 2. Mapped faults and lineaments in the area surrounding TA-16-388 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines) include those mapped by Gardner et al. (2001) and Lewis et al. (2002). Lineaments from Vaniman and Wohletz (1990; blue lines). Five faults and one lineament fall inside or project into the 3000 ft (914 m) buffer around TA-16-388. None project within 200 ft (61 m) of the facility. Nine point-location offsets are identified within the 3000 ft (914 m) buffer and were mapped by high-precision geodetic studies (Lewis et al., 2002). While a small fault segment is co-located with the southern termination of the single mapped lineament, no offset locations fall along mapped lineaments. See text for further discussion.

Plate 3. Mapped faults and lineaments in the area surrounding TA-36-8 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines); lineaments from Wong et al. (1995; blue lines). Three lineaments fall inside or project into the 3000 ft (914 m) buffer around TA-36-8. None project within 200 ft (61 m) of the facility. No mapped faults or point-location offsets are identified within the 3000 ft (914 m) buffer. See text for further discussion.

Plate 4. Mapped faults and lineaments in the area surrounding TA-39-6 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines); lineaments from Wong et al. (1995; blue lines). One lineament falls inside the 3000 ft

(914 m) buffer around TA-39-6. None project within 200 ft (61 m) of the facility. No mapped faults or point-location offsets are identified within the 3000 ft (914 m) buffer. See text for further discussion.

10 References

Bates, RL and JA Jackson, eds., 1984, *Dictionary of Geological Terms*; American Geological Institute, 571 pp.

Broxton, DE and SL Reneau, 1995, Stratigraphic nomenclature of the Bandelier Tuff for the Environmental Restoration Project at Los Alamos National Laboratory; Los Alamos National Laboratory report LA-13010-MS, 21 pp.

Broxton, DE, Ryti, RT, Carlson, D, Warren, RG, Kluk, E, and Chipera, S, 1996, Natural background geochemistry of the Bandelier Tuff at MDA P, Los Alamos National Laboratory; Los Alamos National Laboratory report LA-UR-96-1151, 42 pp.

Broxton, D, Warren, R, Longmire, P, Gilkeson, R, Johnson, S, Rogers, D, Stone, W, Newman, B, Everett, M, Vaniman, D, McLin, S, Skalski, J, and Larssen, D, 2002, Characterization Well R-25 completion report, Los Alamos National Laboratory report LA-13909-MS, 77 pp. with 8 appendices.

Dethier, DP, 1997, Geology of White Rock quadrangle, Los Alamos and Santa Fe counties, New Mexico; New Mexico Bureau of Mines and Mineral Resources, Geologic Map 73, scale 1:24,000.

Dransfield, BJ, and JN Gardner, 1985, Subsurface geology of the Pajarito Plateau, Española Basin, New Mexico; Los Alamos National Laboratory report LA-10455-MS, 15 pp.

Gardner, JN, Baldridge, WS, Gribble, R, Manley, K, Tanaka, K, Geissman, JW, Gonzalez, M, and Baron, G, 1990, Results from Seismic Hazards Trench #1 (SHT-1), Los Alamos Seismic Hazards Investigations; Los Alamos National Laboratory unpublished report EES1-SH90-19, 57 pp.

Gardner, JN, Lavine, A, Vaniman, D, and WoldeGabriel, G, 1998, High-precision geologic mapping to evaluate the potential for seismic surface rupture at TA-55, Los Alamos National Laboratory; Los Alamos National Laboratory report LA-13456-MS, 13 pp.

Gardner, JN, Lavine, A, WoldeGabriel, G, Krier, D, Vaniman, D, Caporuscio, FA, Lewis, CJ, Reneau, SL, Kluk, E, and Snow, MJ, 1999, Structural geology of the northwestern portion of Los Alamos National Laboratory, Rio Grande rift, New Mexico: Implications for seismic surface rupture potential from TA-3 to TA-55; Los Alamos National Laboratory report LA-13589-MS, 112 pp.

Gardner, JN, Reneau SL, Lewis CJ, Lavine A, Krier D, WoldeGabriel G, and Guthrie, G, 2001, Geology of the Pajarito fault zone in the vicinity of S-Site (TA-16), LosAlamos National Laboratory, Rio Grande rift,New Mexico. Los Alamos National Laboratory report LA-13831-MS, 86 pp.

Goff, F, Gardner, JN, and Reneau, SL, 2001, Geologic map and structure of the Frijoles Quadrangle, Los Alamos and Sandoval Counties, New Mexico; New Mexico Bureau of Geology and Mineral Resources, Geologic Open-File Map OF-GM 42, scale 1:24,000.

Izett, GA, and Obradovich, JD, 1994, $^{40}Ar/^{39}Ar$ age constraints for the Jaramillo normal subchron and the Matuyama-Brunhes geomagnetic boundary; *J Geophys Res* **99** (B2), pp. 2925-2934.

Kelley, VC, 1979, Tectonics, middle Rio Grande rift, New Mexico; in Riecker, RE, ed., Rio Grande rift: Tectonics and Magmatism, Washington, D.C., American Geophysical Union, p. 57-70.

Kelson, KI, Hemphill-Haley, MA, Olig, SS, Simpson, GD, Gardner, JN, Reneau, SL, Kolbe, TR, Forman, SL, and Wong, IG, 1996, Late-Pleistocene and possibly Holocene displacement along the Rendija Canyon fault, Los Alamos County, New Mexico; New Mexico Geological Society Guidebook 47, 153–160.

Kolbe, T, Sawyer, J, Gorton, A, Olig, S, Simpson, D, Fenton, C, Reneau, SL, Carney, J, Bott, J, and Wong, IG, 1994, Evaluation of the potential for surface faulting at the proposed Mixed Waste Disposal Facility, TA-67; unpublished consulting report prepared for the Los Alamos National Laboratory by Woodward-Clyde Federal Services, Oakland, California.

LANL ER Project (Los Alamos National Laboratory Environmental Restoration Project), 1998, RFI Report for Potential Release Site 16-021(c), Los Alamos National Laboratory report LA-UR-98-4101, 3 volumes.

LANL, 2020a, Los Alamos National Laboratory General Part A Permit Application, Revision 10.0, June 2020, LA-UR-19-32403.

LANL, 2020b, Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit, June 2020, LA-UR-20-24479, 2 volumes.

Lavine, A, Lewis, CJ, Katcher, DK, and Wilson, J, 2003, Geology of the north-central to northeastern portion of Los Alamos National Laboratory, New Mexico; Los Alamos National Laboratory report LA-14043-MS, 44 pp.

Lettis Consultants International, Inc., 2019, Pajarito Fault System Paleoseismic Trenching Project: Phase 1 Report, Los Alamos, NM, unpublished consulting report prepared for Los Alamos National Laboratory, Walnut Creek, CA, 230 p.

Lewis, CJ, Lavine, A, Reneau, SL, Gardner, JN, Channell, R, and Criswell, CW, 2002, Geology of the western part of Los Alamos National Laboratory (TA-3 to TA-16), Rio Grande rift, New Mexico; Los Alamos National Laboratory report LA-13960-MS, 98 pp.

Lewis, CJ, Gardner, JN, Schultz-Fellenz, ES, Lavine, A, Olig, SS, and Reneau, SL, 2009, Along-strike variation in throw and fault interaction in the Pajarito fault system, north-central New Mexico; *Geosphere* **5**, pp. 252-269.

McCalpin, J.P, 1998, Late Quaternary faulting on the Pajarito fault, west of Los Alamos National Laboratory, north-central New Mexico: Results from the seven-trench transect excavated in summer of 1997; unpublished consulting report prepared for Los Alamos National Laboratory by GEO-HAZ Consulting Inc., Estes Park, Colorado.

Meyer, L, 2007, L Meyer to D Winchell, personal communication (letter), August 1, 2007.

Olig, SS, Youngs, R, Wong, I.G 1998, Probabilistic seismic hazard analyses for surface fault displacement at TA-3, Los Alamos National Laboratory; unpublished consulting report prepared for Los Alamos National Laboratory by Woodward-Clyde Federal Services, Oakland, California.

Ogg, JG, Ogg, G, and Grandstein, FM, eds., 2008, *The Concise Geologic Time Scale*; Cambridge University Press, 184 pp.

Phillips, EH, Goff, F, Kyle, PR, McIntosh, WC, Dunbar, NW, and Gardner, JN, 2007, The $^{40}Ar/^{39}Ar$ age constraints on the duration of resurgence at the Valles caldera, New Mexico; *J Geophys Res* **112** (B09201), DOI: 10.1029/2006JB004511.

Reneau, SL, Kolbe, TR, Simpson, DT, Carney, JS, Gardner, JN, Olig, SS, and Vaniman, DT, 1995, Surficial materials and structure at Pajarito Mesa; in *Geological Site Characterization for the proposed Mixed Waste Disposal Facility, Los Alamos National Laboratory*, SL Reneau and R Raymond, eds.; Los Alamos National Laboratory report LA-13089-MS, 31-69.

Reneau SL, and McDonald EV, 1996, Landscape history and processes on the Pajarito Plateau, Northern New Mexico: Rocky Mountain Cell, Friends of the Pleistocene Field Trip Guidebook, 12-15 September, 179 pp.

Rogers, MA, Budding, K, and Christie, C, 1996, Distinguishing tectonic joints from cooling joints in the Bandelier Tuff (Pleistocene), Pajarito Plateau, Los Alamos County, New Mexico; *New Mexico Geological Society Guidebook,* **47,** pp. 293-302.

Self, S, Heiken, G, Sykes, ML, Wohletz K, Fisher RV, and Dethier DP, 1996, Field excursions to the Jemez Mountains, New Mexico: *New Mexico Bureau of Mines and Mineral Resources Bulletin* **134**, 72 pp.

Vaniman, D and Wohletz, K, 1990, Results of geological mapping/fracture studies, TA-55 area: Los Alamos; Los Alamos National Laboratory Seismic Hazards Memo EES1-SH-90-17, 25 p.

Warren, RG, McDonald, EV, and Ryti, RT, 1997, Baseline geochemistry of soil and bedrock Tshirege Member of the Bandelier Tuff, Los Alamos National Laboratory report LA-13330-MS, 69 pp.

Wells DL and KJ Coppersmith, 1994, New empirical relationships among magnitude, rupture length, rupture width, rupture area, and surface displacement, *Bulletin of the Seismological Society of America* **84** (4), p. 974-1002.

Wohletz, K, 1995, Measurement and analysis of rock fractures in the Tshirege Member of the Bandelier Tuff along Los Alamos Canyon adjacent to TA-21; in *Earth Science Investigations for Environmental Restoration—Los Alamos National Laboratory Technical Area 21*, DE Broxton and PG Eller, eds.; Los Alamos National Laboratory report LA-12934-MS, 19-31.

WoldeGabriel, G, Warren, RG, Broxton, DE, Vaniman, DT, Heizler, MT, Kluk, EC, and Peters, L, 2001, Episodic volcanism, petrology, and lithostratigraphy of the Pajarito Plateau and adjacent areas of the Española Basin and the Jemez Mountains, *New Mexico Museum of Natural History and Science Bulletin* **18**, p. 97–129.

Wong, IG, Kelson, K, Olig, SS, Kolbe, T, Hemphill-Haley, M, Bott, J, Green, R, Kanakari, H, Sawyer, J, Silva, W, Stark, C, Haraden, C, Fenton, C, Unruh, J, Gardner, JN, Reneau, SL, and House, L, 1995, Seismic hazards evaluation of the Los Alamos National Laboratory; unpublished consulting report prepared for Los Alamos National Laboratory by Woodward-Clyde Federal Services, Oakland, California.

Wong, IG, Silva, W, Olig, SS, Dober, M, Gregor, N, Gardner, JN, Lewis, CJ, Terra, F, Zachariasen, J, Stokoe, K, Thomas, P, and Upadhyaya, S, 2007, Update of the probabilistic seismic hazard analysis and development of seismic design ground motions at the Los Alamos National Laboratory, unpublished consulting report prepared for Los Alamos National Laboratory by URS Corporation's Seismic Hazards Group, Oakland, California.

Zimmerer, MJ, Lafferty J, and Coble MA, 2016, The eruptive and magmatic history of the youngest pulse of volcanism at the Valles caldera: Implications for successfully dating late Quaternary eruptions; *Journal of Volcanology and Geothermal Research* **310**, p. 50-57.

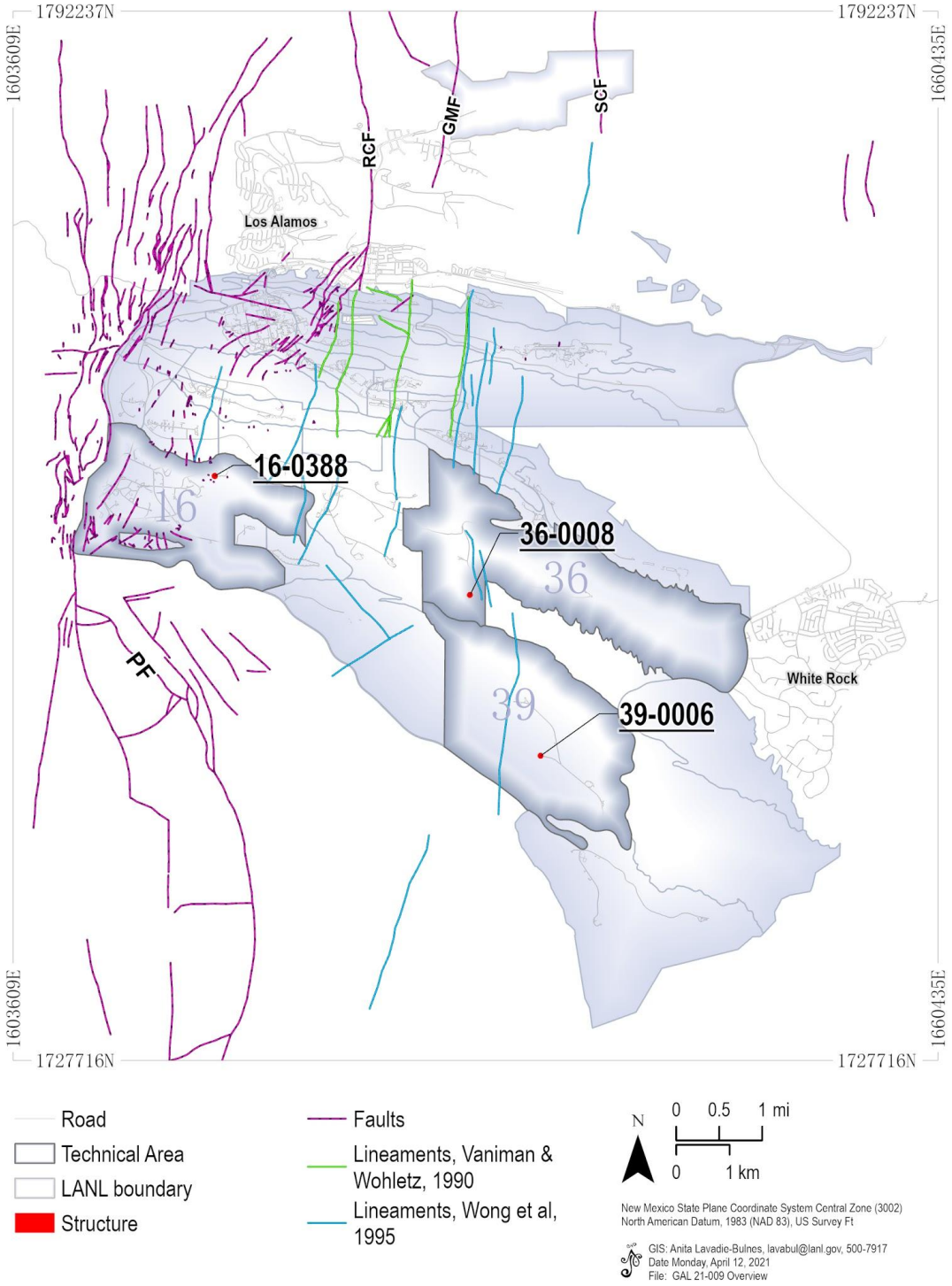

1792237N
1792237N
1603609E
1660435E
RCF
GMF
SCF
Los Alamos
16-0388
16
36-0008
36
PF
39
39-0006
White Rock
1603609E
1660435E
1727716N
1727716N
Road
Technical Area
LANL boundary
Structure
Faults
Lineaments, Vaniman & Wohletz, 1990
Lineaments, Wong et al, 1995
N
0 0.5 1 mi
0 1 km
New Mexico State Plane Coordinate System Central Zone (3002)
North American Datum, 1983 (NAD 83), US Survey Ft
GIS: Anita Lavadie-Bulnes, lavabul@lanl.gov, 500-7917
Date Monday, April 12, 2021
File: GAL 21-009 Overview

Figure 1.

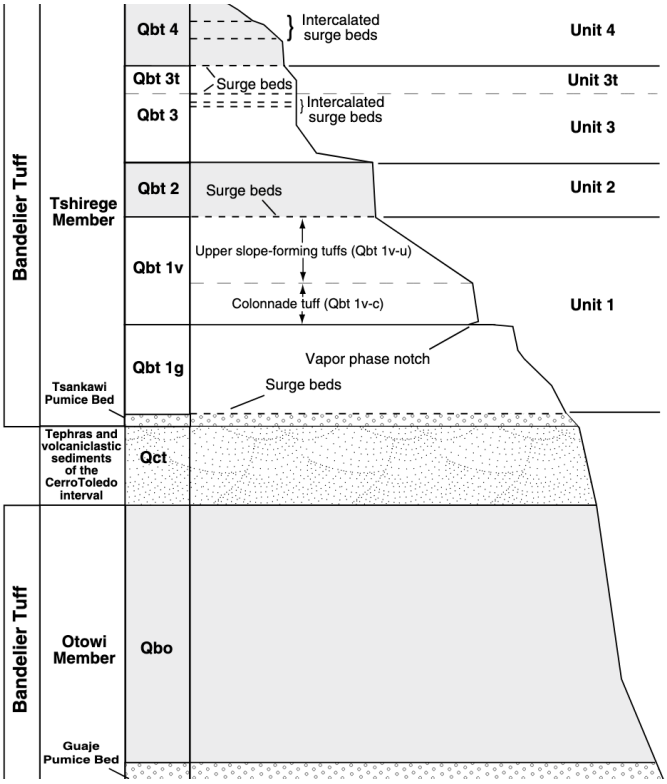

Bandelier Tuff
Tshirege Member
Qbt 4
Intercalated surge beds
Unit 4
Qbt 3t
Surge beds
Unit 3t
Qbt 3
Intercalated surge beds
Unit 3
Qbt 2
Surge beds
Unit 2
Qbt 1v
Upper slope-forming tuffs (Qbt 1v-u)
Colonnade tuff (Qbt 1v-c)
Unit 1
Qbt 1g
Vapor phase notch
Surge beds
Tsankawi Pumice Bed
Tephras and volcaniclastic sediments of the CerroToledo interval
Qct
Bandelier Tuff
Otowi Member
Qbo
Guaje Pumice Bed

Figure 2.

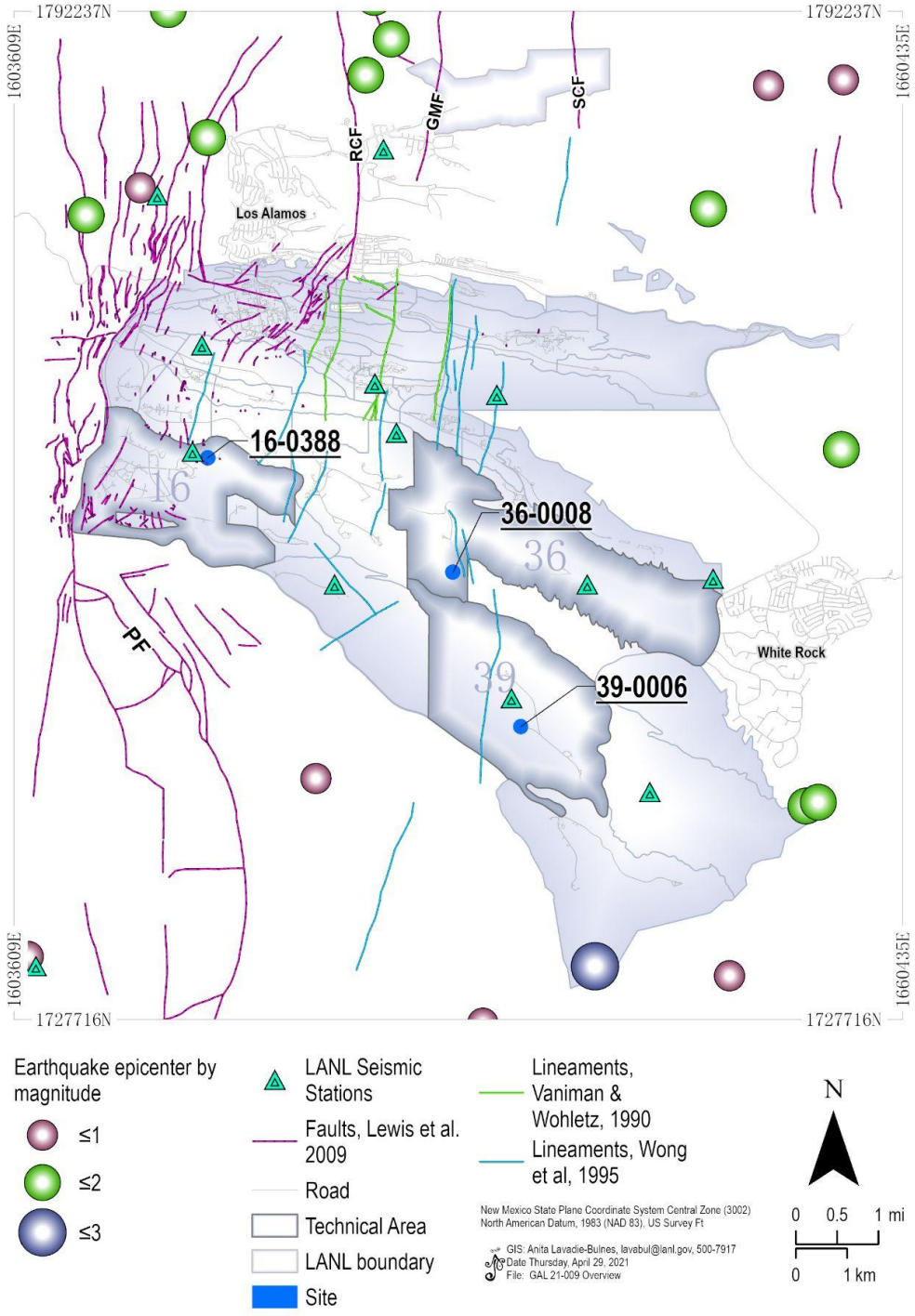

1792237N
1792237N
1603609E
1660435E
1603609E
1660435E
1727716N
1727716N
RCF
GMF
SCF
Los Alamos
16-0388
16
36-0008
36
39
39-0006
PF
White Rock
Earthquake epicenter by magnitude
≤1
≤2
≤3
LANL Seismic Stations
Faults, Lewis et al. 2009
Road
Technical Area
LANL boundary
Site
Lineaments, Vaniman & Wohletz, 1990
Lineaments, Wong et al, 1995
N
0 0.5 1 mi
0 1 km
New Mexico State Plane Coordinate System Central Zone (3002)
North American Datum, 1983 (NAD 83), US Survey Ft
GIS: Anita Lavadie-Bulnes, lavabul@lanl.gov, 500-7917
Date Thursday, April 29, 2021
File: GAL 21-009 Overview

Figure 3.

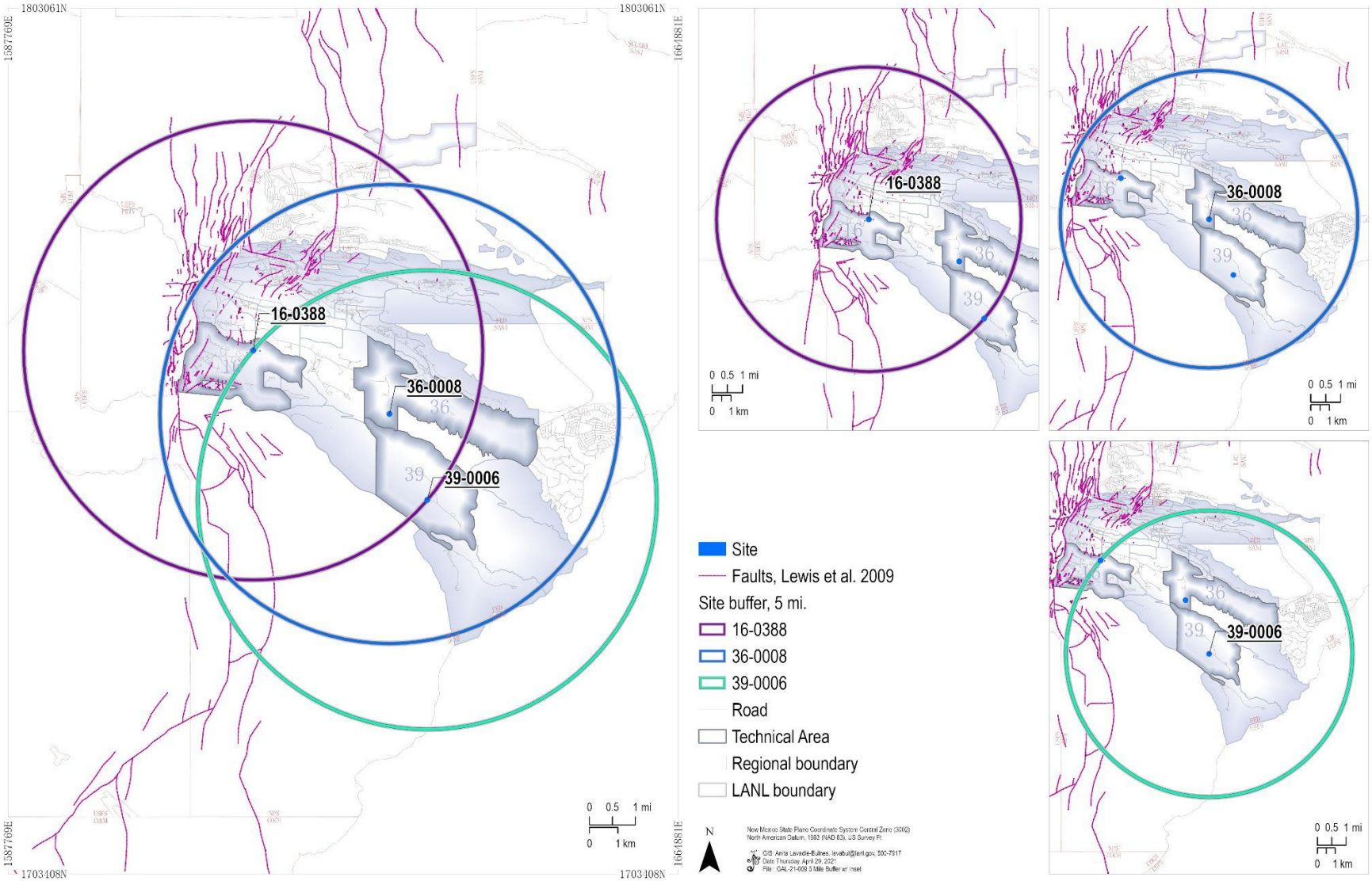
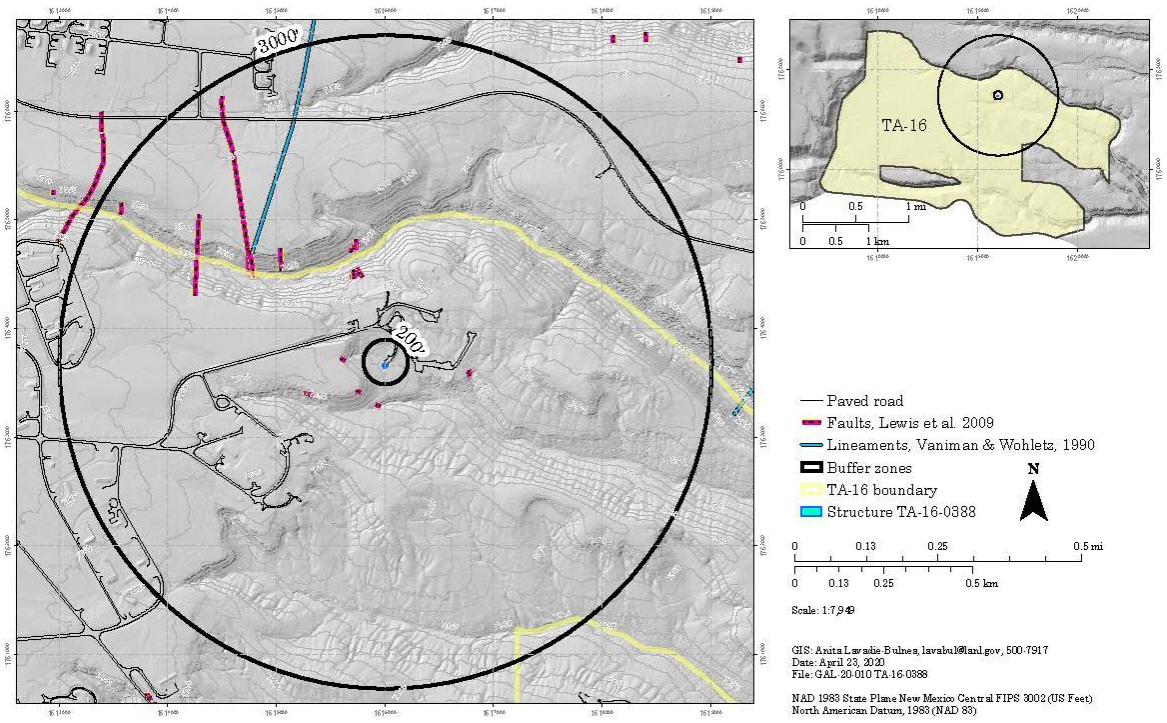

1803061N
1587769E
1664881E
1703408N
16-0388
36-0008
39-0006
0 0.5 1 mi
0 1 km
Site
Faults, Lewis et al. 2009
Site buffer, 5 mi.
16-0388
36-0008
39-0006
Road
Technical Area
Regional boundary
LANL boundary
N

Plate 1.

(a)



(b)

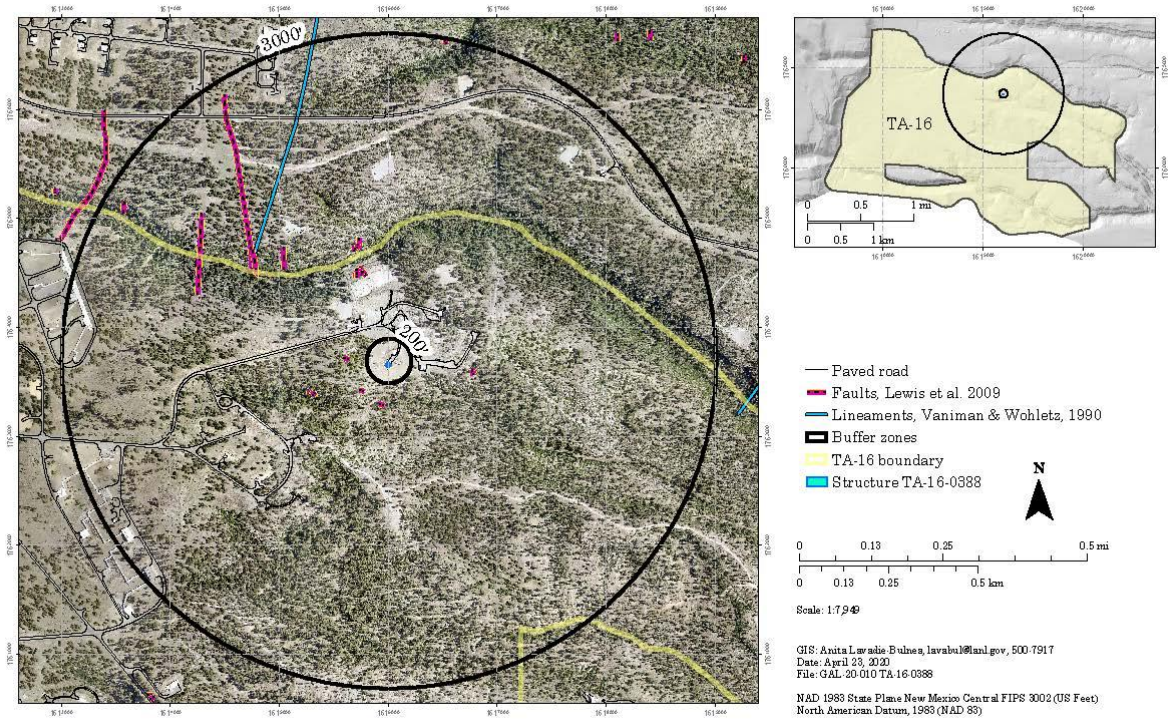


Plate 2. TA-16-388 (a) digital elevation model; (b) imagery.

(a)

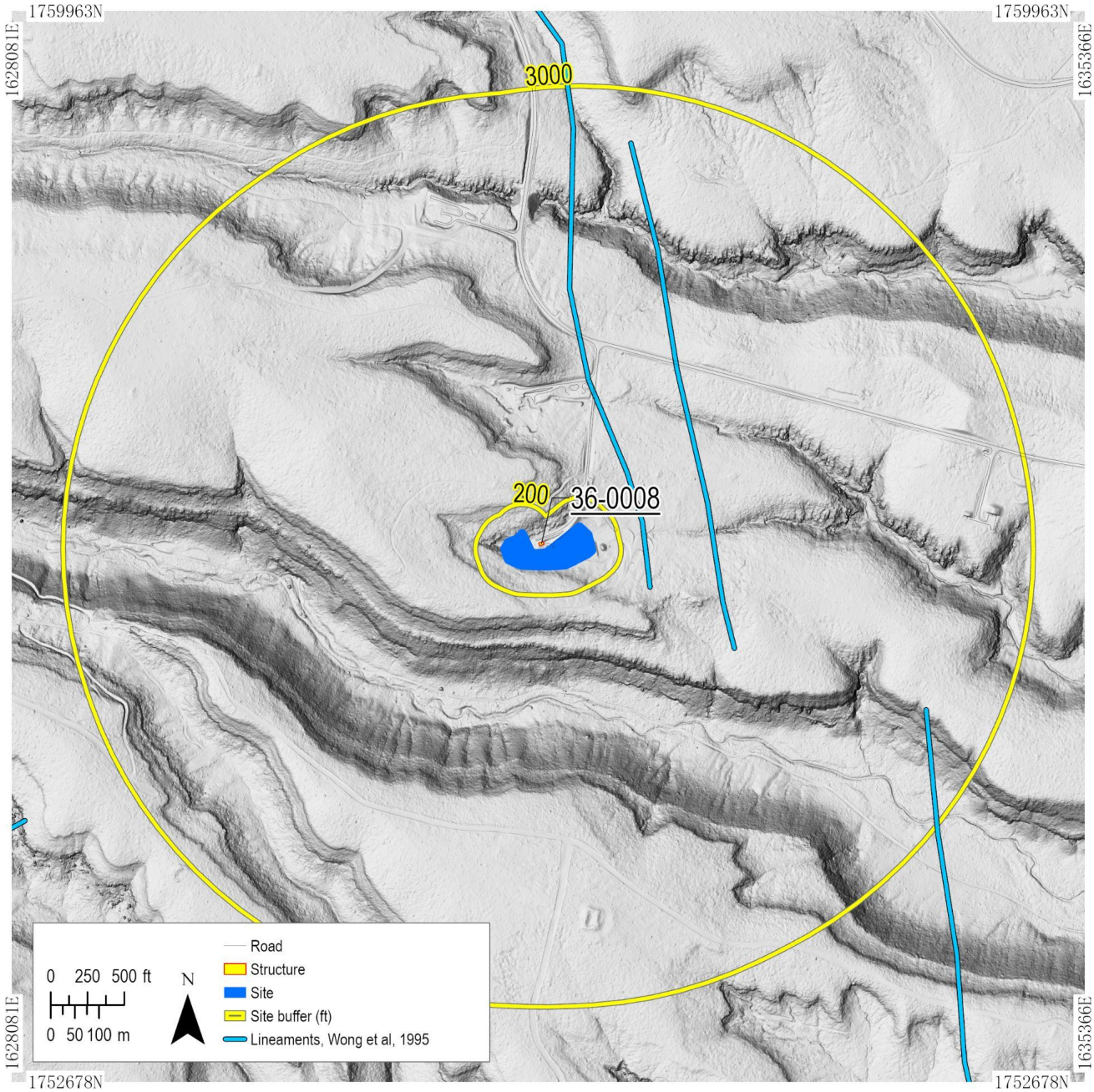


Plate 3. TA-36-8 (a) digital elevation model; (b) imagery.

(b)

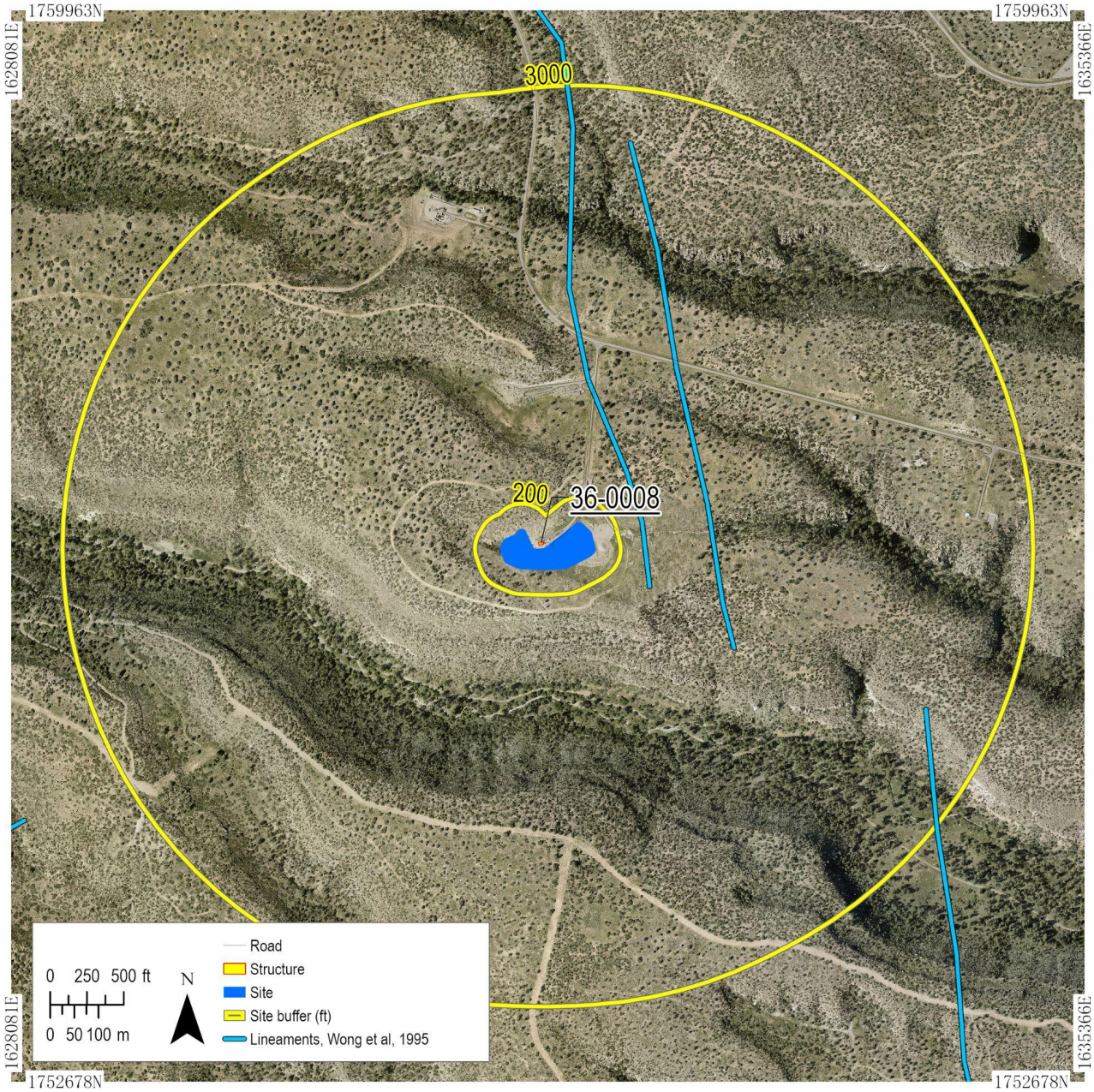


Plate 3. TA-36-8 (a) digital elevation model; (b) imagery.

(a)

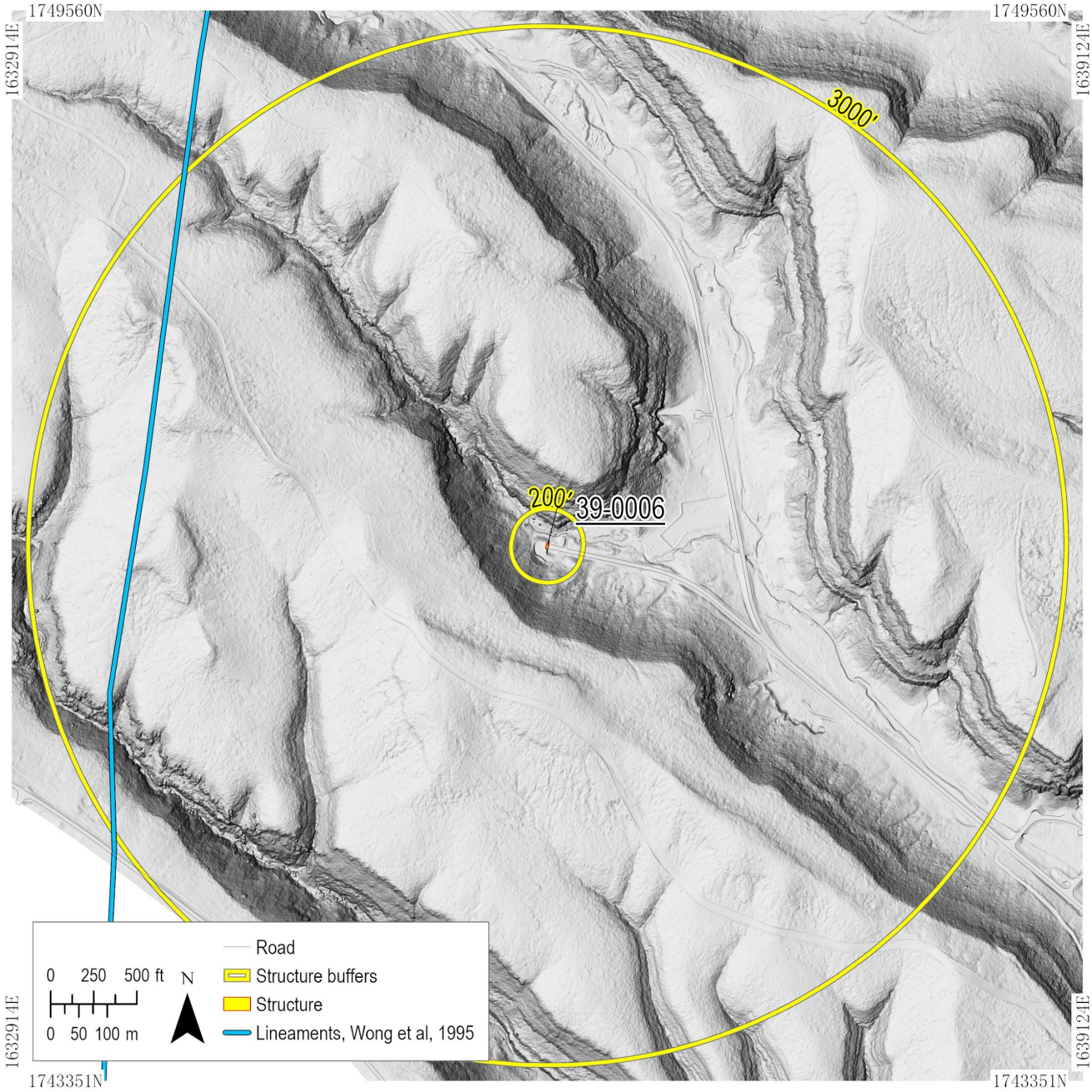


Plate 4. TA-39-6 (a) digital elevation model; (b) imagery.

(b)

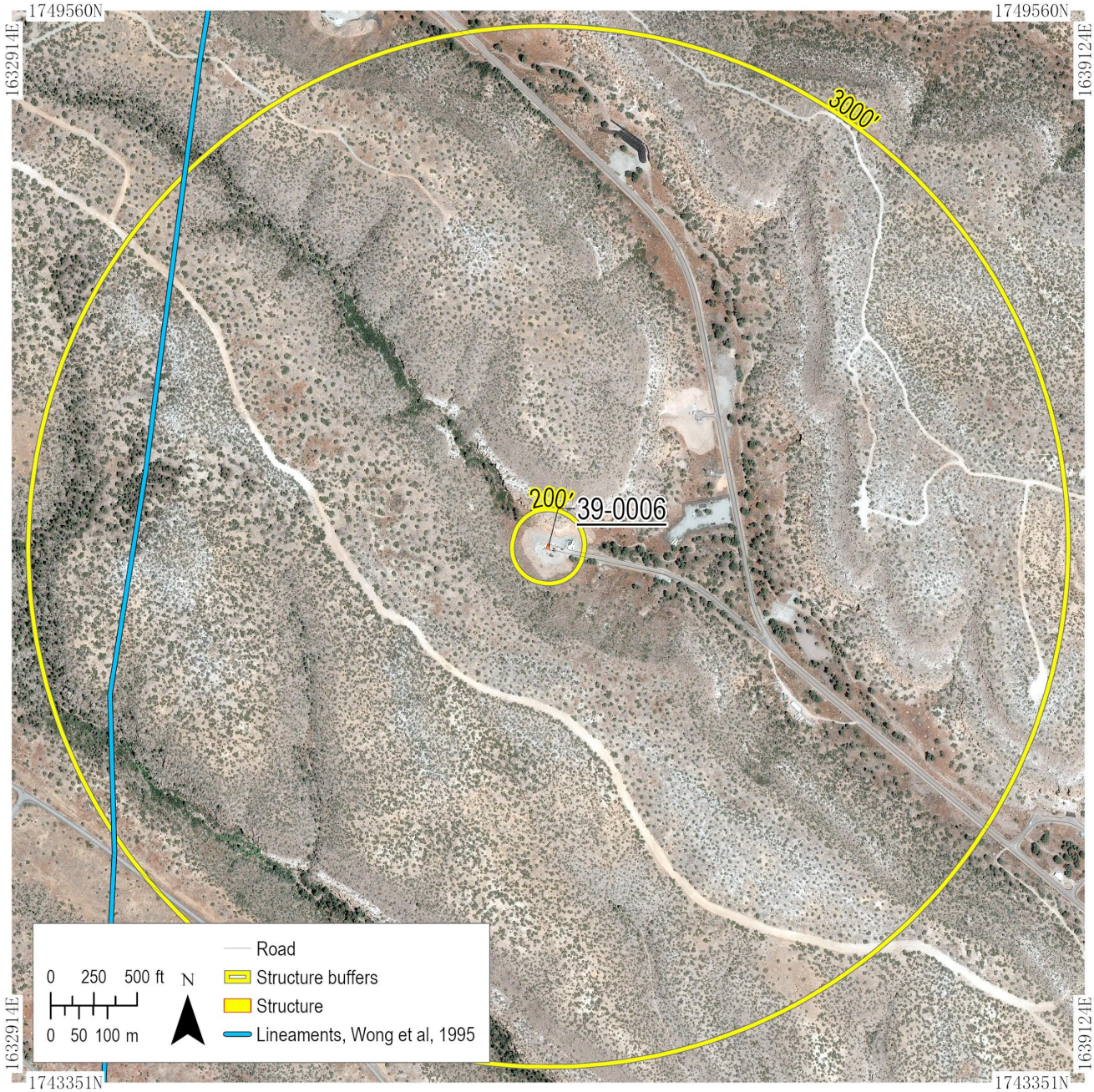


Plate 4. TA-39-6 (a) digital elevation model; (b) imagery.