

**Summary of Available Data for LOU 25  
Process Hardware Storage Area  
Tronox Facility – Henderson, Nevada**

- Name of Facility:** Process Hardware Storage Area
- Goal of Closure:**
- Closure for future commercial/industrial uses.
- Site Investigation Area:**
- Size: 210 feet by 65 feet (0.3 acre).
  - Located on the west side of the Unit 2 building.
  - Current Status/Features: The Process Hardware Storage Area is no longer active. The asphalt has been removed and the southeast corner of the area is covered with the remains of the concrete pad.
- Description:**
- LOU 25 consisted of a concrete and asphalt pad where process hardware was temporarily stored until equipment could be sold as scrap metal [Ref. 1 and 4].
  - This storage area was in use from 1989 [Ref. 1 and 4] through the mid-1990s [Ref. 3].
  - Materials stored in the area included:
    - scrap metal parts; and
    - decommissioned sodium chlorate and perchlorate process equipment from Units 4 and 5 [Ref. 1 and 4].
  - Equipment such as parts, tanks, etc., were rinsed or decontaminated at Units 4 or 5 prior to placement on the storage pad [Ref. 1 and 4].

Process Waste Streams Associated with LOU 25	Known or Potential Constituents Associated with LOU 25
Residual mother liquor drained from the decommissioned process equipment.	<ul style="list-style-type: none"> <li>• Metals</li> <li>• Chlorate residue</li> <li>• Perchlorate residue</li> <li>• Ammonia residue</li> <li>• Hexavalent chromium</li> <li>• Wet chemistry analytes</li> </ul>

- Overlapping or Adjacent LOUs:** The following LOUs overlap or are adjacent to LOU 25:
- Overlapping LOUs
- LOU 59 (Storm Sewer System) – Branches of the Storm Sewer System run north-south along the length of LOU 25.
  - LOU 60 (Acid drain System) – Branches of the Acid Drain Pipeline System originate from LOU 25 and run along the central portion of LOU 25.
- The pipe segments (with sumps or inlets) of LOUs 59 and 60 that overlap LOU 25 are initiated within or just south (upgradient) of the LOU 25 boundary; therefore, wastes

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associated with LOUs 59 and 60 are consistent with the wastes associated with LOU 25.

Adjacent LOUs

- LOU 4 (Hardesty Chemical Company Site) – Located north (downgradient) of LOU 25.
- LOU 26 (Trash Storage Area) – Located northwest (downgradient) of LOU 25.
- LOU 27 (PCB Storage Area) – Located northeast (downgradient) of LOU 25.

LOUs 4, 26, and 27 are downgradient of LOU 25; therefore these LOUs are not considered to affect LOU 25.

Known or potential chemical classes associated with overlapping or adjacent LOUs are consistent with those listed for LOU 25; therefore, the addition of other chemical classes to the Phase B Analytical Plan for LOU 25 is not required. For detailed information on the LOUs listed above, please refer to the specific LOU data package.

**Other LOUs Potentially Affecting Soils in LOU 25:**

- None identified based on the documents reviewed.

**Known or Potential Chemical Classes:**

- Metals
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes

**Known or Potential Release Mechanisms:**

- No known releases were identified in the documents reviewed.
- Potential for releases from LOU 25 are considered to be minimal since equipment was decontaminated prior to placement in the storage area [Ref. 1 and 3].
- Potential surface runoff to surface soils.

**Results of Historical Sampling:**

Soil

- No known historical soil sampling was identified in the documents reviewed.

Groundwater

- Downgradient monitoring well M-92 is routinely tested for hexavalent chromium, perchlorate and TDS as part of a routine groundwater monitoring program. See attached

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LOU 25 Table 3 for a summary of historical analytical results.

**Did Historical Samples Address Potential Release?** • No

**Summary of Phase A SAI:**

Soil

- None specifically conducted for LOU 25.

Groundwater

- None specifically conducted for LOU 25. The closest well sampled (M-92) is approximately 340 feet to the northwest (downgradient) and was not specifically sampled to evaluate this LOU.

Analytical groundwater results from the Phase A sampling event are summarized in LOU 25 Tables 1 and 2 and LOU 25 Tables 4 through 10 (see attached) [Ref. 2].

**Are Phase A Sample Locations in “Worst Case” Areas?** • No Phase A borings were located in or near this LOU.

**Is Phase B Investigation Recommended?** • Yes

**Proposed Phase B Soil Investigation/Rationale:**

- The Phase B investigation of LOU 25 consists of collecting soil samples from four locations.
  - Two (2) soil borings will be drilled within the boundaries of LOU 25:
  - Two (2) soil borings will be drilled cross-gradient (one to the east and one to the west) of LOU 25.

All four borings along with the analytical program to evaluate soil samples from LOU 25 are listed on **Table A – Soil Sampling and Analytical Plan for LOU 25.**

- Soil sample locations consist of both judgmental and randomly-placed locations.
- Judgmental sample locations:
  - Designed to evaluate soil for known or potential chemical classes associated with LOU 25, based on the known process waste streams.
  - Three (3) of the four sample locations are judgmental locations and include soil borings SA29, SA190, and SA111.

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- Random sample grid locations:
  - Designed to assess whether unknown constituents associated with LOU 25 are present.
  - One (1) of the four sample locations is randomly-placed (i.e., soil boring RSAR4).

**Proposed Phase B Constituents List for Soils:**

Judgmental sample locations will be analyzed for LOU-specific constituents consisting of the following:

- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes

Judgmental sample locations will also be analyzed for the following constituents for area-wide coverage purposes:

- TPH-DRO/ORO
- VOCs
- SVOCs
- Organochlorine pesticides
- Dioxins/furans
- Radionuclides
- Asbestos

Random sample grid locations will be analyzed for the following full list of Phase A site related chemicals for LOU-specific and area-wide coverage purposes:

- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- TPH-DRO/ORO
- Organochlorine pesticides
- Dioxins/furans
- Radionuclides
- Asbestos

**Proposed Phase B Groundwater Investigation/Rationale:**

- The Phase B groundwater investigation of LOU 25 consists of collecting groundwater samples from two (2) locations to evaluate local groundwater conditions and as part of the Site-wide evaluation of constituent trends in groundwater.
  - Two (2) wells north (downgradient) of LOU 25 will be sampled. These wells are M-92 and M-143.

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- Both wells along with the analytical program to evaluate groundwater samples associated with LOU 25 are listed on **Table B – Groundwater Sampling and Analytical Plan for LOU 25.**

**Proposed Phase B Constituents List for Groundwater:**

Groundwater samples will be analyzed for the following analytes:

- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs
- SVOCs
- Organochlorine pesticides
- Radionuclides

**Proposed Phase B Soil Gas Investigation/Rationale:**

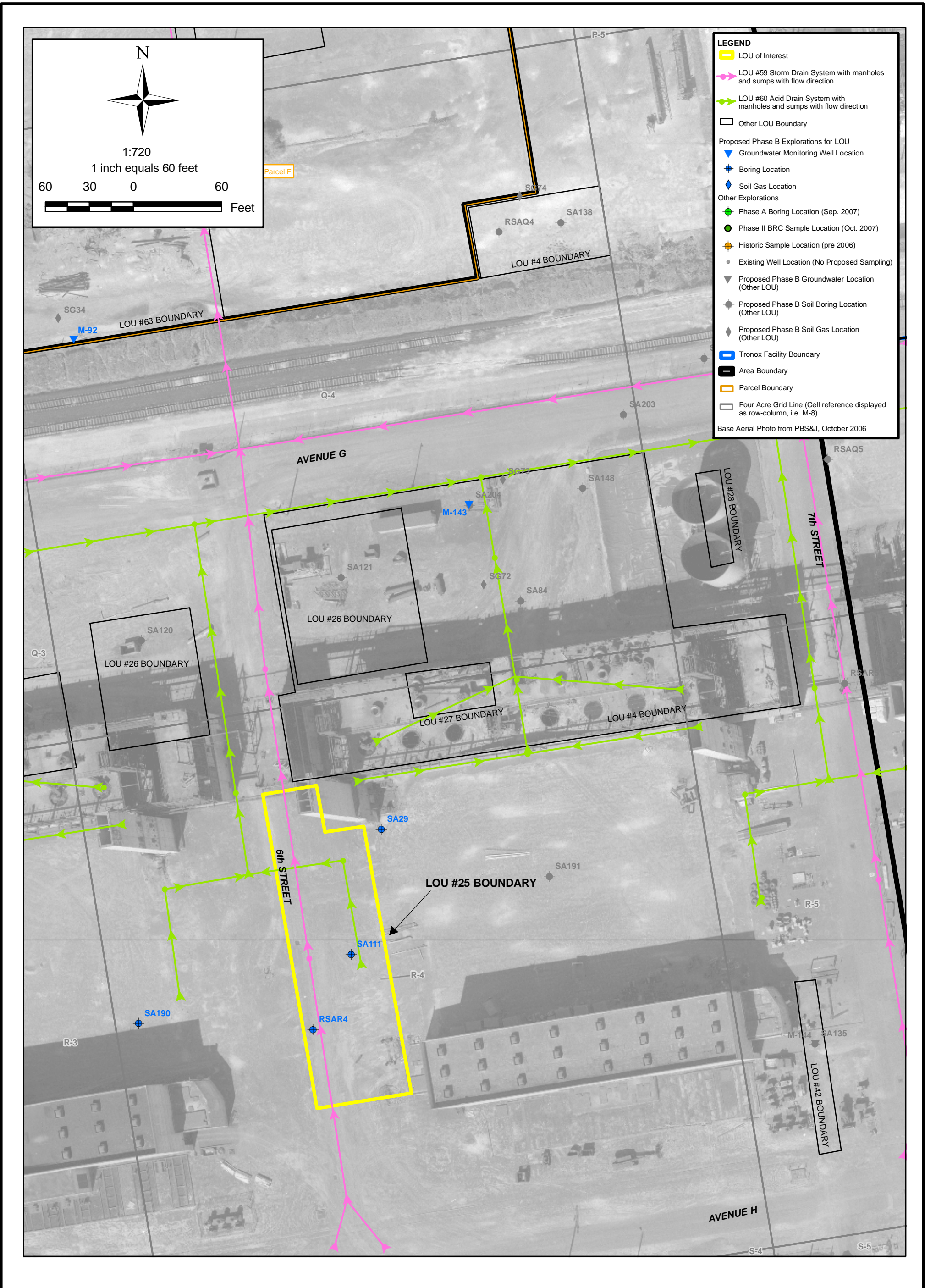
- None proposed for this LOU.

**References:**

1. ENSR, 2005, Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada, ENSR, Camarillo, California, 04020-023-130, February 2005 and August 2005.
2. ENSR, 2007b, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, November 2007.
3. Environmental Answers, Keith Bailey, verbal communication, April 9, 2008.
4. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).

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**LOU Figure**



**LEGEND**

- LOU of Interest
- LOU #59 Storm Drain System with manholes and sumps with flow direction
- LOU #60 Acid Drain System with manholes and sumps with flow direction
- Other LOU Boundary

Proposed Phase B Explorations for LOU

- ▼ Groundwater Monitoring Well Location
- ◆ Boring Location
- ◆ Soil Gas Location

Other Explorations

- ◆ Phase A Boring Location (Sep. 2007)
- Phase II BRC Sample Location (Oct. 2007)
- ◆ Historic Sample Location (pre 2006)
- Existing Well Location (No Proposed Sampling)
- ▼ Proposed Phase B Groundwater Location (Other LOU)
- ◆ Proposed Phase B Soil Boring Location (Other LOU)
- ◆ Proposed Phase B Soil Gas Location (Other LOU)

- Tronox Facility Boundary
- Area Boundary
- Parcel Boundary
- Four Acre Grid Line (Cell reference displayed as row-column, i.e. M-8)

Base Aerial Photo from PBS&J, October 2006

SHEET NUMBER: <b>X</b>	FIGURE NUMBER: <b>1</b>
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**SAMPLE LOCATIONS FOR LOU #25  
PROCESS HARDWARE STORAGE AREA**

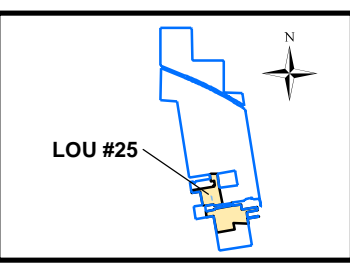
Phase B Area IV Source Area Investigation  
Tronox Facility  
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	5/14/2008	04020-023-430

**ENSR | AECOM**

**ENSR CORPORATION**  
1220 AVENIDA ACASO  
CAMARILLO, CALIFORNIA 93012  
PHONE: (805) 388-3775  
FAX: (805) 388-3577  
WEB: [HTTP://WWW.ENSR.AECOM.COM](http://www.ensr.aecom.com)

DESIGNED BY: B. Ho
DRAWN BY: M. Scop
CHECKED BY: G. Hels
APPROVED BY: B. Ho



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**Sampling and Analytical Plans for LOU 25:**

Table A – Soil Sampling and Analytical Plan for LOU 25  
Table B – Groundwater Sampling and Analytical Plan for LOU 25



Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths <sup>1</sup> (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	VOCs <sup>2</sup> (EPA 8260B)	Wet Chemistry <sup>3</sup>	Total Cyanide (EPA 9012A)	OCPs <sup>4</sup> (8081A)	SVOCs <sup>5</sup> (EPA 8270C)	Radionuclides <sup>6</sup>	Dioxins/Furans <sup>7</sup>	PCBs <sup>8</sup> (EPA 1668)	Asbestos <sup>9</sup> (EPA/540/R-97/028)	Geo-technical Tests <sup>10</sup>	Location Description and Characterized Area Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on grid R-4.																			
R-4	25, 59	RSAR4	RSAR4-0.0	0.0													X		Boring located to evaluate LOU 25 (Process Hardware Storage Area), LOU 59 (Storm Sewer System), and for Unit 2 area coverage.
R-4	25, 59		RSAR4-0.5	0.5	X	X	X	X	X			X	X	X	X				
R-4	25, 59		RSAR4-10	10	X	X	X	X	X			Hold	X	X					
R-4	25, 59		RSAR4-20	20	X	X	X	X	X			Hold	X	X					
R-4	25, 59		RSAR4-30	30	X	X	X	X	X			Hold	X	X					
R-4	25, 59		RSAR4-40	40	X	X	X	X	X			X	X	X					
R-4	25, Unit 2	SA29	SA29-0.0	0.0													X		Boring located to evaluate potential impacts associated with surface runoff from LOU 25 (Process Hardware Storage Area) and for Unit 2 area coverage.
R-4	25, Unit 2		SA29-0.5	0.5	X	X	X	X	X			X	X	X	X				
R-4	25, Unit 2		SA29-10	10	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 2		SA29-20	20	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 2		SA29-30	30	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 2		SA29-35	35	X	X	X	X	X			X	X	X					
R-4	25, 59, 60, Unit 2	SA111	SA111-0.0	0.0													X		Boring located to evaluate LOU 25 (Process Hardware Storage Area), LOU 59 (Storm Sewer Drain), LOU 60 (Acid Drain System) and for Unit 2 area coverage.
R-4	25, 59, 60, Unit 2		SA111-0.5	0.5	X	X	X	X	X			X	X	X	X				
R-4	25, 59, 60, Unit 2		SA111-10	10	X	X	X	X	X			Hold	X	X					
R-4	25, 59, 60, Unit 2		SA111-20	20	X	X	X	X	X			Hold	X	X					
R-4	25, 59, 60, Unit 2		SA111-30	30	X	X	X	X	X			Hold	X	X					
R-4	25, 59, 60, Unit 2		SA111-40	40	X	X	X	X	X			X	X	X					
R-4	25, Unit 1	SA190	SA190-0.0	0.0													X		Boring located to evaluate LOU 25 (Process Hardware Storage Area) and for Unit 1 area-coverage.
R-4	25, Unit 1		SA190-0.5	0.5	X	X	X	X	X			X	X	X	X				
R-4	25, Unit 1		SA190-10	10	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 1		SA190-20	20	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 1		SA190-30	30	X	X	X	X	X			Hold	X	X					
R-4	25, Unit 1		SA190-40	40	X	X	X	X	X			X	X	X					
<b>Number of Borings:</b>					<b>4</b>														
<b>Number of Samples:</b>					<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>0</b>	<b>8</b>	<b>20</b>	<b>20</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>0</b>	
<b>Notes:</b>																			
X Sample will be collected and analyzed. No sample collected under Phase B sampling program.																			
TPH-DRO/ORO Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.																			
1. If area is paved, samples will be collected at 0.5 feet below, or if an unpaved area is within a reasonable distance, the sample will be moved to the unpaved area.																			
2. Samples for VOC analysis will be preserved in the field using sodium bisulfate (or DI water) and methanol preservatives per EPA Method 5035.																			
3. Consists of wet chemistry parameters (including pH) listed on Table 1 of the Phase B Source Area Work Plan.																			
4. Organochlorine Pesticides (includes analysis for hexachlorobenzene).																			
5. Semi-volatile Organic Compounds																			
6. Radionuclides consists of alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).																			
7. Dioxins/furans: 90% will be tested by immunoassay, 10% analyzed by HRGC/HRMS in the laboratory.																			
8. Polychlorinated biphenyls																			
9. Soil samples for asbestos analyses will be collected from a depth of 0 to 2-inches bgs.																			
10. Geotechnical Tests consist of: moisture content (ASTM D-2216), grain size analysis (ASTM D-422 and C117-04), Soil Dry Bulk Density (ASTM D-2937), Grain Density (ASTM D-854, Soil-Water Filled Porosity (ASTM D-2216); Vertical Hydraulic Conductivity (ASTM D-5084/USEPA 9100).																			

Grid Location	Location Area	Monitoring Well No.	Sample ID Number	Screen Interval (ft bgs)	Soil Type Expected Across Screen Interval <sup>1</sup>	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs <sup>2</sup> (EPA 8260)	Wet Chemistry (a)	Total Cyanide (EPA 9012A)	OCPs <sup>3</sup> (EPA 8081A)	SVOCs <sup>4</sup> (EPA 8270C)	Radio-nuclides <sup>5</sup>	Rationale
<b>Wells are organized by grid location as shown on Plate A - Starting point is on grid Q-4 and ending point on grid R-4.</b>																
Q-4	Parcel F	M-92	M-92	34.9 - 44.9	MCfg1	yes	X	X	X	X	X		X	X	X	Located to serve as a downgradient stepout for LOUs 25, 41, 59, and 65; as an upgradient stepout for LOU 63; and for general Site coverage.
R-4	IV	M-143	M-143	TBD	TBD	new well	X	X	X	X	X		X	X	X	New well to be installed; located to evaluate LOUs 4, 25, 26, 27, 28, 42, and 60 for general Site coverage
<b>Number of Field Samples:</b>							<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	
<b>Notes:</b>																
X Sample will be collected and analyzed.																
1 It is anticipated that the large majority of the flow to the well will be from the coarse-grained sediments. As such, in the cases where there are two lithologies present across the screen interval, the water sampled will represent conditions in the coarse-grained interval.																
2 VOCs = Volatile organic compounds (to include analysis for naphthalene).																
3 OCPs = Organochlorine pesticides (to include analysis for hexachlorobenzene).																
4 SVOCs = Semi volatile organic compounds.																
5 Radionuclides consists of alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).																
(a) Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.																
TBD To be determined when well is constructed																
MCfg1 Muddy Creek Formation - first fine-grained facies																
MCcg1 Muddy Creek Formation - first coarse-grained facies																
MCfg2 Muddy Creek Formation - second fine-grained facies																

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**Soil and Groundwater Characterization Data**

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LOU-specific analytes identified include:

- Wet chemistry analytes
- Metals (Phase A list)
- Hexavalent chromium
- Perchlorate

The tables in **BOLD** below present Phase A data associated with these LOU-specific analytes.

**LOU 25 Table 1 - Groundwater Characterization Data - Wet Chemistry**

**LOU 25 Table 2 - Groundwater Characterization Data - Metals**

**LOU 25 Table 3 - Groundwater Characterization Data - Routine Monitoring**

LOU 25 Table 4 – Groundwater Characterization Data - Organochlorine Pesticides (OCPs)

LOU 25 Table 5 - Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)

LOU 25 Table 6 - Groundwater Characterization Data - PCBs

**LOU 25 Table 7 - Groundwater Characterization Data - Perchlorate**

LOU 25 Table 8 - Groundwater Characterization Data - Radionuclides

LOU 25 Table 9 - Groundwater Characterization Data - SVOCs

LOU 25 Table 10 - Groundwater Characterization Data - VOCs

Notes for All Phase A Data Tables are Presented at the End of the Tables

**LOU 25 Table 1  
Groundwater Characterization Data - Wet Chemistry**

Process Hardware Storage Area  
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Sampling Program		Ph A <sup>1</sup>	
Well ID		M92	
Sample ID		M92	
Sample Date		11/29/2006	
Wet Chemistry Parameters	MCL <sup>2</sup> ug/L		Units
Total Dissolved Solids	5.00E+05 j	1850	mg/L
Total Suspended Solids	--	22.0 J	mg/L
Alkalinity (as CaCO3)	--	5.0 U	mg/L
Bicarbonate	--	80.0	mg/L
Total Alkalinity	--	80.0	mg/L
Ammonia (as N)	--	50.0 U	ug/L
MBAS	--	0.20 U	mg/L
Cyanide	2.00E+02	R	ug/L
pH (liquid)	--	7.4 J	none
Specific Conductance	--	1930	umhos/cm
Bromide	--	0.21 J	mg/L
Chlorate	--	3.2 J	mg/L
Chloride	2.50E+05	192	mg/L
Nitrate (as N)	1.00E+04	4.0	mg/L
Nitrite	1.00E+03	0.020 U	mg/L
ortho-Phosphate	--	5.0 U	mg/L
Sulfate	2.50E+05 j	992	mg/L
Total Organic Carbon	--	50.0 U	mg/L

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
  2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
- (j) Secondary Drinking Water Regulation value.

**LOU 25 Table 2**  
**Groundwater Characterization Data - Metals**

Process Hardware Storage Area  
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Sampling Program		Ph A <sup>1</sup>	
Well ID:		M-92	
Sample ID		M-92-Z	
Sample Depth (ft)			
Sample Date		05/08/2007	
Metals	MCL <sup>2</sup> ug/L		Unit
Aluminum	5.00E+01 j	32.6 U	ug/L
Antimony	6.00E+00	0.50 U	ug/L
Arsenic	1.00E+01	<b>95.7</b>	ug/L
Barium	2.00E+03	18.2 U	ug/L
Beryllium	4.00E+00	1.8 U	ug/L
Boron	7.30E+03 c	<b>1820</b>	ug/L
Cadmium	5.00E+00	0.057 U	ug/L
Calcium	--	<b>155000</b>	ug/L
Chromium (Total)	1.00E+02	<b>15.1 J-</b>	ug/L
Chromium-hexavalent	1.09E+02 c	<b>15.9 J</b>	ug/L
Cobalt	7.30E+02 c	<b>0.32 J-</b>	ug/L
Copper	1.30E+03 p	2.4 U	ug/L
Iron	3.00E+02 j	188 UJ	ug/L
Lead	1.50E+01 u	0.49 U	ug/L
Magnesium	1.50E+05 a	<b>83500</b>	ug/L
Manganese	5.00E+01 j	6.8 U	ug/L
Molybdenum	1.82E+02 c	<b>18.7</b>	ug/L
Nickel	7.30E+02 c	10.3 UJ	ug/L
Platinum	--	0.10 U	ug/L
Potassium	--	<b>9650</b>	ug/L
Selenium	5.00E+01	<b>2.3 J</b>	ug/L
Silver	1.00E+02 j	0.20 U	ug/L
Sodium	--	<b>373000</b>	ug/L
Strontium	2.19E+04 c	<b>2760</b>	ug/L
Thallium	2.00E+00	1.0 U	ug/L
Tin	2.19E+04 c	<b>0.23 J</b>	ug/L
Titanium	1.46E+05 c	4.9 U	ug/L
Tungsten	--	1.8 UJ	ug/L
Uranium	3.00E+01	<b>8.3 J+</b>	ug/L
Vanadium	3.65E+01 c	32.0 U	ug/L
Zinc	5.00E+03 j	2.0 UJ	ug/L
Mercury	2.00E+00	0.093 U	ug/L

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.

**LOU 25 Table 3  
Groundwater Characterization Data - Routine Monitoring<sup>1</sup>**

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Well ID	Date	Depth to water (ft)	Perchlorate mg/L	Qual	MCL <sup>2</sup> ug/L	Total Chromium mg/L	Qual	MCL <sup>2</sup> ug/L	TDS mg/L	Qual	MCL <sup>2</sup> ug/L	Nitrate (as N) mg/L	Qual	MCL <sup>2</sup> ug/L	Chlorate mg/L	Qual	MCL <sup>2</sup> ug/L
M-92	2/3/2006	36.67	0.89	d	1.80E+01 a,m	<0.01	ud	1.00E+02			5.00E+05 j			1.00E+04			--
M-92	5/4/2006	36.65	0.62	d	1.80E+01 a,m	<0.01	ud	1.00E+02	1980		5.00E+05 j			1.00E+04			--
M-92	8/2/2006	36.95	0.567	d	1.80E+01 a,m	<0.01	ud	1.00E+02	1670		5.00E+05 j			1.00E+04			--
M-92	11/1/2006	36.96	0.676	d	1.80E+01 a,m	<0.01	ud	1.00E+02	1920		5.00E+05 j			1.00E+04			--
M-92	1/31/2007	37.21	0.674		1.80E+01 a,m	<0.02	U	1.00E+02	1990		5.00E+05 j			1.00E+04			--
M-92	5/3/2007	37.24	0.695	J	1.80E+01 a,m	<0.02	U	1.00E+02	1920	J	5.00E+05 j			1.00E+04			--
M-92	8/1/2007	37.77	0.752		1.80E+01 a,m	<0.02	U	1.00E+02	1990		5.00E+05 j			1.00E+04			--

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
  - (a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.
  - (m) Equal to the provisional action level derived by NDEP as referenced in "Defining a Perchlorate Drinking Water Standard". NDEP Bureau of Corrective Action. URL [[http://ndep.nv.gov/bca/perchlorate02\\_05.htm](http://ndep.nv.gov/bca/perchlorate02_05.htm)].
  - (j) Secondary Drinking Water Regulation value.

< = less than the reporting limit

Blank cell or --- = no data and or no qualifier

Qual = data qualifiers applied by laboratory or during data validation

TDS = Total Dissolved Solids

mg/l = milligram per liter

Laboratory Qualifiers:

d = the sample was diluted

u = the analyte was not detected above the sample reporting limit

ud = the sample was diluted and was not detected above the sample reporting limit

Validation Qualifiers:

J = the result is an estimated quantity

U = the analyte was analyzed for, but was not detected above the sample reporting limit

**LOU 25 Table 4**  
**Groundwater Characterization Data - Organochlorine Pesticides (OCPs)**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	
Well ID		M-92	
Sample ID		M-92	
Sample Date		11/29/2006	
Organochlorine Pesticides	MCL <sup>2</sup> ug/L		Unit
4,4'-DDD	2.80E-01 c	0.050 U	ug/L
4,4'-DDE	1.98E-01 c	0.050 U	ug/L
4,4'-DDT	1.98E-01 c	0.050 U	ug/L
Aldrin	4.00E-03 c	0.050 U	ug/L
Alpha-BHC	1.10E-02 c, (bbb)	0.050 U	ug/L
Alpha-chlordane	2.00E+00 (l)	0.050 U	ug/L
Beta-BHC	3.74E-02 c, (bbb)	0.050 U	ug/L
Delta-BHC	1.10E-02 c, (z)	0.050 U	ug/L
Dieldrin	4.20E-03 c, (z)	0.050 U	ug/L
Endosulfan I	2.19E+02 c, (aa)	0.050 U	ug/L
Endosulfan II	2.19E+02 c, (aa)	0.050 U	ug/L
Endosulfan Sulfate	2.19E+02 c, (aa)	0.050 U	ug/L
Endrin	2.00E+00	0.050 U	ug/L
Endrin Aldehyde	1.09E+01 c, (k)	0.050 U	ug/L
Endrin Ketone	1.09E+01 c, (k)	0.050 U	ug/L
Gamma-BHC (Lindane)	2.00E-01	0.050 U	ug/L
Gamma-Chlordane	2.00E+00 (l)	0.050 U	ug/L
Heptachlor	4.00E-01	0.050 U	ug/L
Heptachlor Epoxide	2.00E-01	0.050 U	ug/L
Methoxychlor	4.00E+01	0.10 U	ug/L
Tech-Chlordane	2.00E+00 (l)	0.50 U	ug/L
Toxaphene	3.00E+00	2.0 U	ug/L

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (bbb) BHC listed as HCH in the PRG table.
  - (l) Value for chlordane used as surrogate for alpha-chlordane, chlordane (technical) and gamma-chlordane due to structural similarities.
  - (z) Value for alpha-BHC used as surrogate for delta-BHC based on structural similarities.
  - (aa) Value for endosulfan used as surrogate for endosulfan I, endosulfan II and endosulfan sulfate based on structural similarities.
  - (k) Value for endrin used as surrogate for endrin aldehyde and endrin ketone due to structural similarities.



**LOU 25 Table 5**  
**Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	
Well ID		M-92	
Sample ID		M-92	
Sample Date		11/29/2006	
OPPs	MCL <sup>2</sup> ug/L		Unit
Azinphos-methyl	--	2.5 UJ	ug/L
Bolstar	--	1.0 U	ug/L
Chlorpyrifos	1.09E+02 c	1.0 U	ug/L
Coumaphos	--	1.0 U	ug/L
Demeton-O	1.46E+00 c,(cc)	1.0 U	ug/L
Demeton-S	1.46E+00 c,(cc)	1.0 U	ug/L
Diazinon	3.28E+01	1.0 U	ug/L
Dichlorvos	2.32E-01	1.0 U	ug/L
Dimethoate	7.30E+00	1.0 U	ug/L
Disulfoton	1.46E+00	0.50 U	ug/L
EPN	3.65E-01	1.2 U	ug/L
Ethoprop	--	0.50 U	ug/L
Ethyl Parathion	9.12E+00 c,(tt)	1.0 U	ug/L
Famphur	--	1.0 U	ug/L
Fensulfothion	--	2.5 U	ug/L
Fenthion	9.10E+00 c,(ff)	2.5 U	ug/L
Malathion	7.30E+02	1.2 U	ug/L
Merphos	1.09E+00	5.0 U	ug/L
Methyl parathion	9.12E+00	4.0 U	ug/L
Mevinphos	--	6.2 U	ug/L
Naled	7.30E+01	1.0 UJ	ug/L
Phorate	7.30E+00	1.2 U	ug/L
Ronnel	1.82E+03	10 U	ug/L
Stirphos	--	3.5 U	ug/L
Sulfotep	1.82E+01	1.5 U	ug/L
Thionazin	--	1.0 U	ug/L
Tokuthion	--	1.6 U	ug/L
Trichloronate	--	0.50 U	ug/L

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (cc) Value for demeton used as surrogate for demeton-o and demeton-s based on structural similarities.
  - (tt) Value for parathion-methyl used as surrogate for parathion-ethyl due to structural similarities.
  - (ff) Value for methyl parathion used as surrogate for fenthion based on structural similarities.

**LOU 25 Table 6  
Groundwater Characterization Data - PCBs**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	
Well ID		M-92	
Sample ID		M-92	
Sample Date		11/29/2006	
PCBs	MCL <sup>2</sup> ug/L		Unit
Aroclor-1016	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1221	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1232	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1242	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1248	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1254	5.00E-01 (bb)	0.10 U	ug/L
Aroclor-1260	5.00E-01 (bb)	0.10 U	ug/L

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted (bb) Value for total PCBs.

**LOU 25 Table 7**  
**Groundwater Characterization Data - Perchlorate**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Well ID Number	Sample ID	Sampling Program	Sample Date	Perchlorate	Units	MCL <sup>2</sup> ug/L
M-92	M-92	Ph A <sup>1</sup>	11/29/2006	610	ug/L	1.80E+01 a,(m)

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.

2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.

(a) NAC 445A.455 Secondary standards. Certain provisions of the National Primary Drinking Water Regulations are adopted by reference (NAC 445A.4525). These values are listed in the first column of this table and are therefore not listed again here. Only NAC 445A.455 Secondary standards are listed.

(m) Equal to the provisional action level derived by NDEP as referenced in "Defining a Perchlorate Drinking Water Standard". NDEP Bureau of Corrective Action. URL [[http://ndep.nv.gov/bca/perchlorate02\\_05.htm](http://ndep.nv.gov/bca/perchlorate02_05.htm)].

**LOU 25 Table 8  
Groundwater Characterization Data - Radionuclides**

Process Hardware Storage Area (near Unit 2) and C-1 Pond and Associated Piping  
Tronox Facility - Henderson, Nevada

				<b>Ra-226</b>	<b>Ra-228</b>	<b>Th-228</b>	<b>Th-230</b>	<b>Th-232</b>	<b>U-233/234</b>	<b>U-235/236</b>	<b>U-238</b>
				pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L
			<b>TW PRG</b> <sup>2,3</sup>	8.16E-04	4.58E-02	1.59E-01	5.23E-01	4.71E-01	6.74E-01	6.63E-01	5.47E-01
<b>Well ID Number</b>	<b>Sample ID</b>	<b>Sampling Program</b>	<b>Date</b>								
M-92	M-92-Z	Ph A <sup>1</sup>	05/08/2007	<b>0.241 J</b>	<b>0.736 J-</b>	0.00575 U	<b>0.0354 B</b>	0.0198 U	<b>3.01</b>	<b>0.0466 J</b>	<b>1.94</b>

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
3. USEPA, 2004. Radionuclide Toxicity and Preliminary Remediation Goals (PRGs) for Superfund. <http://epa-prgs.ornl.gov/radionuclides/download.shtml>. August 4, 2004. Soil values are the outdoor worker values; water values are the tapwater values. For radionuclides with decay chains, the PRG for the decay chain was used.

**LOU 25 Table 9**  
**Groundwater Characterization Data - SVOCs**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>
			Well No.
			M-92
			Sample ID
			M-92
			Sample Date
			11/29/2006
SVOCs	Analytic Method	MCL <sup>2</sup> ug/L	ug/L
1,4-Dioxane	non-SIM	6.11E+00 c	10 U
2-Methylnaphthalene	non-SIM	6.20E+00 c,(jj)	10 U
2-Methylnaphthalene	SIM	6.20E+00 c,(jj)	
Acenaphthene	non-SIM	3.65E+02 c	10 U
Acenaphthene	SIM	3.65E+02 c	
Acenaphthylene	non-SIM	3.65E+02 c,(pp)	10 U
Acenaphthylene	SIM	3.65E+02 c,(pp)	
Anthracene	non-SIM	1.83E+03 c	10 U
Anthracene	SIM	1.83E+03 c	
Benz(a)anthracene	non-SIM	9.21E-02 c	10 U
Benz(a)anthracene	SIM	9.21E-02 c	
Benzo(a)pyrene	non-SIM	2.00E-01	10 U
Benzo(a)pyrene	SIM	2.00E-01	
Benzo(b)fluoranthene	non-SIM	9.21E-02 c	10 U
Benzo(b)fluoranthene	SIM	9.21E-02 c	
Benzo(g,h,i)perylene	non-SIM	1.83E+02 c,(w)	10 U
Benzo(g,h,i)perylene	SIM	1.83E+02 c,(w)	
Benzo(k)fluoranthene	non-SIM	9.21E-01 c	10 U
Benzo(k)fluoranthene	SIM	9.21E-01 c	
bis(2-Ethylhexyl)phthalate	non-SIM	6.00E+00	<b>3.2 J</b>
Butyl benzyl phthalate	non-SIM	7.30E+03 c	10 U
Chrysene	non-SIM	9.21E+00 c	10 U
Chrysene	SIM	9.21E+00 c	
Dibenz(a,h)anthracene	non-SIM	9.21E-03 c	10 U
Dibenz(a,h)anthracene	SIM	9.21E-03 c	
Diethyl phthalate	non-SIM	2.92E+04 c	10 U
Dimethyl phthalate	non-SIM	3.65E+05 c	10 U
Di-N-Butyl phthalate	non-SIM	3.65E+03 c	10 U
Di-N-Octyl phthalate	non-SIM	1.46E+03 c	10 U
Fluoranthene	non-SIM	1.46E+03 c	10 U
Fluoranthene	SIM	1.46E+03 c	
Fluorene	non-SIM	2.43E+02 c	10 U
Fluorene	SIM	2.43E+02 c	
Hexachlorobenzene	non-SIM	1.00E+00	10 U
Hexachlorobenzene	SIM	1.00E+00	
Indeno(1,2,3-cd)pyrene	non-SIM	9.21E-02 c	10 U
Indeno(1,2,3-cd)pyrene	SIM	9.21E-02 c	
Naphthalene	non-SIM	6.20E+00 c	5.0 U
Naphthalene	non-SIM	6.20E+00 c	10 U
Naphthalene	SIM	6.20E+00 c	
Nitrobenzene	non-SIM	3.40E+00 c	10 U

**LOU 25 Table 9 (continued)  
Groundwater Characterization Data - SVOCs**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>
Well No.			M-92
Sample ID			M-92
Sample Date			11/29/2006
SVOCs	Analytic Method	MCL <sup>2</sup> ug/L	ug/L
Octachlorostyrene	non-SIM	-- c	10 U
Phenanthrene	non-SIM	1.80E+03 (n)	10 U
Phenanthrene	SIM	1.80E+03 (n)	
Pyrene	non-SIM	1.83E+02 c	10 U
Pyrene	SIM	1.83E+02 c	
Pyridine	non-SIM	3.65E+01 c	20 U

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted.
  - (c) Equal to the USEPA Region 9 Preliminary Remediation Goals (PRGs) for tapwater (October, 2004).
  - (jj) Value for naphthalene used as surrogate for 2-methylnaphthalene based on structural similarities.
  - (pp) Value for acenaphthene used as surrogate for acenaphthylene based on structural similarities.
  - (w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.
  - (w) Value for anthracene used as surrogate for phenanthrene due to structural similarities.

**LOU 25 Table 10**  
**Groundwater Characterization Data - VOCs**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A
Well ID		M-92	M-92
Sample ID		M-92	M-92
Sample Date		11/29/2006	11/29/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L
Naphthalene	1.88E+02	5.0 U	5.0 U
1,1,1,2-Tetrachloroethane	7.28E+00	5.0 U	5.0 U
1,1,1-Trichloroethane	6.90E+03 (mm)	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	9.29E-01	5.0 U	5.0 U
1,1,2-Trichloroethane	1.61E+00	5.0 U	5.0 U
1,1-Dichloroethane	1.74E+03	5.0 U	5.0 U
1,1-Dichloroethene	4.13E+02	14	5.4
1,1-Dichloropropene	1.76E+00 (gg)	5.0 U	5.0 U
1,2,3-Trichlorobenzene	2.16E+02 (hh)	5.0 U	5.0 U
1,2,3-Trichloropropane	7.60E-02 (yy)	5.0 U	5.0 U
1,2,4-Trichlorobenzene	2.16E+02	5.0 U	5.0 U
1,2,4-Trimethylbenzene	1.70E+02	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	2.02E+00	5.0 U	5.0 U
1,2-Dichlorobenzene	4.00E+03 (mm)	5.0 U	5.0 U
1,2-Dichloroethane	6.03E-01	5.0 U	5.0 U
1,2-Dichloropropane	7.42E-01	5.0 U	5.0 U
1,3,5-Trimethylbenzene	6.97E+01	5.0 U	5.0 U
1,3-Dichlorobenzene	2.10E+03 (mm)	5.0 U	5.0 U
1,3-Dichloropropane	3.61E+02	5.0 U	5.0 U
1,4-Dichlorobenzene	7.87E+00	0.76 J	5.0 U
2,2-Dichloropropane	7.42E-01 (ii)	5.0 U	5.0 U
2-Butanone	1.13E+05	10 U	10 U
2-Chlorotoluene	5.60E+02	5.0 U	5.0 U
2-Hexanone	4.70E+04 (nn)	10 UJ	10 UJ
2-Methoxy-2-methyl-butane	--	5.0 U	5.0 U
4-Chlorotoluene	5.60E+02 (ww)	5.0 U	5.0 U
4-Isopropyltoluene	--	5.0 U	5.0 U
4-Methyl-2-pentanone	4.70E+04	10 U	10 U
Acetone	5.43E+04	10 U	10 U
Benzene	1.41E+00	5.0 U	5.0 U
Bromobenzene	9.22E+01	5.0 U	5.0 U
Bromochloromethane	1.83E+00 (qq)	5.0 U	5.0 U
Bromodichloromethane	1.83E+00	5.0 U	5.0 U
Bromoform	2.18E+02	5.0 U	5.0 U
Bromomethane	1.31E+01	10 UJ	10 UJ
Carbon tetrachloride	5.49E-01	5.0 U	5.0 U
Chlorobenzene	5.30E+02	5.0 U	5.0 U
Chloroethane	6.49E+00	5.0 UJ	5.0 UJ
Chloroform	4.70E-01	30	12
Chloromethane	1.56E+02	5.0 UJ	5.0 UJ
cis-1,2-Dichloroethene	1.46E+02	5.0 U	5.0 U
cis-1,3-Dichloropropene	1.76E+00 (gg)	5.0 U	5.0 U
Dibromochloromethane	2.55E+00	5.0 U	5.0 U
Dibromomethane	2.34E+02 (xx)	5.0 U	5.0 U
Dichlorodifluoromethane	3.08E+02	5.0 UJ	5.0 UJ
Ethyl t-butyl ether	3.64E+01 (kk)	5.0 U	5.0 U
Ethylbenzene	7.40E+03 (mm)	5.0 U	5.0 U
Ethylene dibromide	7.30E-02	5.0 U	5.0 U

**LOU 25 Table 10 (continued)  
Groundwater Characterization Data - VOCs**

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A
Well ID		M-92	M-92
Sample ID		M-92	M-92
Sample Date		11/29/2006	11/29/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L
Hexachlorobutadiene	2.21E+01	5.0 U	5.0 U
Isopropyl ether	--	5.0 U	5.0 U
Isopropylbenzene	2.00E+03 (zz)	5.0 U	5.0 U
Methyl tert butyl ether	3.64E+01	5.0 U	5.0 U
Methylene chloride	2.05E+01	5.0 U	5.0 U
N-Butylbenzene	2.19E+03 (mm)	5.0 U	5.0 U
N-Propylbenzene	2.19E+03 (mm)	5.0 U	5.0 U
sec-Butylbenzene	1.63E+03 (mm)	5.0 U	5.0 U
Styrene	1.80E+04 (mm)	5.0 U	5.0 U
t-Butyl alcohol	--	10 UJ	10 UJ
tert-Butylbenzene	1.97E+03 (mm)	5.0 U	5.0 U
Tetrachloroethene	1.31E+00	5.0 U	5.0 U
Toluene	2.20E+03 (mm)	5.0 U	5.0 U
trans-1,2-Dichloroethylene	--	5.0 U	5.0 U
trans-1,3-Dichloropropene	1.76E+00 (gg)	5.0 U	5.0 U
Trichloroethene	1.15E-01	3.8 J	5.0 U
Trichlorofluoromethane	1.28E+03 (mm)	5.0 UJ	5.0 UJ
Vinylchloride	7.46E-01	5.0 UJ	5.0 UJ
Xylene (Total)	9.00E+02 (mm)	10 U	10 U

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.

2. U.S. EPA Maximum Contaminant Level (MCL) values unless noted

(gg) Value for 1,3-dichloropropene used as surrogate for 1,1-dichloropropene, cis-1,3-dichloropropene and trans-1,3-dichloropropene based on structural similarities.

(hh) Value for 1,2,4-trichlorobenzene used as surrogate for 1,2,3-trichlorobenzene based on structural similarities.

(yy) PRG table (c) lists both cancer and non-cancer endpoint-based values. The cancer endpoint-based values were selected, as the cancer endpoint-based values are lower than the noncancer endpoint-based values.

(ii) Value for 1,2-dichloropropane used as surrogate for 2,2-dichloropropane based on structural similarities.

(nn) Value for methyl isobutyl ketone used as surrogate for 2-hexanone based on structural similarities.

(ww) Value for 2-chlorotoluene used as surrogate for 4-chlorotoluene based on structural similarities.

(qq) Value for bromodichloromethane used as surrogate for bromochloromethane due to structural similarities.

(o) See footnote (b). Listed under synonym monochlorobenzene.

(xx) Value for methylene bromide used as surrogate for dibromomethane based on structural similarities.

(kk) Value for methyl tertbutyl ether (MTBE) used as surrogate for ethyl-tert-butyl ether (ETBE) based on structural similarities.

(zz) Isopropyl benzene is listed as cumene (isopropylbenzene) in the PRG table.



## Notes for Phase A Data Tables

Process Hardware Storage Area  
Tronox Facility - Henderson, Nevada

Blank	Not analyzed.
<b>Bold</b>	Bold values are constituents detected above the laboratory sample quantitation limit.
Gray	Grayed out values are non-detected values with the laboratory sample quantitation limits shown.
B	The result may be a false positive totally attributable to blank contamination.
D	Dissolved Metals
DO	Dissolved Oxygen
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J-	The result is an estimated quantity and the result may be biased low.
J+	The result is an estimated quantity and the result may be biased high.
JB	The result may be biased high partially attributable to blank contamination.
JK	The result is an estimated maximum possible concentration.
R	The result was rejected and unusable due to serious data deficiencies. The presence or absence of the analyte cannot be verified.
S	Soluble metals
T	Total Metals
U	The analyte was analyzed for, but was not detected above the laboratory sample quantitation limit.
UJ	The analyte was not detected above the laboratory sample quantitation limit and the limit is approximate.
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
ml/min	Milliliters per minute
ng/kg	Nanogram per kilogram
nm	Not measured.
NTUs	Nephelometric Turbidity Units
ORP	Oxidation-reduction potential
pCi/g	PicoCuries per gram
pCi/L	PicoCuries per liter
s/gPM10	Revised protocol structures per gram PM10 fraction dust.
TEF	Toxic Equivalency Factor
TEQ	Toxic Equivalent Concentration
ug/kg	Micrograms per kilogram
ug/L	Micrograms per liter
umhos/cm	MicroSiemens per centimeter
L	Sample ID suffix indicating the sample was collected using low low-flow pumping rates (100-150 ml/min).
F	Sample ID suffix indicating the sample was collected using low-flow pumping rates (150-480 ml/min) and field filtered.
Z	Sample ID suffix indicating the sample was collected using low-flow pumping rates (150-480 ml/min).
*	No analytical data is available for this sample due to a laboratory error.
(a)	Calculated assuming 0 for non-detected congeners and 2006 toxic equivalency factors (TEFs).
(b)	Calculated assuming 1/2 detection limit as proxy for non-detected congeners and 2006 TEFs.
--	MSSL or PRG not established