

**Summary of Available Data for LOUs 16, 17, 18, 19, 52, 53, and 57  
Multiple LOUs in AP Plant Area  
Facility – Henderson, Nevada**

**Name of Facility:** **LOUs 16 and 17 – Ponds AP-1 through AP-3 and Associated Transfer Lines  
LOU 18 – Pond AP-4  
LOU 19 – Ponds AP-5 and AP-6  
LOU 52 – AP Plant Screening Building, Dryer Building and Associated Piping  
LOU 53 – AP Plant Area Tank Farm  
LOU 57 – AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines**

**Goal of Closure:** LOUs 16, 17, 18, 52, 53, and 57

- Closure for future commercial/industrial use.

LOU 19 (Ponds AP-5 and AP-6)

- These ponds are in the process of being decommissioned; therefore, closure will be requested once the decommissioning is complete.

**Site Investigation Area:** **LOUs 16, 17 and 18 (Ponds AP-1 through AP-3 and Associated Transfer Lines and Pond AP-4):**

- Size [Ref. 4]:
  - Pond AP-1: Approximately 14,000 square (sq.) feet of surface area and 370,000-gallon capacity.
  - Pond AP-2: Approximately 14,000 sq. feet of surface area and 400,000-gallon capacity.
  - Pond AP-3: Approximately 2,000 sq. feet of surface area and 65,000-gallon capacity.
  - Pond AP-4: Approximately 20,000 sq. feet of surface area and 720,000-gallon capacity.
- Location: Central portion of the Site, south of Beta Ditch (LOU 5).
- Current Status/Features: LOUs 16, 17, and 18, which consist of Ponds AP-1 through 4 and associated transfer lines, are no longer in service and the pond linings have been removed.

**LOU 19 Ponds AP-5 and AP-6:**

- Size [Ref. 4]:
  - Pond AP-5: Approximately 35,000 sq. feet (0.8 acre) of surface area and 1,817,000-gallon capacity.
  - Pond AP-6: Approximately 450 feet by 150 feet (1.6 acres) [Not originally part of LOU 19, but added for completeness].
- Location: Central portion of the site, north of the Beta Ditch.

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- Current Status/Features: Pond AP-5 is in service and contains residual solids from the other five AP ponds. AP-5 is in the process of being decommissioned. Approximately 870 tons of perchlorate have been dissolved and removed from the pond. It is anticipated that the remaining inert solids will be removed from the pond in 2009. Pond AP-6 is empty and the liner remains in place. Pond AP-6 serves as a standby pond. It could receive materials should other on-site pond develop leaks.

**LOU 52 AP Plant Screening Building, Dryer Building and Associated Piping:**

- Size: Approximately 35 feet by 75 feet.
- Location: Central portion of the site, south of Beta Ditch.
- Current Status/Features: LOU 52 which forms a part of the AP Plant is not currently active. Portions of the structure are still present.

**LOU 53 AP Plant Area Tank Farm :**

Size: Approximately 18,805 square feet (0.4 acres).

- Location: Central portion of site, south of Beta Ditch (LOU 5).
- Current Status/Features: AP Plant Area Tank Farm is not currently active, although some tanks remain.

**LOU 57 AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines:**

- Size: Transfer lines located within an area approximately 1,500 feet by 825 feet (28.5 acres).
- Location: Central portion of the site, north of the steam plant.
- Current Status/Features: LOU 57, which consists of transfer lines extending from the AP Plant Tank Farm area to the main chlorate process area in Unit 3, is no longer in service and the associated pipelines are being demolished.

**Descriptions:**

**LOUs 16, 17, and 18 (Ponds AP-1 through AP-3 and Associated Transfer Lines and Pond AP-4):**

- The four lined ponds were used to temporarily store solutions from the AP production process and AP plant cooling towers for recycling to the process [Ref. 6]. Two other AP ponds (Ponds AP-5 and AP-6) are described under LOU 19.

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- Process solutions routed to the ponds included sodium perchlorate purification and filter wash liquor from ammonium perchlorate purification [Ref. 6].
- Ponds AP-1, AP-3, and AP-4 were installed with double liner systems consisting of a 40-mil high density polyethylene (HDPE) bottom, side underliner of 400 gm/m<sup>2</sup> weight polypropylene geotextile, and top liner of 60-mil HDPE [Ref. 6].
- Pond AP-2 was a single-lined pond with a bottom liner of Polyvinyl Chloride (PVC) and a side underliner of reinforced butyl rubber [Ref. 5]. Pond AP-2 was decommissioned after fall of 1995 and the liner was removed and disposed of at the Apex Industrial Waste Landfill [Ref. 5].
- The liners for Ponds AP-2 and AP-3 were replaced with single liners between 1979 and June 1980 [Ref. 6].
- Ponds AP-1 through AP-3 were constructed in 1974 [Ref. 5]. Pond AP-4 was constructed in circa 1983. All four ponds were removed from service, cleaned, and emptied in the early 2000's [Ref. 7].
- All four ponds received various wastes from sodium perchlorate and ammonium perchlorate processes and AP Plant Cooling Tower contents were pumped between the four ponds. The ponds were used to concentrate the waste stream by evaporation and return it as high strength liquor to the process [Ref. 6].
- Pond AP-4 functioned as a surge basin to store unusual flows from the AP Plant Cooling Towers. Pond AP-4 also received salt crystallizer washout and minor flows from the ammonium perchlorate process [Ref. 6].
- Sludge was removed from all four ponds circa 1979, 1983, 1989, and 1990 and the waste was disposal offsite [Ref. 6].
- Prior to 1974, wastes were discharged to the Beta Ditch and BMI ponds [Ref. 6].

**LOU 19 Ponds AP-5 and AP-6:**

- Pond AP-5 was used to temporarily store solutions from the AP production process and AP Plant Cooling Towers for recycling to the process [Ref. 6].
- Pond AP-5 was installed with a double-lined system consisting of a 40-mil HDPE bottom liner, a polypropylene geotextile side liner, and 60-mil HDPE upper liner [Ref. 5].
- Pond AP-5 also received overflows from the AP Cooling Tower (ammonium, perchlorate, and sodium chloride) [Ref. 6].

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- Pond AP-5 was constructed in 1983 and was removed from service in 2001 [Ref. 7].
- In accordance with the April 13, 2005 Administrative Order on Consent, transfers of perchlorate from pond AP-5 to the GW-11 pond were initiated in August 2006 as part of the decommissioning of Pond AP-5. Of the approximately 1000 tons of perchlorate thought to be in Pond AP-5 [Ref. 3], a total of 874 tons of perchlorate had been transferred through April 2008. It is expected that transfers will continue through mid-2009 when the residual inert pond solids will be removed, washed, filtered and shipped off-site for disposal. The liner and any impacted solids beneath the liner will be removed and shipped off-site for disposal.
- Pond AP-6 was removed from service circa 2001. The double-lined pond is empty. Once Pond AP-5 is decommissioned, the Pond AP-6 can be demolished.

**LOU 52 AP Plant Screening Building, Dryer Building and Associated Piping:**

- LOU 52 is part of the original ammonium perchlorate plant and consists of [Ref. 6]:
  - The product screening building (the D-2 building);
  - The dryer building; and
  - a common sump and floor drain system.
- The sump is located in a topographically low area, adjacent to the northern side of the dryer building [Ref. 6].
- The dryer building, screening building, and the sump were constructed during the early 1950's [Ref. 6].
- Washdown operations were conducted at the screening and dryer buildings, and the sump collected the washdown water [Ref. 6].
- The sump was constructed of fiberglass-reinforced plastic (FRP) and is equipped with automatic level control and pumping devices [Ref. 6].
- Poor drainage patterns of the concrete floors in the two buildings caused the wash water to flow out of the building, away from the floor drains [Ref.6].
- Soil exhibiting white stains caused by deposition of ammonium perchlorate was collected and recycled for perchlorate recovery [Ref. 6].
- Secondary containment was installed around the sump and a lined collection ditch was constructed around the perimeter of the building [Ref. 6].

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**LOU 53 AP Plant Area Tank Farm :**

- The AP Plant Area Tank Farm contained open-top and closed-top tanks for process solution storage including [Ref. 2]:
  - Two AP storage tanks on concrete pads built in the early 1950s;
  - A sodium perchlorate tank, a sodium hydroxide tank and a hydrogen peroxide tank constructed in early 1950s;
  - Two new AP storage tanks built in 1991 with secondary containment
  - A sodium hydroxide tank constructed in 1991 with secondary containment.
- The deteriorated concrete pad did not route releases to the central sump constructed of sloped asphalt with a fiberglass reinforced tank [Ref. 6].
- The 1991 upgrades included with installation of new AP and sodium hydroxide tanks with secondary containment and repairs to the pad [Ref. 6].

**LOU 57 AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines :**

Transfer lines to Ponds:

- Transfer lines extended from the AP Plant cooling Towers to the five AP process ponds, between these five ponds, and back to the AP process [Ref. 6].

Transfer lines to Sodium Chlorate Process:

- Transfer lines extended from the AP Plant Tank Farm (LOU 53) to the main chlorate process in Unit 3 [Ref. 6].
  - These lines consisted of flexible HDPE pipe routed over long distance and were above ground except for localized segments below ground
  - The lines ran south from the AP Plant Tank Farm area and headed east just south of the steam plant. At 9<sup>th</sup> Street, the line ran south to the northwest corner of the Unit 5 building. From here, the line turned west and terminated at Unit 3.
- The transfer lines and ponds were in service from 1974 to 1995 (replacing the prior practice of discharge to Beta Ditch) [Ref. 6].
- Minor leaks from pipes were repaired as needed [Ref. 6].
- Kleinfelder did not observe visual evidence of impacts to soils [Ref. 6].

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<b>Process Waste Stream Associated With LOUs 16, 17 and 18</b>	<b>Known or Potential Constituents Associated with LOUs 16, 17, &amp; 18</b>
<p>Filter Cake from Sodium Perchlorate purification and filtration process routed to Ponds AP-1 and AP-2 [Ref. 6].</p>	<ul style="list-style-type: none"> <li>• Perchlorate</li> <li>• Chromic hydroxide</li> <li>• Calcium carbonate</li> <li>• Metals (hexavalent chromium, calcium and, sodium)</li> <li>• Wet chemistry analytes</li> <li>• Chlorate</li> </ul>
<p>Ammonium perchlorate filter wash liquor routed to Ponds AP-1 and AP-2 [Ref. 6].</p>	<ul style="list-style-type: none"> <li>• Perchlorate</li> <li>• Calcium carbonate</li> <li>• Calcium sulfate</li> <li>• Magnesium sulfate</li> <li>• Hexavalent chromium</li> <li>• Diatomaceous earth</li> <li>• Wet chemistry analytes</li> </ul>
<p>Waste streams from the dissolving tank, dryer feed screw, and cyclone dust (Rotoclone) routed to AP-1, AP-2, and AP-3 [Ref. 6].</p> <ul style="list-style-type: none"> <li>• Rotoclones are water bath emission control devices. Potential infiltration to subsurface soils and groundwater.</li> <li>• Possible impacts to surrounding soils from surface releases.</li> </ul>	<ul style="list-style-type: none"> <li>• Perchlorate</li> <li>• Ammonia</li> <li>• Calcium carbonate</li> <li>• Calcium sulfate</li> <li>• Magnesium sulfate</li> <li>• Hexavalent chromium</li> <li>• Diatomaceous earth</li> <li>• Wet chemistry analytes</li> </ul>
<p>Washwater from sodium chloride and AP crystallizers and AP centrifuges [Ref. 6].</p>	<ul style="list-style-type: none"> <li>• Sodium chloride</li> <li>• Wet chemistry analytes</li> <li>• Ammonia</li> <li>• Perchlorate</li> </ul>
<p>Overflow from the AP Plant Cooling Tower routed via underground line to Pond AP-4 [Ref. 6].</p>	<ul style="list-style-type: none"> <li>• Sulfates</li> <li>• Carbonates</li> <li>• Phosphates</li> <li>• Chloride</li> <li>• Sulfide</li> <li>• Perchlorate</li> <li>• Chlorate</li> <li>• Ammonia</li> <li>• Hexavalent chromium</li> <li>• Metals</li> </ul>

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<b>Process Waste Stream Associated With LOU 19</b>	<b>Known or Potential Constituents Associated with LOU 19</b>
AP Plant Cooling Tower discharges [Ref. 6]	<ul style="list-style-type: none"> <li>• Metals</li> <li>• Hexavalent chromium</li> <li>• Perchlorate</li> <li>• Chlorate</li> <li>• Ammonia</li> <li>• Wet chemistry analytes</li> </ul>
<b>Process Waste Stream Associated With LOU 52</b>	<b>Known or Potential Constituents Associated with LOU 52</b>
Washdown water from drying and screening process to the sump [Ref. 6].	<ul style="list-style-type: none"> <li>• Metals</li> <li>• Perchlorate</li> <li>• Ammonia</li> <li>• Wet chemistry analytes</li> <li>• Hexavalent chromium</li> </ul>
<b>Process Waste Stream Associated With LOU 53</b>	<b>Known or Potential Constituents Associated with LOU 53</b>
Process fluids that leaked or overflowed from the storage tanks and washwater from washed-down concrete pad [Ref. 6].	<ul style="list-style-type: none"> <li>• Perchlorate</li> <li>• Metals (including hexavalent chromium)</li> <li>• Wet chemistry analytes</li> <li>• Ammonia</li> <li>• Chlorate</li> <li>• Caustics (sodium hydroxide)</li> </ul>
<b>Process Waste Stream Associated with LOU 57</b>	<b>Known or Potential Constituents Associated with LOU 57</b>
AP Plant Cooling Tower overflow [Ref. 6]	<ul style="list-style-type: none"> <li>• Ammonium Perchlorate</li> <li>• Metals</li> <li>• Hexavalent chromium</li> <li>• Wet chemistry analytes</li> </ul>
Leaks from transfer lines and surface impoundments containing process fluids including filter wash liquor from sodium perchlorate purification process, slurried filter cake and solids from dissolving tank, dryer feed screw and cyclone, and washwater from crystallizers and centrifuges [Ref. 6].	<ul style="list-style-type: none"> <li>• Perchlorate</li> <li>• Metals (chromium, and iron)</li> <li>• Wet chemistry analytes</li> <li>• Ammonia</li> </ul>

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Spent caustic scrubbing solution from chlorine gas scrubbing operation. Pre-1976 discharged to Beta Ditch and post-1976 recycled to sodium chlorate process in Unit 3 [Ref. 6].	<ul style="list-style-type: none"> <li>• Sodium chloride and sodium hypochlorite</li> <li>• Metals</li> <li>• Perchlorate</li> <li>• Wet chemistry analytes</li> </ul>
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**Overlapping or Adjacent LOUs:**

- The following LOUs overlap or are adjacent to LOU 57. (Note that LOU 57 is the large area used in describing overlapping or adjacent LOUs rather than repeating the discussion for each LOU within the LOU 57 boundaries.)

Overlapping LOUs

- LOU 5 (Beta Ditch) – Runs along the length and in the middle of LOU 57.
- LOU 16 and 17 (Ponds AP-1, AP-2, AP-3 and Transfer Lines) – Overlaps the central portion of LOU 57.
- LOU 18 (Pond AP-4) – overlaps with the eastern portion of LOU 57.
- LOU 19 (Pond AP-5) – Overlaps the northern portion of LOU 57.
- LOU 52 (AP Plant Screening Building, Dryer Building and Sump) – Overlaps the southwestern corner of LOU 57.
- LOU 53 – (AP Plant Tank Farm Area) – Overlaps the southern portion of LOU 57.
- LOU 60 (Acid Drain System) – Overlaps LOU 57 from the southeastern to the northwestern corner.

Adjacent LOUs

- LOU 20 (Pond C-1 and Associated Piping) – Located to the east (cross-gradient) of LOU 57.
- LOU 30 (AP Area Pad-35) – Located north (downgradient) of LOU 57.
- LOU 31 (Drum Recycling Area) – Located north (downgradient) of LOU 57.
- LOU 39 (Satellite Accumulation Point- AP Maintenance Shop) - Located southwest (upgradient) of LOU 57.

LOUs 20 and 39 are cross-gradient and LOUs 30 and 31 are downgradient of LOU 57 and are not considered to affect LOU 57; therefore, the addition of other chemical classes to the proposed Phase B analytical plan for LOU 57 is not required. For detailed information on the LOUs listed above, please refer to the specific LOU data package.



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**LOUs Potentially Affecting Soils in LOU 57:**

- LOU 5: Beta Ditch was used to convey process waste streams from the southern portion of the Site as well as from the adjacent property to the west. Effluent along Beta Ditch flowed from the west continuing off-site to the east. Potential surface releases from LOU 5 may have occurred that affected LOU 57; however, no surface releases have been documented. Prior to 1976, AP Plant wastes were also discharged into the Beta Ditch.
- LOUs 16, 17, 18, 19 and 53: LOUs 16 through 19 consist of Ponds AP-1 through 5 and associated pipelines and LOU 53 is the AP Plant Tank Farm. Waste from various AP Plant processes was routed through these pipelines and was discharged into these ponds. Tanks in LOU 53 stored process liquids. As LOU 57 encompasses all these LOUs, any leaks in the pipelines, ponds, or tanks would potentially affect LOU 57.
- LOU 52: LOU 57 also encompasses LOU 52. Washwater from the building associated with LOU 52 would potentially flow away from the drainage system or overflow the sump and migrate to LOU 57.
- LOU 60: The Acid Drain System passing diagonally through LOU 57 carried effluent from onsite and offsite sources to the acid effluent neutralization plant. Potential releases from LOU 60 may have occurred that affected LOU 57; however, no releases have been documented.

With the exception of LOUs 5 and 60, known or potential chemical classes that are associated with all the above mentioned LOUs are consistent with those listed for LOU 57. LOU 5 contained organics and pesticides; therefore, VOC, SVOC, and organochlorine pesticide chemical classes have been added to the analytical plan for LOU 57. LOUs 5 and 60 may have been impacted by cyanide from operations at LOU 62; therefore, cyanide has been added to the list of analytes for LOUs 16, 17, 18, 19, 52, 53, and 57.

For detailed information on these LOUs, please refer to the specific LOU data package.

**Known or Potential Chemical Classes:**

- Metals
- Cyanide
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes

**Known or Potential Release Mechanisms:**

- Possible impacts to surrounding soils from surface releases.

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- Potential migration through cracked/deteriorated liners, concrete, or asphalt to surrounding soils.
- Potential infiltration to subsurface soils and groundwater.

**LOU 16, 17 and 18 (Ponds AP-1 through AP-3 and Associated Transfer Lines and Pond AP-4)**

- A leak was reported from Pond AP-2 in 1979 and the liner was replaced prior to June 1980 [Ref. 4].
- By late 1983, frequent patching was required to mitigate leaks in Ponds AP-1 and AP-3. These liners were replaced with new double liner systems [Ref. 4].

**LOU 52 AP Plant Screening Building, Dryer Building and Associated Piping**

- Surface flow and possible infiltration to the underlying soils and groundwater from overflowing sump (none documented).
- Water containing ammonium perchlorate is reported to have been released by two mechanisms [Ref. 6]:
  - Flow of the wash water to the concrete and asphalt floors outside the drying and screening buildings and away from the drains due to poor drainage patterns.
  - Sump overflows due to excessive wash down water.
- White stains caused by deposition of ammonium perchlorate were observed on the concrete and asphalt floors outside both buildings [Ref. 6].

**LOU 53 AP Plant Area Tank Farm**

- Multiple small, infrequent non-reportable quantity releases from 1950's era tanks over use history. Releases resulted from pinhole leaks in the tank walls and discharges occurred to the concrete pad and surrounding soils [Ref. 6].
- Sodium hydroxide releases to surrounding soil during sodium hydroxide dilution process [Ref. 6].
- Releases impacted soils surrounding the concrete pad; visibly stained soils present in the AP Plant Tank Farm area [Ref. 6].

**LOU 57 AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines**

- Pre-1976: discharge to Beta Ditch [Ref. 6].

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- Post-January 1976: Multiple small, non-reportable quantity releases from pipeline leaks to the ground along the pipeline route [Ref. 6].
- Occasionally, the AP solution lines to and from the AP Plant Cooling Towers and between the process area and the ponds released AP solution to the ground surface [Ref. 6].
- Releases from poor connections in the HDPE lines and at the pumping station couplings have also contributed to small releases of AP solution [Ref. 6].
- Visibly stained soils were observed along portions of the transfer lines, in the immediate area of the AP Plant Cooling Tower, and in the immediate area of the transfer line pump stations [Ref. 6].

**Results of Historical Sampling:**

- Local wells (M-17, M-25, and M-89) were sampled between 1996 and 2002 and soil beneath Ponds AP-1, AP-2, and AP-3 were analyzed for chromium in 1993 [Ref. 1].
- Pond sludge and liquids were tested in 1993 for TCLP chromium and all samples reported results less than 5 mg/l [Refs. 1 and 5].
- Analytical results are summarized in LOUs 16, 17, 18, 19, 52, 53, and 57 Table 22 (see attached) [Ref. 3].

**Did Historical Samples Address Potential Release?**

- Not completely. Historical borings are limited in depth and constituents tested, and are not representative of the full extent of the LOU.

**Summary of Phase A SAI:**

Soil

- The closest borings (SA15 and SA16) are located within LOU 57 and were specifically sampled to evaluate LOU 57 and LOUs 16, 17, 18, respectively [Ref. 2].

Groundwater

- A groundwater grab sample (GWSA5) was collected from soil boring SA15. The closest well sampled (M-89) is located within LOU 57 approximately 65 feet to the north (downgradient) of LOUs 16, 17 and 18 and was specifically sampled to evaluate these LOUs [Ref. 2].

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Chemical classes detected in Phase A soil borings from SA15 and SA16 include the following:

- Metals
- Hexavalent chromium
- Perchlorate
- Wet chemistry analytes
- VOCs
- Organochlorine pesticides
- Dioxins/furans
- Radionuclides
- Asbestos

As a result of the Phase A data, the Phase B analytical plan for samples collected from LOUs 16, 17, 18, 19, 52, 53, and 57 will be expanded to include analyses for organochlorine pesticides, VOCs, dioxins/furans, radionuclides, and asbestos.

- Analytical results for soil and groundwater from the Phase A sampling event are summarized in LOUs 16, 17, 18, 19, 52, 53, and 57 Tables 1 through 21 (see attached) [Ref. 2].

**Are Phase A Sample Locations in “Worst Case” Areas?**

- No

**Is Phase B Investigation Recommended?**

- Yes

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

The Phase B investigation for LOUs 16, 17, 18, 19, 52, 53, and 57 consists of collecting soil samples from the following 23 locations:

- Seven (7) soil borings will be drilled within LOUs 16, 17, 18, 52, and 53.
- Eleven (11) soil borings will be drilled within LOU 57 but outside of any pond boundary.
- Three (3) soil borings will be drilled south (upgradient) of LOU 57.
- Two (2) soil borings will be drilled north (downgradient) of LOU 57.
- All 23 borings along with the analytical program to evaluate soil samples from LOUs 16, 17, 18, 19, 52, 53, and 57 are listed on **Table A – Soil Sampling and Analytical Plan for LOUs 16, 17, 18, 19, 52, 53, and 57.**
- Soil sample locations consist of both judgmental and randomly-placed locations.

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- Judgmental sample locations:
  - Designed to evaluate soil for known or potential chemical classes associated with LOUs, based on the known process waste streams.
  - Twenty (20) of the 23 sample locations are judgmental locations and include soil borings SA123, SA70, SA73, SA86, SA155, SA63, SA49, SA198, SA197, SA64, SA60, SA105, SA94, SA104, SA196, SA113, SA129, SA65, SA175, and SA58.
- Random sample grid locations:
  - Designed to assess whether unknown constituents associated with the LOUs are present.
  - Three (3) of the 23 sample locations are randomly-placed locations and include soil borings RSAM5, RSAM6, and RSAM7.
  - All 23 borings along with the analytical program to evaluate soil samples from LOUs 16, 17, 18, 19, 52, 53, and 57 are listed on **Table A – Soil Sampling and Analytical Plan for LOUs 16, 17, 18, 19, 52, 53, and 57.**

**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
- Cyanide
- Wet chemistry analytes
- Perchlorate

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

- VOCs
- Organochlorine pesticides
- Dioxins/furans
- Asbestos

Random sample grid locations will be analyzed for the following list of Phase A site related chemicals for wide coverage purposes:

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

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- SVOCs
- TPH-DRO/ORO
- Organochlorine pesticides
- Dioxins/Furans
- Asbestos
- Radionuclides

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

The Phase B groundwater investigation of LOUs 16, 17, 18, 19, 52, 53, and 57 consists of collecting groundwater samples from eleven (11) locations to evaluate local groundwater conditions and as part of the Site-wide evaluation of constituent trends in groundwater.

- Wells I-AR, M-110, M-89, M-22A, M-11A, and M-17A with in LOU 57 will be used to evaluate local and area-wide groundwater conditions.
- Wells M-25 and M-38 north (downgradient) of LOU 57 will be used to evaluate local and area-wide groundwater conditions.
- Wells M-76, M-75, and M-2A south (upgradient) of LOU 57 will be used to evaluate local and area-wide groundwater conditions.
- The sampling wells and the analytical program to evaluate groundwater samples associated with LOUs 16, 17, 18, 19, 52, 53, and 57 are listed on **Table B – Groundwater Sampling and Analytical Plan for LOUs 16, 17, 18, 19, 52, 53, and 57.**

**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:**

Soil gas samples will be collected from six (6) locations to evaluate area conditions for the presence of vapor-phase VOCs in the vadose zone.

- SG25 and SG26 (companion to well M-89) are located to evaluate area conditions for the presence of vapor-phase VOCs in the vadose zone.

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- SG82, SG81, SG80, and SG79 are located to evaluate VOCs in the vadose that may be due to releases from Ponds AP-1 through AP-4.

Details of the soil gas sampling program are contained in the NDEP-approved (March 26, 2008) Soil Gas Survey Work Plan, Tronox LLC, Henderson, Nevada, dated March 20, 2008.

**Proposed Phase B Constituents List for Soil Gas:**

- VOCs (EPA TO-15).

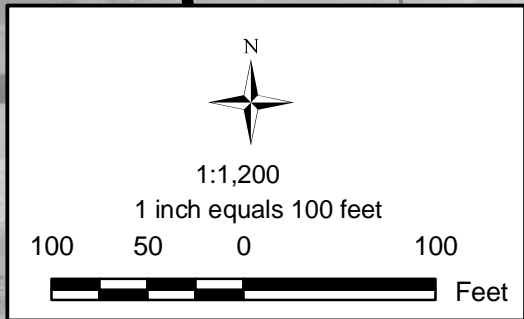
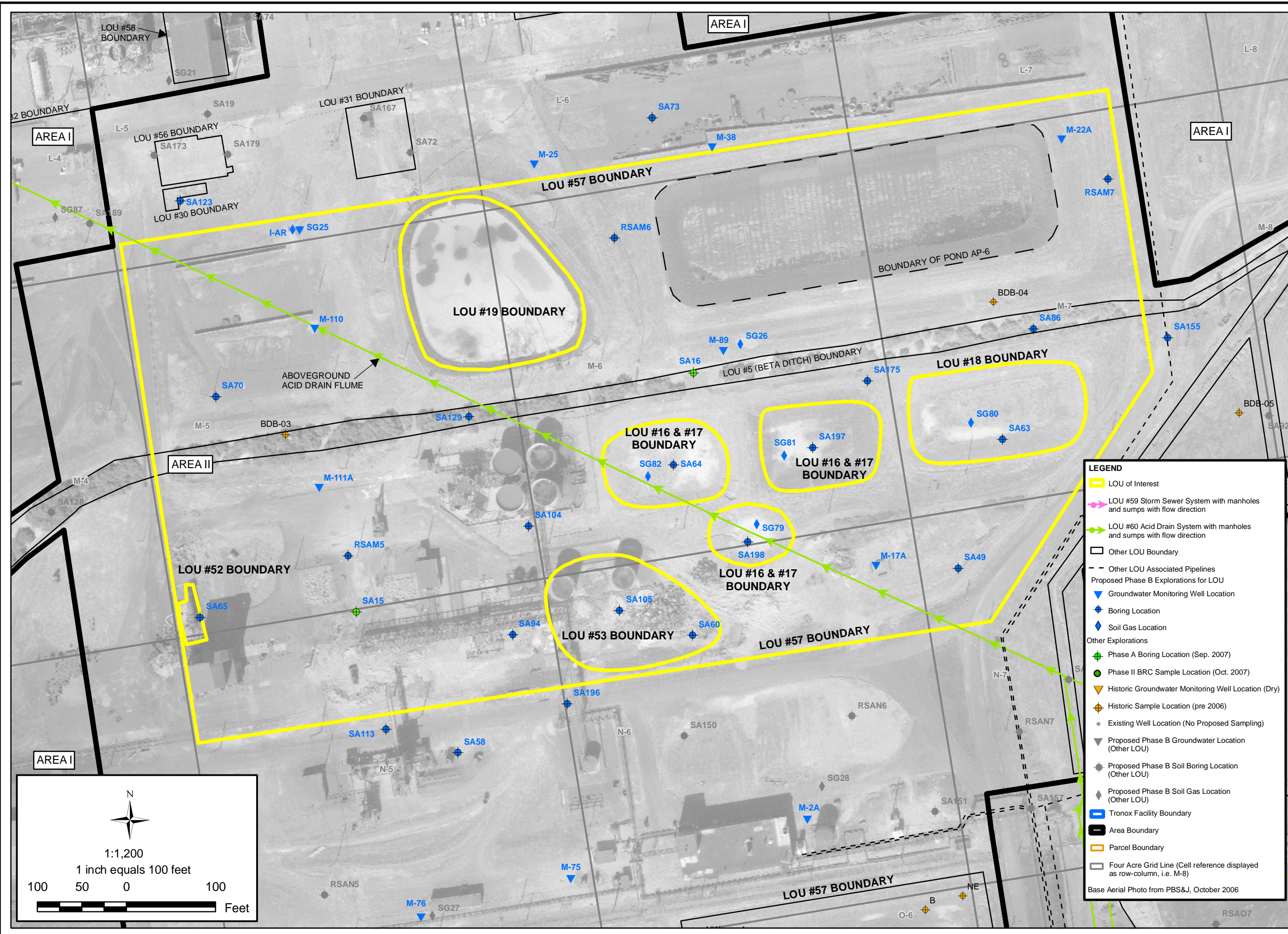
**References:**

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5. Kerr-McGee, 1996b, Response to Letter of Understanding, Henderson, Nevada, October 1996.
6. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).
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**Summary of Available Data for LOUs 16, 17, 18, 19, 52, 53, and 57**  
**Multiple LOUs in AP Plant Area**  
Facility – Henderson, Nevada

**LOU Map**

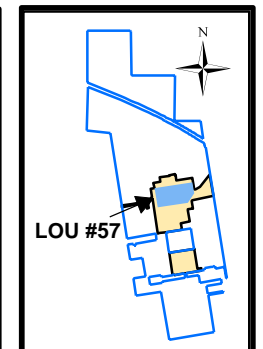




**LEGEND**

- LOU of Interest
- LOU #59 Storm Sewer System with manholes and sumps with flow direction
- LOU #60 Acid Drain System with manholes and sumps with flow direction
- Other LOU Boundary
- Other LOU Associated Pipelines
- 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 Groundwater Monitoring Well Location (Dry)
  - 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



DESIGNED BY:	G. Hels
DRAWN BY:	M. Scop
CHECKED BY:	G. Hels
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**SAMPLE LOCATIONS FOR LOU #57, #16, #17, #18, #19, #52 & #53 AP PLANT AREA**

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

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/11/2008	04020-023-430

FIGURE NUMBER:	1
SHEET NUMBER:	X



**Summary of Available Data for LOUs 16, 17, 18, 19, 52, 53, and 57**  
**Multiple LOUs in AP Plant Area**  
Facility – Henderson, Nevada

**Sampling and Analytical Plans for LOUs 16, 17, 18, 19, 52, 53, and 57**

Table A – Soil Sampling and Analytical Plan for LOUs 16, 17, 18, 19, 52, 53, and 57

Table B – Groundwater Sampling and Analytical Plan for LOUs 16, 17, 18, 19, 52,  
53, and 57



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)	TPH-GRO (EPA 8015B)	VOCs <sup>2</sup> (EPA 8260B)	Wet Chemistry <sup>3</sup>	Total Cyanide (EPA 9012A)	OCPs <sup>4</sup> (EPA 8081A)	SVOCs <sup>5</sup> (EPA 8270C)	Radio-nuclides <sup>6</sup>	Dioxins/Furans <sup>7</sup>	Asbestos <sup>8</sup> EPA/540/R-97/028	Geo-technical Tests <sup>10</sup>	Rationale
<b>Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 2 (M-2) and ending with the southeastern most grid in Area 2 (S-7).</b>																			
M-7	5, 57		SA86-0.5	0.5	X	X	X	X		X	X	X	X	X	X	X			AP Plant SIs and Transfer Lines). Located in the bottom of LOU 5 to evaluate upstream sources, and for general coverage of LOU 57.
M-7	5, 57		SA86-10	10	X	X	X	X		X	X	X	Hold	X	X	X			
M-7	5, 57		SA86-20	20	X	X	X	X		X	X	X	Hold	X	X	X			
M-7	5, 57		SA86-25	25	X	X	X	X		X	X	X	X	X	X	X			
M-7	22, 23, 57	SA155	SA155-0.0	0.0													X		Boring located to evaluate LOU 22 (Pond WC-West Associated Piping), LOU 23 (Pond WC-East Associated Piping), and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). To evaluate potential LOU 22 and 23 piping releases and for general stepout coverage of LOU 57.
M-7	22, 23, 57		SA155-0.5	0.5	X	X	X			X	X		X		X	X			
M-7	22, 23, 57		SA155-10	10	X	X	X			X	X		X		X	X			
M-7	5, 57	RSAM7	RSAM7-0.0	0.0													X		Boring located to evaluate LOU 5 (Beta Ditch) and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Randomly located to provide downslope overflow releases from LOU 5, general coverage for LOU 57, and for site wide coverage.
M-7	5, 57		RSAM7-0.5	0.5	X	X	X	X		X	X		X	X	X	X			
M-7	5, 57		RSAM7-10	10	X	X	X	X		X	X		Hold	X	X	X			
M-7	5, 57		RSAM7-20	20	X	X	X	X		X	X		Hold	X	X	X			
M-7	5, 57		RSAM7-30	30	X	X	X	X		X	X		Hold	X	X	X			
M-7	5, 57		RSAM7-35	35	X	X	X	X		X	X		X	X	X	X			
N-5	57	SA58	SA58-0.0	0.0													X		Boring located to evaluate LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located as an upslope stepout for general coverage of LOU 57.
N-5	57		SA58-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-5	57		SA58-10	10	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA58-20	20	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA58-30	30	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA58-35	35	X	X	X			X	X		X	X	X	X			
N-5	57	SA94	SA94-0.0	0.0													X		Boring located to evaluate LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located to evaluate potential releases from historical piping releases associated with LOU 57.
N-5	57		SA94-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-5	57		SA94-10	10	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA94-20	20	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA94-30	30	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA94-35	35	X	X	X			X	X		X	X	X	X			
N-5	57	SA113	SA113-0.0	0.0													X		Boring located to evaluate LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located adjacent to LOU 57 associated pipeline to evaluate potential releases.
N-5	57		SA113-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-5	57		SA113-10	10	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA113-20	20	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA113-30	30	X	X	X			X	X		Hold	X	X	X			
N-5	57		SA113-35	35	X	X	X			X	X		X	X	X	X			
N-5	57	SA196	SA196-0.0	0.0													X		Boring located to evaluate LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located along associated piping for LOU 57 and as an upslope stepout to LOU 57.
N-5	57		SA196-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-5	57		SA196-10	10	X	X	X			X	X		X	X	X	X			
N-6	53, 57	SA60	SA60-0.0	0.0													X		Boring located to evaluate LOU 53 (AP Plant Area Tank Farm) and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located at a low spot at location of former tanks in LOU 53 (see LOU 53 summary for historical source) to evaluate worst case conditions, and for general coverage of LOU 57.
N-6	53, 57		SA60-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-6	53, 57		SA60-10	10	X	X	X			X	X		Hold	X	X	X			
N-6	53, 57		SA60-20	20	X	X	X			X	X		Hold	X	X	X			
N-6	53, 57		SA60-30	30	X	X	X			X	X		Hold	X	X	X			
N-6	53, 57		SA60-35	35	X	X	X			X	X		X	X	X	X			
N-6	53, 57	SA105	SA105-0.0	0.0													X		Boring located to evaluate LOU 53 (AP Plant Area Tank Farm) and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located at a low spot at location of former tanks in LOU 53 (see LOU 53 summary for historical source) to evaluate worst case conditions, and for general coverage of LOU 57.
N-6	53, 57		SA105-0.5	0.5	X	X	X	X		X	X		X	X	X	X			
N-6	53, 57		SA105-10	10	X	X	X	X		X	X		Hold	X	X	X			
N-6	53, 57		SA105-20	20	X	X	X	X		X	X		Hold	X	X	X			
N-6	53, 57		SA105-30	30	X	X	X	X		X	X		Hold	X	X	X			
N-6	53, 57		SA105-37	37	X	X	X	X		X	X		X	X	X	X			
N-7	5, 57	SA49	SA49-0.0	0.0													X		Boring located to evaluate LOU 5 (Beta Ditch) and LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines). Located as a downslope stepout for LOU 5 to evaluate potential overflows releases and for general coverage of LOU 57.
N-7	5, 57		SA49-0.5	0.5	X	X	X			X	X		X	X	X	X			
N-7	5, 57		SA49-10	10	X	X	X			X	X		Hold	X	X	X			
N-7	5, 57		SA49-20	20	X	X	X			X	X		Hold	X	X	X			
N-7	5, 57		SA49-30	30	X	X	X			X	X		Hold	X	X	X			
N-7	5, 57		SA49-35	35	X	X	X			X	X		X	X	X	X			
<b>Number of Samples:</b>						<b>104</b>	<b>104</b>	<b>104</b>	<b>29</b>	<b>0</b>	<b>104</b>	<b>104</b>	<b>9</b>	<b>46</b>	<b>74</b>	<b>104</b>	<b>23</b>	<b>23</b>	<b>1</b>

**Notes:**

- n/a Not applicable - boring is not associated with a specific LOU but is located to evaluate soil for general area-wide coverage.
- X Sample will be collected and analyzed.
- No sample collected under Phase B sampling program.
- DD\* Sample depth to be determined in the field where DD = sample depth (ft).
- TPH-DRO/ORO Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.
- 1. The 0.5 ft bgs sample will be collected from the 0.0 to 0.5 ft bgs interval, unless the area is paved. If area is paved, samples will be collected at 0.5 feet below or from a representative depth beneath the pavement. Alternately, 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 isotopic thorium and isotopic uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).
- 7. Dioxins/furans will be analyzed by EPA Method 8290 for all samples. Screening reports will be provided for 90% of the samples and full data packages for 10% of the samples.
- 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).
- 11. SPLP samples will be analyzed by EPA method 1312 using two preparation methods: 1) with extraction fluid #2 (reagent water at pH 5.0±0.05), and 2) with extraction method #3 (reagent water); per NDEP.

Grid Location	Location Area	Monitoring Well No.	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)	OCPs <sup>3</sup> (EPA 8081A)	SVOCs <sup>4</sup> (EPA 8270C)	Radionuclides <sup>5</sup>	Rationale
<b>Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area II (L-4) and ending with the southeastern-most grid covering Area II (S-7).</b>														
L5	II	I-AR	25 - 45	Qal/MCfg1	yes	X	X	X	X	X	X	X	X	Located as an upgradient stepout for LOUs 30, 31, and 56; and LOU 58 and for general Site coverage.
L6	II	M-25	24 - 39	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 16, 19 and 53 as an upgradient stepout for LOU 55; and for general Site coverage.
L6	II	M-38	20 - 35	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 16, 17, 19, and LOU 57; and for general Site coverage.
M5	II	M-110	30 - 40	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 57 as a downgradient stepout for LOU 5; and for general Site coverage.
M5	II	M-111A*	29.7 - 39.7	Qal/MCfg1	new well	X	X	X	X	X	X	X	X	Replacement well for M-111 which was destroyed by site grading and located to evaluate LOU 57; a downgradient stepout for LOU 52; as an upgradient stepout for LOUs 5 and 19; and for general Site coverage.
M6	II	M-89	18 - 38.2	Qal/MCfg1	yes	X	X	X	X	X	X	X	X	Located to evaluate LOU 57; as a downgradient stepout for LOUs 5, 16, 17, and 53; and for general Site coverage.
M7	II	M-22A	16 - 36	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 57; as a downgradient stepout for LOUs 5, and 16 through 18; and for general Site coverage.
N5	II	M-75	34.6 - 49.3	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 7, 8, 9, and 45; as an upgradient stepout for LOUs 16, 17, 19, 53 and 57; and for general Site coverage.
N5	II	M-76	34.6 - 49.3	MCcg1	yes	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 8 and 45; as an upgradient stepout for LOUs 53 and 57; and for general Site coverage.
N6	II	M-2A*	nr	nr	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOUs 7, 8, 9, 13, 14, 20, 34, and 45; as an upgradient stepout for LOUs 16, 17, 18, 22, 23, 53, and 57; and for general Site coverage.
N6	II	M-17A	35 - 45	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 57; as an upgradient stepout for LOUs 5, 16, 17, 18, 22, and 23; and for general Site coverage.
<b>Number of Field Samples:</b>						<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	

**Notes:**

- \* Well completion information or boring log not available. Soil type inferred from nearby wells and geologic cross-section provided in the Phase A Source Area Investigation Report (ENSR 2007). ENSR is in the process of obtaining information from BMI.
- 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 isotopic Thorium and isotopic Uranium, and Radium-226, plus Radium-228 by beta counting (per NDEP).

IIIN/E/W/S Well located outside (north, east, west, or south) of Area II.

nr Not recorded in the All Wells Database (June 2008).

TBD To be determined when well is constructed

(a) Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.

Qal Quaternary Alluvium

MCfg1 Muddy Creek Formation - first fine-grained facies

MCcg1 Muddy Creek Formation - first coarse-grained facies

**Summary of Available Data for LOUs 16, 17, 18, 19, 52, 53, and 57**  
**Multiple LOUs in AP Plant Area**  
Facility – Henderson, Nevada

**Soil and Groundwater Characterization Data**

**Summary of Available Data for LOUs 16, 17, 18, 19, 52, 53, and 57  
Multiple LOUs in AP Plant Area  
Facility – Henderson, Nevada**

LOU-specific analytes identified include:

- Wet Chemistry analytes
- Metals (Phase A list)
- Hexavalent Chromium
- Perchlorate
- Cyanide

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

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 1 – Soil Characterization Data - Wet Chemistry**

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 2 – Groundwater Characterization Data - Wet Chemistry**

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 3 – Soil Characterization Data - Dioxins and Dibenzofurans

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 4 – Soil Characterization Data - Metals**

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 5 – Groundwater Characterization Data - Metals

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 6 – Soil Characterization Data -Organochlorine Pesticides (OCPs)

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 7 – Groundwater Characterization Data - Organochlorine Pesticides (OCPs)

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 8 – Soil Characterization Data - Organophosphorus Pesticides (OPPs)

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 9 – Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 10 – Soil Characterization Data - PCBs

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 11 – Groundwater Characterization Data - PCBs

LOUs 16, 17, 18, 19, 52, 53, and 57 **Table 12 – Soil Characterization Data - Perchlorate**

LOUs 16, 17, 18, 19, 52, 53, and 57 **Table 13 – Groundwater Characterization Data - Perchlorate**

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 14 – Soil Characterization Data - Radionuclides

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 15 – Groundwater Characterization Data - Radionuclides

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 16 – Soil Character Data-SVOCs

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 17 – Groundwater Character Data-SVOCs

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 18 – Soil Characterization Data - TPH and Fuel Alcohols

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 19 – Soil Characterization Data - VOCs

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 20 – Groundwater Characterization Data - VOCs

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 21– Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 22 – Soil and Groundwater Characterization Data-Routine Monitoring

Notes for Phase A Data Tables are presented at the end of the table.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 1  
Soil Characterization Data - Wet Chemistry**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	
Boring No.		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16	
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30	
Sample Depth (ft)		0.5	10	10	20	30	35	0.5	10	20	30	
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006	
Wet Chemistry Parameter	MSSL <sup>2</sup> mg/kg											Units
Percent moisture	--	13.4	14.8	9.0	9.3	26.5	27.3	6.4	10.2	8.2	38.1	percent
Alkalinity (as CaCO <sub>3</sub> )	--	233	58.7 U	54.9 U	55.1 U	344	125	214 J+	315 J+	275 J+	80.7 UJ	mg/kg
Bicarbonate	--	332	368	462	1620	1630	160	812 J+	371 J+	528 J+	163 J+	mg/kg
Total Alkalinity	--	566	368	505	1620	1970	285	1030 J+	686 J+	803 J+	179 J+	mg/kg
Ammonia (as N)	--	928 J	R	58.5 J	380 J	28.0 J	456 J	5.3 UJ	5.6 UJ	5.4 UJ	208 J-	mg/kg
Cyanide	1.37E+04	0.58 UJ	0.59 UJ	0.55 UJ	0.55 UJ	0.68 UJ	0.69 UJ	0.53 UJ	0.56 UJ	0.54 UJ	0.81 UJ	mg/kg
MBAS	--	4.0 U	4.0 U	3.5 J	2.7 J	2.7 J	4.0 U	2.5 U	2.6 U	3.3 U	4.7 U	mg/kg
pH (solid)	--	8.8	7.9	7.9	7.8	8.2	8.5	8.8	9.7	9.6	9.9	none
Bromide	--	2.9 U	2.9 U	2.7 U	83.3	3.4 U	3.4 U	2.7 U	2.8 U	2.7 U	4.0 U	mg/kg
Chlorate	--	2.1 J-	5.9 U	15.7 J-	R	8.9 J-	R	5.3 UJ	5.6 UJ	5.4 U	8.1 U	mg/kg
Chloride	--	6.2	746 J	266 J	344	218	187	6.3	8.4	2.4	1530	mg/kg
Nitrate (as N)	--	35.3	515 J	43.4 J	176	10.4	10.9 J+	0.29 J+	0.22 U	0.29 J+	8.0	mg/kg
Nitrite	--	1.3	5.3 J-	7.1	5.6	3.0	3.5	0.21 U	0.18 J	0.095 J	6.7	mg/kg
ortho-Phosphate	--	5.8 U	5.9 U	54.9 U	20.7 J	13.9	6.9 U	5.3 U	2.7 J	5.0 J	80.7 U	mg/kg
Sulfate	--	13.4	39.3	36.6	11600	258	225 J+	47.0 J	13.9	11.6	229	mg/kg
Total Organic Carbon	--	2800	5800	8500	4700	38600	21100	2900	9800	3400	11800	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).



**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 2**  
**Groundwater Characterization Data - Wet Chemistry**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Well ID		SA15	M-89	
Sample ID		GWSA15 <sup>2</sup>	M-89	
Sample Date		11/08/2006	12/05/2006	
Wet Chemistry Parameters	MCL <sup>3</sup> mg/L			Units
Total Dissolved Solids	5.00E+02 j	<b>14400</b>	<b>13800</b>	mg/L
Total Suspended Solids	--	<b>29800</b>	<b>70.0 J</b>	mg/L
Alkalinity (as CaCO3)	--	5.0 U	5.0 U	mg/L
Bicarbonate	--	<b>198</b>	<b>150</b>	mg/L
Total Alkalinity	--	<b>198</b>	<b>150</b>	mg/L
Ammonia (as N)	--	<b>893000</b>		ug/L
MBAS	--	2.1 U	<b>1.8 J</b>	mg/L
Cyanide	2.00E-01	5.0 UJ	R	ug/L
pH (liquid)	--	<b>7.3 J</b>	<b>7.0 J</b>	none
Specific Conductance	--	<b>21500</b>	<b>3070</b>	umhos/cm
Bromide	--	25.0 U	25.0 U	mg/L
Chlorate	--	<b>172</b>	<b>6460</b>	mg/L
Chloride	2.50E+02	<b>3750</b>	<b>2300</b>	mg/L
Nitrate (as N)	1.00E+01	<b>132</b>	<b>32.1</b>	mg/L
Nitrite	1.00E+00	2.0 U	10.0 U	mg/L
ortho-Phosphate	--	50.0 U	5.0 U	mg/L
Sulfate	2.50E+02 j	<b>2200</b>	<b>1080</b>	mg/L
Total Organic Carbon	--	<b>3.8 J-</b>	50.0 U	mg/L

**Notes:**

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

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 3  
Soil Characterization Data - Dioxins and Dibenzofurans**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

<b>Sampling Program</b>				Ph A <sup>1</sup>	Ph A
<b>Boring No.</b>				SA15	SA16
<b>Sample ID</b>				SA15-0.5	SA16-0.5
<b>Sample Depth (ft)</b>				0.5	0.5
<b>Sample Date</b>				11/08/2006	11/09/2006
<b>chemical_name:</b>	<b>Anaytical Method</b>	<b>Unit</b>	<b>MSSL<sup>2</sup> ng/kg</b>		
Dioxin 8290 SCREEN Total TEQ-ENSR Calculated (a) ng/kg		ng/kg	--	<b>983</b>	<b>1149</b>
Dioxin SW 846 8290 Total TEQ-ENSR Calculated (a) ng/kg		ng/kg	--	<b>803</b>	<b>894</b>
Dioxin 8290 SCREEN Total TEQ-ENSR Calculated (b) ng/kg		ng/kg	--	<b>983</b>	<b>1149</b>
Dioxin SW 846 8290 Total TEQ-ENSR Calculated (b) ng/kg		ng/kg	--	<b>803</b>	<b>894</b>
1,2,3,4,6,7,8-Heptachlorodibenzofuran	8290 Screen	ng/kg	--	<b>5619.090</b>	<b>6033.394</b>
1,2,3,4,6,7,8-Heptachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>5666.967 J</b>	<b>5388.734 J</b>
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>365.788</b>	<b>443.741</b>
1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>365.788</b>	<b>443.741</b>
1,2,3,4,7,8,9-Heptachlorodibenzofuran	8290 Screen	ng/kg	--	<b>3264.854</b>	<b>2950.816</b>
1,2,3,4,7,8,9-Heptachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>2758.352 J</b>	<b>2485.881 J</b>
1,2,3,4,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>2303.115</b>	<b>2650.305</b>
1,2,3,4,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>1868.559 J</b>	<b>2143.656 J</b>
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>33.024</b>	<b>49.392</b>
1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>33.024</b>	<b>49.392</b>
1,2,3,6,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>1407.017</b>	<b>1625.974</b>
1,2,3,6,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>1161.921 J</b>	<b>1362.448 J</b>
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>89.921</b>	<b>122.741</b>
1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>89.921</b>	<b>122.741</b>
1,2,3,7,8,9-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>240.602</b>	<b>246.274</b>
1,2,3,7,8,9-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>240.702</b>	<b>246.274</b>
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>109.299</b>	<b>140.746</b>
1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>109.299</b>	<b>140.746</b>
1,2,3,7,8-Pentachlorodibenzofuran	8290 Screen	ng/kg	--	<b>1020.569</b>	<b>1287.384</b>
1,2,3,7,8-Pentachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>890.137 J</b>	<b>1090.766 J</b>
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>57.995</b>	<b>87.894</b>
1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>57.995</b>	<b>87.894</b>
2,3,4,6,7,8-Hexachlorodibenzofuran	8290 Screen	ng/kg	--	<b>787.272</b>	<b>859.203</b>
2,3,4,6,7,8-Hexachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>648.672 J</b>	<b>695.192 J</b>
2,3,4,7,8-Pentachlorodibenzofuran	8290 Screen	ng/kg	--	<b>502.763</b>	<b>592.395</b>
2,3,4,7,8-Pentachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>502.759</b>	<b>473.372 J</b>
2,3,7,8-Tetrachlorodibenzofuran	8290 Screen	ng/kg	--	<b>1292.662</b>	<b>1518.736</b>
2,3,7,8-Tetrachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>415.316 J</b>	<b>446.407 J</b>
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	1.00E+03 h,v	<b>18.916</b>	<b>23.713</b>
2,3,7,8-Tetrachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	1.00E+03 h,v	<b>18.916</b>	<b>23.713</b>

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 3 (continued)  
Soil Characterization Data - Dioxins and Dibenzofurans**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

<b>Sampling Program</b>				Ph A	Ph A
<b>Boring No.</b>				SA15	SA16
<b>Sample ID</b>				SA15-0.5	SA16-0.5
<b>Sample Depth (ft)</b>				0.5	0.5
<b>Sample Date</b>				11/08/2006	11/09/2006
<b>chemical_name:</b>	<b>Anaytical Method</b>	<b>Unit</b>	<b>MSSL<sup>2</sup> ng/kg</b>		
Octachlorodibenzofuran	8290 Screen	ng/kg	--	<b>17916.923</b>	<b>16111.960</b>
Octachlorodibenzofuran	SW 846 8290	ng/kg	--	<b>13990.188 J</b>	<b>12526.796 J</b>
Octachlorodibenzo-p-Dioxin	8290 Screen	ng/kg	--	<b>410.286</b>	<b>442.736</b>
Octachlorodibenzo-p-Dioxin	SW 846 8290	ng/kg	--	<b>410.286 J</b>	<b>442.736 J</b>
Tetrachlorinated Dibenzofurans, (Total)	SW 846 8290	ng/kg	--	<b>7527.737 J</b>	<b>10701.264 J</b>
Total HpCDD	SW 846 8290	ng/kg	--	<b>569.535</b>	<b>679.868</b>
Total HpCDF	SW 846 8290	ng/kg	--	<b>12074.690 J</b>	<b>11239.820 J</b>
Total HxCDD	SW 846 8290	ng/kg	--	<b>714.161</b>	<b>968.365</b>
Total HxCDF	SW 846 8290	ng/kg	--	<b>8663.283 J</b>	<b>9676.516 J</b>
Total PeCDD	SW 846 8290	ng/kg	--	<b>653.379</b>	<b>1060.548</b>
Total PeCDF	SW 846 8290	ng/kg	--	<b>8089.831 J</b>	<b>10241.201 J</b>
Total TCDD	SW 846 8290	ng/kg	--	<b>607.201</b>	<b>1020.732</b>

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
  - (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.
  - (h) Dioxins and furans were expressed as 2,3,7,8- TCDD TEQ (toxic equivalents), calculated using the TEFs published by Van den Berg et al., 2006.
  - (v) USEPA. 1998. Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites. OSWER Directive 9200.4-26. April, 1998. A value of 1000 ng/kg is applicable to residential soils. The range of 5000 to 20000 ng/kg is applicable to commercial/industrial soils. The Agency for Toxic Substances and Disease Registry (ATSDR) provides a screening level of 50 ng/kg for dioxin in residential soil [<http://www.atsdr.cdc.gov/substances/dioxin/policy/>].

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 4  
Soil Characterization Data - Metals**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	
Boring No.		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16	
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30	
Sample Depth (ft)		0.5	10	10	20	30	35	0.5	10	20	30	
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006	
Metals	MSSL <sup>2</sup> mg/kg											Units
Aluminum	1.00E+05	8180 J	7600 J	6240 J	5850 J	7930 J	12100 J	6810	7320	5230	14100	mg/kg
Antimony	4.50E+02	0.18 J-	0.15 J-	0.12 J-	0.13 J-	0.13 J-	0.18 J-	0.16 J-	0.11 J-	0.10 J-	0.19 J-	mg/kg
Arsenic	2.80E+02	2.5	5.3	4.2	11.4	20.4	16.2	2.5	4.3	5.6	24.8	mg/kg
Barium	1.00E+05	207 J	191 J	143 J	113 J	48.3 J	51.8 J	169 J	167 J	74.5 J	172 J	mg/kg
Beryllium	2.20E+03	0.49	0.49	0.41	0.32	0.34	0.58	0.48	0.50	0.36	0.82	mg/kg
Boron	1.00E+05	3.6 J-	3.5 J-	2.9 J-	5.9 J-	12.0 J-	16.9 J-	4.2 UJ	4.0 UJ	6.1 UJ	30.4 UJ	mg/kg
Cadmium	5.60E+02	1.7	0.068	0.059	0.076	0.069	0.12	0.12	0.062	0.041 J	0.18	mg/kg
Calcium	--	5940 J	19300 J	18100 J	40400 J	129000 J	99800 J	15000	19800	10800	24700	mg/kg
Chromium (Total)	7.10E+01	11.5 J-	10.6 J-	7.7 J-	8.6 J-	24.2 J-	18.1 J-	11.2 J-	10.7 J-	16.5 J-	36.8 J-	mg/kg
Chromium-hexavalent	5.00E+02	0.23 U	0.23 U	0.22 U	0.22 U	0.27 U	0.28 U	0.12 J	0.20 J	0.22 U	9.3	mg/kg
Cobalt	2.10E+03	9.4 J-	6.6 J-	6.4 J-	3.2 J-	2.8 J-	4.5 J-	7.0 J-	7.7 J-	3.0 J-	6.3 J-	mg/kg
Copper	4.20E+04	14.3 J	12.7 J	11.0 J	8.0 J	6.1 J	10.6 J	13.3 J	12.9 J	8.9 J	15.9 J	mg/kg
Iron	1.00E+05	14100 J	13900 J	11600 J	7050 J	7320 J	10300 J	12600	11700	7330	17800	mg/kg
Lead	8.00E+02	10.5	7.5	7.1	6.6	4.3	6.9	9.1	7.0	4.9	10.9	mg/kg
Magnesium	--	6620 J-	7970 J-	7250 J-	7550 J-	44700 J-	27300 J-	6030 J-	10600 J-	7550 J-	63700 J-	mg/kg
Manganese	3.50E+04	568 J+	239 J+	230 J+	151 J+	118 J+	212 J+	361	269	92.8	365	mg/kg
Molybdenum	5.70E+03	0.64	0.48 J	0.43 J	0.43 J	0.2615 U	0.72	0.52 J	0.31 J	0.40 J	1.1	mg/kg
Nickel	2.30E+04	14.1 J	12.5 J	11.6 J	9.1 J	8.6 J	11.9 J	13.1 J-	16.9 J-	9.5 J-	14.4 J-	mg/kg
Platinum	--	0.040 J	0.019 J	0.017 J	0.011 U	0.014 U	0.030 J	0.017 J	0.011 U	0.011 U	0.018 J	mg/kg
Potassium	--	1430 J	1370 J	1230 J	1810 J	2040 J	3090 J	1880	1590	1160	3210	mg/kg
Selenium	5.70E+03	0.13 UJ	0.13 UJ	0.12 UJ	0.12 UJ	0.15 UJ	0.15 UJ	0.12 U	0.12 U	0.12 U	0.17 U	mg/kg
Silver	5.70E+03	0.18 J	0.15 J	0.12 J	0.11 J	0.11 J	0.18 J	0.13 J	0.13 J	0.14 J	0.22 J	mg/kg
Sodium	--	763 J-	420 J-	384 J-	447 J-	1040 J-	1340 J-	345 J-	1550 J-	1470 J-	3070 J-	mg/kg
Strontium	1.00E+05	46.1 J	99.0 J	74.2 J	805 J	437 J	119 J	72.5 J	109 J	86.5 J	126 J	mg/kg
Thallium	--	0.16 J	0.082 U	0.077 U	0.077 U	0.098 J	0.21 J	0.095 J	0.078 U	0.076 U	0.26 J	mg/kg
Tin	--	0.64	0.56	0.45	0.45	0.38	0.59	0.51	0.42	0.40	0.74	mg/kg
Titanium	--	677 J	643 J	478 J	395 J	354 J	454 J	490	490	273	502	mg/kg

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 4 (continued)  
Soil Characterization Data - Metals**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	
Boring No.		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16	
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30	
Sample Depth (ft)		0.5	10	10	20	30	35	0.5	10	20	30	
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006	
Metals	MSSL <sup>2</sup> mg/kg											Units
Tungsten	--	0.33 J-	0.36 J-	0.32 J-	0.37 J-	0.15 J-	0.42 J-	0.34 J-	0.28 J-	0.16 J-	0.46 J-	mg/kg
Uranium	--	0.81	1.3	1.1	1.6	6.1	2.8	0.74	1.2	1.6	3.4	mg/kg
Vanadium	5.70E+03	38.0 J-	39.2 J-	31.6 J-	23.5 J-	27.3 J-	22.3 J-	30.3 J-	39.2 J-	20.1 J-	27.9 J-	mg/kg
Zinc	1.00E+05	36.7 J-	26.4 J-	21.5 J-	17.5 J-	17.2 J-	27.7 J-	27.0 J-	24.3 J-	17.7 J-	38.4 J-	mg/kg
Mercury	3.41E+02 (t)	0.0077 U	0.0078 UJ	0.0073 UJ	0.0074 UJ	0.0091 UJ	0.0092 UJ	0.0071 UJ	0.0093 J	0.011 J	0.011 UJ	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
- (t) Value for mercury and compounds.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 5  
Groundwater Characterization Data - Metals**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A <sup>1</sup>	
Well ID:		SA15	M-89	
Sample ID		GWSA15	M-89-Z	
Sample Date		11/08/2006	05/11/2007	
Metals	MCL <sup>2</sup> ug/L			Unit
Aluminum	5.00E+01 j	157 UJ	786 U	ug/L
Antimony	6.00E+00	0.76 J-	50.0 U	ug/L
Arsenic	1.00E+01	53.6	200 U	ug/L
Barium	2.00E+03	39.8	42.3 J	ug/L
Beryllium	4.00E+00	1.8 UJ	8.8 U	ug/L
Boron	7.30E+03	2560 J-	4280 J	ug/L
Cadmium	5.00E+00	0.17 J	5.7 U	ug/L
Calcium	--	308000 J	764000	ug/L
Chromium (Total)	1.00E+02	56.0 UJ	22500	ug/L
Chromium-hexavalent	1.09E+02	20.3 J	21700 J	ug/L
Cobalt	7.30E+02	6.3 UJ	31.3 U	ug/L
Copper	1.30E+03 p	6.3 J-	25.0 U	ug/L
Iron	3.00E+02 j	188 UJ	940 UJ	ug/L
Lead	1.50E+01 u	9.8 U	49.2 U	ug/L
Magnesium	1.50E+05 a	144000 J	406000	ug/L
Manganese	5.00E+01 j	28.4 J+	34.2 U	ug/L
Molybdenum	1.82E+02	66.5	50.0 U	ug/L
Nickel	7.30E+02	13.6 J-	51.7 U	ug/L
Platinum	--	56.0	10.0 U	ug/L
Potassium	--	42200 J-	38200	ug/L
Selenium	5.00E+01	1.9 J	100 U	ug/L
Silver	1.00E+02 j	0.20 U	20.3 U	ug/L
Sodium	--	2940000 J	2050000	ug/L
Strontium	2.19E+04	10300 J	19800	ug/L
Thallium	2.00E+00	6.4 U	32.0 U	ug/L
Tin	2.19E+04	0.20 UJ	20.0 U	ug/L
Titanium	1.46E+05	5.4 J	39.1 U	ug/L
Tungsten	--	1.2 J-	50.0 U	ug/L
Uranium	3.00E+01	18.9 J	26.7 J	ug/L
Vanadium	3.65E+01	8.8 J-	160 UJ	ug/L
Zinc	5.00E+03 j	20.0 UJ	100 U	ug/L
Mercury	2.00E+00	0.093 U	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.

(j) Secondary Drinking Water Regulation value.

(p) The national primary drinking water regulations (b) lists a treatment technology action level of 1.3 mg/l as the MCL for Copper. Therefore, the secondary value is not used.

(u) See footnote (b). Treatment technology action level.

(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.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 6**  
**Soil Characterization Data - Organochlorine Pesticides (OCPs)**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	
Boring No.		SA15	SA15	SA16	
Sample ID		SA15-0.5	SA15-10	SA16-0.5	
Sample Depth (ft)		0.5	10	0.5	
Sample Date		11/08/2006	11/08/2006	11/09/2006	
Organochlorine Pesticides	MSSL <sup>2</sup> mg/kg				Unit
4,4'-DDD	1.10E+01	0.0020 U	0.020 U	0.0018 U	mg/kg
4,4'-DDE	7.80E+00	0.0020 UJ	<b>0.065 J</b>	0.0018 U	mg/kg
4,4'-DDT	7.80E+00	0.0020 UJ	<b>0.052 J</b>	0.0018 U	mg/kg
Aldrin	1.10E-01	0.0020 U	0.020 U	0.0018 U	mg/kg
Alpha-BHC	4.00E-01	0.0020 U	0.020 U	0.0018 U	mg/kg
Alpha-chlordane	1.40E+00 (y)	0.0020 U	0.020 U	0.0018 U	mg/kg
Beta-BHC	1.40E+00	<b>0.0030</b>	<b>0.052</b>	<b>0.0041</b>	mg/kg
Delta-BHC	--	0.0020 U	0.020 U	0.0018 U	mg/kg
Dieldrin	1.20E-01	0.0020 U	0.020 U	0.0018 U	mg/kg
Endosulfan I	4.10E+03 (aa)	0.0020 U	0.020 U	0.0018 U	mg/kg
Endosulfan II	4.10E+03 (aa)	0.0020 U	0.020 U	0.0018 U	mg/kg
Endosulfan Sulfate	4.10E+03 (aa)	0.0020 U	0.020 U	0.0018 U	mg/kg
Endrin	2.10E+02	0.0020 U	0.020 U	0.0018 U	mg/kg
Endrin Aldehyde	2.10E+02 (k)	0.0020 U	0.020 U	0.0018 U	mg/kg
Endrin Ketone	2.10E+02 (k)	0.0020 U	0.020 U	0.0018 U	mg/kg
Gamma-BHC (Lindane)	1.90E+00	0.0020 U	0.020 U	0.0018 U	mg/kg
Gamma-Chlordane	1.40E+00 (y)	0.0020 U	0.020 U	0.0018 U	mg/kg
Heptachlor	4.30E-01	0.0020 U	0.020 U	0.0018 U	mg/kg
Heptachlor Epoxide	2.10E-01	0.0020 U	0.020 U	0.0018 U	mg/kg
Methoxychlor	3.40E+03	0.0038 U	0.039 U	0.0035 U	mg/kg
Tech-Chlordane	1.40E+00	0.012 U	0.12 U	0.011 U	mg/kg
Toxaphene	1.70E+00	0.058 U	0.59 U	0.053 U	mg/kg

**Notes:**

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

2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).

(y) Value for chlordane (technical) used as surrogate for alpha-chlordane and gamma-chlordane 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.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 7**  
**Groundwater Characterization Data - Organochlorine Pesticides (OCPs)**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Well ID		SA15	M-89	
Sample ID		GWSA15	M-89	
Sample Date		11/08/2006	12/05/2006	
Organochlorine Pesticides	MCL <sup>2</sup> ug/L	ug/L		Unit
4,4'-DDD	2.80E-01	0.050 U	0.050 U	ug/L
4,4'-DDE	1.98E-01	0.050 U	0.050 U	ug/L
4,4'-DDT	1.98E-01	0.050 U	0.050 U	ug/L
Aldrin	4.00E-03	0.050 U	0.050 U	ug/L
Alpha-BHC	1.10E-02	0.050 U	0.050 U	ug/L
Alpha-chlordane	2.00E+00 (l)	0.050 U	0.050 U	ug/L
Beta-BHC	3.74E-02	0.050 U	0.050 U	ug/L
Delta-BHC	1.10E-02 (z)	0.050 U	0.050 U	ug/L
Dieldrin	4.20E-03 (z)	0.050 U	0.050 U	ug/L
Endosulfan I	2.19E+02 (aa)	0.050 U	0.050 U	ug/L
Endosulfan II	2.19E+02 (aa)	0.050 U	0.050 U	ug/L
Endosulfan Sulfate	2.19E+02 (aa)	0.050 U	0.050 U	ug/L
Endrin	2.00E+00	0.050 U	0.050 U	ug/L
Endrin Aldehyde	1.09E+01 (k)	0.050 U	0.050 U	ug/L
Endrin Ketone	1.09E+01 (k)	0.050 U	0.050 U	ug/L
Gamma-BHC (Lindane)	2.00E-01	0.050 U	0.050 U	ug/L
Gamma-Chlordane	2.00E+00 (l)	0.050 U	0.050 U	ug/L
Heptachlor	4.00E-01	0.050 U	0.050 U	ug/L
Heptachlor Epoxide	2.00E-01	0.050 U	0.050 U	ug/L
Methoxychlor	4.00E+01	0.10 UJ	0.10 U	ug/L
Tech-Chlordane	2.00E+00 (l)	0.50 U	0.50 U	ug/L
Toxaphene	3.00E+00	2.0 U	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.
  - (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.



**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 8**  
**Soil Characterization Data - Organophosphorus Pesticides (OPPs)**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Boring No.		SA15	SA16	
Sample ID		SA15-0.5	SA16-0.5	
Sample Depth (ft)		0.5	0.5	
Sample Date		11/08/2006	11/09/2006	
OPPs	MSSL <sup>2</sup> mg/kg	mg/kg		Unit
Azinphos-methyl	--	0.015 UJ	0.014 UJ	mg/kg
Bolstar	--	0.015 U	0.014 UJ	mg/kg
Chlorpyrifos	2.10E+03	0.023 U	0.021 UJ	mg/kg
Coumaphos	--	0.015 U	0.014 UJ	mg/kg
Demeton-O	--	0.045 U	0.042 UJ	mg/kg
Demeton-S	--	0.017 U	0.016 UJ	mg/kg
Diazinon	6.20E+02	0.025 U	0.023 UJ	mg/kg
Dichlorvos	6.60E+00	0.027 U	0.025 UJ	mg/kg
Dimethoate	--	0.025 U	0.023 UJ	mg/kg
Disulfoton	2.70E+01	0.055 U	0.051 UJ	mg/kg
EPN	--	0.015 U	0.014 UJ	mg/kg
Ethoprop	--	0.017 U	0.016 UJ	mg/kg
Ethyl Parathion	4.10E+03	0.021 U	0.019 UJ	mg/kg
Famphur	--	0.015 U	0.014 UJ	mg/kg
Fensulfothion	--	0.015 U	0.014 UJ	mg/kg
Fenthion	1.70E+02 (ff)	0.038 U	0.035 UJ	mg/kg
Malathion	1.40E+04	0.017 U	0.016 UJ	mg/kg
Merphos	--	0.035 U	0.032 UJ	mg/kg
Methyl parathion	1.70E+02	0.023 U	0.021 UJ	mg/kg
Mevinphos	--	0.017 U	0.016 UJ	mg/kg
Naled	1.40E+03	0.038 UJ	0.035 UJ	mg/kg
Phorate	--	0.023 U	0.021 UJ	mg/kg
Ronnel	3.40E+04	0.021 UJ	0.019 UJ	mg/kg
Stirphos	--	0.017 UJ	0.016 UJ	mg/kg
Sulfotep	--	0.023 U	0.021 UJ	mg/kg
Thionazin	--	0.021 U	0.019 UJ	mg/kg
Tokuthion	--	0.023 U	0.021 UJ	mg/kg
Trichloronate	--	0.023 U	0.021 UJ	mg/kg

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
- (ff) Value for methyl parathion used as surrogate for fenthion based on structural similarities.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 9  
Groundwater Characterization Data - Organophosphorus Pesticides (OPPs)**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Well ID		SA15	M-89	
Sample ID		GWSA15	M-89	
Sample Date		11/08/2006	12/05/2006	
OPPs	MCL <sup>2</sup> ug/L	ug/L		Unit
Azinphos-methyl	--	2.5 U	2.5 U	ug/L
Bolstar	--	1.0 U	1.0 U	ug/L
Chlorpyrifos	1.09E+02	1.0 U	1.0 U	ug/L
Coumaphos	--	1.0 U	1.0 U	ug/L
Demeton-O	1.46E+00 (cc)	1.0 U	1.0 U	ug/L
Demeton-S	1.46E+00 (cc)	1.0 U	1.0 U	ug/L
Diazinon	3.28E+01	1.0 U	1.0 U	ug/L
Dichlorvos	2.32E-01	1.0 U	1.0 U	ug/L
Dimethoate	7.30E+00	1.0 U	1.0 U	ug/L
Disulfoton	1.46E+00	0.50 U	0.50 U	ug/L
EPN	3.65E-01	1.2 U	1.2 U	ug/L
Ethoprop	--	0.50 U	0.50 U	ug/L
Ethyl Parathion	9.12E+00 (tt)	1.0 U	1.0 U	ug/L
Famphur	--	1.0 U	1.0 U	ug/L
Fensulfothion	--	2.5 U	2.5 U	ug/L
Fenthion	9.10E+00 (ff)	2.5 U	2.5 U	ug/L
Malathion	7.30E+02	1.2 U	1.2 U	ug/L
Merphos	1.09E+00	5.0 U	5.0 U	ug/L
Methyl parathion	9.12E+00	4.0 U	4.0 U	ug/L
Mevinphos	--	6.2 U	6.2 U	ug/L
Naled	7.30E+01	1.0 U	1.0 U	ug/L
Phorate	7.30E+00	1.2 U	1.2 U	ug/L
Ronnel	1.82E+03	10 U	10 U	ug/L
Stirphos	--	3.5 U	3.5 U	ug/L
Sulfotep	1.82E+01	1.5 U	1.5 U	ug/L
Thionazin	--	1.0 U	1.0 U	ug/L
Tokuthion	--	1.6 U	1.6 U	ug/L
Trichloronate	--	0.50 U	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.  
(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.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 10  
Soil Characterization Data - PCBs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	
Boring ID		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16	
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30	
Sample Depth (ft)		0.5	10	10	20	30	35	0.5	10	20	30	
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006	
PCBs	MSSL <sup>2</sup> mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg					Unit
Aroclor-1016	2.40E+01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1221	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1232	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1242	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1248	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1254	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg
Aroclor-1260	8.30E-01 (i)	0.038 U	0.039 U	0.036 U	0.036 U	0.045 U	0.045 U	0.035 U	0.037 U	0.036 U	0.053 U	mg/kg

- Notes:**
1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).  
(i) For PCBs, the individual Aroclors were compared to the TSCA action level of 10 mg/kg, for high occupancy, restricted (non-residential) use. (40 CFR Part 761; 63 FR 35383-35474, June 29, 1998).

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 11  
Groundwater Characterization Data - PCBs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	
Well ID		SA15	M-89	
Sample ID		GWSA15	M-89	
Sample Date		11/08/2006	12/05/2006	
PCBs	MCL <sup>2</sup> ug/L			Unit
Aroclor-1016	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1221	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1232	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1242	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1248	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1254	5.00E-01 (bb)	0.10 U	0.10 U	ug/L
Aroclor-1260	5.00E-01 (bb)	0.10 U	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.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 12  
Soil Characterization Data - Perchlorate**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

<b>Boring ID</b>	<b>Sample ID</b>	<b>Sample Depth (ft)</b>	<b>Sample Date</b>	<b>Perchlorate ug/kg</b>	<b>MSSL<sup>1</sup> ug/kg</b>	<b>Sampling Program</b>
SA15	SA15-0.5	0.5	11/08/2006	<b>113000</b>	7.95E+05	Ph A <sup>2</sup>
SA15	SA15-10	10	11/08/2006	<b>1210000</b>	7.95E+05	Ph A
SA15	SA15-10D	10	11/08/2006	<b>1160000</b>	7.95E+05	Ph A
SA15	SA15-20	20	11/08/2006	<b>943000</b>	7.95E+05	Ph A
SA15	SA15-30	30	11/08/2006	<b>2330000</b>	7.95E+05	Ph A
SA15	SA15-35	35	11/08/2006	<b>204000</b>	7.95E+05	Ph A
SA16	SA16-0.5	0.5	11/09/2006	<b>3720</b>	7.95E+05	Ph A
SA16	SA16-10	10	11/09/2006	<b>177</b>	7.95E+05	Ph A
SA16	SA16-20	20	11/09/2006	<b>609</b>	7.95E+05	Ph A
SA16	SA16-30	30	11/09/2006	<b>1860000</b>	7.95E+05	Ph A

**Notes:**

1. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
2. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 13  
Groundwater Characterization Data - Perchlorate**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

<b>Well ID Number</b>	<b>Sample ID</b>	<b>Sample Date</b>	<b>Perchlorate</b>	<b>Units</b>	<b>MCL<sup>1</sup> ug/L</b>	<b>Sampling Program</b>
SA15	GWSA15	11/08/2006	<b>6290000</b>	ug/L	1.80E+01 a,(m)	Ph A <sup>2</sup>
M-89	M-89	12/05/2006	<b>898000 J+</b>	ug/L	1.80E+01 a,(m)	Ph A

**Notes:**

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

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 14  
Soil Characterization Data - Radionuclides**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

				Ra-226	Ra-228	Th-228	Th-230	Th-232	U-233/234	U-235/236	U-238	
				(gamma)	(gamma)	(TH MOD)	(TH MOD)	(TH MOD)	(U MOD)	(U MOD)	(U MOD)	
				pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	
Boring ID Number	Sample ID	Sample Depth (ft)	Date									Sampling Program
SA15	SA15-0.5	0.5	11/08/2006	1.19 J+	2.11 J+							Ph A <sup>1</sup>
SA15	SA15-10	10	11/08/2006	1.2 J+	1.91 J+	0.868 J	0.794 J	0.796 J	0.518 J	0.0102 U	0.376 J	Ph A
SA15	SA15-10D	10	11/08/2006	1.21 J+	1.89 J+	0.779 J	0.529 J	0.544 J	0.404 J	0.00471 U	0.392 J	Ph A
SA15	SA15-20	20	11/08/2006	1.43 J+	1.84 J+							Ph A
SA15	SA15-30	30	11/08/2006	1.91 J+	0.777 J+							Ph A
SA15	SA15-35	35	11/08/2006	1.54 J+	0.852 J+							Ph A
SA16	SA16-0.5	0.5	11/09/2006	1.16 J+	1.92 J+							Ph A
SA16	SA16-10	10	11/09/2006	1.07 J+	1.5 J+							Ph A
SA16	SA16-20	20	11/09/2006	1.85 J+	2.07 J+							Ph A
SA16	SA16-30	30	11/09/2006	1.71 J+	1.17 J+							Ph A

**Notes:**

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

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 15  
Groundwater Characterization Data - Radionuclides**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

			Ra-226	Ra-228	Th-228	Th-230	Th-232	U-233/234	U-235/236	U-238	
			pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	
<b>Well ID Number</b>	<b>Sample ID</b>	<b>Date</b>									<b>Sampling Program</b>
SA15	GWSA15	11/08/2006	<b>3.32 J+</b>	<b>2.18</b>							Ph A <sup>1</sup>
M-89	M-89-Z	05/11/2007	<b>0.352 J</b>	<b>1.27 JB</b>							Ph A

**Notes:**

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



**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 16**  
**Soil Characterization Data - SVOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
Boring No.			SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16
Sample ID			SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30
Sample Depth (ft)			0.5	10	10	20	30	35	0.5	10	20	30
Sample Date			11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006
SVOC	Analytical Method	MSSL <sup>2</sup> ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
1,4-Dioxane	non-SIM	1.70E+05	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
2-Methylnaphthalene	non-SIM	2.10E+05 (jj)	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
2-Methylnaphthalene	SIM	2.10E+05 (jj)										
Acenaphthene	non-SIM	3.30E+07	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Acenaphthene	SIM	3.30E+07										
Acenaphthylene	non-SIM	3.30E+07 (pp)	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Acenaphthylene	SIM	3.30E+07 (pp)										
Anthracene	non-SIM	1.00E+08	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Anthracene	SIM	1.00E+08										
Benz(a)anthracene	non-SIM	2.30E+03	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Benz(a)anthracene	SIM	2.30E+03										
Benzo(a)pyrene	non-SIM	2.30E+02	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Benzo(a)pyrene	SIM	2.30E+02										
Benzo(b)fluoranthene	non-SIM	2.30E+03	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Benzo(b)fluoranthene	SIM	2.30E+03										
Benzo(g,h,i)perylene	non-SIM	3.20E+07 (w)	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Benzo(g,h,i)perylene	SIM	3.20E+07 (w)										
Benzo(k)fluoranthene	non-SIM	2.30E+04	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Benzo(k)fluoranthene	SIM	2.30E+04										
bis(2-Ethylhexyl)phthalate	non-SIM	1.40E+05	380 U	390 U	<b>160 J</b>	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Butyl benzyl phthalate	non-SIM	2.40E+05	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Chrysene	non-SIM	2.30E+05	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Chrysene	SIM	2.30E+05										
Dibenz(a,h)anthracene	non-SIM	2.30E+02	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Dibenz(a,h)anthracene	SIM	2.30E+02										
Diethyl phthalate	non-SIM	1.00E+08	380 U	390 U	360 U	360 U	<b>150 J</b>	450 U	350 U	370 U	360 U	530 U
Dimethyl phthalate	non-SIM	1.00E+08	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Di-N-Butyl phthalate	non-SIM	6.80E+07	380 U	390 U	<b>650</b>	360 U	450 U	450 U	350 U	370 U	360 U	530 U

LOUs 16, 17, 18, 19, 52, 53, and 57 Table 16 (continued)

**Soil Characterization Data - SVOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A
Boring No.			SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16
Sample ID			SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30
Sample Depth (ft)			0.5	10	10	20	30	35	0.5	10	20	30
Sample Date			11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006
SVOC	Analytical Method	MSSL <sup>2</sup> ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Di-N-Octyl phthalate	non-SIM	--	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Fluoranthene	non-SIM	2.40E+07	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Fluoranthene	SIM	2.40E+07										
Fluorene	non-SIM	2.60E+07	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Fluorene	SIM	2.60E+07										
Hexachlorobenzene	non-SIM	1.20E+03	<b>310 J</b>	390 U	<b>160 J</b>	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Hexachlorobenzene	SIM	1.20E+03										
Indeno(1,2,3-cd)pyrene	non-SIM	2.30E+03	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Indeno(1,2,3-cd)pyrene	SIM	2.30E+03										
Naphthalene	non-SIM	2.10E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Naphthalene	non-SIM	2.10E+05	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Naphthalene	SIM	2.10E+05										
Nitrobenzene	non-SIM	1.10E+05	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Octachlorostyrene	non-SIM	--	<b>130 J</b>	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Phenanthrene	non-SIM	1.00E+08 (n)	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Phenanthrene	SIM	1.00E+08 (n)										
Pyrene	non-SIM	3.20E+07	380 U	390 U	360 U	360 U	450 U	450 U	350 U	370 U	360 U	530 U
Pyrene	SIM	3.20E+07										
Pyridine	non-SIM	6.80E+05	1800 U	1900 U	1800 U	1800 U	2200 U	2200 U	1700 U	1800 U	1700 U	2600 U

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
- (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.  
 (n) Value for anthracene used as surrogate for phenanthrene due to structural similarities.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 17  
Groundwater Characterization Data - SVOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A <sup>1</sup>	Ph A
Well No.			SA15	M-89
Sample ID			GWSA15	M-89
Sample Date			11/08/2006	12/05/2006
SVOCs	Analytical Method	MCL <sup>2</sup> ug/L	ug/L	ug/L
1,4-Dioxane	non-SIM	6.11E+00	10 U	10 U
2-Methylnaphthalene	non-SIM	6.20E+00 (jj)	10 U	10 U
2-Methylnaphthalene	SIM	6.20E+00 (jj)		
Acenaphthene	non-SIM	3.65E+02	10 U	10 U
Acenaphthene	SIM	3.65E+02		
Acenaphthylene	non-SIM	3.65E+02 (pp)	10 U	10 U
Acenaphthylene	SIM	3.65E+02 (pp)		
Anthracene	non-SIM	1.83E+03	10 U	10 U
Anthracene	SIM	1.83E+03		
Benz(a)anthracene	non-SIM	9.21E-02	10 U	10 U
Benz(a)anthracene	SIM	9.21E-02		
Benzo(a)pyrene	non-SIM	2.00E-01	10 U	10 U
Benzo(a)pyrene	SIM	2.00E-01		
Benzo(b)fluoranthene	non-SIM	9.21E-02	10 U	10 U
Benzo(b)fluoranthene	SIM	9.21E-02		
Benzo(g,h,i)perylene	non-SIM	1.83E+02 (w)	10 U	10 U
Benzo(g,h,i)perylene	SIM	1.83E+02 (w)		
Benzo(k)fluoranthene	non-SIM	9.21E-01	10 U	10 U
Benzo(k)fluoranthene	SIM	9.21E-01		
bis(2-Ethylhexyl)phthalate	non-SIM	6.00E+00	<b>1.1 J</b>	10 U
Butyl benzyl phthalate	non-SIM	7.30E+03	10 U	10 U
Chrysene	non-SIM	9.21E+00	10 U	10 U
Chrysene	SIM	9.21E+00		
Dibenz(a,h)anthracene	non-SIM	9.21E-03	10 U	10 U
Dibenz(a,h)anthracene	SIM	9.21E-03		
Diethyl phthalate	non-SIM	2.92E+04	10 U	10 U
Dimethyl phthalate	non-SIM	3.65E+05	10 U	10 U
Di-N-Butyl phthalate	non-SIM	3.65E+03	10 U	10 U
Di-N-Octyl phthalate	non-SIM	1.46E+03	10 U	10 U
Fluoranthene	non-SIM	1.46E+03	10 U	10 U
Fluoranthene	SIM	1.46E+03		
Fluorene	non-SIM	2.43E+02	10 U	10 U
Fluorene	SIM	2.43E+02		
Hexachlorobenzene	non-SIM	1.00E+00	10 U	10 U
Hexachlorobenzene	SIM	1.00E+00		
Indeno(1,2,3-cd)pyrene	non-SIM	9.21E-02	10 U	10 U
Indeno(1,2,3-cd)pyrene	SIM	9.21E-02		
Naphthalene	non-SIM	6.20E+00	5.0 U	5.0 U
Naphthalene	non-SIM	6.20E+00	10 U	10 U

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 17 (continued)  
Groundwater Characterization Data - SVOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program			Ph A	Ph A
Well No.			SA15	M-89
Sample ID			GWSA15	M-89
Sample Date			11/08/2006	12/05/2006
SVOCs	Analytical Method	MCL <sup>2</sup> ug/L	ug/L	ug/L
Naphthalene	SIM	6.20E+00		
Nitrobenzene	non-SIM	3.40E+00	10 U	10 U
Octachlorostyrene	non-SIM	--	10 U	10 U
Phenanthrene	non-SIM	1.80E+03 (n)	10 U	10 U
Phenanthrene	SIM	1.80E+03 (n)		
Pyrene	non-SIM	1.83E+02	10 U	10 U
Pyrene	SIM	1.83E+02		
Pyridine	non-SIM	3.65E+01	20 U	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.
  - (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.
  - (n) Value for anthracene used as surrogate for phenanthrene due to structural similarities.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 18**  
**Soil Characterization Data - TPH and Fuel Alcohols**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

				Fuel Alcohols			Total Petroleum Hydrocarbons			
				Ethanol mg/kg	Ethylene glycol mg/kg	Methanol mg/kg	TPH - ORO mg/kg	TPH - DRO mg/kg	TPH - GRO mg/kg	
			<b>MSSL<sup>1</sup> mg/kg</b>	--	1.00E+05	1.00E+05	1.00E+02 vv	1.00E+02 vv	1.00E+02 vv	
Boring No.	Sample ID.	Sample Depth (ft)	Sample Date							Sampling Program
SA15	SA15-0.5	0.5	11/08/2006				29 U	29 U	0.12 U	Ph A <sup>2</sup>
SA16	SA16-0.5	0.5	11/09/2006				27 U	27 U	0.11 UJ	Ph A
SA16	SA16-10	10	11/09/2006				28 U	28 U	0.11 U	Ph A
SA16	SA16-20	20	11/09/2006				27 U	27 U	0.11 U	Ph A
SA16	SA16-30	30	11/09/2006				40 U	40 U	0.16 U	Ph A

**Notes:**

1. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
  2. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility - Henderson, Nevada, September 2007.
- (w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 19**  
**Soil Characterization Data - VOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A <sup>1</sup>	Ph A	Ph A	Ph A
Boring No.		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30
Sample Depth (ft)		0.5	10	10	20	30	35				
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006
VOCs	MSSL <sup>2</sup> ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Naphthalene	2.10E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,1,1,2-Tetrachloroethane	7.60E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,1,1-Trichloroethane	1.40E+06	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,1,2,2-Tetrachloroethane	9.70E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,1,2-Trichloroethane	2.10E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,1-Dichloroethane	2.30E+06	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,1-Dichloroethene	4.70E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,1-Dichloropropene	1.75E+03 (gg)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,2,3-Trichlorobenzene	2.60E+05 (hh)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	<b>17 J</b>	8.1 UJ
1,2,3-Trichloropropane	1.60E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,2,4-Trichlorobenzene	2.60E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	<b>5.0 J</b>	8.1 UJ
1,2,4-Trimethylbenzene	2.20E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,2-Dibromo-3-chloropropane	2.00E+01	5.8 UJ	5.9 UJ	5.5 UJ	5.5 UJ	6.8 U	6.9 UJ	5.3 U	5.6 U	5.4 U	8.1 U
1,2-Dichlorobenzene	3.70E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,2-Dichloroethane	8.40E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,2-Dichloropropane	8.50E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,3,5-Trimethylbenzene	7.80E+04	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,3-Dichlorobenzene	1.40E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
1,3-Dichloropropane	4.10E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
1,4-Dichlorobenzene	8.10E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
2,2-Dichloropropane	8.50E+02 (ii)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
2-Butanone	3.40E+07	12 U	12 U	11 U	11 U	14 U	14 U	11 U	11 U	<b>2.0 J</b>	16 U
2-Chlorotoluene	5.10E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
2-Hexanone	1.72E+07 (nn)	12 UJ	12 UJ	11 UJ	11 UJ	14 U	14 UJ	11 U	11 U	11 U	16 U
2-Methoxy-2-methyl-butane	--	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
4-Chlorotoluene	5.10E+05 (ww)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
4-Isopropyltoluene	--	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
4-Methyl-2-pentanone	1.70E+07	12 UJ	12 UJ	11 UJ	11 UJ	14 U	14 UJ	11 U	11 U	11 U	16 U

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 19 (continued)**  
**Soil Characterization Data - VOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A <sup>1</sup>	Ph A	Ph A	Ph A
Boring No.		SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16
Sample ID		SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30
Sample Depth (ft)		0.5	10	10	20	30	35				
Sample Date		11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006
VOCs	MSSL <sup>2</sup> ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acetone	6.00E+07	12 U	12 U	11 U	11 U	14 UJ	14 U	11 UJ	11 UJ	29 UJ	16 UJ
Benzene	1.60E+03	<b>0.84 J</b>	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Bromobenzene	1.20E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Bromochloromethane	1.75E+03 (qq)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Bromodichloromethane	2.60E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Bromoform	2.40E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Bromomethane	1.50E+04	12 U	12 U	11 U	11 U	14 UJ	14 U	11 UJ	11 UJ	11 UJ	16 UJ
Carbon tetrachloride	5.80E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Chlorobenzene	5.00E+05	<b>7.5</b>	<b>1.9 J</b>	<b>1.2 J</b>	<b>0.99 J</b>	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Chloroethane	7.20E+03	5.8 UJ	5.9 UJ	5.5 UJ	5.5 UJ	6.8 UJ	6.9 UJ	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Chloroform	5.80E+02	<b>2.8 J</b>	<b>0.59 J</b>	<b>0.54 J</b>	<b>0.35 J</b>	<b>8.3</b>	<b>4.9 J</b>	5.3 U	5.6 U	5.4 U	<b>240</b>
Chloromethane	1.70E+05	5.8 UJ	5.9 UJ	5.5 UJ	5.5 UJ	6.8 UJ	6.9 UJ	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
cis-1,2-Dichloroethene	1.60E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
cis-1,3-Dichloropropene	1.75E+03 (gg)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Dibromochloromethane	2.60E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Dibromomethane	5.90E+05 (xx)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Dichlorodifluoromethane	3.40E+05	5.8 UJ	5.9 UJ	5.5 UJ	5.5 UJ	6.8 UJ	6.9 UJ	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Ethyl t-butyl ether	7.90E+04 (kk)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Ethylbenzene	2.30E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Ethylene dibromide	7.00E+01	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Hexachlorobutadiene	2.50E+04	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
isopropyl ether	--	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Isopropylbenzene	5.80E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Methyl tert butyl ether	7.90E+04	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Methylene chloride	2.20E+04	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	15 UJ	8.1 UJ
N-Butylbenzene	2.40E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
N-Propylbenzene	2.40E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
sec-Butylbenzene	2.20E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 19 (continued)**  
**Soil Characterization Data - VOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	Ph A	Ph A	Ph A <sup>1</sup>	Ph A	Ph A	Ph A	
Boring No.	SA15	SA15	SA15	SA15	SA15	SA15	SA16	SA16	SA16	SA16	
Sample ID	SA15-0.5	SA15-10	SA15-10D	SA15-20	SA15-30	SA15-35	SA16-0.5	SA16-10	SA16-20	SA16-30	
Sample Depth (ft)	0.5	10	10	20	30	35					
Sample Date	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/08/2006	11/09/2006	11/09/2006	11/09/2006	11/09/2006	
VOCs	MSSL <sup>2</sup> ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
Styrene	1.70E+06	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
t-Butyl alcohol	--	12 UJ	12 UJ	11 UJ	11 UJ	16 UJ	14 UJ	12 UJ	15 UJ	16 UJ	21.0 UJ
tert-Butylbenzene	3.90E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Tetrachloroethene	1.70E+03	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Toluene	5.20E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
trans-1,2-Dichloroethylene	2.00E+05	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
trans-1,3-Dichloropropene	1.75E+03 (gg)	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Trichloroethene	1.00E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 UJ	6.9 U	5.3 UJ	5.6 UJ	<b>1.1 J</b>	<b>8.8 J</b>
Trichlorofluoromethane	1.40E+06	5.8 UJ	5.9 UJ	5.5 UJ	5.5 UJ	6.8 UJ	6.9 UJ	5.3 UJ	5.6 UJ	5.4 UJ	8.1 UJ
Vinylchloride	8.60E+02	5.8 U	5.9 U	5.5 U	5.5 U	6.8 U	6.9 U	5.3 U	5.6 U	5.4 U	8.1 U
Xylene (Total)	2.10E+05	12 U	12 U	11 U	11 U	14 UJ	14 U	11 UJ	11 UJ	11 UJ	16 UJ

**Notes:**

1. ENSR, 2007, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
  2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).
- (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.  
(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.  
(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.



**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 20  
Groundwater Characterization Data - VOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A
Well ID		SA15	M-89
Sample ID		GWSA15	M-89
Sample Date		11/08/2006	12/05/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L
Naphthalene	6.20E+00	5.0 U	5.0 U
1,1,1,2-Tetrachloroethane	4.32E-01	5.0 U	5.0 U
1,1,1-Trichloroethane	2.00E+02	5.0 U	5.0 U
1,1,2,2-Tetrachloroethane	5.00E+00	5.0 U	5.0 U
1,1,2-Trichloroethane	5.00E+00	5.0 U	5.0 U
1,1-Dichloroethane	8.11E+02	5.0 U	5.0 U
1,1-Dichloroethene	7.00E+00	5.0 U	5.0 U
1,1-Dichloropropene	3.95E-01 gg	5.0 U	5.0 U
1,2,3-Trichlorobenzene	7.16E+00 hh	5.0 U	5.0 U
1,2,3-Trichloropropane	5.60E-03	5.0 U	5.0 U
1,2,4-Trichlorobenzene	7.00E+01	5.0 U	5.0 U
1,2,4-Trimethylbenzene	1.23E+01	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane	2.00E-01	5.0 U	5.0 UJ
1,2-Dichlorobenzene	6.00E+02	5.0 U	5.0 U
1,2-Dichloroethane	5.00E+00	5.0 U	5.0 U
1,2-Dichloropropane	5.00E+00	5.0 U	5.0 U
1,3,5-Trimethylbenzene	1.23E+01	5.0 U	5.0 U
1,3-Dichlorobenzene	1.83E+02	5.0 U	5.0 U
1,3-Dichloropropane	1.22E+02	5.0 U	5.0 U
1,4-Dichlorobenzene	7.50E+01	5.0 U	5.0 U
2,2-Dichloropropane	1.65E-01 ii	5.0 U	5.0 U
2-Butanone	6.97E+03	10 U	10 U
2-Chlorotoluene	1.22E+02	5.0 U	5.0 U
2-Hexanone	2.00E+03 nn	10 UJ	10 U
2-Methoxy-2-methyl-butane	--	5.0 U	5.0 U
4-Chlorotoluene	1.22E+02 ww	5.0 U	5.0 U
4-Isopropyltoluene	--	5.0 U	5.0 U
4-Methyl-2-pentanone	1.99E+03	10 U	10 UJ
Acetone	5.48E+03	10 U	10 U
Benzene	5.00E+00	5.0 U	5.0 U
Bromobenzene	2.03E+01	5.0 U	5.0 U
Bromochloromethane	1.81E-01 qq	5.0 U	5.0 U
Bromodichloromethane	8.00E+01 r	5.0 U	5.0 U
Bromoform	8.00E+01 r	5.0 U	<b>3.4 J</b>
Bromomethane	8.66E+00	10 U	10 UJ
Carbon tetrachloride	5.00E+00	5.0 U	<b>1.3 J</b>
Chlorobenzene	1.00E+02 o	5.0 U	5.0 U
Chloroethane	4.64E+00	5.0 UJ	5.0 U
Chloroform	8.00E+01 r	<b>41</b>	<b>1700 J+</b>
Chloromethane	1.58E+02	5.0 UJ	5.0 U
cis-1,2-Dichloroethene	7.00E+01	5.0 U	5.0 U
cis-1,3-Dichloropropene	3.95E-01 gg	5.0 U	5.0 U
Dibromochloromethane	8.00E+01 r	5.0 U	5.0 U
Dibromomethane	6.08E+01 xx	5.0 U	5.0 U
Dichlorodifluoromethane	3.95E+02	5.0 UJ	5.0 U
Ethyl t-butyl ether	1.10E+01 kk	5.0 U	5.0 U
Ethylbenzene	7.00E+02	5.0 U	5.0 U
Ethylene dibromide	--	5.0 U	5.0 U
Hexachlorobutadiene	8.62E-01	5.0 U	5.0 U

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 20 (continued)  
Groundwater Characterization Data - VOCs**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A <sup>1</sup>	Ph A
Well ID		SA15	M-89
Sample ID		GWSA15	M-89
Sample Date		11/08/2006	12/05/2006
VOCs	MCL <sup>2</sup> ug/L	ug/L	ug/L
isopropyl ether	--	5.0 U	5.0 U
Isopropylbenzene	6.58E+02	5.0 U	5.0 U
Methyl tert butyl ether	2.00E+01 a,uu	5.0 U	<b>0.94 J</b>
Methylene chloride	5.00E+00	5.0 U	5.0 U
N-Butylbenzene	2.43E+02	5.0 U	5.0 U
N-Propylbenzene	2.43E+02	5.0 U	5.0 U
sec-Butylbenzene	2.43E+02	5.0 U	5.0 U
Styrene	1.00E+02	5.0 U	5.0 U
t-Butyl alcohol	--	10 UJ	10 UJ
tert-Butylbenzene	2.43E+02	5.0 U	5.0 U
Tetrachloroethene	5.00E+00	5.0 U	5.0 U
Toluene	1.00E+03	5 U	5.0 U
trans-1,2-Dichloroethylene	1.00E+02	5.0 U	5.0 U
trans-1,3-Dichloropropene	--	5.0 U	5.0 U
Trichloroethene	5.00E+00	5.0 U	<b>12</b>
Trichlorofluoromethane	--	5.0 UJ	5.0 U
Vinylchloride	2.00E+00	5.0 U	5.0 U
Xylene (Total)	1.00E+04	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.
  - (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.
- (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.
- (uu) NDEP, 1998. Oxygenated Fuel Corrective Action Guidance. Draft. October, 12 1998. URL [[http://ndep.nv.gov/bca/mtbe\\_doc.htm](http://ndep.nv.gov/bca/mtbe_doc.htm)].

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 21**  
**Soil Characterization Data - Long Asbestos Fibers in Respirable Soil Fraction**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

<b>Boring No.</b>	<b>Sample ID</b>	<b>Sample Date</b>	<b>Long Amphibole Protocol Structures s/gPM10</b>	<b>Long Amphibole Protocol Structures (structures/samples)</b>	<b>Long Chrysotile Protocol Structures s/gPM10</b>	<b>Long Chrysotile Protocol Structures (structures/samples)</b>	<b>Sampling Program</b>
SA15	SA15	12/08/2006	<b>5990000</b>	<b>2</b>	<b>5990000</b>	<b>2</b>	Ph A <sup>1</sup>
SA16	SA16	12/02/2006	<b>5900000</b>	<b>2</b>	<b>14800000</b>	<b>5</b>	Ph A

**Notes:**

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

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 22**  
**Soil and Groundwater Characterization Data - Routine Monitoring<sup>1</sup>**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Well ID	Date	Depth to water (ft)	Perchlorate mg/L	Qual	MCL <sup>2</sup> mg/L	Total Chromium mg/L	Qual	MCL <sup>2</sup> mg/L	TDS mg/L	Qual	MCL <sup>2</sup> mg/L	Nitrate (as N) mg/L	Qual	MCL <sup>2</sup> mg/L	Chlorate mg/L	Qual	MCL <sup>2</sup> mg/L
M-17A	2/3/2006	32.38	860	d	1.80E-02 a,m	28	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-17A	5/5/2006	32.64	810	d	1.80E-02 a,m	29	d	1.00E-01	16200		5.00E+02 j			1.00E+01			--
M-17A	8/4/2006	33.02	788	d	1.80E-02 a,m	29	d	1.00E-01	10400		5.00E+02 j			1.00E+01			--
M-17A	11/3/2006	33.04	775	d	1.80E-02 a,m	28	d	1.00E-01	13830		5.00E+02 j			1.00E+01			--
M-17A	2/2/2007	32.91	788		1.80E-02 a,m	28		1.00E-01	14300		5.00E+02 j			1.00E+01			--
M-17A	5/4/2007	32.99	671		1.80E-02 a,m	28		1.00E-01	12800		5.00E+02 j			1.00E+01			--
M-17A	8/3/2007	33.41	974		1.80E-02 a,m	27		1.00E-01	13800	J-	5.00E+02 j			1.00E+01			--
M-25	2/3/2006	30.93	740	d	1.80E-02 a,m	11	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-25	5/4/2006	31.15			1.80E-02 a,m			1.00E-01			5.00E+02 j	3.3	d	1.00E+01			--
M-25	5/4/2006	31.15	550	d	1.80E-02 a,m	11	d	1.00E-01	9980		5.00E+02 j	28	d	1.00E+01	3100	d	--
M-25	8/1/2006	32.06	488	d	1.80E-02 a,m	11	d	1.00E-01	6940		5.00E+02 j	7.8	d	1.00E+01	3200	d	--
M-25	11/2/2006	32.18	617	d	1.80E-02 a,m	12	d	1.00E-01	9800		5.00E+02 j	28.2	d	1.00E+01	3400	d	--
M-25	1/30/2007	32.55	523		1.80E-02 a,m	12		1.00E-01	9280		5.00E+02 j			1.00E+01			--
M-25	5/1/2007	32.97	495		1.80E-02 a,m	12		1.00E-01	9380		5.00E+02 j	11.9		1.00E+01	3440		--
M-25	7/31/2007	33.28	492		1.80E-02 a,m	12		1.00E-01	9400		5.00E+02 j			1.00E+01			--
M-89	2/2/2006	32.64	1100	d	1.80E-02 a,m	27	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-89	5/4/2006	32.93	990	d	1.80E-02 a,m	26	d	1.00E-01	10000		5.00E+02 j			1.00E+01			--
M-89	8/4/2006	33.31	996	d	1.80E-02 a,m	27	d	1.00E-01	8840		5.00E+02 j			1.00E+01			--
M-89	11/3/2006	33.37	935	d	1.80E-02 a,m	26	d	1.00E-01	15330		5.00E+02 j			1.00E+01			--
M-89	2/1/2007	33.23	841		1.80E-02 a,m	24		1.00E-01	13400		5.00E+02 j			1.00E+01			--
M-89	5/4/2007	33.38	774		1.80E-02 a,m	21		1.00E-01	11100		5.00E+02 j			1.00E+01			--
M-89	8/3/2007	33.73	728		1.80E-02 a,m	23		1.00E-01	12300	J-	5.00E+02 j			1.00E+01			--

**Notes:**

1. ENSR, 2007. Quarterly Performance Report for Remediation Systems, Tronox Facility - Henderson, Nevada, July – 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  
Validation Qualifiers:  
J- = the result is an estimated quantity and the result may be biased low

**LOUs 16, 17, 18, 19, 52, 53, and 57 Table 23  
Soil Characterization Data - Historical**

Multiple LOUs in AP Plant Area  
Tronox Facility - Henderson, Nevada

Sampling Program		CSM <sup>1</sup>	
Boring No.		BDB04	
Sample ID		BDB04	
Sample Depth (ft)		1.0	
Sample Date		04/12/96	
Analytical	MSSL <sup>2</sup> mg/kg		Units
Asbestos	--	3	%
Arsenic	2.80E+02	ND	mg/kg
Barium	1.00E+05	290 B	mg/kg
Chromium	7.10E+01	39	mg/kg
Lead	8.00E+02	590	mg/kg
Mercury	3.41E+02 (t)	ND	mg/kg
Vanadium	5.70E+03	28 B	mg/kg
Chlorate	--	0.13	mg/kg
pH	--	8.8	--
alpha-BHC	4.00E-01	ND	mg/kg
beta-BHC	1.40E+00	ND	mg/kg
4/4-DDE	7.80E+00	420	mg/kg
4/4 DDT	7.80E+00	53	mg/kg
1,2-Dichloro benzene	3.70E+02	ND	mg/kg
1-3-Dichlorobenzene	1.40E+02	ND	mg/kg
1-4-Dichlorobenzene	8.10E+00	ND	mg/kg
Hexachloro benzene	1.20E+00	6.8	mg/kg
Chlorobenzene	5.00E+02	--	mg/kg

**Notes:**

1. ENSR, 2005, Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada, ENSR, Camarillo, California, 04020-023-130, February 2005 and August 2005.

2. U.S. EPA, Region 6, Medium Specific Screening Levels (MSSLs) for Industrial - Outdoor Worker (March, 2008).

(t) Value for mercury and compounds.

**LOUs 16, 17, 18, 19, 52, 53, and 57**  
**Notes for Phase A Data Tables**

Multiple LOUs in AP Plant 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.
--	Not established