

Summary of Available Data for LOU 21
Pond Mn-1 and Associated Piping
 Tronox Facility – Henderson, Nevada

Name of Facility:	Pond Mn-1 and Associated Piping
Goal of Closure:	<ul style="list-style-type: none"> • Continuation of current use - regulatory closure not presently requested because Area III is active. • A limited number of boring locations will be drilled near the LOUs near the active portions of Area III to investigate current soil conditions and to establish baseline soil conditions. Additional investigations will be conducted when this area becomes inactive.
Site Investigation Area:	<ul style="list-style-type: none"> • Size: Approximately 53,000 square feet (1.2 acres). • Location: Located in the northern portion of Area III, near the eastern property boundary. • Current Status/Features: Pond Mn-1 and the associated piping are currently active.
Description:	<ul style="list-style-type: none"> • Pond Mn-1 was constructed in May 1983 and is currently active as an evaporation pond [Ref. 3]. • The pond is enclosed with six-foot high berms and is double-lined (60-mil high density polypropylene underlain by four to six inches of bentonite clay [permeability 10^{-6} cm/second]) with a leak detection system located between the two liners [Ref. 1 and 3]. The system is tested twice per month and no problems with the system have been reported [Ref. 4]. • The pond receives non-hazardous manganese dioxide process wastewater (manganese dioxide cell-feed filter waste water and sodium hexametaphosphate cathode wash solution, both from the manganese dioxide process) from Unit 6 via a pipeline which outfalls at the southeast corner of the pond [Ref. 4]. • The associated pipeline runs from Unit 6 along 11th Street to Pond Mn-1. The pipeline is buried from Unit 6 to approximately 200 feet south of the pond (near the northern boundary of LOU 24 [Ref. 4]. • From 1983 to 1989, Pond Mn-1 also received calcine-belt filter wash water from the manganese (Mn) production process [Ref. 3 and 4]. Calcine filter wash water was eliminated in September 1989 [Ref. 4]. • The pipeline routes associated with the calcine building were above ground and exited the building to the west and then ran north along 9th Street. These pipelines were removed approximately 10 years ago [Ref. 4]. No documentation was found in the reports reviewed of samples collected along the pipeline route after their removal.

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- From 1983 to 1994, Pond Mn-1 served as an alternate receptor for waste water if the adjacent Pond C-1 (LOU 20) neared maximum capacity and vice versa [Ref. 4].
- No wastes from production processes that contained fuels, solvents, PCBs, pesticides or dioxins/furans were placed into Pond Mn-1 [Ref. 4].
- Water from the steam plant was also discharged to Pond Mn-1 [Ref. 4].
- Pond Mn-1's pipeline system consists of low-flow plastic lines with no vents or sample points [Ref. 4].

Process Waste Streams Associated with LOU 21	Known or Potential Constituents Associated with LOU 21
Non-hazardous manganese dioxide cell feed waste water	<ul style="list-style-type: none"> • Metal Wastes
Filter waste	<ul style="list-style-type: none"> • Calcium, magnesium and manganese
Cathode wash solution	<ul style="list-style-type: none"> • Sodium hexametaphosphate • Wet chemistry analytes • Metals
Former calcine-belt filter wash water took finely ground raw ore as a slurry to the belt filter and water filtered out from that process carried water soluble elements and compounds.	<ul style="list-style-type: none"> • Potassium phosphate • Manganese • Wet chemistry analytes
Manganese Leach Plant wash water	<ul style="list-style-type: none"> • Potassium oxide and metals
Past diverted flows from LOU 20 (C-1 Pond)	<ul style="list-style-type: none"> • Metals • Wet chemistry analytes
Water from the Steam Plant originating from boiler blowdowns, backwash and regeneration water from the secondary and ammonium perchlorate softeners, sludge bed blowdown from the hot process softener, brine from vapor recompression unit, and miscellaneous pump seal flushes [Ref 3].	<ul style="list-style-type: none"> • Sodium • Calcium • Magnesium • Boron

Overlapping or Adjacent LOUs:

Overlapping LOUs:

- None

Adjacent LOUs:

- LOU 59 (Storm Sewer System) – A branch of the Storm Sewer System is located approximately 100 feet to the east (crossgradient) of the pond boundary.
- LOU 24 (Leach Beds, Associated Conveyance Facilities and Mn Tailings Area) – LOU 24 is located approximately 150 feet to the south (upgradient) of the southern boundary of the pond.

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- LOU 20 (C-1 Pond and Associated Piping) – LOU 20 is located approximately 75 feet to the north (downgradient) of LOU 21.

LOUs Potentially Affecting Soils in LOU 21:

- The historical Mn tailings pile (LOU 24) is located topographically upgradient of LOU 21; however, the soil berms surrounding LOU 21 would prevent liquid runoff from LOU 24 from directly impacting the soils within LOU 21. Runoff from LOU 24 could, however, impact the soil berms around LOU 21. Known or potential chemical classes associated with LOU 24 are consistent with those listed for LOU 21; therefore, the addition of other chemical classes to the Phase B Analytical Plan for LOU 21 is not required.
- LOU 59 (Storm Sewer System) is approximately 100 feet east of LOU 21, and since no leaks have been reported, the possibility of fluids from LOU 59 impacting the soils of LOU 21 is minimal. Known or potential chemical classes associated with LOU 59 in Area III are consistent with those listed for LOU 21; therefore, the addition of other chemical classes to the Phase B Analytical Plan for LOU 21 is not required.

For detailed information on the LOUs listed above, please refer to the specific LOU data packages.

Known or Potential Chemical Classes:

- Metals (including manganese and boron)
- Wet chemistry analytes

Known or Potential Release Mechanisms:

- No known releases were identified in the documents reviewed.
- Potential surface spills to surrounding soils.
- Potential liner leaks or leaching to subsurface (no known releases, leak detection system did not identify leaks) [Ref. 3].

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- Results of Historical Sampling:**
- No known historical soil samples were identified in the documents reviewed.
 - Upgradient well M-35 and downgradient wells M-19 and M-34 are tested for perchlorate, total chromium, manganese, and TDS as part of a routine groundwater monitoring program [Ref. 2].
 - Wells M-34, M-35 and M-19, while tested on a routine basis, have not been specifically tested to evaluate LOU 21. Available data for these wells is presented in LOU 21 Tables 1 and 2 [Ref. 2] (see attached).

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

Summary of Phase A SAI:

Soil

- None specifically conducted for this LOU. The closest Phase A boring (SA17) is approximately 375 feet north (downgradient) and was not specifically sampled to evaluate this LOU [Ref. 5]. Boring SA17 is not considered representative for LOU 21.

Groundwater

- None specifically conducted for this LOU. The closest Phase A well sampled (M-39) is approximately 435 feet to the north (downgradient) and was not specifically sampled to evaluate this LOU [Ref. 5].

The Phase A boring and well are located within LOU 5 (Beta Ditch) and north of LOU 5. Beta Ditch carried a wide variety of chemicals; therefore, the Phase A results for SA17 and M-39 were not considered to be representative of LOU 21.

- Are Phase A Sample Locations in “Worst Case” Areas?**
- No

- Is Phase B Investigation Recommended?**
- Yes

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Proposed Phase B Soil Investigation/Rationale:

LOU 21 is active and cannot be directly investigated without damaging the pond liners and suspending plant production activities. Direct subsurface assessment beneath Pond Mn-1 will be deferred until decommissioning, when the pond is permanently inactive.

- The Phase B Source Area Investigation for this LOU (pond and associated piping) will consist of collecting soil samples from seven (7) judgmental and randomly-located sample locations.
 - Three (3) soil boring locations will be drilled south (upgradient) of LOU 21.
 - Two (2) soil boring locations will be drilled along the pipeline running north-south along the east boundary of the Site.
 - One (1) soil boring location will be drilled along the pipeline running east-west toward the Tronox Stem Plant in Area II.
 - All seven borings along with the analytical program to evaluate soil samples from LOU 21 are listed on **Table A – Soil Sampling and Analytical Plan for LOU 21**.
- Soil sample locations consist of both judgmental and randomly-placed locations.
- Judgmental sample locations:
 - Designed to evaluate soil for known or potential chemical classes associated with LOU 21, based on the known process waste streams.
 - Five (5) of the seven borings are judgmental and include the soil borings SA157, SA139, SA160, SA171, and SA174.
- Random sample grid locations:
 - Designed to assess whether unknown constituents associated with LOU 21 are present.
 - Two (2) of the seven sample locations is a randomly-placed location and includes soil borings RSAN8 and RSAP7.

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Proposed Phase B Constituents List for Soils: Judgmental sample locations will be analyzed for the following LOU-specific constituents and constituents for area-wide coverage:

- Metals (Phase A list)
- Wet chemistry analytes

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

- Hexavalent chromium
- Perchlorate
- VOCs
- Organochlorine pesticides
- Dioxins/furans
- Radionuclides
- Asbestos

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

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

Proposed Phase B Groundwater Investigation/Rationale: The Phase B groundwater investigation of LOU 21 consists of collecting groundwater samples from five (5) locations to evaluate local groundwater conditions and as part of the Site-wide evaluation of constituent trends in groundwater.

- Three (3) wells south (upgradient) of LOU 21 will be sampled. These wells are M-52, M-35, and CLD4-R.
- One (1) well north (downgradient) of LOU 21 will be sampled. This well is M-19.
- One (1) well east (cross-gradient) of LOU 21 will be sampled. This well is M-31A.
- All three wells along with the analytical program to evaluate groundwater samples associated with LOU 21 are listed on **Table B – Groundwater Sampling and Analytical Plan for LOU 21.**

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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: A soil gas samples will be collected from one (1) location to evaluate area conditions for the presence of vapor-phase VOCs in the vadose zone.

- SG84 is located to evaluate the associated piping from the former calcine building in the leach plant area to LOU 21.

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.

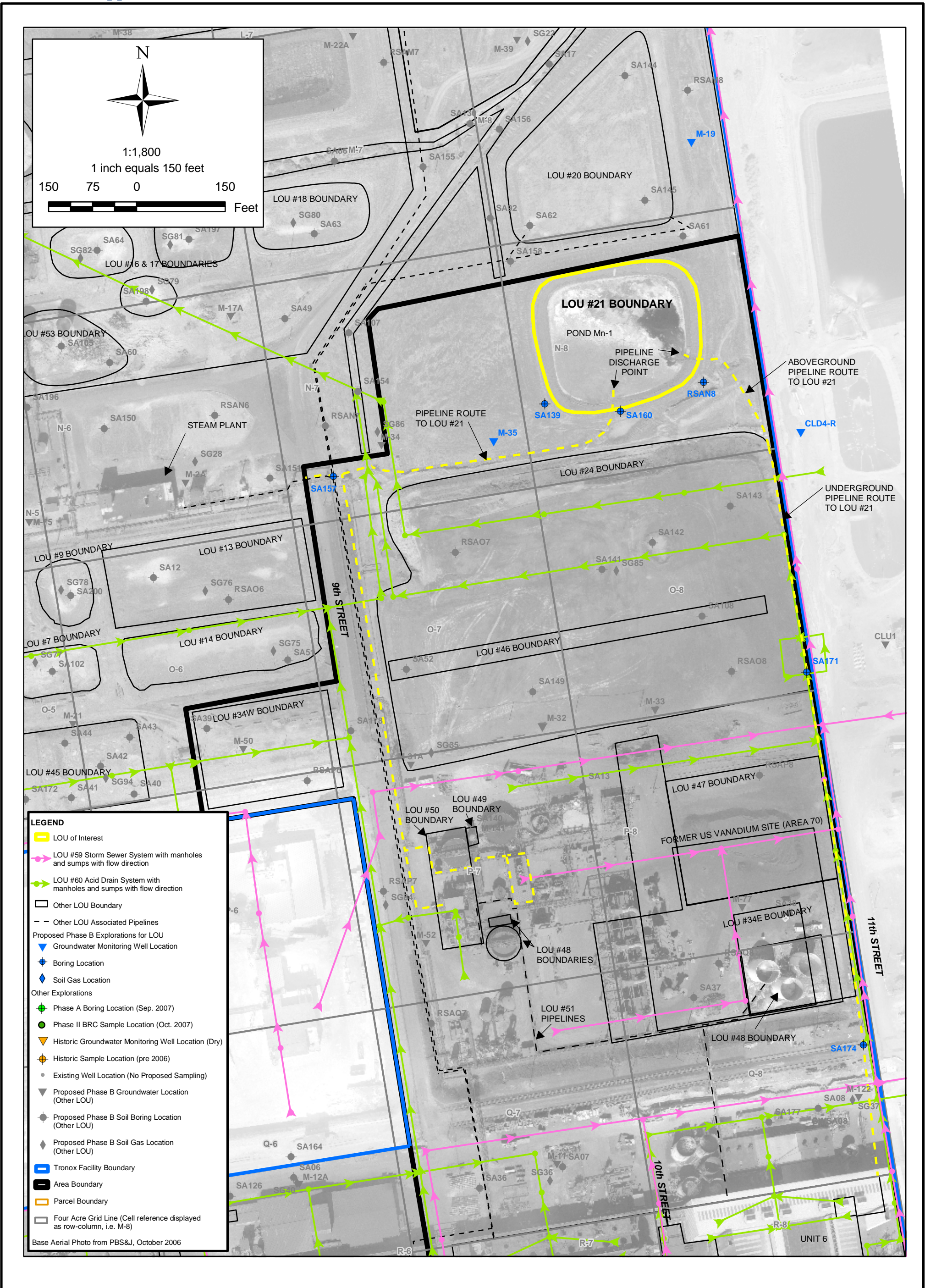
Proposed Phase B Constituents List for Soil Gas: • VOCs (EPA TO-15)

References:

1. ENSR, 2005, Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada, ENSR, Camarillo, California, 04020-023-130, February 2005 and August 2005.
2. ENSR, 2007a, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, and November 2007.
3. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).
4. Tronox, Susan Crowley, verbal communication, January 14, 2008.
5. ENSR, 2007b, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.

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LOU Figure



SHEET NUMBER: X

FIGURE NUMBER: 1

SAMPLE LOCATIONS FOR LOU #21, POND Mn-1 AND ASSOCIATED PIPING

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

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/4/2008	04020-023-430

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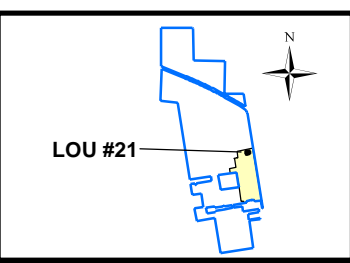
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Sampling and Analytical Plans for LOU 21:

- Table A – Soil Sampling and Analytical Plan for LOU 21
- Table B – Groundwater Sampling and Analytical Plan for LOU 21

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths ¹ (ft. bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs ² (EPA 8260B)	Wet Chemistry ³	Total Cyanide (EPA 9012A)	OCPs ⁴ (EPA 8081A)	SVOCs ⁵ (EPA 8270C)	Radio-nuclides ⁶	Dioxins/Furans ⁷	PCBs ⁸ (EPA 8082 and 1668A)	Asbestos ⁹ (EPA/540/R-97/028)	Geo-technical Tests ¹⁰	Rationale
Borings are organized by grid location as shown on Plate A - Starting point is on the northwestern most grid in Area 3 (N-7) and ending with the southeastern most grid in Area 3 (S-8).																				
N-7	20, 21, 22, 23	SA157	SA157-0.0	0.0														X		Boring located to evaluate LOU 20 (Pond C-1 Associated Piping), LOU 21 (Pond Mn-1 and Associated Piping), LOU 22 (WC-West Associated Piping), and LOU 23 (WC-East Associated Piping). Located at piping junction from all LOUs at highest release potential location (manhole and junction).
N-7	20, 21, 22, 23		SA157-0.5	0.5	X	X	X			X	X		X	X	X	X				
N-7	20, 21, 22, 23		SA157-10	10	X	X	X			X	X		Hold	X	X					
N-7	20, 21, 22, 23		SA157-20	20	X	X	X			X	X		Hold	X	X					
N-7	20, 21, 22, 23		SA157-30	30	X	X	X			X	X		Hold	X	X					
N-7	20, 21, 22, 23		SA157-40	40	X	X	X			X	X		X	X	X					
N-8	21, 24, 46	RSAN8	RSAN8-0.0	0.0														X		Boring located to evaluate LOU 24 (Manganese [Mn] Tailings Pile Area), LOU 46 (Former Old Main Cooling Tower and Recirculation Lines), and LOU 21 (Pond Mn-1 and Associated Piping). Located near the perimeter of two LOUs and associated piping at a high release potential location (down slope and low spot).
N-8	21, 24, 46		RSAN8-0.5	0.5	X	X	X	X		X	X		X	X	X	X				
N-8	21, 24, 46		RSAN8-10	10	X	X	X	X		X	X		Hold	X	X				X	
N-8	21, 24, 46		RSAN8-20	20	X	X	X	X		X	X		Hold	X	X					
N-8	21, 24, 46		RSAN8-30	30	X	X	X	X		X	X		Hold	X	X					
N-8	21, 24, 46		RSAN8-40	40	X	X	X	X		X	X		X	X	X					
N-8	21, 24, 46	SA139	SA139-0.0	0.0														X		Boring located to evaluate LOU 21 (Pond Mn-1 and Associated Piping), LOU 24 (Mn Tailings Pile area), and LOU 46 (Former Old Main Cooling Tower and Recirculation Lines). Located near the perimeter of two LOUs and associated piping at a high release potential location (down slope and low spot).
N-8	21, 24, 46		SA139-0.5	0.5	X	X	X			X	X		X		X	X				
N-8	21, 24, 46		SA139-10	10	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA139-20	20	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA139-30	30	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA139-40	40	X	X	X			X	X		X		X					
N-8	21, 24, 46	SA160	SA160-0.0	0.0														X		Cooling Tower and Recirculation Lines) and LOU 21 (Pond Mn-1 and Associated Piping). Located
N-8	21, 24, 46		SA160-0.5	0.5	X	X	X			X	X		X		X	X				
N-8	21, 24, 46		SA160-10	10	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA160-20	20	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA160-30	30	X	X	X			X	X		Hold	X						
N-8	21, 24, 46		SA160-40	40	X	X	X			X	X		X		X					
O-8	21, 24, 46, 59, 60	SA171	SA171-0.0	0.0														X		Area), LOU 46 (Former Old Main Cooling Tower and Recirculation Lines), LOU 59 (Storm Sewer System), and LOU 60 (Acid Drain System). Located within LOU 24 nearby LOU 46 and adjacent to LOUs 21,59 and 60 piping at a reasonable release location to evaluate all five LOUs. Boring located to evaluate LOU 21 (Pond Mn-1 and Associated Piping), LOU 24 (Mn Tailings Pile
O-8	21, 24, 46, 59, 60		SA171-0.5	0.5	X	X	X			X	X		X		X	X				
O-8	21, 24, 46, 59, 60		SA171-10	10	X	X	X			X	X		Hold	X						
O-8	21, 24, 46, 59, 60		SA171-20	20	X	X	X			X	X		Hold	X						
O-8	21, 24, 46, 59, 60		SA171-30	30	X	X	X			X	X		Hold	X						
O-8	21, 24, 46, 59, 60		SA171-40	40	X	X	X			X	X		X		X					
Q-8	21, 59, 60	SA174	SA174-0.0	0.0														X		Boring located to evaluate LOU 21 (Pond Mn-1 and Associated Piping), LOU 59 (Storm Sewer System), and LOU 60 (Acid Drain System). Located adjacent to all three LOU pipelines at a reasonable release location from edge of street with differential load potential.
Q-8	21, 59, 60		SA174-0.5	0.5	X	X	X			X	X		X		X	X				
Q-8	21, 59, 60		SA174-10	10	X	X	X			X	X		Hold	X						
Q-8	21, 59, 60		SA174-20	20	X	X	X			X	X		Hold	X						
Q-8	21, 59, 60		SA174-30	30	X	X	X			X	X		Hold	X						
Q-8	21, 59, 60		SA174-40	40	X	X	X			X	X		X		X					
Number of Borings:		6																		
Number of Samples:					30	30	30	5	0	30	30	0	12	10	30	6	0	6	1	
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 - Sample locations will be analyzed by USEPA methods 8082 and 1668A. Concrete surfaces at these locations will also include chip and/or wipe samples per EPA Region 1 SOP for Sampling Concrete in the Field (1997).																				
9. Soil samples for asbestos analyses will be collected from a depth of 0 to 2-inches bgs.																				
10. Geotechnical Tests consist of: moisture content (ASTM D-2216), grain size analysis (ASTM D-422 and C117-04), Soil Dry Bulk Density (ASTM D-2937), Grain Density (ASTM D-854, Soil-Water Filled Porosity (ASTM D-2216); Vertical Hydraulic Conductivity (ASTM D-5084/USEPA 9100).																				

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Soil Type Expected Across Screen Interval ¹ .	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs ² (EPA 8260)	Wet Chemistry (a)	OCPs ³ (EPA 8081A)	SVOCs ⁴ (EPA 8270C)	Radio-nuclides ⁵	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern-most grid in Area III (N-7) and ending with the southeastern-most grid covering Area III (Q-9).														
N-7	III	M-35	25 - 40	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient step out for LOUs 24 and 46; as an crossgradient step out for LOU 21; and for general Site coverage.
M-8	IIIN	M-19	14.5 - 34.5	Qal/MCfg1	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient step out for LOU 21 and for general Site coverage.
N-9	IIIE	CLD-4R	nr	nr	no	X	X	X	X	X	X	X	X	Serves as a step out downgradient well for LOUs 24 and 46; as a step out upgradient well for LOU 21; as a cross-gradient step out to LOUs 59 and 60; and general Site coverage located on Timet.
Number of Field Samples:						3	3	3	3	3	3	3	3	
Notes:														
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).													
(a)	Complete list of wet chemistry parameters are shown on Table 1. All groundwater samples will have pH measured in the field.													
IIIN/E/W/S	Well located outside (north, east, west, or south) of Area III.													
TBD	To be determined when well is constructed.													
nr	Not recorded in the All Wells Database (June 2008).													
Qal	Quaternary Alluvium													
MCfg1	Muddy Creek Formation - first fine-grained facies													
MCcg1	Muddy Creek Formation - first coarse-grained facies													
MCfg2	Muddy Creek Formation - second fine-grained facies													

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Soil and Groundwater Characterization Data

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LOU-specific analytes identified include:

- Metals
- Wet chemistry analytes
- Hexavalent chromium
- Perchlorate
- VOCs
- SVOCs
- Organochlorine Pesticides
- Radionuclides

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

LOU 21 Table 1 – Groundwater Characterization Data – Routine Monitoring

LOU 21 Table 2 – Summary of Historical Groundwater Analytical Data

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

**LOU 21 Table 1
Groundwater Characterization Data - Routine Monitoring¹**

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Well ID	Date	Depth to water (ft)	Perchlorate mg/L	Qual	MCL ² mg/L	Total Chromium mg/L	Qual	MCL ² mg/L	TDS mg/L	Qual	MCL ² mg/L	Nitrate (as N) mg/L	Qual	MCL ² mg/L	Chlorate mg/L	Qual	MCL ² mg/L
M-19	2/2/2006	31.67	1	d	1.80E-02 a,m	0.2	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-19	5/3/2006	33.14	0.96	d	1.80E-02 a,m	0.19	d	1.00E-01	2950		5.00E+02 j			1.00E+01			--
M-19	8/2/2006	34.11	0.91	d	1.80E-02 a,m	0.22	d	1.00E-01	2650		5.00E+02 j			1.00E+01			--
M-19	11/1/2006	35.72	1.83	d	1.80E-02 a,m	0.32	d	1.00E-01	3670		5.00E+02 j			1.00E+01			--
M-19	1/31/2007	34.92	1.9		1.80E-02 a,m	0.29		1.00E-01	3740		5.00E+02 j			1.00E+01			--
M-19	5/2/2007	34.51	1.91		1.80E-02 a,m	0.34		1.00E-01	3720		5.00E+02 j			1.00E+01			--
M-19	8/1/2007	34.93	2.49		1.80E-02 a,m	0.38		1.00E-01	4820		5.00E+02 j			1.00E+01			--
M-34	2/2/2006	---	1800	d	1.80E-02 a,m	17	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-34	5/3/2006	---	1700	d	1.80E-02 a,m	18	d	1.00E-01	8960		5.00E+02 j			1.00E+01			--
M-34	5/7/2006	40.86	1950	d	1.80E-02 a,m			1.00E-01	14500		5.00E+02 j			1.00E+01			--
M-34	8/2/2006	---	1550	d	1.80E-02 a,m	18	d	1.00E-01	7430		5.00E+02 j			1.00E+01			--
M-34	11/1/2006	---	1910	d	1.80E-02 a,m	18	d	1.00E-01	10900		5.00E+02 j			1.00E+01			--
M-34	1/31/2007	---	1860		1.80E-02 a,m	17		1.00E-01	12000		5.00E+02 j			1.00E+01			--
M-34	5/2/2007	37.52	1670		1.80E-02 a,m	17		1.00E-01	9850		5.00E+02 j			1.00E+01			--
M-34	8/1/2007	---	2130		1.80E-02 a,m	16		1.00E-01	11900		5.00E+02 j			1.00E+01			--
M-35	2/2/2006	34.73	810	d	1.80E-02 a,m	9.4	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-35	5/3/2006	35.02	550	d	1.80E-02 a,m	9.8	d	1.00E-01	6090		5.00E+02 j			1.00E+01			--
M-35	5/7/2006	38.68	945	d	1.80E-02 a,m			1.00E-01	9610		5.00E+02 j			1.00E+01			--
M-35	5/7/2006	38.68	777	d	1.80E-02 a,m			1.00E-01	9670		5.00E+02 j			1.00E+01			--
M-35	8/2/2006	35.54	694	d	1.80E-02 a,m	11	d	1.00E-01	6240		5.00E+02 j			1.00E+01			--
M-35	11/1/2006	35.67	785	d	1.80E-02 a,m	12	d	1.00E-01	9070		5.00E+02 j			1.00E+01			--
M-35	1/31/2007	35.74	650		1.80E-02 a,m	12		1.00E-01	9530		5.00E+02 j			1.00E+01			--
M-35	5/2/2007	35.52	408		1.80E-02 a,m	6.2		1.00E-01	6090		5.00E+02 j			1.00E+01			--
M-35	8/1/2007	35.97	407		1.80E-02 a,m	9.4		1.00E-01	7280		5.00E+02 j			1.00E+01			--

Notes:

1. ENSR, 2007, Quarterly Performance Report for Remediation Systems, Tronox LLC, Henderson, Nevada, July-September 2007, and November 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].
 - (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 = milligrams per liter

Laboratory Qualifiers:

d = the sample was diluted

LOU 21 Table 2
Summary of Historical Groundwater Analytical Data

Pond Mn-1 and Associated Piping
Tronox Facility - Henderson, Nevada

Well ID	Sample Date	Total Depth (ft bgs)	Depth to Water (ft TOC)	pH (Lab)	EC (Lab, µmho/cm)	Cr-total (ppm)	Mn (ppm)	ClO ₄ (ppm)
M-19	5/6/99	39.54	33.03	7.14	12000	0.62	0.70	13.0
M-19	5/5/00	39.54	34.50	7.62	11300	0.71	0.34	7.360
M-19	5/4/01	39.54	35.06	7.38	10700	0.88	0.08	0.056
M-19	4/29/02	39.54	34.02	7.3	8360	0.45	0.17	6.8
M-34	5/6/99	42.39	36.69	7.04	19,500	--	28	1,500
M-34	5/5/00	42.39	37.44	7.22	18,900	--	30	1,700
M-34	5/4/01	42.39	37.52	7.21	16,400	--	33	2,100
M-34	4/29/02	42.39	36.38	7.2	14,370	--	28	2,000
M-35	5/6/99	42.80	34.27	7.13	9720	4.30	0.85	1000
M-35	5/5/00	42.80	35.22	7.31	8970	3.40	1.20	820
M-35	5/4/01	42.80	25.40	7.28	9970	4.60	2.40	1000
M-35	3/11/02	42.80	---	---	---	---	0.07	---
M-35	4/29/02	42.80	34.27	7.2	9370	6.8	0.14	990
M-35	9/9/02	42.80	---	---	---	---	0.22	---
M-35	12/9/02	42.80	35.40	7.2	9280	6.8	0.061	590
M-35	4/29/03	42.80	---	---	---	---	ND<0.15	---

Notes:

ft bgs = feet below ground surface

ppm = parts per million

µmho/cm = micromhos per centimeter

ft TOC = feet from Top of Casing

ND<0.15 = Not determined, not detected above the designated detection limit.

--- = Either no data was obtained or was not analyzed for the respective constituent.

EC = Electrical Conductivity

Cr-total: Total Chromium

Mn = Manganese

ClO₄: Perchlorate

Source:

LOU 21
Notes for Phase A Data Tables

Pond Mn-1 and Associated Piping
Tronox Facility - Henderson, Nevada

Blank	Not analyzed.
Bold	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