Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

Name of Facility: **Historic Manganese Tailings Area, West**

Goal of Closure:
- Closure for future commercial/industrial use.

Site Investigation Area:
- Size: Approximately 250 feet by 165 feet (0.95 acre).
- Location: South-central portion of the Site, north of the Chemstar property, west of 9th Street and north of Avenue F.
- Current Status/Features: LOU 34W is currently vacant and no structures or historic manganese (Mn) tailings are present.

Description:
- This open area was used to spread Mn tailings (solid filter cake) from the beneficiation of manganese dioxide process [Ref. 2]. The tailings were periodically graded for drainage.
- Prior to 1985, the tailings piles were consolidated to the current location of the historic Mn tailings pile (LOU 24).

Process Waste Streams Associated with LOU 34W	Known or Potential Constituents Associated with LOU 34W
Infiltration of moisture remaining in manganese dioxide tailings to the underlying soil and possibly groundwater.	• Metals (manganese, chromium) • Wet chemistry analytes
Surface runoff of precipitation.	• Metals (manganese, chromium) • Heavy metal sulfides • Wet chemistry analytes
Percolation of precipitation through tailings and leaching into underlying soils and possibly groundwater.	• Metals (manganese, chromium) • Wet chemistry analytes

Overlapping or Adjacent LOUs: The following LOUs overlap or are adjacent to LOU 34W:

<u>Overlapping LOUs</u>
- LOU 60 (Acid Drainage System) – A segment of the Acid Drainage System runs through the center of LOU 34W.

<u>Adjacent LOUs</u>
- LOU 14 (Pond P-1 and Associated Conveyance Piping) – LOU 14 is located approximately 45 feet north (downgradient) of LOU 34W.

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

- LOU 45 (Diesel Storage Tank) – LOU 45 is located approximately 100 feet to the west (crossgradient) of LOU 34W.
- LOUs 24 and 46 (Leach Beds, associated Conveyance Facilities, and Mn Tailings Area; and Former Main Cooling Tower and Recirculation Lines) – LOUs 24 and 46 are located approximately 100 feet to the east (crossgradient) of LOU 34W.

Known or potential chemical classes associated with LOUs 14, 24, and 46 are consistent with those listed for LOU 34W; therefore, the addition of other chemical classes to the Phase B Analytical Plan for LOU 34W is not required.

LOUs Potentially Affecting Soils in LOU 34W:

- LOU 45 (Diesel Storage Tank): This LOU consisted of a 500,000-gallon above-ground storage tank (AST) with an 18,000-gallon overflow AST [Ref. 2]. In the event of a major release (none documented in the reports reviewed) fluids could have impacted LOU 34W.
- LOU 60 (Acid Drain System): The portion of the Acid Drain System along the center of LOU 34W conveyed effluent from the Chemstar facility to the Trade Effluent Settling Ponds (LOU 1).
- No releases have been reported from LOU 45. In the event of a leak, fluids would have infiltrated the ground surface; therefore, the potential impact from LOU 45 upon the soils of LOU 34W is considered to be unlikely. As a result, the addition of other chemical classes to the Phase B Analytical Plan for LOU 34W is not required.
- The potential for releases from LOU 60 to affect soils of LOU 34W is considered to be minimal, since no leaks have been reported in the documents reviewed.

Known or Potential Chemical Classes:

- Metals
- Wet chemistry analytes

Known or Potential Release Mechanisms:

- Potential percolation of precipitation or infiltration of moisture through tailings to underlying soil and possibly groundwater [Ref. 2].
- Potential surface runoff to surrounding soil or diversion ditches [Ref. 2].
- Potential of incomplete removal of tails to LOU 24 (Historic Mn Tailings Pile).

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

Results of Historical Sampling:

Soil

- No known historical soil sampling was identified in the documents reviewed. Soil samples from LOU 34E containing similar manganese dioxide tailings as LOU 34W were analyzed.
  - EP TOX and TCLP testing of tailings identified eight heavy metals at non-hazardous concentrations. Waste stream evaluation identified calcium sulfate as the only water soluble constituent in appreciable quantities [Ref. 2].

Groundwater

- Historical monitoring well M-50 was identified within the LOU boundaries. This well was installed in 1997 and has been routinely sampled for pH, electric conductivity, total chromium, and perchlorate. Analytical results for groundwater are summarized in LOU 34W Table 1 [Ref. 1] (see attached).

Did Historical Samples Address Potential Release?

- No

Summary of Phase A SAI:

Soil

- Mn ore and Historic Mn tailings pile composite samples were collected and analyzed for metals and radionuclides. Results indicated that the samples are non-hazardous [Ref. 1].
- None specifically conducted for LOU 34W. Phase A boring SA13 is approximately 400 feet west (cross-gradient) and was not specifically sampled to evaluate this LOU [Ref. 1]; therefore, SA13 is not considered to be representative of soil conditions in LOU 34W.

Groundwater

- None specifically conducted for LOU 34W. The closest well sampled (M-2A) is approximately 390 feet north (downgradient) and was not specifically sampled to evaluate this LOU [Ref. 1].
- Analytical results for the Mn Tailings samples from the Phase A sampling event are summarized in LOU 34W Tables 1, 2, and 5 [Ref. 1] (see attached).

Are Phase A Sample Locations in "Worst Case" Areas?

- No

Is Phase B Investigation Recommended?

- Yes

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

Proposed Phase B Soil Investigation/Rationale:

The Phase B Source Area Investigation for LOU 34W will consist of collecting soil samples from the following three (3) locations.

- Two (2) soil borings will be drilled within the boundaries of LOU 34W.
- One (1) soil boring will be drilled east (cross-gradient) of LOU 34W.
- All four borings along with the analytical program to evaluate soil samples from LOU 34W are listed on **Table A – Soil Sampling and Analytical Plan for LOU 34W.**

- 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 LOUs, based on the known process waste streams.
  - Two (2) of the three sample locations are judgmental locations and include soil borings SA178 and SA39.
- Random sample grid locations:
  - Designed to assess whether unknown constituents associated with the LOUs are present.
  - One (1) of the three sample locations is randomly-placed (i.e., RSAP6).

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)
- Wet chemistry analytes

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

- Hexavalent chromium
- Perchlorate
- VOCs
- Radionuclides
- Organochlorine pesticides
- Asbestos

The random sample grid location will be analyzed for the following full list of Phase A Site-related chemicals for LOU-specific and area-wide coverage purposes:

- Metals (Phase A list)
- Hexavalent chromium

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

- 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 34W consists of collecting groundwater samples from one (1) location to evaluate local groundwater conditions and as part of a Site-wide evaluation of constituent trends in groundwater.

- Well M-50, located approximately in the center of LOU 34W, will be used to evaluate local and area-wide groundwater conditions.
- The analytical program to evaluate groundwater samples from well M-50 associated with LOU 34W is listed on **Table B – Groundwater Sampling and Analytical Plan for LOU 34W.**

Proposed Phase B Constituents List for Groundwater:

Groundwater samples will be analyzed for the following analytes:

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

Proposed Phase B Soil Gas Investigation/Rationale:

- None proposed specifically for this LOU.

Proposed Phase B Constituents List for Soil Gas:

- None proposed specifically for this LOU.

References:

1. ENSR, 2007a, Phase A Source Area Investigation Results, Tronox Facility, Henderson, Nevada, September 2007.
2. Kleinfelder, 1993, Environmental Conditions Assessment, Kerr-McGee Chemical Corporation, Henderson, Nevada Facility, April 15, 1993 (Final).

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West

Tronox Facility – Henderson, Nevada

LOU Figure

J:\TronoxGIS\mxd\Phase_B_WorkPlan\LOUs\lou-34W.mxd

N

1:1,800
1 inch equals 150 feet
150 75 0 150
Feet

LOU #34W BOUNDARY
LOU #5 BOUNDARY
LOU #21 BOUNDARY
POND Mn-1
LOU #24 BOUNDARY
LOU #13 BOUNDARY
LOU #14 BOUNDARY
LOU #46 BOUNDARY
LOU #45 BOUNDARY
LOU #47 BOUNDARY
LOU #49 BOUNDARY
LOU #50 BOUNDARY
LOU #48 BOUNDARY
LOU #34 EAST BOUNDARY
LOU #51 TRANSFER LINES
LOU #43 BOUNDARY
LOU #61 BOUNDARY
LOU #44 BOUNDARY
FORMER U.S. VANADIUM SITE (AREA 70)
FORMER U.S. VANADIUM SITE
AREA III
AREA II
UNIT 4
UNIT 5
UNIT 6
9th STREET
10th STREET
11th STREET
AVENUE G
AVENUE H

LEGEND
- LOU of Interest
- LOU #59 Storm Sewer in 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

FIGURE NUMBER: 1
SHEET NUMBER: X

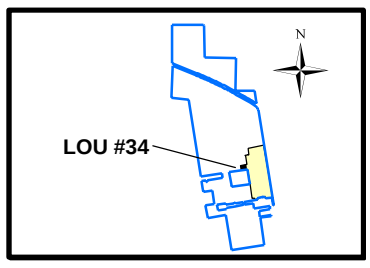
SAMPLE LOCATIONS FOR LOU #34 W FORMER MANGANESE TAILINGS AREA

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

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

ENSR | AECOM
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: HTTP://WWW.ENSR.AECOM.COM

DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
B. Ho	T. McAdam	G. Hels	B. Ho



Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

Sampling and Analytical Plans for LOU 34W

Table A – Soil Sampling and Analytical Plan for LOU 34W
Table B – Groundwater Sampling and Analytical Plan for LOU 34W

Table A
Soil Sampling and Analytical Plan for LOU 34W
Phase B Source Area Investigation Work Plan
Tronox Facility - Henderson, Nevada

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).																				
O-6	34W	SA39	SA39-0.0	0.0														X		Boring located north of Chemstar to evaluate LOU 34W (Historic Mn Tailings Pile Area, West).
O-6	34W		SA39-0.5	0.5	X	X	X	X		X	X		X		X	X				Located in low spot of LOU 34W at likely worst case location.
O-6	34W		SA39-10	10	X	X	X	X		X	X		Hold		X					
O-6	34W		SA39-20	20	X	X	X	X		X	X		Hold		X					
O-6	34W		SA39-30	30	X	X	X	X		X	X		Hold		X					
O-6	34W		SA39-40	40	X	X	X	X		X	X		X		X					
O-7	34W, 60, 20, 22, 23	SA178	SA178-0.0	0.0														X		Boring located to evaluate LOU 20 (Pond C-1 Associated Piping Associated Piping), LOU 22
O-7	34W, 60, 20, 22, 23		SA178-0.5	0.5	X	X	X			X	X	X	X	X	X	X				(WC-West Associated Piping), LOU 23 (WC-East Associated Piping), LOU 34W (Historic Mn
O-7	34W, 60, 20, 22, 23		SA178-10	10	X	X	X			X	X	X	Hold	X	X						Tailings Pile Area, West), and LOU 60 (Acid Drain system). Located within this cluster of LOUs
O-7	34W, 60, 20, 22, 23		SA178-20	20	X	X	X			X	X	X	Hold	X	X						likely high release potential location for all five LOUs (low point,edge of road).
O-7	34W, 60, 20, 22, 23		SA178-30	30	X	X	X			X	X	X	Hold	X	X						
O-7	34W, 60, 20, 22, 23		SA178-40	40	X	X	X			X	X	X	X	X	X						
P-6	34W	RSAP6	RSAP6-0.0	0.0														X		Boring located to evaluate LOU 34W (Historic Mn Tailings Pile Area, West). Random boring
P-6	34W		RSAP6-0.5	0.5	X	X	X	X		X	X		X	X	X	X				within low spot of LOU 34W at worst case potiential enviormental issue location.
P-6	34W		RSAP6-10	10	X	X	X	X		X	X		Hold	X	X					
P-6	34W		RSAP6-20	20	X	X	X	X		X	X		Hold	X	X					
P-6	34W		RSAP6-30	30	X	X	X	X		X	X		Hold	X	X					
P-6	34W		RSAP6-40	40	X	X	X	X		X	X		X	X	X					
Number of Borings:		**3**																		
Number of Samples:					**15**	**15**	**15**	**10**	**0**	**15**	**15**	**5**	**6**	**10**	**15**	**3**	**0**	**3**	**0**	

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 srufaces 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).

Table B
Groundwater Sampling and Analysis Plan for LOU 34W
Phase B Source Area Investigation Area III Work Plan
Tronox Facility - Henderson, Nevada

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).														
O-6	III	M-50	39.6 - 59.6	MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 34W; as an upgradient step out for LOU 60; and for general Site coverage.
					Number of Field Samples:	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	

Notes:

X	Sample will be collected and analyzed.
	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.
1	
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

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West

Tronox Facility – Henderson, Nevada

Soil and Groundwater Characterization Data

Summary of Available Data for LOU 34W
Historic Manganese Tailings Area, West
Tronox Facility – Henderson, Nevada

LOU-specific analytes identified include:

- Metals (Phase A list)
- Wet chemistry analytes

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

LOU 34W Table 1 – Soil Characterization Data – Wet Chemistry
LOU 34W Table 2 – Soil Characterization Data – Metals
LOU 34W Table 3 – Groundwater Characterization Data – Routine Monitoring
LOU 34W Table 4 – Summary of Historical Soil Analytical Data
LOU 34W Table 5 – Soil Characterization Data – Radionuclides

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

LOU 34W Table 1
Soil Characterization Data - Wet Chemistry

Leach Beds, Associated Conveyance Facilities and Mn Tailings Area; and
Former Old Main Cooling Tower and Recirculation Lines
Tronox Facility - Henderson, Nevada

Sampling Program		Ph A[1]	Ph A	
Boring No.		--	--	
Sample ID		Mn Ore	Mn Tailings	
Sample Depth (ft)		0.5	composite	
Sample Date		01/19/2007	01/19/2007	
Wet Chemistry Parameter	**MSSL[2] mg/kg**			**Units**
Percent moisture	--	**4.9**	**19.5**	percent
Alkalinity (as CaCO3)	--			mg/kg
Bicarbonate	--			mg/kg
Total Alkalinity	--			mg/kg
Ammonia (as N)	--			mg/kg
Cyanide	1.37E+04			mg/kg
MBAS	--			mg/kg
pH (solid)	--			none
Bromide	--			mg/kg
Chlorate	--			mg/kg
Chloride	--			mg/kg
Nitrate (as N)	--			mg/kg
Nitrite	--			mg/kg
ortho-Phosphate	--			mg/kg
Sulfate	--			mg/kg
Total Organic Carbon	--			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).

LOU 34W Table 2
Soil Characterization Data - Metals

Leach Beds, Associated Conveyance Facilities and Mn Tailings Area; and
Former Old Main Cooling Tower and Recirculation Lines
Tronox Facility - Henderson, Nevada

	Sampling Program	Ph A[1]	Ph A	
	Boring No.	--	--	
	Sample ID	Mn Ore	Mn Tailings	
	Sample Depth (ft)	0.5	composite	
	Sample Date	01/19/2007	01/19/2007	
Metals	**MSSL[2] mg/kg**			**Units**
Aluminum	1.00E+05	**10300 J**	**51700 J**	mg/kg
Antimony	4.50E+02	**3.4**	**3.6**	mg/kg
Arsenic	2.80E+02	**24.9**	**90.1**	mg/kg
Barium	1.00E+05	**1360 J**	**473 J**	mg/kg
Beryllium	2.20E+03	0.66 U	**2.3 J**	mg/kg
Boron	1.00E+05	4.4 UJ	65.2 UJ	mg/kg
Cadmium	5.60E+02	**7.8 J-**	**8.2 J-**	mg/kg
Calcium	--	**361 J-**	**25500 J-**	mg/kg
Chromium (Total)	7.10E+01	**4.0**	**74.3**	mg/kg
Chromium-hexavalent	5.00E+02	**0.15 J**	**0.32**	mg/kg
Cobalt	2.10E+03	**871**	**1840**	mg/kg
Copper	4.20E+04	**155 J**	**797 J**	mg/kg
Iron	1.00E+05	**9240 J**	**54600 J**	mg/kg
Lead	8.00E+02	**31.8**	**121**	mg/kg
Magnesium	--	**80.7 J-**	**5550 J-**	mg/kg
Manganese	3.50E+04	**560000**	**79600**	mg/kg
Molybdenum	5.70E+03	**5.0**	**31.7**	mg/kg
Nickel	2.30E+04	**368 J**	**788 J**	mg/kg
Platinum	--	**0.038 J**	**0.22 J**	mg/kg
Potassium	--	**3860 J-**	**10200 J-**	mg/kg
Selenium	5.70E+03	**1.0 J-**	**4.4**	mg/kg
Silver	5.70E+03	**1.9 J-**	**3.2 J-**	mg/kg
Sodium	--	**97.5 J-**	**1650 J-**	mg/kg
Strontium	1.00E+05	**116 J**	**244 J**	mg/kg
Thallium	--	**3.3 J+**	**6.4 J+**	mg/kg
Tin	--	**0.81**	**2.0**	mg/kg
Titanium	--	**65.0 J-**	**721 J-**	mg/kg
Tungsten	--	**17.4**	**52.6**	mg/kg
Uranium	--	**0.30**	**2.2**	mg/kg
Vanadium	5.70E+03	**58.1 J-**	**179 J-**	mg/kg
Zinc	1.00E+05	**325 J**	**940 J**	mg/kg
Mercury	3.41E+02 (t)	**0.017 J**	**0.23 J+**	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.

LOU 34W Table 3
Groundwater Characterization Data - Routine Monitoring

Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area, and Former Old Main Cooling Tower and Recirculation Lines
Tronox Facility - Henderson, Nevada

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-50	2/2/2006	46.44	970	d	1.80E-02 a,m	39	d	1.00E-01			5.00E+02 j			1.00E+01			--
M-50	5/3/2006	46.58	870	d	1.80E-02 a,m	37	d	1.00E-01	11700		5.00E+02 j			1.00E+01			--
M-50	8/2/2006	46.66	856	d	1.80E-02 a,m	34	d	1.00E-01	10400		5.00E+02 j			1.00E+01			--
M-50	11/1/2006	46.65	1030	d	1.80E-02 a,m	34	d	1.00E-01	13500		5.00E+02 j			1.00E+01			--
M-50	1/31/2007	46.66	801		1.80E-02 a,m	32		1.00E-01	14000		5.00E+02 j			1.00E+01			--
M-50	5/2/2007	46.53	776		1.80E-02 a,m	31		1.00E-01	12400		5.00E+02 j			1.00E+01			--
M-50	8/1/2007	47.02	1080		1.80E-02 a,m	29		1.00E-01	14100		5.00E+02 j			1.00E+01			--

Notes
< = less than the reporting limit
Blank cell or --- = no data and or no qualifier
Qual = data qualifiers applied by laboratory or during data validation
TDS = Total Dissolved Solids
mg/l = milligram per liter

Laboratory Qualifiers:
d = the sample was diluted
u = the analyte was not detected above the sample reporting limit
ud = the sample was dilluted and was not detected above the sample reporting limit

Validation Qualifiers:
J = the result is an estimated quantity
J- = the result is an estimated quantity and the result may be biased low
U = the analyte was analyzed for, but was not detected above the sample reporting limit
UJ = the sample was not detected above the sample reporting limit and the reporting limit is approximate

LOU 34W Table 4
Summary of Historical Soil Analytical Data

Leach Beds, Associated Conveyance Facilities and Mn Tailings Area; and
Former Old Main Cooling Tower and Recirculation Lines
Tronox Facility, Henderson, Nevada

Tailings Sample
Sample Date: **5/2/1990** Sample Matrix: **Soil**
Sample Analysis by: DataChem Laboratories

Sample #	TCLP Metals, EPA Method 6010 (mg/l)							
	As	**Ba**	**Cd**	**Cr**	**Pb**	**Hg ***	**Se**	**Ag**
Tailings Sample	< 0.3	< 0.3	0.45	0.14	< 0.3	< 0.0002	< 0.3	0.09
Reporting Limit	0.3	0.5	0.05	0.05	0.3	0.0002	0.3	0.05
MSSL[1] mg/kg	2.80E+02	1.00E+05	5.60E+02	7.10E+01	8.00E+02	3.41E+02	5.70E+03	5.70E+03

MnO_2 Tailings Sample (#4)
Sample Date: **1/15/1993** Sample Matrix: **Soil**
Sample Analysis by: Lockheed Analytical Laboratories

Sample #	TCLP Metals Extract, EPA Method 6010 (mg/l)							
	As	**Ba**	**Cd**	**Cr**	**Pb**	**Hg ***	**Se ****	**Ag**
Mn Tailings	<1.0	<10	<0.1	<0.5	<1.0	<0.02	<0.1 N	<0.5
Reporting Limit	1	10	0.1	0.5	1	0.02	0.1	0.5
MSSL mg/kg	2.80E+02	1.00E+05	5.60E+02	7.10E+01	8.00E+02	3.41E+02	5.70E+03	5.70E+03

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

mg/l = milligrams per liter
As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
Pb = Lead
Hg* = Mercury, Analytical Method is 7471
Se ** = Selenium, Analytical Method 7740
Ag = Silver
MnO_2 = Manganese Dioxide
N = aliquot diluted (1:10) to reduce acetate matrix interferences.
< = not detected above the designated method reporting limit.

Source: Kerr-McGee, 1996b, Response to LOU Comments.

LOU 34W Table 5
Soil Characterization Data - Radionuclides

Leach Beds, Associated Conveyance Facilities and Mn Tailings Area; and
Former Old Main Cooling Tower and Recirculation Lines
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**
MN ORE			01/19/2007	0.271 U	**0.55**	**0.517**	**0.249 J**	**0.514 J**	**0.21 J**	**0.0311 J**	**0.217 J**	Ph A[1]
MN TAILINGS			01/19/2007	0.968 U	**1.54**	**1.19**	**0.802 J**	**0.957 J**	**0.882**	0.0134 U	**0.854**	Ph A

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

LOU 34W
Notes for Phase A Data Tables

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	Soluable 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