Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

Name of Facility:

Satellite Accumulation Point, Ammonium Perchlorate (AP) Maintenance Shop

Goal of Closure:

- Continuation of current use – regulatory closure not presently requested.

Site Investigation Area:

- Size: Two areas, both approximately 20 feet by 20 feet.
- Location:
  - The Satellite Accumulation Point Area is located in the southeast portion of the AP Maintenance Shop building, and
  - The Product Storage Area is located approximately 45 feet west of the AP Maintenance Shop building.
- Current Status/Features: Both the Satellite Accumulation Point Area associated with the AP Maintenance Shop and the nearby Product Storage Area are currently active.

Description:

- LOU 39 consists of: a Satellite Accumulation Point Area in the AP Maintenance Shop building where hazardous waste materials including a solvent-based parts washer were located and a Product Storage area west of the AP Maintenance Shop building [Ref. 3].
- The Satellite Accumulation Point Area is located on a concrete floor in the AP Maintenance Shop building [Ref. 3].
- From 1989 (when the AP Maintenance Shop became operational) until 1993, 1,1,1-trichloroethane (1,1,1-TCA) was used in the parts washer to remove oil and grease from mechanical parts. Waste from the parts washer contained a mixture of oil and grease sludge as well as 1,1,1-TCA. Waste material was placed into drums that were stored next to the washer. In 1993, the use of 1,1,1-TCA in the parts washer was permanently discontinued [Ref. 3].
- The Product Storage Area is located approximately 45 feet west of the Maintenance Shop. From 1989 to 1993, new drums of 1,1,1-TCA were stored on the concrete pad of the storage area. During this period, drums containing waste from the parts washer were also stored in this area, but on bare soil adjacent to the concrete pad. [Ref. 3].
- During the 1991 Site inspection, no cracks were observed in the concrete floor at the Satellite Accumulation Point Area in the AP Maintenance Shop. Minor drips below the parts washer and a minor soil stain in the Product Storage Area were observed [Ref. 3].

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- Visibly stained soil was removed and sampled in April 1997. The volume of excavated soil and disposition of the soil are unknown [Ref. 1].

Process Waste Streams Associated with LOU 39	Known or Potential Constituents Associated with LOU 39
Oil and grease sludge containing 1,1,1-TCA from the parts washer, and waste materials from the Satellite Accumulation Point Area.	• Metals • Perchlorate • Wet chemistry analytes • VOCs (1,1,1-TCA) • TPH (oil and grease)

Overlapping or Adjacent LOUs:

The following LOUs overlap or are adjacent to LOU 39:

Overlapping LOUs

- None

Adjacent LOUs

- LOU 38 (Former Satellite Accumulation Point-AP Laboratory) is west of LOU 39.
- LOU 5 (Beta Ditch) is north (downgradient) of LOU 39.
- LOU 57 (AP Plant Transfer Lines to Sodium Chlorate Process and Ponds) is northwest of LOU 39.

LOU 38 is cross gradient to LOU 39 and LOUs 5 and 57 are downgradient and are not considered to affect LOU 39; therefore, no additional chemical classes have been added to the proposed Phase B Analytical Plan for LOU 39.

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

Other LOUs Potentially Affecting Soils in LOU 39:

- None

Known or Potential Chemical Classes:

- Metals
- Perchlorate
- Wet chemistry analytes
- VOCs
- TPH-DRO/ORO

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Known or Potential Release Mechanisms:

- Possible impacts to surrounding soils from surface releases.
- Minor spills in the Product Storage Area are indicated by the stained surface soil [Ref. 3].

Results of Historical Sampling:

- In April 1997, stained soil in the Product Storage area was removed (volume unknown) and sampled (sample S8-1S). TPH Diesel-Range Organics and Oil-Range Organics were detected in sample S8-1S. Additional soil was removed and re-sampled (sample S8-1RE) with TPH being not detected [Ref. 1]. Analytical results are summarized: LOU 39 Table 1 (see attached).

Did Historical Samples Address Potential Release?

- Yes, but only in the Product Storage Area.

Summary of Phase A SAI:

Soil

- None specifically conducted for this LOU [Ref. 2].

Groundwater

- None specifically conducted for this LOU [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 of LOU 39 consists of collecting soil samples from two (2) locations:
  - one (1) boring will be drilled adjacent to the Satellite Accumulation Point Area, and
  - one (1) boring will be drilled adjacent to the Product Storage Area.
  - All two borings along with the analytical program to evaluate soil samples from LOU 39 are listed on **Table A – Soil Sampling and Analytical Plan for LOU 39.**
- Soil sample locations consist of both judgmental and randomly placed locations.
- Judgmental sample locations:
  - Are designed to evaluate soil for known or potential chemical classes associated with LOU 39, based on the known process waste streams;

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

  - One (1) sample location (SA87) is a Judgmental location.
- Random sample grid locations:
  - Are designed to assess whether unknown constituents associated with LOU 39 are present.
  - One (1) sample location (RSAN4) is a randomly-placed location.

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)
- Perchlorate
- Wet chemistry analytes
- VOCs
- TPH-DRO/ORO

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

- Hexavalent chromium
- Radionuclides
- Dioxins/furans
- Asbestos

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

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

Proposed Phase B Groundwater Investigation/Rationale:

- The Phase B groundwater investigation of LOU 39 consists of collecting groundwater samples from three (3) locations to evaluate local groundwater conditions and as part of site-wide evaluation of constituent trends in groundwater.

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

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- Two (2) wells (M-142 and M-128) south (upgradient) of LOU 39 will be sampled.
- One (1) well (M-14A) north (downgradient) of LOU 39 will be sampled.
- All three wells along with the analytical program to evaluate groundwater samples associated with LOU 39 are listed **on Table B – Groundwater Sampling and Analytical Plan for LOU 39.**

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:

One (1) soil gas sample will be collected to evaluate area conditions for the presence of vapor-phase VOCs in the vadose zone.

- SG30 will be located adjacent to soil boring SA87 to investigate satellite accumulation and AP maintenance shop as a potential VOC source.

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

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

LOU Map

J:\TronoxGIS\mxd\Phase_B_WorkPlan\LOUs\lou-39.mxd

N

1:1,200

1 inch equals 100 feet

100 50 0 100

Feet

LEGEND

- LOU of Interest

Proposed Phase B Explorations for LOU

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

Other Explorations

- Phase A Boring Location (Sep. 2007)
- Phase II BRC Sample Location (Oct. 2007)
- Historic Sample Location (pre 2006)
- Existing Well Location (No Proposed Sampling)
- Proposed Phase B Groundwater Location (Other LOU)
- Proposed Phase B Soil Boring Location (Other LOU)
- Tronox Facility Boundary
- Area Boundary
- Four Acre Grid Line (Cell reference displayed as row-column, i.e. M-8)

Base Aerial Photo from PBS&J, October 2006

AREA I

AREA II

APPROXIMATE ALIGNMENT OF FORMER SURFACE DRAINAGE CONVEYANCE FROM ACID EFFLUENT NEUTRALIZATION PLANT (1941-1944)

LOU #2 BOUNDARY

LOU #5 BOUNDARY

LOU #52 BOUNDARY

LOU #57 BOUNDARY

LOU #54 BOUNDARY

LOU #38 BOUNDARY

LOU #53

LOU #9

LOU #7

LOU #8

SATELLITE ACCUMULATION POINT AREA

PRODUCT STORAGE AREA

LOU #39 BOUNDARIES

RSAN4

S8-IRE

S8-1S

SA87

M-142

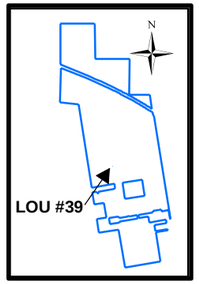
SG30

Note:
Boring SA87 will be converted to groundwater monitoring well (M-142).

M-14A

M-128

SG54 SG87 SA89 SA123 SG25 M-126 L-4 L-5 M-110 SA70 M-5 M-111A SA104 RSAM5 SA105 SA94 SA196 SA113 SA58 N-6 N-5 M-75 M-76 SG27 SA100 SG56 RSAM3 SG55 SA69 M-4 SA128 M-3 SG31 M-125 SA86 M-2 SA14 RSAM4 SA165 SA65 SA15 SG59 SA85 N-3 N-4 N-2 O-3 O-4 O-5 O-6 SA53 SA54 SG78 SA200 SG77 SA102



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

ENSR | AECOM

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

SAMPLE LOCATIONS FOR LOU #39
SATELLITE ACCUMULATION POINT
AP-MAINTENANCE SHOP
Phase B Source Area Investigation
Tronox Facility
Henderson, Nevada

SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	4/2/2008	04020-023-430

FIGURE NUMBER:

1

SHEET NUMBER:

X

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

Sampling and Analytical Plans for LOU 39:

Table A – Soil Analytical Plan for LOU 39
Table B – Groundwater Analytical Plan for LOU 39

Table A
Soil Sampling and Analytical Plan for LOU 39
Phase B Source Area Investigation Work Plan
Tronox Facility - Henderson, Nevada

Grid Location	LOU Number	Phase B Boring No.	Sample ID Number	Sample Depths (ft, bgs)	Perchlorate (EPA 314.0)	Metals (EPA 6020)	Hex Cr (EPA 7199)	TPH-DRO/ORO (EPA 8015B)	TPH-GRO (EPA 8015B)	VOCs 1. (EPA 8260B)	Wet Chemistry 2.	OCPs 3. (8081A)	SVOCs 4. (EPA 8270C)	Radio-nuclides 5.	Dioxins/Furans 6.	Formal-dehyde Titrant (EPA 8315A)	Asbestos EPA/540/ R-97/028	Location Description and Characterized Area Rationale
Borings are organized by grid(N-4) location as shown on Plate A																		
N-4	39	SA87	SA87-0.0	0.0													X	Boring located at the southeast corner of the AP Maintenance shop building to evaluate LOU 39 (Satellite Accumulation Point-AP Laboratory).
N-4	39		SA87-0.5	0.5	X	X	X	X		X	X			X	X			
N-4	39		SA87-10	10	X	X	X	X		X	X			X				
N-4	39		SA87-20	20	X	X	X	X		X	X			X				
N-4	39		SA87-30	30	X	X	X	X		X	X			X				
N-4	39		SA87-40	40	X	X	X	X		X	X			X				
N-4	39	RSAN4	RSAN4-0.0	0.0													X	Boring located to evaluate former drum storage area in LOU 39 (Satellite Accumulation Point-AP Laboratory) and for general site coverage.
N-4	39		RSAN4-0.5	0.5	X	X	X	X		X	X	X	X	X	X			
N-4	39		RSAN4-10	10	X	X	X	X		X	X	Hold	X	X				
N-4	39		RSAN4-20	20	X	X	X	X		X	X		X	X				
N-4	39		RSAN4-30	30	X	X	X	X		X	X		X	X				
N-4	39		RSAN4-40	40	X	X	X	X		X	X		X	X				
Number of Borings:		**2**																
Number of Samples:					**10**	**10**	**10**	**10**	**0**	**10**	**10**	**1**	**5**	**10**	**2**	**0**	**2**	

Notes:

X Sample will be collected and analyzed.
No sample collected under Phase B sampling program.
TPH-DRO/ORO Total petroleum hydrocarbons - Diesel-Range Organics/Oil-Range Organics.
1. Samples for VOC analysis will be preserved in the field using sodium bisulfate (or DI water) and methanol preservatives per EPA Method 5035.
2. Includes wet chemistry parameters listed on Table 1 of the Phase B Source Area Work Plan.
3. Organochlorine Pesticides (includes analysis for hexachlorobenzene).
4. Semi-volatile Organic Compounds
5. Radionuclides consists of alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP).
6. Dioxins/furans: 90% will be tested by immunoassay, 10% analyzed by HRGC/HRMS in the laboratory.

Table B
Groundwater Sampling and Analysis Plan for LOU 39
Phase B Source Area Investigation Area I Work Plan
Tronox Facility - Henderson, Nevada

Grid Location	Location Area	Monitoring Well No.	Screen Interval (ft bgs)	Well Sampled for Phase A? (y/n)	Perchlorate (EPA 314.0)	Hex Cr (EPA 7199)	Metals	VOCs1 (EPA 8260)	Wet Chemistry2	OCPs3 (EPA 8081A)	SVOCs4 (EPA 8270C)	Radio-nuclides5	Rationale
Wells are organized by grid location as shown on Plate A - Starting point is on the northwestern - most grid in Area 1 (L-4) and ending with the southwestern - most grid covering Area (O-4)													
L-4	1	M-14A	20 - 40	no	X	X	X	X	X	X	X	X	Located as an upgradient stepout for LOUs 30, 56, and 58; as a downgradient well for LOU 39; and for general site coverage.
N-4	1	M-142	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well constructed in borehole for SA87 to evaluate LOU 39 (Satellite Accumulation Point, AP Maintenance Shop).
O-4	1	M-128	TBD	new well	X	X	X	X	X	X	X	X	New monitoring well to serve as a downgradient stepout for LOUs 35 and 64; as an upgradient stepout for LOUs 39, 52, and 57; and for general site coverage.
				Number of Field Samples:	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	

Notes:

X	Sample will be collected and analyzed.
1	Volatile organic compounds- samples for VOC analysis will be preserved in the field using sodium bisulfate(or DI water) and methanol preservatives per EPA method 5035
2	Includes wet chemistry parameters listed on table 1. of the Phase B Source Area Work Plan.
3	Organochlorine pesticides(includes analysis for hexachlorobenzene).
4	Semi-volitile organic compounds
5	Radionuclides consists of alpha spec reporting for Thorium-230/232, Uranium 234/235, Uranium-238, and beta spec for Radium-226/228 (per NDEP)
TBD	To Be Determined when well is constructed.

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

Soil and Groundwater Characterization Data

Summary of Available Data for LOU 39 – Satellite Accumulation Point, AP Maintenance Shop

Tronox Facility – Henderson, Nevada

LOU-specific analytes identified include:

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

The table below presents historical data associated with the LOU-specific analytes listed above. There is no Phase A data associated with this LOU.

LOU 39 – Table 1 – Summary of Historical Soil Analytical Data – TPH

LOU 39 Table 1
Summary of Historical Soil Analytical Data - TPH

Satellite Accumulation Point - AP Maintenance Shop
Tronox Facility - Henderson, Nevada

Sample Analyzed for:		**TPH-8015M**				
Sample Matrix:		**Soil**				
Sample Analysis by:		**LAS Laboratories**				
SAMPLE #	**Date**	**TPH Constituent**	**Result (mg/kg)**	**PQL (mg/kg)**	**PRG[1] (mg/kg)**	**Note**
S8-1S	4/8/1997	Diesel*	180	29	1.00E+02 w	
	4/8/1997	Gasoline*	<29	29	1.00E+02 w	
	4/8/1997	Motor Oil	1500 [2]	29	1.00E+02 w	4 Dilutions
S8-1RE	4/10/1997	Diesel*	<31	31	1.00E+02 w	

Notes:

1. U.S. EPA, Region 9, Preliminary Remediation Goals (PRGs) for industrial soil (October, 2004)
2. Four dilutions were used for this sample analysis.

(w) Value for pyrene used as surrogate for benzo(g,h,i)perylene based on structural similarities.
TPH = Total Petroleum Hydrocarbons
mg/kg = milligrams per kilogram
PQL = Practical Quantitation Limit
* =Range Organics
< = not detected above the designated method reporting limit.
Source: ENSR, 1997, Phase II ECA, August 1997

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.
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.