

Prepared for:
Tronox LLC
Henderson, Nevada

Phase B Source Area Investigation Work Plan
Area II (Central LOUs)
Tronox LLC Facility
Henderson, Nevada

ENSR Corporation
June 2008
Document No.: 04020-023-430 – II

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June 27, 2008

Ms. Shannon Harbour, P.E.
Nevada Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

**Subject: Phase B Source Area Investigation – Area II Work Plan
TRONOX LLC, Henderson, Nevada**

Dear Ms. Harbour:

Tronox LLC (Tronox) has undertaken an Environmental Conditions Assessment (ECA) as directed by the Nevada Division of Environmental Protection (NDEP). Towards this work, Tronox has prepared the attached *Phase B Source Area Investigation – Area II, Tronox LLC, Henderson Nevada*. This is the fourth of the "Area" work plans, and incorporates NDEP comments on the Area I and Area IV documents. This is one of the set of six Phase B work plans which collectively will provide information to be used in assessing soil, soil gas and groundwater impacts at the Tronox Henderson facility. The associated CD will be provided under a separate submittal to NDEP within two business days.

Please contact me at (702) 651-2234 if you have any comments or questions concerning this correspondence.

Sincerely,



Susan M. Crowley
Staff Environmental Specialist

Susan M. Crowley
Staff Environmental Specialist

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**Phase B Source Area Investigation
 Work Plan – Area II
 Tronox LLC Facility
 Henderson, Nevada**

Responsible CEM for this project

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.



Susan M. Crowley
 Environmental Specialist
 Tronox LLC

Susan M. Crowley, CEM 1428 exp. date 3/8/09
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ABBREVIATIONS AND ACRONYMS

AP	Ammonium Perchlorate
ASTM	American Society for Testing and Materials
bgs	below ground surface
BMI	Black Mountain Industrial
BRC	Basic Remediation Company
CAS	Columbia Analytical Services
CEM	Certified Environmental Manager
CSM	Conceptual Site Model
ECA	Environmental Conditions Assessment
EDD	electronic data deliverable
ft/ft	feet per foot
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
LOU	Letter of Understanding
MCfg1	Muddy Creek Formation – first fine-grained facies
MCL	Maximum Contaminant Level
MSSL	Medium Specific Screening Levels
NDEP	Nevada Division of Environmental Protection
OCHs	organochlorine herbicides
OCPs	organochlorine pesticides
OPPs	organophosphorus pesticides
PCB	polychlorinated biphenyl
PRGs	Preliminary Remediation Goals
Qal	Quaternary Alluvium
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
SAPs	sampling and analytical plans
SPLP	Synthetic Precipitation Leaching Procedure
SRCs	Site-related chemicals
SVOC	semi-volatile organic compound
Tronox	Tronox LLC
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WDC	Water Development Corporation

1.0 Introduction

This document presents the Area II Work Plan (Work Plan), which is part of the Phase B Source Area Investigation at the Tronox LLC (Tronox) facility located within the Black Mountain Industrial (BMI) Complex in Henderson, Nevada (the Site). The Site is owned and operated by Tronox, headquartered in Oklahoma City, Oklahoma. Tronox was formerly known as Kerr-McGee Chemical LLC. The Source Area Investigation, including Phase A and Phase B, is being conducted under the regulatory oversight of the Nevada Division of Environmental Protection (NDEP) and is being submitted as part of the Environmental Conditions Assessment (ECA) as required by NDEP (2004).

The Phase B activities follow the Phase A Source Area Investigation (ENSR 2007b) and are intended to further characterize soil and groundwater conditions at the source areas within the roughly 450-acre Site (**Figure 1**).

At the request of the NDEP, the Phase B Source Area Investigation field activities have been segmented into investigations of soil gas, soil and groundwater, and background groundwater conditions with each segment requiring separate, stand-alone work plans that describe the goals, scope of work, and methods used to implement each investigation.

To investigate the approximately 70 source areas on the Site and their potential affect on soil conditions, the Site has been subdivided into four "Areas" (Area I, II, III, and IV) as shown on **Figure 2**. The Phase B soil investigation by ENSR does not include investigation of soils in Parcels A through D, F, G, and H (see **Figure 2**), which are for sale, and are being investigated by the Basic Remediation Company (BRC) independently, of ENSR's Phase B Source Area Investigation. (Parcel E consists of land that is jointly used by Montrose Chemical and others, and evaluation of this parcel will be addressed at a later date.)

Whereas the Site has been subdivided into four Areas for the soil investigation, Tronox will evaluate groundwater conditions and soil gas on a Site-wide basis.

Individual work plan documents have been prepared that describe the scope of work to investigate each of the four Areas. This document presents the work plan to investigate soil and groundwater conditions in Area II. The Area I Work Plan was submitted on April 3, 2008 (ENSR 2008c), and NDEP provided conditional approval and comments on May 6, 2008 (NDEP 2008b). The Area IV Work Plan was submitted on May 16, 2008 (ENSR 2008e), and NDEP provided conditional approval and comments on June 18, 2008. On June 30, 2008, the Area III Work Plan (ENSR 2008f) was submitted to NDEP. Additionally, a separate work plan to evaluate soil gas and the vapor intrusion pathway for the entire Site has been prepared (ENSR 2008b). The soil gas investigation work plan was approved with conditions by the NDEP on March 26, 2008.

The four Area investigation work plans focus on evaluation of potential source areas for the Site-related analytes as shown on **Table 1**, (which was updated and forwarded to NDEP on May 29, 2008; Tronox 2008). (The Site-related analytes, herein after referred to as Site-related chemicals [SRCs], increased slightly from the full list of SRCs addressed in previous reports.) Potential source areas were identified by the NDEP in their August 15, 1994 Letter of Understanding (LOU). Seventy areas have been identified as on-site potential source areas. Of the 70 potential source areas identified in the NDEP LOU, 29 are within Area II as shown in **Figure 3** and as listed below:

- LOU-5 – On-Site Portion of Beta Ditch, Including “Small Diversion Ditch” Northwest of Pond C-1
- LOU-7 – Old P-2 Pond and Associated Conveyance Facilities
- LOU-8 – Old P-3 Pond and Associated Conveyance Facilities
- LOU-9 – New P-2 Pond and Associated Piping
- LOU-11 – Sodium Chlorate Filter Cake Holding Area
- LOU-12 – Hazardous Waste Storage Area
- LOU-13 – Pond S-1
- LOU-14 – Pond P-1 and Associated Conveyance Piping
- LOU-15 – Platinum Drying Unit
- LOUs–16 and 17 – Ammonium Perchlorate (AP) Ponds AP-1, AP-2 and AP-3 and Associated Transfer Lines
- LOU-18 – Pond AP-4
- LOU-19 – Pond AP-5
- LOU-20 – Pond C-1 and Associated Piping
- LOU 22 & 23 – Ponds WC-West and WC-East
- LOU-29 – Solid Waste Dumpsters
- LOU-30 – AP Area Pad 35
- LOU-31 – Drum Recycling Area
- LOU-36 – Former Satellite Accumulation Point, Unit 3, Maintenance Shop
- LOU-43 – Unit 4 Basement and Old Sodium Chlorate Plant Decommissioning
- LOU-45 – Diesel Storage Tank
- LOU-52 – AP Plant Area Screening Building, dryer Building and Associated Sump
- LOU-53 – AP Plant Area Tank Farm
- LOU-55 – Area Affected by July 1990 Fire
- LOU-56 – AP Plant Area Old Building D-1-Washdown
- LOU-57 – AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SIs and Transfer Lines
- LOU 59 – Storm Sewer System in Area II
- LOU 60 – Acid Drain System in Area II

The Area II Work Plan includes a compilation of individual sampling and analysis plans for each of the 29 LOUs that are presented in **Appendix A**. The LOUs adjacent to Area II are also shown on **Figure 3**, and were addressed in work plans for Areas I, III and IV.

It is important to note that the work plan for Area II is designed to investigate both soil and groundwater within the Area (**Figure 3**). Results of the BRC soil investigations on Tronox sale Parcels A, B, C, D, F, G and H will be incorporated into the final Phase B Source Area Investigation report.

In several cases individual LOUs have been combined with overlapping or adjacent LOUs into a single consolidated LOU package in **Appendix A**. This has been done to simplify the discussion of the

investigations to occur at each LOU. The combined LOU packages for Area II are: LOUs 7, 8, 9, 13 and 14; LOUs 16, 17, 18, 19, 52, 53, and 57; LOUs 30 and 56; and LOUs 43, 11, 12 and 15..

1.1 Purpose and Objectives

The purpose of this Area II Work Plan is to describe the assessment of each potential source area, the sampling and data-gathering methods to be used, the locations to be sampled, the rationale for the locations proposed, and the analytical methodologies to be employed for the Phase B Source Area Investigation of Area II.

The objective of the Area II investigation is to gather information on the nature and extent of SRCs that may have been released to the environment in each of the respective potential source areas. Additionally, the scope-of-work has been designed to gather information for human health risk-based decision-making purposes. As such, samples of soil and groundwater will be collected and analyzed to support the evaluation of potential routes of exposure (e.g., direct contact pathway, soil-to-groundwater pathway, and groundwater pathway) in an industrial/commercial setting. The evaluation of the potential for migration of volatile organic compounds (VOCs) that may migrate from groundwater and/or soil to indoor air will be evaluated on a Site-wide basis under a separate soil gas survey work plan (ENSR 2008b) as noted above.

The distribution of sampling locations is designed in part to evaluate potential sources within each LOU and to provide general coverage within each Area supporting the planned future risk assessment, assuming that the receptors have equal probability of contacting environmental media within operationally (or on other basis) defined exposure areas of the Site. To evaluate source areas, proposed soil borings are placed at locations where constituents are anticipated to occur in soil at the highest concentrations or "worst case scenario" for most source areas. In a few cases, where containment structures cover "worst case" locations, sampling is proposed adjacent to the containments. Soil borings are also placed in locations outside the boundary of LOUs to gain additional insight into the horizontal extent of constituents in soil. The number of samples to be collected from Area II is designed to provide a large enough statistical sample distribution to allow for completion of the planned risk assessment program.

Data from the investigation will be evaluated in conjunction with data from the other Area investigations to identify the exposure areas that will be used as part of the site-specific human health risk assessment (HHRA). The exposure areas will be identified based on current or planned operational areas, the SRC data, and chemical distribution across the Site. In addition, a screening level risk assessment will be performed for each of the source areas, using U.S. EPA Region VI Medium Specific Screening Levels (MSSLs) (updated March 2008 [USEPA 2008]) and screening levels from appropriate state and federal guidance, to provide further information for defining exposure areas.. The screening level risk assessment will consist of a simple comparison of the sample analytical results to the MSSLs or other appropriate state and federal screening levels, which is in essence, the first step (Hazard Identification) of the full four-step risk assessment process to be used as part of the Site-specific HHRA.

The Site-specific HHRA will be performed generally consistent with the methods presented in Section 9 of the Basic Remediation Company (BRC) Closure Plan (BRC 2007a). However, some modifications to the BRC Closure Plan are necessary so that the methods are appropriate for the evaluation of the Tronox Areas I through IV. Site-specific modifications to the BRC Closure Plan will be discussed in a separate memorandum that will be prepared following discussions with NDEP, and will include, but may not be limited to, the following:

- Exposure areas, pathways and receptors and associated exposure factors
- Selection of chemicals of potential concern
- Methodology for evaluation of soil gas results to evaluate the potential vapor intrusion pathway (i.e., soil gas measurements for the Site-specific HHRA instead of flux chamber measurements to assess the potential vapor intrusion inhalation pathway).

The HHRA will be prepared following completion of the Phase B Source Area Investigation report.

Upon completing field activities and receipt of the analytical results, the Area II investigation data will be compiled. The data will undergo comprehensive data validation as described by NDEP guidance (NDEP 2006) and in the *Quality Assurance Project Plan (QAPP)* (ENSR 2008d). Upon completion of the data validation, the Area II data will be discussed with NDEP. If data gaps are identified, additional field sampling may be proposed as an addendum to the Area II Work Plan.

1.2 Documents of Record

Previously prepared planning documents for the BMI Common Areas in general, and the Site in particular, have been reviewed and approved by the NDEP. These documents are considered documents of record and are referenced as appropriate herein to refer the reader to detailed prior discussions on Site conditions and information used to develop the LOU data packages and sampling and analysis plans. These documents include the following:

- *Environmental Conditions Assessment* (Kleinfelder 1993);
- *Response to Letter of Understanding, Henderson, Nevada Facility* (Kerr-McGee 1996);
- *Phase II Environmental Conditions Assessment, Kerr-McGee Chemical LLC, Henderson, Nevada* (ENSR 1997);
- *Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada* (ENSR 2005);
- *Upgradient Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2006a);
- *Upgradient Investigation Work Plan Addendum, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2006b);
- *Phase A Source Area Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2006c);
- *Upgradient Investigation Results Report, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2006e);
- *Addendum to the Phase A Source Area Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2007a);

- *Phase A Source Area Investigation Results Report, Tronox LLC Facility, Henderson, Nevada* (ENSR 2007b);
- *Revisions to the Upgradient Investigation Results, Tronox LLC Facility, Henderson, Nevada Site* (ENSR 2007c);
- *Phase B Source Area Investigation Work Plan – Soil Gas Survey, Tronox LLC Facility, Henderson, Nevada* (ENSR 2008b);
- *Phase B Source Area Investigation Work Plan Area I (Northern LOUs), Tronox LLC Facility, Henderson, Nevada* (ENSR 2008c);
- *Phase B Source Area Investigation Work Plan Area IV (Western and Southern LOUs), Tronox LLC Facility, Henderson, Nevada [Draft]* (ENSR 2008e); and
- *Phase B Source Area Investigation Work Plan Area III (Western LOUs), Tronox LLC Facility, Henderson, Nevada [Draft]* (ENSR 2008f).

Additional documents that have been prepared to define field procedures and protocols, quality assurance and quality control (QA/QC), and health and safety are as follows:

- *Basic Remediation Company (BRC) Field Sampling and Standard Operating Procedures for the BMI Common Areas* (BRC 2007b);
- *Health and Safety Plan (HASP) Revision 3* (ENSR 2008a); and
- *Quality Assurance Project Plan (QAPP), Tronox LLC Facility, Henderson, Nevada* (ENSR 2008d).

1.3 Project Organization

The Tronox project manager is Susan Crowley. Ms. Crowley is a Nevada-Certified Environmental Manager (CEM # 1428, expiring March 8, 2009) and is the person who serves as the point of contact for regulatory and environmental issues pertinent to the Site. She is located at the Tronox Henderson Facility. Her telephone number is (702) 651-2234. Ms. Crowley manages the consultants and subcontractors that will be performing the tasks described in this Work Plan. Ms. Crowley will be supported by Tronox hydrogeologist Mr. Tom Reed.

ENSR Corporation is Tronox's environmental consultant. Mr. Michael Flack (Senior Program Manager and Hydrogeologist), Dr. Keith Bailey of Environmental Answers LLC (Engineer), Dr. Lisa Bradley (Senior Toxicologist), Brian Ho, CEM (Phase B Investigation Team Leader and Field Manager), Elizabeth Perry (Geostatistician), and Robert Kennedy (Senior Chemist and Data QA/QC Officer) comprise ENSR's senior team, who along with ENSR Staff Geologists and Engineers will be assisting with this project as needed. Ms. Elizabeth Martinez will be responsible for QA/QC of documents.

Boart-Longyear and Water Development Corporation (WDC) have been solicited for competitive bids to advance the soil borings, using either sonic or hollow-stem auger equipment, and to install additional groundwater monitor wells. Both firms are licensed by the State of Nevada to install water wells.

The primary analytical laboratories that will be used for the analytical program (excluding radionuclides) will be the Columbia Analytical Services (CAS) Laboratories in Rochester, NY; Kelso, WA; and Houston, TX (Nevada

certification numbers NY000322008A, WA35, and TX014112007A, respectively). The radionuclides analysis will be performed by GEL Laboratories, LLC of Charlestown, South Carolina (Nevada certification number SC12). Analysis of soil samples for asbestos will be performed by EMSL Analytical, Inc. of Westmont, New Jersey – the same laboratory that performed the asbestos analysis for the Phase A Source Area Investigation. Laboratory data for the analytical suites will be provided to Tronox in hard copy format as well as Tronox-specific EQulS™ electronic data deliverable (EDD) format. The laboratory will provide sample receipt notification upon receipt of samples at the laboratory.

2.0 Source Area Investigation for Area II

This section provides a brief summary of the site conditions within Area II and the approach used to develop the soil and groundwater sampling and analytical plans (SAPs) for Area II. The potential source areas that will be evaluated, including associated soil borings and wells for the Area II investigation are shown on **Plate A**.

The list of SRCs for which samples will be investigated in the Phase B Source Area Investigation is presented in **Table 1**. The soil SAP is presented in **Table 2**, which lists the soil borings proposed for Area II, the rationale for each soil boring location, the sample depths, and the analytical program for each soil sample. The groundwater SAP is presented in **Table 3**, which lists the monitoring wells proposed for sampling in Area II along with the analytical plan for each groundwater sample.

2.1 Site Conditions

Background information including the Site description, Site location, physical setting, regional and local geology, hydrogeology, etc., are described in detail in the *Conceptual Site Model (CSM) Report* (ENSR 2005) and the *Phase A Source Area Investigation Results Report* (ENSR 2007b). **Figure 4** shows local groundwater conditions within Area II that were developed from groundwater levels measured in May and December 2007 as well as historic wind direction for the Site. Two geological cross sections showing local stratigraphy in Area III are presented in **Figures 6 and 7**. The general hydrogeologic conditions within Area II are summarized as follows:

- Groundwater is generally encountered in the fine-grained facies within uppermost Muddy Creek Formation (MCfg1) below most of Area II and in the Quaternary Alluvium (Qal) in the northern central portion of Area II. In the southernmost portion of Area II however, groundwater could be initially encountered in the uppermost coarse-grained facies of the Muddy Creek Formation (MCcf1).
- The depth to groundwater measured in May and December 2007 ranges from about 29 to 40 feet below ground surface (bgs) and is generally deepest in the southernmost portion of the Area.
- The groundwater flow direction is generally to the north in Area II ranging from about 0.077 feet per foot (ft/ft) north of Area II to a gradient of about 0.083 ft/ft south of Area II (Figure 4).
- The prevailing wind direction for the period between March 2003 and 2008 is to the northwest and south-southeast at wind speeds up to about 8 to 13 miles per hour (Community Environmental Monitoring Program 2008).

2.2 Development of Area II Sampling and Analytical Plans

The scope of work for each potential source area was designed to address the Phase B Source Area Investigation objectives as described in Section 1.1. **Appendix A** contains the data packages for each LOU in Area II. Included in the LOU data packages are associated historic data and recent information from the Phase A Source Area Investigation, and figures showing the LOU and locations of proposed Phase B soil and groundwater samples. Each data package contains a set of soil and groundwater SAPs that are LOU-specific. The LOU-specific SAPs have been consolidated into Area II SAPs for soil and groundwater and are shown as **Table 2** (Soils Sampling and Analysis Plan) and **Table 3** (Groundwater Sampling and Analysis Plan). LOU-specific sample locations as shown in the data packages have been consolidated and are shown on **Plate A**. For LOUs that include conveyances (e.g., pipelines) that cross Area II boundaries into Areas I, III or IV for example, the Area II SAPs list only those sample locations that are in Area II. (Sample locations to evaluate conveyances that cross into Areas I, III or IV were listed in the respective SAPs for each Area.)

The data packages incorporate NDEP comments from their review of several draft LOU data package submittals. Historic information in the data packages is derived from a number of sources including:

- *Environmental Conditions Assessment Report* (Kleinfelder 1993);
- *Response to Letter of Understanding, Henderson, Nevada Facility* (Kerr-McGee 1996);
- *Personal communications with Susan Crowley, Tronox,*
- *Personal communications with Keith Bailey, Environmental Answers,*
- *Phase II Environmental Conditions Assessment, Kerr-McGee Chemical LLC, Henderson, Nevada* (ENSR 1997);
- *Conceptual Site Model (CSM), Kerr-McGee Facility, Henderson, Nevada* (ENSR 2005);
- *Aerial Reconnaissance of Hazardous Waste Sources BMI Industrial Complex, Henderson, 1943-1979* (USEPA 1980);
- *Phase A Source Area Investigation Results Report, Tronox LLC Facility, Henderson, Nevada* (ENSR 2007b); and
- *NDEP Response to: Phase B Source Area Investigation Work Plan, Area I (Northern LOUs), Tronox LLC Facility, Henderson, Nevada* (NDEP 2008b).
- *NDEP Response to: Phase B Source Area Investigation Work Plan, Area IV (Western and Southern LOUs), Tronox LLC Facility, Henderson, Nevada* (NDEP 2008c)

The LOU data packages in Appendix A along with the LOU data packages that were provided in the Work Plans for Areas I, III, and IV contain more detailed information than the CSM report (ENSR 2005). As such, the LOU data packages and Phase B Source Area Investigation results will be used to revise the CSM, including associated CSM figures, three-dimensional cartoons, and measles chart. The CSM will be updated after completion of the Phase B soil, soil gas, and groundwater investigation.

2.2.1 Evaluation of LOUs

An LOU summary was prepared for each of the 70 recognized potential source areas identified in the NDEP LOU. This facilitated incorporating data on potential impacts of adjacent LOUs into the 29 LOUs in Area II. As noted above, several individual overlapping or adjacent LOUs have been consolidated into a single LOU data package. For each of the 29 LOUs the following were described:

- Closure goals;
- Site investigation area details, including size, location, and current status and features;
- LOU information such as construction details, historical and/or current operations, years of operation, materials used, and process waste streams generated and received;
- adjacent or overlapping LOUs;
- LOUs with the potential to affect the specific LOU;
- known or potential chemical classes associated with the LOU;
- known or potential release mechanisms;
- results of historical sampling; and,
- historical data, including Phase A data.

Each LOU summary includes a discussion of the proposed investigation/rationale and constituents for soil, groundwater, and soil gas. A more detailed discussion of the data reviewed as part of the LOU evaluations is provided below.

As part of the evaluation of an LOU, the goal of closure was developed with the input from Tronox and is based on the current and proposed future use of the area. A summary of the closure goals for LOUs in Area II is presented in **Table 4**. Closure is not being requested for LOU 59 (Storm Sewer System, still active). For currently operating LOUs, the Phase B Investigation and subsequent HHRA will provide a “baseline” condition for the LOU and the surrounding area. If current operations do not exacerbate contamination, future closure may not require sampling for the full SRC list (i.e., if a chemical is not detected in the Phase B Investigation and is not a part of the process associated with the LOU, it may not be analyzed for at the time of closure).

The Site investigation area for each LOU is described, including the dimensions/area, location within the Site, and current status and features of the LOU. These descriptions were developed through review of historical documents, available aerial photographs, recent Site visits, and interviews with Tronox employees. The description provides information about the construction details, historical and/or current operations, years of operation, materials used, and process waste streams generated. To further evaluate potential SRCs at an LOU, process waste streams received from other LOUs or areas of the Site were included in the summary and considered when designing the Phase B scope of work for a particular LOU. SRCs associated with the known process waste streams are provided in a table in the LOU summary.

Associated SRCs for adjacent and/or overlapping LOUs were considered when evaluating an LOU. If an adjacent or overlapping LOU was considered to have the potential to affect the primary LOU, the lists of known or potential chemical classes were compared and analytes were added, if necessary, to the primary LOU's scope of work based on the affecting LOU. A brief description of the affecting LOU and the additional analytes added is included in the LOU summary.

In order to evaluate suitable locations and sampling depths for the Phase B soil borings, known or potential release mechanisms were evaluated. Potential release mechanisms (i.e., infiltration, surface runoff, etc.) associated with an LOU is based on surface features, LOU construction, and historical operations. Known releases noted in historical documents are described and considered. In addition, analytical results and historical soil and groundwater sampling locations from previous investigations were evaluated for their adequacy to address potential or known releases. Further, sources of soil impacts related to soil gas migration from areas outside the LOU and Area III, and the re-wetting of soil by impacted groundwater through capillary rise and/or fluctuation of the water table were considered in selection of soil boring locations and depths.

Data from the *Phase A Source Area Investigation Results Report* (ENSR 2007b) were also evaluated. For an LOU with a Phase A sampling location within its boundaries, Phase A data were used as indicators of possible previously unknown SRCs at that LOU. SRCs detected in Phase A borings, and not already associated with an LOU, were added to the “Known or Potential Chemical Classes” list. For LOUs with no Phase A locations within their boundaries, the closest Phase A location is provided. The Phase A data in these cases is provided in the LOU summary only as an indication of subsurface soil and groundwater conditions in the vicinity of the LOU. Analytical data from the Phase A Source Area Investigation were reviewed and constituent classes detected in soil were compared to the list of “Known or Potential Chemical Classes” identified for the specific LOU. Phase A constituent classes not consistent with the “Known or Potential Chemical Classes” list were added to the Phase B analytical program. Based on the location of the Phase A sample locations, a

determination was made as to whether or not they were located in “worst case” areas of the LOU. If not, Phase B investigations were proposed.

A soil boring assessment has been proposed as part of the Phase B Source Area Investigation to evaluate the known and potential source areas onsite. In general, soil borings designed to assess an LOU will be drilled within the LOU boundaries. In cases where drilling within an LOU is not possible (e.g., an LOU is active or the integrity of containment could be compromised) soil borings will be located adjacent to the LOU. Soil borings upgradient and downgradient of an LOU will also be sampled to further assess the LOU and the impact, if any, on surrounding areas.

The Phase B soil borings consist of two categories, “judgmental” and “random.” Judgmental boring locations are designed to evaluate known or potential chemical classes associated with a specific LOU based on the known process waste streams. These soil borings are located in or near an LOU at locations considered to be either “worst case”, representative of soil conditions at the LOU, or in areas of reported or known releases. The Phase B analytical program for the judgmental borings is based on known or potential chemical classes specifically associated with an LOU.

To further evaluate the possibility of additional potential source areas beyond the 70 already identified onsite, an additional random soil boring assessment will be implemented area-wide as part of the Phase B Source Area Investigation. With the concurrence of NDEP, the Site has been divided into 4-acre grids as shown on **Plate A**. Each grid has been further subdivided into 25 subsections, one of which was randomly selected to be sampled for the Area II investigation (**Plate A**). Soil samples from the randomly located borings will be collected at an initial interval of 0.0 to 0.5 feet bgs and each 10 feet thereafter, extending to the water table. In areas where surface features were noted, such as minor stains or above ground pipelines, judgmental soil samples will only be collected at 0.0 to 0.5 feet and 10 feet bgs.

Within Area II of the Site, the combined random and judgmental soil boring evaluation program will include the drilling of 82 soil borings. Each random sample location is designated with an identifier such as RSAQ5. The prefix symbol “R” identifies the sample as random; “SA” indicates it is a source area investigation boring, and “Q5” denotes the grid identifier.

To be conservative, a modified Phase A Source Area Investigation soil sampling suite is proposed (see Section 2.3.2).

Groundwater conditions upgradient and downgradient of the LOU, and/or at the LOU will be evaluated by sampling existing or new groundwater monitoring wells. Groundwater beneath the Site is considered to be a Site-wide issue therefore, the modified Phase A Source Area Investigation groundwater sampling analytical suite will be implemented for each proposed well (see Section 2.3.3).

2.2.2 Evaluation of Other Potential Sources

The Phase B scope of work includes sampling locations for potential source areas not identified as LOUs. A review of Phase A data suggests that offsite sources of constituents may exist. Soil borings designed to evaluate areas not associated with a specific LOU are listed in **Table 5**. These proposed borings include judgmental and random borings as described in Section 2.2.1 and will be analyzed for the modified Phase A analytical suite (see Section 2.3.2).

2.3 Summary of Area II Investigation

The proposed soil and groundwater sampling locations shown on **Plate A** were selected to determine the nature and extent of SRCs within Area II. Soil samples will be collected at 82 locations within Area II. Because the movement of groundwater transcends man-made features such as LOU boundaries, groundwater samples will also be collected from additional wells that are located in Areas I, III and IV, which surround Area II. In total, groundwater samples will be collected from 36 wells, under this work plan of which about 35 percent were sampled during the Phase A Source Area Investigation (**Plate A**). Six of the 36 wells are located out side (north, east, south, and west) of the Area II boundary.

The following is a summary of the soil and groundwater sampling program for the Phase B Source Area Investigation for Area II. Procedures and protocols for collecting soil and groundwater samples are presented in the QAPP (ENSR 2008d).

2.3.1 Surface Soil Sampling for Asbestos and Dioxins/Furans

Asbestos fibers and dioxins/furans were identified in surface soil samples from the Phase A Source Area Investigation (ENSR 2007b). As a result, surface soil samples will be collected and analyzed for asbestos and dioxins/furans as part of the Phase B Source Area Investigation. The samples for asbestos will be collected from a depth of 0.0 (surface) to 2 inches bgs. The samples for dioxins/furans will be collected from a depth of 0.0 to 0.5 feet bgs.

Soil samples for the asbestos and dioxin/furans analysis will be collected from each of the 84 proposed Phase B boring locations in Area III (**Plate A**). Asbestos samples will be analyzed by the modified elutriator method of Berman and Kolk based on United States Environmental Protection Agency (USEPA) 540/R-97/028. Dioxin/furan analysis will be by USEPA method 8290. **Table 2** lists the locations where surface soil samples for asbestos and dioxin/furans analysis will be collected. Sampling procedures are described in the QAPP (ENSR 2008d).

The number of samples to be collected, when combined with the Phase A Source Area Investigation results for Area II, is designed to provide a sufficient sample and geographic distribution for the Site-wide HHRA.

2.3.2 Subsurface Soil Sampling

Soil samples will be collected at 84 locations within Area II and analyzed for constituent classes that were identified as follows:

- constituents that were identified in an LOU based on historical site investigations;
- constituents that were identified as historically being used or stored at an LOU;
- constituents that were or are potentially associated with process waste streams at an LOU; and
- constituents that were associated with overlapping or adjacent LOUs.

In addition, soil samples from randomly selected sample locations will be analyzed for the modified Phase A list of SRCs (see below).

The analytes listed on **Table 1** are the same analytes used for the Phase A samples with the following modifications:

- Analysis of soil for polychlorinated biphenyl (PCB) compounds will not be performed on Phase B soil samples except at locations where it is documented that PCBs were used or stored (e.g., LOU 40 – PCB Transformer Spill [Area III] and LOU 27 – PCB Storage Area [Area IV]) or reported in Phase A samples (e.g., boring SA09 in LOU 35 – Truck Emptying/Dumping Site [Area I]). For Area II, no soil samples will be tested for PCBs. The basis for not sampling PCBs Site-wide is that PCBs were only detected in one out of 130 soil samples (i.e., Phase A boring SA09 at 0.47J mg/kg at 20 feet bgs) in the Phase A Source Area Investigation (ENSR 2007b).
- Analysis of soil for organophosphorus pesticides (OPPs) will not be performed on Phase B soil samples. The basis for this decision is that there is no documentation to indicate OPPs were used, manufactured, or stored on the Site. Moreover, OPPs (Demeton-O) were detected in only one out of 36 Phase A soil samples (i.e., Phase A boring SA17 at 0.092J mg/kg). SA17 is located in Beta Ditch, which also received waste effluent from offsite sources west of the Tronox Site.
- Analysis of soil for organochlorine pesticides (OCPs) will be performed on Phase B soil samples to assess the potential for OCP use on the Site, to have contributed to a groundwater plume of organic contaminants identified under the Site. Soil sample will be collected at all proposed sampling depths (surface, every 10 feet to the capillary fringe, and at the capillary fringe), for each sampling location. However, only the surface and capillary fringe samples will initially be analyzed. All other samples will be placed on hold, pending the results of the initial samples. If OCPs are detected in either sample, the remaining samples for that location will be analyzed.
- Analysis of soil for organochlorine herbicides (OCHs) will not be performed on Phase B soil samples. The basis for this decision is that there is no documentation to indicate OCHs were used, manufactured, or stored on the Site. Moreover, OCHs were not detected in any of the Phase A soil samples analyzed.
- Analyses of soil for radionuclides will consist of alpha spectroscopy for Radium-226, Thorium - 230/232, Uranium 234/235 and Uranium 238; beta counting will be used for Radium-228. Unlike the Phase A Source Area Investigation, Phase B soil samples will not be analyzed using gamma spectroscopy as the default analytical technique.
- Formaldehyde was added to the Phase B analyte list since formaldehyde may have been associated with LOU 38 – Former Satellite Accumulation Point, Ammonium Perchlorate (AP) Change House/Laboratory, and LOU 54 – AP Plant Area Change House/Laboratory Septic Tank.
- In Area II, total cyanide will only be analyzed in borings associated with LOU 62 (State Industries Inc.) and segments of LOU 60 (former Acid Drain System) that could have potentially carried effluent from LOU 62 to LOU 5 (Beta Ditch). Free cyanide analysis will be conducted in samples were total cyanide is detected.

In general, soil samples for the Phase B Source Area Investigation will be collected initially at a depth of 0.0 to 0.5 foot bgs and thereafter at 10-foot depth intervals to the level of the water table. If the boring location is covered with pavement (asphalt, concrete, etc.) then the initial subsurface sample will be collected at 0.5 feet below the pavement's gravel base. The soil sampling program proposed for Area II, including a complete list of soil borings, the proposed sample depths, and the analytical program for each sample is shown in **Table 2**. Sample containers, analytical methods, and holding times for soil samples area listed in **Table 6**.

2.3.3 Groundwater Sampling

The *Phase A Source Area Investigation Results Report* (ENSR 2007b) identified SRCs in groundwater that were present at concentrations above comparison levels. The *Phase A Source Area Investigation Results Report*, the ECA report (Kleinfelder 1993), and the CSM report (ENSR 2005) form the basis for further evaluation of SRCs in shallow groundwater as part of the Phase B Source Area Investigation.

As shown on **Figure 5**, groundwater samples will be collected from 36 wells within or adjacent to Area II as part of the Site-wide evaluation of SRCs in groundwater. The sample locations were selected to evaluate specific LOU areas as identified in the CSM report (ENSR 2005) as potential source areas, and to further evaluate the horizontal extent of SRCs that was identified in the *Phase A Source Area Investigation Results Report* (ENSR 2007b). **Table 3** lists the wells that will be sampled for laboratory analyses as part of the Area II investigation of groundwater. Sample containers, analytical methods, and holding times for groundwater samples area listed in **Table 7**. **Table 9** is a subset of the All Wells Database (June 2008) that focuses on well completion data for the Tronox wells, as well as the three Timet wells proposed for sampling under the Phase B investigation program.

Groundwater samples will be analyzed for the list of SRCs shown on **Table 1**. Unlike the Phase A analytical program for groundwater samples, the Phase B groundwater samples will not be analyzed for PCBs because PCBs were not detected in as part of the Phase A investigation. Similarly, groundwater samples will not be analyzed for OPPs because OPPs were not detected in the Phase A samples that were collected from 27 wells spread across the Site.

2.3.4 Additional Data Collection

Additional tests will be performed on soil samples collected in Area II to gather data in support of further site characterization activities or risk assessment modeling. This includes performing tests on soil samples to: 1) evaluate the soil-to-groundwater migration potential of SRCs, and 2) gather data on the physical properties of onsite soils to provide Site-specific parameters.

2.3.4.1 Soil-to-Groundwater Migration Potential of SRCs

The *Phase A Source Area Investigation Results Report* (ENSR 2007b) identified SRCs in soil that have the potential to migrate to groundwater at concentrations of potential concern. Soil samples collected from the alluvium and Muddy Creek formation above the capillary fringe will be analyzed for leachability from the following Area II soil borings: RSAL6, SA64, SA102 and SA30. **Table 2** provides the following information for the sampling locations: grid location associated LOU, boring number, sample depth(s), SRCs to be analyzed for, expected soil type and rationale for sampling location/depth. **Table 8** lists the Soil Screening Levels (SSLs) based on the soil to groundwater pathway for the SRCs.

The potential for an SRC to partition from soil to groundwater will be determined using the Synthetic Precipitation Leaching Procedure (SPLP), USEPA Method 1312. The partitioning factor approach uses a leaching agent to evaluate the concentration of the chemical of interest (i.e., target SRC) that might leach from the solid matrix and partition into the pore water thus having the potential to affect water quality. Evaluating the potential for partitioning involves a stepwise process as follows:

- Soil samples are initially analyzed for the target SRCs to determine their solid matrix concentration (**Table 2**);

- Samples are then subjected to the leaching procedure using extraction fluid #2 (reagent water at a pH of 5.0 ±0.05) to derive the leachate;
- Samples will also be subjected to the leaching procedure using extraction fluid #3 (solely reagent water);
- The leachates are then analyzed for the target SRCs to evaluate a chemical's potential to partition from the solid matrix into the pore water.

The leachate data derived from the reagent water and that from the pH 5.0 water will be compared to reflect variable conditions at the site. The SPLP employs as the leaching agent a liquid with a pH of about 5.0 (reagent fluid #2) to reflect slightly acidic precipitation in areas west of the Mississippi (USEPA 1994). The analytical suite will include the SRC chemical categories shown on **Table 2**. SRCs were selected for analysis along the soil-to-groundwater pathway because they were reported above detection limits in Phase A samples, were detected in soil samples in other previous site investigations, and had CSM-indicated concentrations that were greater than their respective comparison level. Sample containers, analytical methods, and holding times for groundwater samples area listed in **Table 7**.

2.3.4.2 Geotechnical Testing Program

Soil samples will be collected and sent to a geotechnical engineering laboratory in order to measure physical parameters of the coarse-grained and fine-grained soils encountered during the course of this investigation. The soil samples will be collected from the same borings and sample depths as the soil samples for SPLP analyses as shown on **Table 2**. Soil samples collected for geotechnical testing will be co-located with soil samples for leachability tests in order to facilitate possible future fate and transport modeling. Data from the geotechnical tests will provide Site-specific data that will be used to support, modeling of the vadose zone for potential contaminant migration pathways, and to support evaluation of remedial alternatives, if necessary.

Tronox intends to follow the simple soil/water partitioning and groundwater dilution model provided in the USEPA's Soil Screening Guidance (1996) to assess the potential impacts to groundwater from residual chemicals in the unsaturated zone. The geotechnical testing program parameters, sample locations and depths were designed to provide sufficient data to use in an unsaturated zone modeling program. Additional details regarding the soil-to-groundwater evaluation will be provided in the HHRA work plan.

Fine-grained and coarse-grained soil samples will be collected and analyzed for the following parameters:

- Moisture content (dry weight basis) using American Society for Testing and Materials (ASTM) Method D-2216;
- Particle size analysis using ASTM Method D-422 (for sand and gravel) and C117-04 (for silt and clay);
- Soil Dry Bulk Density using ASTM Method D2937;
- Grain Density using ASTM Method D854;
- Soil Water-Filled Porosity using ASTM Method D2216; and
- Vertical Hydraulic Conductivity using ASTM D5084/USEPA 9100.

3.0 Investigation Report and Schedule

Upon completing field activities and receipt of the analytical results, the Area II investigation data will be compiled. The Area II data will be discussed with NDEP. If data gaps are identified, additional field sampling may be proposed as an addendum to the Area II Work Plan. Elements of the Area II investigation and results will be integrated with the soil and groundwater data from the Area I, III, and IV investigations, the soil gas investigation, and the background water quality investigation to create a report on the results of the Phase B Source Area Investigation for the Site. One document will be provided to NDEP, which will summarize all the Area investigation results.

The Phase B report will summarize the Site description, LOUs, previous environmental assessments conducted at the Site, including the Phase A results, Site physical conditions and the findings of the soil, soil gas, and groundwater sampling program. The report will be organized similar to the *Phase A Source Area Investigation Results Report* (ENSR 2007b) and will include the following:

- Copies of applicable permits;
- Field logs, groundwater sampling and boring logs;
- Description of field procedures and any deviations from the proposed program;
- Presentation of field observations and analytical results;
- Certified analytical laboratory reports and chain-of-custody documentation;
- Data validation summary report and data validation memorandum;
- Summary tables of results organized by chemical species (i.e., VOCs, SVOCs, metals) and environmental media (i.e., soil, soil gas, and groundwater);
- Figures showing the results of the soil, soil gas and groundwater sampling program organized in a similar fashion as the tables by chemical species and environmental media;
- Discussion of the data and comparison to screening level criteria; and
- Recommendations for additional assessment, as applicable.

The Area II investigation activities will commence within 30 days following NDEP approval of this Work Plan. Actual start dates will depend on the availability of drilling contractors at the time of approval. General milestones and durations are provided below:

- Field Activities – three to four weeks, inclusive of utility clearance activities at the Site;
- Laboratory Analyses – four to six weeks; and
- Data Validation and Analysis – four to six weeks.

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TABLES

Table 1
List of Site-Related Chemicals and Reporting Limits
 Phase B Source Area Investigation Work Plan - Area II
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
			mg/kg		ug/L	
Metals						
Aluminum	7429-90-5	EPA 6010	1.00E+01	7.50E+01	5.00E+01	5.00E+01
Antimony	7440-36-0	EPA 6020	5.00E-02	3.00E-01	5.00E-02	6.00E+00
Arsenic	7440-38-2	EPA 6020	5.00E-01	1.59E-01	5.00E-01	1.00E+01
Barium	7440-39-3	EPA 6010	2.00E+00	8.20E+01	5.00E+00	2.00E+03
Beryllium	7440-41-7	EPA 6020	2.00E-02	3.00E+00	2.00E-02	4.00E+00
Boron	7440-42-8	EPA 6020	5.00E-01	2.27E+00	5.00E-01	7.30E+02
Cadmium	7440-43-9	EPA 6020	2.00E-02	4.00E-01	2.00E-02	5.00E+00
Calcium	7440-70-2	EPA 6010	1.00E+01	na	5.00E+01	na
Chromium (total)	7440-47-3	EPA 6020	2.00E-01	4.48E+01	2.00E-01	1.09E+01
Chromium (hexavalent)	18540-29-9	EPA 7199+3060A / 218.6	5.00E-01	2.00E+00	1.00E+01	1.00E+02
Cobalt	7440-48-4	EPA 6010	2.00E+00	3.29E+00	1.00E+01	7.30E+01
Copper	7440-50-8	EPA 6010	2.00E+00	4.68E+02	1.00E+01	1.30E+03
Iron	7439-89-6	EPA 6010	4.00E+00	7.53E+00	2.00E+01	3.00E+02
Lead	7439-92-1	EPA 6020	5.00E-02	1.34E+01	2.00E-02	1.50E+01
Magnesium	7439-95-4	EPA 6010	4.00E+00	na	2.00E+01	1.50E+05
Manganese	7439-95-4	EPA 6010	2.00E+00	3.26E+00	5.00E+00	5.00E+01
Mercury	7439-97-6	EPA 7471/7470	2.00E-02	1.64E-01	2.00E-01	2.00E+00
Molybdenum	7439-98-7	EPA 6020	5.00E-02	3.66E-01	5.00E-02	1.82E+01
Nickel	7440-02-0	EPA 6020	2.00E-01	7.00E+00	2.00E-01	7.30E+01
Platinum	7440-06-4	EPA 6020	1.00E-01	na	1.00E-01	na
Potassium	7440-09-7	EPA 6010	2.00E+02	na	2.00E+03	na
Selenium	7782-49-2	EPA 6020	1.00E+00	5.11E+02	1.00E+00	5.00E+01
Silver	7440-22-4	EPA 6020	2.00E-02	2.00E+00	2.00E-02	1.00E+02
Sodium	7440-23-5	EPA 6010	2.00E+01	na	1.00E+02	na
Strontium	7440-24-6	EPA 6010	2.00E+00	7.69E+01	1.00E+01	2.19E+03
Tin	7440-31-5	EPA 6010	1.00E+01	5.48E+02	5.00E+01	2.19E+03
Titanium	7440-32-6	EPA 6010	2.00E+00	1.46E+04	1.00E+01	1.46E+04

Table 1
List of Site-Related Chemicals and Repeating Limits
 Phase B Source Area Investigation Work Plan - Area II
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
Thallium	7440-28-0	EPA 6020	2.00E-02	1.42E-01	2.00E-02	2.00E+00
Tungsten	7440-33-7	EPA 6020	1.00E-01	na	1.00E-01	na
Uranium	7440-61-1	EPA 6020	2.00E-02	1.53E-02	2.00E-02	3.00E+01
Vanadium	7440-62-2	EPA 6020	2.00E-01	1.02E+02	2.00E-01	3.65E+00
Zinc	7440-66-6	EPA 6010	2.00E+00	6.20E+02	1.00E+01	5.00E+03
Wet Chem Analytes			mg/kg		ug/L	
Alkalinity (total, CQ^- , HCO_3^-)	na	SM 2320B	2.00E+01	na	2.00E+03	na
Ammonia	7664-41-7	EPA 350.1	5.00E+00	na	5.00E+01	na
Bromide	24959-67-9	EPA 9056	1.00E+00	na	1.00E+02	na
Chlorate	7790-93-4	EPA 300.1	2.00E-01	na	2.00E+01	na
Chloride	16887-00-6	EPA 9056	2.00E+00	na	2.00E+02	2.50E+05
Conductivity	na	EPA 9050A	na	na	na	na
Cyanide (total)	57-12-5	EPA 9012A	1.00E+00	1.20E+03	1.00E+01	2.00E+02
Nitrate	7697-37-2	EPA 9056	5.00E-01	na	5.00E+01	1.00E+04
Nitrite	14797-65-0	EPA 9056	5.00E-01	na	5.00E+01	1.00E+03
Perchlorate	14797-73-0	EPA 314.0	1.00E-01	1.00E+01	1.00E+00	1.80E+01
pH	na	EPA 9045C/9040B	na	na	na	na
Phosphate (total)	14265-44-2	EPA 365.1	5.00E-01	na	5.00E+01	na
Sulfate	14808-79-8	EPA 9056	2.00E+00	na	2.00E+02	2.50E+05
Surfactants (MBAS)	na	SM 5540C	1.00E+00	na	2.00E+01	na
TDS	na	SM 2540C	na	na	1.00E+04	1.90E+06
Total Organic Carbon	7440-44-0	EPA Lloyd Kahn/ 9060	3.00E+02	na	1.00E+03	na
TSS	na	SM 2540D	na	na	1.00E+04	na

Table 1
List of Site-Related Chemicals and Repeating Limits
 Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
TPH			ug/kg		ug/L	
GRO(C6-C10)	na	EPA 8015B	5.00E+01	1.00E+03	na	na
DRO(C10-C28)	na	EPA 8015B	4.00E+04	1.00E+03	na	na
ORO (C28-C40)	na	EPA 8015B	4.00E+04	1.00E+03	na	na
Organochlorine Pesticides			mg/kg		ug/L	
4,4'-DDD	72-54-8	EPA 8081A	3.30E-03	8.00E-01	5.00E-02	2.80E-02
4,4'-DDE	72-55-9	EPA 8081A	3.30E-03	7.02E-01	5.00E-02	1.98E-02
4,4'-DDT	50-29-3	EPA 8081A	3.30E-03	7.02E-01	5.00E-02	1.98E-02
Aldrin	309-00-2	EPA 8081A	1.70E-03	1.00E-02	5.00E-02	4.00E-02
alpha-BHC	319-84-6	EPA 8081A	1.70E-03	3.59E-02	5.00E-02	1.10E-03
alpha-Chlordane	5103-71-9	EPA 8081A	1.70E-03	6.47E-01	5.00E-02	2.00E+00
beta-BHC	319-85-7	EPA 8081A	1.70E-03	1.00E-04	5.00E-02	3.74E-03
Chlordane, technical	57-74-9	EPA 8081A	8.30E-03	6.47E-01	2.50E-01	2.00E+00
delta-BHC	319-86-8	EPA 8081A	1.70E-03	3.59E-02	5.00E-02	1.10E-03
Dieldrin	60-57-1	EPA 8081A	3.30E-03	1.10E-02	5.00E-02	4.20E-02
Endosulfan I	959-98-8	EPA 8081A	1.70E-03	3.70E+02	5.00E-02	2.19E+01
Endosulfan II	33213-65-9	EPA 8081A	3.30E-03	3.70E+02	5.00E-02	2.19E+01
Endosulfan sulfate	1031-07-8	EPA 8081A	3.30E-03	3.70E+02	5.00E-02	2.19E+01
Endrin	72-20-8	EPA 8081A	3.30E-03	1.85E+01	5.00E-02	2.00E+00
Endrin aldehyde	7421-93-4	EPA 8081A	3.30E-03	4.98E-02	5.00E-02	1.09E+00
Endrin Ketone	53494-70-5	EPA 8081A	3.30E-03	1.85E+01	5.00E-02	1.09E+00
gamma-BHC (Lindane)	58-89-9	EPA 8081A	1.70E-03	1.74E-01	5.00E-02	2.00E-01
gamma-Chlordane	5103-74-2	EPA 8081A	1.70E-03	6.47E-01	5.00E-02	1.20E+00
Heptachlor	76-44-8	EPA 8081A	1.70E-03	3.83E-02	5.00E-02	4.00E-01
Heptachlor epoxide	1024-57-3	EPA 8081A	1.70E-03	1.89E-02	5.00E-02	2.00E-01
Hexachlorobenzene	118-74-1	EPA 8081A	1.70E-03	1.00E-01	5.00E-02	1.00E+00
Methoxychlor	72-43-5	EPA 8081A	1.70E-02	8.00E+00	5.00E-01	4.00E+01
Toxaphene	8001-35-2	EPA 8081A	3.30E-02	1.57E-01	1.00E+00	3.00E+00

Table 1
List of Site-Related Chemicals and Reporting Limits
 Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
PCBs as Aroclors			mg/kg		ug/L	
Aroclor 1016	12674-11-2	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1221	11104-28-2	EPA 8082	6.70E-02	2.03E-01	4.00E-01	5.00E-01
Aroclor 1232	11141-16-5	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1242	53469-21-9	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1248	12672-29-6	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1254	11097-69-1	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
Aroclor 1260	11096-82-5	EPA 8082	3.30E-02	2.03E-01	2.00E-01	5.00E-01
PCBs as congeners **			mg/kg		ug/L	
Total PCBs	na	EPA 1668A	1.00E-04	2.03E-01	1.00E-03	5.00E-01
3,3',4,4'-tetraCB (PCB 77)	32598-13-3	EPA 1668A	6.00E-07	3.00E-02	4.17E-06	4.50E-03
3,4,4',5-tetraCB (PCB 81)	70362-50-4	EPA 1668A	7.00E-07	9.80E-03	4.34E-06	1.50E-03
3,3',4,4',5-pentaCB (PCB 126)	57465-28-8	EPA 1668A	7.40E-07	3.00E-05	3.32E-06	4.50E-06
3,3',4,4',5,5'-hexaCB (PCB 169)	32774-16-6	EPA 1668A	4.80E-07	9.80E-05	2.07E-06	1.50E-05
2,3,3',4,4'-pentaCB (PCB 105)	32598-14-4	EPA 1668A	6.40E-07	9.80E-02	3.48E-06	1.50E-02
2,3,4,4',5-pentaCB (PCB 114)	74472-37-0	EPA 1668A	6.80E-07	9.80E-02	3.83E-06	1.50E-02
2,3',4,4',5-pentaCB (PCB 118)	31208-00-6	EPA 1668A	5.50E-07	9.80E-02	3.47E-06	1.50E-02
2',3,4,4',5-pentaCB (PCB 123)	65510-44-3	EPA 1668A	6.30E-07	9.80E-02	3.85E-06	1.50E-02
2,3,3',4,4',5-hexaCB (PCB 156)	38380-08-4	EPA 1668A	6.20E-07	9.80E-02	2.88E-06	1.50E-02
2,3,3',4,4',5'-hexaCB (PCB 157)	69782-90-7	EPA 1668A	6.20E-07	9.80E-02	2.88E-06	1.50E-02
2,3',4,4',5,5'-hexaCB (PCB 167)	52663-72-6	EPA 1668A	4.20E-07	9.80E-02	1.80E-06	1.50E-02
2,3,3',4,4',5,5'-heptaCB (PCB 189)	39635-31-9	EPA 1668A	4.60E-07	9.80E-02	4.14E-06	1.50E-02
Dioxins & Furans**			ng/kg			
1,2,3,4,6,7,8,9-Ocatchlorodibenzofuran	39001-02-0	EPA 1613B/ 8290	5.90E-01	*	na	na
1,2,3,4,6,7,8,9-Ocatchlorodibenzo-p-dioxin	3268-87-9	EPA 1613B/ 8290	5.70E-01	*	na	na
1,2,3,4,6,7,8-Heptatchlorodibenzofuran	67562-39-4	EPA 1613B/ 8290	2.20E-01	*	na	na
1,2,3,4,6,7,8-Heptatchlorodibenzo-p-dioxin	35822-46-9	EPA 1613B/ 8290	2.60E-01	*	na	na
1,2,3,4,7,8,9-Heptatchlorodibenzofuran	55673-89-7	EPA 1613B/ 8290	3.50E-01	*	na	na

Table 1
List of Site-Related Chemicals and Reporting Limits
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
Dioxins & Furans** (continued)			ng/kg			
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	EPA 1613B/ 8290	9.00E-02	*	na	na
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	EPA 1613B/ 8290	1.00E-01	*	na	na
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	EPA 1613B/ 8290	1.50E-01	*	na	na
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	EPA 1613B/ 8290	1.90E-01	*	na	na
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	EPA 1613B/ 8290	1.40E-01	*	na	na
1,2,3,7,8-Pentachlorodibenzof-p-dioxin	40321-76-4	EPA 1613B/ 8290	1.50E-01	*	na	na
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	EPA 1613B/ 8290	1.10E-01	*	na	na
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	EPA 1613B/ 8290	1.60E-01	*	na	na
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	EPA 1613B/ 8290	1.20E-01	*	na	na
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	EPA 1613B/ 8290	1.70E-01	1.00E+03	na	na
Radionuclides			pCi/g		pCi/L	
Radium 226	13982-63-3	EPA 903.1 modified/ 903.1	5.00E-01	2.60E-03	1.00E+00	5.00E+00
Radium 228	15262-20-1	EPA 904.0 modified/ 904.0	5.00E-01	8.10E-09	3.00E+00	5.00E+00
Thorium 228	14274-82-9	EML HASL 300 Alpha Spec	5.00E-02	3.62E-10	3.00E-02	1.59E-02
Thorium 230	14269-63-7	EML HASL 300 Alpha Spec	5.00E-02	1.49E-05	3.00E-02	5.23E-02
Thorium 232	7440-29-1	EML HASL 300 Alpha Spec	1.00E-01	1.90E+00	3.00E-02	4.71E-02
Uranium 234	13966-29-5	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	6.74E-02
Uranium 235	15117-96-1	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	6.63E-02
Uranium 238	7440-61-1	EML HASL 300 Alpha Spec	4.00E-02	1.53E-02	3.00E-02	5.47E-02
VOCs			mg/kg		ug/L	
1,1,1,2-Tetrachloroethane	630-20-6	EPA 8260	5.00E-03	7.28E-01	1.00E+00	4.32E-02
1,1,1-Trichloroethane	71-55-6	EPA 8260	5.00E-03	1.00E-01	1.00E+00	2.00E+02
1,1,2,2-Tetrachloroethane	79-34-5	EPA 8260	5.00E-03	9.29E-02	1.00E+00	5.53E-03
1,1,2-Trichloroethane	79-00-5	EPA 8260	5.00E-03	1.61E-01	1.00E+00	5.00E+00
1,1-Dichloroethane	75-34-3	EPA 8260	5.00E-03	1.00E+00	1.00E+00	8.11E+01

Table 1
List of Site-Related Chemicals and Reporting Limits
 Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
VOCs (continued)			mg/kg		ug/L	
1,1-Dichloroethene	75-35-4	EPA 8260	5.00E-03	4.13E+01	1.00E+00	7.00E+00
1,1-Dichloropropene	563-58-6	EPA 8260	5.00E-03	1.76E-01	2.00E+00	3.95E-02
1,2,3-Trichlorobenzene	120-82-1	EPA 8260	5.00E-03	2.34E-01	2.00E+00	7.00E+01
1,2,3-Trichloropropane	96-18-4	EPA 8260	5.00E-03	7.60E-03	2.00E+00	5.60E-04
1,2,4-Trichlorobenzene	120-82-1	EPA 8260	5.00E-03	3.00E-01	2.00E+00	7.00E+01
1,2,4-Trimethylbenzene	95-63-6	EPA 8260	5.00E-03	1.70E+01	2.00E+00	1.23E+00
1,2-Dibromo-3-chloropropane	96-12-8	EPA 8260	5.00E-03	2.02E-01	5.00E+00	2.00E-01
1,2-Dibromoethane	106-93-4	EPA 8260	5.00E-03	7.30E-03	1.00E+00	5.00E-02
1,2-Dichlorobenzene	95-50-1	EPA 8260	5.00E-03	9.00E-01	2.00E+00	2.60E+02
1,2-Dichloroethane	107-06-2	EPA 8260	5.00E-03	1.00E-03	1.00E+00	5.00E+00
1,2-Dichloropropane	78-87-5	EPA 8260	5.00E-03	7.42E-02	1.00E+00	5.00E+00
1,3,5-Trimethylbenzene	108-67-8	EPA 8260	5.00E-03	1.60E-03	2.00E+00	1.23E+00
1,3-Dichlorobenzene	541-73-1	EPA 8260	5.00E-03	1.80E-02	2.00E+00	1.83E+01
1,3-Dichloropropane	142-28-9	EPA 8260	5.00E-03	3.61E+01	2.00E+00	1.22E+01
1,4-Dichlorobenzene	106-46-7	EPA 8260	5.00E-03	1.00E-01	2.00E+00	7.50E+01
2,2-Dichloropropane	594-20-7	EPA 8260	5.00E-03	7.42E-02	2.00E+00	1.65E-02
2-Butanone	78-93-3	EPA 8260	1.00E-02	7.82E-02	1.00E+01	6.97E+02
2-Chlorotoluene	95-49-8	EPA 8260	5.00E-03	4.30E-03	5.00E+00	1.22E+01
2-Hexanone	591-78-6	EPA 8260	1.00E-02	2.79E-02	1.00E+01	2.00E+02
4-Chlorotoluene	106-43-4	EPA 8260	5.00E-03	5.60E+01	5.00E+00	1.22E+01
4-Methyl-2-pentanone	108-10-1	EPA 8260	1.00E-02	4.70E+03	1.00E+01	1.99E+02
Acetone	67-64-1	EPA 8260	2.00E-02	8.00E-01	2.00E+01	5.48E+02
Benzene	71-43-2	EPA 8260	5.00E-03	2.00E-03	1.00E+00	5.00E+00
Bromobenzene	108-86-1	EPA 8260	5.00E-03	9.22E+00	2.00E+00	2.03E+00
Bromochloromethane	74-97-5	EPA 8260	5.00E-03	1.83E-01	2.00E+00	1.81E-02

Table 1
List of Site-Related Chemicals and Reporting Limits
 Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
VOCs (continued)						
Bromodichloromethane	75-27-4	EPA 8260	5.00E-03	1.83E-01	1.00E+00	2.10E-01
Bromoform	75-25-2	EPA 8260	5.00E-03	4.00E-02	1.00E+00	8.30E-04
Bromomethane	74-83-9	EPA 8260	5.00E-03	1.31E+00	2.00E+00	8.66E-01
Carbon Tetrachloride	56-23-5	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00
Chlorobenzene	108-90-7	EPA 8260	5.00E-03	7.00E-02	1.00E+00	3.90E+01
Chloroethane	75-00-3	EPA 8260	5.00E-03	6.49E-01	2.00E+00	4.64E-01
Chloroform	67-66-3	EPA 8260	5.00E-03	3.00E-02	1.00E+00	8.00E+01
Chloromethane	74-87-3	EPA 8260	5.00E-03	1.56E+01	2.00E+00	6.70E-01
cis-1,2-Dichloroethene	156-92-2	EPA 8260	5.00E-03	1.46E+01	1.00E+00	7.00E+01
cis-1,3-Dichloropropene	10061-01-5	EPA 8260	5.00E-03	1.76E-01	1.00E+00	3.95E-02
Dibromochloromethane	124-48-1	EPA 8260	5.00E-03	2.55E-01	1.00E+00	3.20E-01
Dibromomethane	74-95-3	EPA 8260	5.00E-03	2.34E+01	1.00E+00	6.08E+00
Dichlorodifluoromethane	75-71-8	EPA 8260	5.00E-03	3.08E+01	1.00E+00	3.95E+01
Diisopropyl ether (DIPE)	108-20-3	EPA 8260	5.00E-03	na	1.00E+00	na
Ethylbenzene	100-41-4	EPA 8260	5.00E-03	7.40E+02	1.00E+00	7.00E+02
Ethyl-tert-butyl ether (ETBE)	637-92-3	EPA 8260	5.00E-03	3.64E+00	1.00E+00	1.10E+00
Hexachlorobutadiene	87-68-3	EPA 8260	5.00E-03	1.00E-01	5.00E+00	8.62E-02
Isopropyl Benzene	98-28-8	EPA 8260	5.00E-03	2.00E+02	2.00E+00	6.58E+01
Methylene Chloride	75-09-2	EPA 8260	5.00E-03	1.00E-03	2.00E+00	5.00E+00
Methyl-tert-butyl ether (MTBE)	1634-04-4	EPA 8260	5.00E-03	3.64E+00	1.00E+00	2.00E+01
Naphthalene	91-20-3	EPA 8260	5.00E-03	4.00E+00	2.00E+00	6.20E-01
n-Butylbenzene	104-51-8	EPA 8260	5.00E-03	2.19E+02	2.00E+00	2.43E+01
n-Propylbenzene	103-65-1	EPA 8260	5.00E-03	2.19E+02	2.00E+00	2.43E+01
p-Isopropyltoluene	99-87-6	EPA 8260	5.00E-03	9.00E+01	2.00E+00	2.06E+01
sec-Butylbenzene	135-98-8	EPA 8260	5.00E-03	1.63E+02	2.00E+00	2.43E+01
Styrene	100-42-5	EPA 8260	5.00E-03	1.80E+03	1.00E+00	1.00E+02
tert-Amyl-methyl ether (TAME)	994-05-8	EPA 8260	5.00E-03	na	1.00E+00	na

Table 1
List of Site-Related Chemicals and Reporting Limits
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
VOCs (continued)			mg/kg		ug/L	
tert-Butyl alcohol (TBA)	75-65-0	EPA 8260	1.00E-01	na	1.00E+02	na
tert-Butylbenzene	98-06-6	EPA 8260	5.00E-03	1.97E+02	2.00E+00	2.43E+01
Tetrachloroethene	127-18-4	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00
Toluene	108-88-3	EPA 8260	5.00E-03	6.00E-01	1.00E+00	1.50E+02
trans-1,2-Dichloroethene	156-60-5	EPA 8260	5.00E-03	2.35E+01	1.00E+00	1.00E+02
trans-1,3-Dichloropropene	10061-02-6	EPA 8260	5.00E-03	1.76E-01	1.00E+00	3.95E-02
Trichloroethene	79-01-6	EPA 8260	5.00E-03	3.00E-03	1.00E+00	5.00E+00
Trichlorofluoromethane	75-69-4	EPA 8260	5.00E-03	1.09E-01	1.00E+00	1.80E+01
Vinyl Chloride	75-01-4	EPA 8260	5.00E-03	7.46E-02	1.00E+00	2.00E+00
Xylenes (total)	1330-20-7	EPA 8260	5.00E-03	9.00E+01	1.00E+00	1.00E+04
SVOCs			mg/kg		ug/L	
1,4-Dioxane	123-91-1	EPA 8270	6.60E-02	1.57E+01	2.00E-01	6.11E-01
2-Methylnaphthalene	91-57-6	EPA 8270	6.60E-03	1.88E+01	2.00E-01	6.20E-01
Acenaphthene	83-32-9	EPA 8270	6.60E-03	2.92E+03	2.00E-01	3.65E+01
Acenaphthylene	208-96-8	EPA 8270	6.60E-03	2.92E+03	2.00E-01	3.65E+01
Anthracene	120-12-7	EPA 8270	6.60E-03	2.40E+04	2.00E-01	1.83E+02
Benzo(a)anthracene	56-55-3	EPA 8270	6.60E-03	8.00E-02	2.00E-01	9.21E-03
Benzo(a)pyrene	50-32-8	EPA 8270	6.60E-03	2.11E-02	2.00E-01	2.00E-01
Benzo(b)fluoranthene	205-99-2	EPA 8270	6.60E-03	2.00E-01	2.00E-01	9.21E-03
Benzo(g,h,i)perylene	191-24-2	EPA 8270	6.60E-03	7.17E+01	2.00E-01	1.83E+01
Benzo(k)fluoranthene	207-08-9	EPA 8270	6.60E-03	2.00E+00	2.00E-01	9.21E-02
Bis(2-ethylhexyl)phthalate	117-81-7	EPA 8270	6.60E-03	1.23E+01	2.00E-01	6.00E+00
Butylbenzylphthalate	85-68-7	EPA 8270	6.60E-03	1.23E+04	2.00E-01	7.30E+02
Chrysene	218-01-9	EPA 8270	6.60E-03	8.00E+00	2.00E-01	9.21E-01
Dibenzo(a,h)anthracene	53-70-3	EPA 8270	6.60E-03	2.11E-02	2.00E-01	9.21E-04
Diethylphthalate	84-66-2	EPA 8270	6.60E-03	1.50E+00	2.00E-01	2.92E+03
Dimethylphthalate	131-11-3	EPA 8270	6.60E-03	6.16E+05	2.00E-01	3.65E+04

Table 1
List of Site-Related Chemicals and Reporting Limits
 Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
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Analyte	CAS No.	Method soil / water	Lab RL	RL Goal	Lab RL	RL Goal
			soil		water	
SVOCs (continued)			mg/kg		ug/L	
Di-n-butylphthalate	84-74-2	EPA 8270	6.60E-03	2.70E+02	2.00E-01	3.65E+02
Di-n-octylphthalate	117-84-0	EPA 8270	6.60E-03	2.46E+03	2.00E-01	1.46E+02
Fluoranthene	206-44-0	EPA 8270	6.60E-03	2.10E+02	2.00E-01	1.46E+02
Fluorene	86-73-7	EPA 8270	6.60E-03	2.63E+03	2.00E-01	2.43E+01
Hexachlorobenzene	118-74-1	EPA 8270	6.60E-03	1.00E-01	2.00E-01	1.00E+00
Indeno(1,2,3-cd)pyrene	193-39-5	EPA 8270	6.60E-03	2.11E-01	2.00E-01	9.21E-03
Naphthalene	91-20-3	EPA 8270	6.60E-03	4.00E+00	2.00E-01	6.20E-01
Nitrobenzene	98-95-3	EPA 8270	6.60E-03	1.03E+01	2.00E-01	3.40E-01
Octachlorostyrene	29082-74-4	EPA 8270	6.60E-03	na	2.00E-01	na
Phenanthrene	85-01-8	EPA 8270	6.60E-03	9.60E+00	2.00E-01	1.80E+02
Pyrene	129-00-0	EPA 8270	6.60E-03	2.10E+02	2.00E-01	1.83E+01
Pyridine	110-86-1	EPA 8270	6.60E-03	6.16E+01	2.00E-01	3.65E+00
Asbestos			structures/gPM10			
Amphibole Protocol Structures	na	EPA/540/R-97/028 modified	3.00E+06	na	na	na
Chrysotile Protocol Structures	na	EPA/540/R-97/028 modified	3.00E+06	na	na	na
Formaldehyde			mg/kg		ug/L	
Formaldehyde	50-00-0	EPA 8315A	1.00E+03	1.0E+04	8.00E+00	5.5E+02
<p>* RL Goal for the TEQ sum for all dioxin/furan congeners is 1000 pg/g ** Lab RLs for PCB congeners and dioxin/furan congeners will be based on sample specific EDLs. Averaged blank EDLs are provided here. All 209 PCB congeners will be reported. Only the WHO designated toxic congeners are listed in this list. Tronox SRC list approved by NDEP on June 3, 2008.</p>						

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	Asbestos ⁸ EPA/540/R-97/028	Geo-technical Tests ⁹	Rationale
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).																			
R-6	43		SA208-30	30	X	X	X			X	X		Hold		X				
R-6	43		SA208-35	35	X	X	X			X	X		X		X				
R-6	43, 59, 60	RSAR6	RSAR6-0.0	0.0													X		Boring located to evaluate LOU 43 (Unit 4 Basement and Old Sodium Chlorate Plant Decommissioning),
R-6	43, 59, 60		RSAR6-0.5	0.5	X	X	X	X		X	X		X	X	X	X			and LOU 59 (Storm Sewer System) and LOU 60 (Acid Drain System). Random boring located near LOU 43 as a
R-6	43, 59, 60		RSAR6-10	10	X	X	X	X		X	X		Hold	X	X				stepout for general coverage, adjacent to LOU 59 and 60 piping to evaluate high risk release area (junction) and for site
R-6	43, 59, 60		RSAR6-20	20	X	X	X	X		X	X		Hold	X	X				wide coverage.

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	Asbestos ⁸ EPA/540/R-97/028	Geo-technical Tests ⁹	Rationale
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).																			
R-6	43, 59, 60		RSAR6-30	30	X	X	X	X		X	X		Hold	X	X				
R-6	43, 59, 60		RSAR6-35	35	X	X	X	X		X	X		X	X	X				
S-7	29	SA122	SA122-0.0	0.0													X		Boring located to evaluate LOU 29 (Solid Waste Dumpsters). Located within the footprint of LOU 29 at a
S-7	29		SA122-0.5	0.5	X	X	X			X	X		X			X			between the two active dumpsters.
S-7	29		SA122-10	10	X	X	X			X	X		X						
S-7	29	SA170	SA170-0.0	0.0													X		Boring located to evaluate LOU 29 (Solid Waste Dumpsters). Located within the footprint of LOU 29 at a
S-7	29		SA170-0.5	0.5	X	X	X			X	X		X			X			stained area to evaluate visible surface release area.
S-7	29		SA170-10	10	X	X	X			X	X		X						
Number of Borings: 82																			
Synthetic Precipitate Leaching Procedure (SPLP) Samples¹⁰:																			
L-6	55	RSAL6	RSAL6-10	10	X	X	X	X		X	X		X	X	X			X	Soil sample collected from the southeast corner of LOU 55 (Area Affected by July 1990 Fire) to evaluate leaching potential of Site-related analytes from Alluvium (Qal) soils. Expected soil type: Gravelly Sand.
L-6	55	RSAL6	RSAL6-DD	DD* = depth (ft)	X	X	X	X		X	X		X	X	X			X	Optional sample - only to be collected if soil type is different than at 10 ft bgs; no sample will be collected within the capillary fringe. Contact between Qal & MCfg1 is approximately 36 feet bgs. Groundwater is expected to occur at approximately 37 feet bgs. Expected soil type: Calichified Gravelly Sand.
M-4	5	SA128	SA128-10	10	X	X	X	X		X	X	X	X	X	X			X	Soil sample collected from within LOU 5 (Beta Ditch) at the confluence of the Stauffer Extension and the out-flow from LOU 59 (Storm Sewer System) to evaluate leaching potential of Site-related analytes. Expected soil type: Sand.
M-4	5	SA128	SA128-DD	DD* = depth (ft)	X	X	X	X		X	X	X	X	X	X			X	Optional sample - only to be collected if soil type is different than at 10 ft bgs; no sample will be collected within the capillary fringe. Contact between Qal & MCfg1 is approximately 30 feet bgs. Groundwater is expected to occur at approximately 35 feet bgs. Expected soil type: Sand.
M-6	5, 16, 17, 57, 60	SA64	SA64-10	10	X	X	X			X	X		X	X	X			X	Soil sample collected from within LOU 16 and 17 (Ponds AP-1 through AP-3 and Associated Transfer Lines) to evaluate leaching potential of Site-related analytes from Alluvium (Qal) soils. Expected soil type: Gravelly Sand.
M-6	5, 16, 17, 57, 60	SA64	SA64-DD	DD* = depth (ft)	X	X	X			X	X		X	X	X			X	Optional sample - only to be collected if soil type is different than at 10 ft bgs; no sample will be collected within the capillary fringe. Contact between Qal & MCfg1 is approximately 26 feet bgs. Groundwater is expected to occur at approximately 26 feet bgs. Expected soil type: Calichified Gravelly Sand.
O-5	7	SA102	SA102-10	10	X	X	X			X	X		X	X	X			X	Soil sample collected within the boundaries of LOU 7 (Old P-2 Pond and Associated Conveyance Facilities) to evaluate leaching potential of Site-related analytes. Expected soil type: Gravelly Sand.
O-5	7	SA102	SA102-DD	DD* = depth (ft)	X	X	X			X	X		X	X	X			X	Optional sample - only to be collected if soil type is different than at 10 ft bgs; no sample will be collected within the capillary fringe. Contact between Qal & MCfg1 is approximately 39 feet bgs. Groundwater is expected to occur at approximately 41 feet bgs. Expected soil type: Calichified Gravel.
R-6	59, 60	SA30	SA30-10	10	X	X	X			X	X		X	X	X			X	Soil sample collected west of LOU 43 (Old Sodium Plant Decommissioning and Unit-4 Basement) to evaluate leaching potential of Site-related analytes. Expected soil type: Sand with caliche lens.
R-6	59, 60	SA30	SA30-DD	DD* = depth (ft)	X	X	X			X	X		X	X	X			X	Optional sample - only to be collected if soil type is different than at 10 ft bgs; no sample will be collected within the capillary fringe. Contact between Qal & MCfg1 is approximately 33 feet bgs. Groundwater is expected to occur at approximately 40 feet bgs. Expected soil type: Sand.
Number of Samples:					375	375	375	248	10	375	375	26	174	281	375	82	42	10	
QA/QC Samples:																			
Field Duplicates (10%)					38	38	38	25	1	38	38	3	18	29	38	9	5	0	
Field Blanks					1	1	1	1	1	1	1	1	1	1	1	1	1	0	
Equipment Rinsate Blanks					30	30	30	30	30	30	30	30	30	30	30	30	30	0	
Trip Blank Samples					0	0	0	0	6	15	0	0	0	0	0	0	0	0	
Matrix Spike (5%)					19	19	19	13	1	19	19	2	9	15	19	1	0	0	
Matrix Spike Duplicate (5%)					19	19	19	13	1	19	19	2	9	15	19	1	0	0	
Total Sample Count:					482	482	482	330	50	497	482	64	241	371	482	124	78	10	
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. Soil samples for asbestos analyses will be collected from a depth of 0 to 2-inches bgs.																			
9. 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).																			
10. SPLP samples will be analyzed by EPA method 1312 using two preparation methods: 1) with extraction fluid #2 (reagent water at pH 5.00±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 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)	Radionuclides ⁵	Rationale
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).														
L4	IIE	M-14A	20 - 40	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout to LOU 5; and for general Site coverage.
L5	IIN	I-B	17.8 - 42.5	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout to LOUs 30 and 56 and for general Site coverage.
L5	II	I-AR	25 - 45	Qal/MCf _{g1}	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	IIN	M-55	14.6 - 44.6	Qal/MCf _{g1}	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout to LOU 55; and for general Site coverage.
L6	IIN	M-78	21.5 - 41.5	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located as a downgradient stepout to LOU 55; and for general Site coverage.
L6	II	M-64	12.7 - 37.3	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 55; as a downgradient stepout for LOUs 30 and 56 and for general Site coverage.
L6	II	M-25	24 - 39	Qal/MCf _{g1}	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/MCf _{g1}	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.
L8	IIN	M-68	11.2 - 39.8	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5; and for general Site coverage.
L9	IIN	CLD2-R	20 - 40.27	Qal	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5; and for general Site coverage.
M2	IIN	TR-4	124.5 - 144.5	MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5; and for general Site coverage.
M3	IIN	M-125	TBD	TBD	new well	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 5; and for general Site coverage.
M5	II	M-110	30 - 40	Qal/MCf _{g1}	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/MCf _{g1}	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/MCf _{g1}	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/MCf _{g1}	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.
M8	IIN	M-39	24.9 - 39.9	Qal/MCf _{g1}	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOUs 5, 20, 22 (pipelines in Area II) and LOU 23 (pipelines in Area II); and for general Site coverage.
M8	II	M-19	14.5 - 34.5	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOUs 5 and 20; to evaluate LOUs 22 and 23 and potential offsite sources to the east; and as general Site coverage.
N4	IIN	M-142	TBD	TBD	new well	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 5; and for general Site coverage.
N5	II	M-75	34.6 - 49.3	Qal/MCf _{g1}	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	MCc _{g1}	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/MCf _{g1}	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.
N7	II	M-34	25 - 40	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to evaluate the outfall of the culvert that empties into the Eastern Diversion segment of LOU 5; as a downgradient stepout for LOUs 13 and 14 as an upgradient step out for LOUs 20, 22, and 23; and for general Site coverage.
N7	IIS	M-35	25 - 40	Qal/MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to evaluate LOUs 5, 20, 22, and 23; and for general Site coverage.
O2	IIS	M-123	TBD	TBD	new well	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 5; and for general Site coverage.
O5	II	M-21	18 - 38	MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 45; as an upgradient stepout for LOUs 7, 9, 13 and 14; as a downgradient stepout for LOU 59; and for general Site coverage.
O6	II	M-50	39.6 - 59.6	MCf _{g1}	no	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for a segment of LOU 59 located in Area II as a ??? well for LOUs 13 and 14; and for general Site coverage.
P5	IIS	M-97	35 - 45	MCf _{g1} /MCc _{g1}	yes	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOU 45 and segments of LOU 59 located in Area II; and for general Site coverage.

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)	Radionuclides ⁵	Rationale
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).														
P7	IIE	M-52	34.5 - 44.5	MCfg1	no	X	X	X	X	X	X	X	X	Located to evaluate LOUs 43, 11, 12, and 15; and for general Site coverage.
Q5	II	M-13	40 - 50	Qal/MCfg1	yes	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOU 60; as an upgradient stepout for LOUs 36 and 45; and for general Site coverage.
Q6	II	M-12A	28 48	MCfg1	yes	X	X	X	X	X	X	X	X	Located as a downgradient stepout for LOUs 12, 15, 29, 36, 43, 59 and 60; and for general Site coverage.
Q7	IIN	M-11	33.3 - 53	Qal/MCfg1	yes	X	X	X	X	X	X	X	X	Located to serve as a downgradient stepout for LOUs 29 and 43; and for general Site coverage.
R5	IIS	M-144	TBD	TBD	new well	X	X	X	X	X	X	X	X	Co-located with Boring SA133 as an upgradient stepout for LOU 60; and for general Site coverage.
R5	II	M-146	TBD	TBD	no	X	X	X	X	X	X	X	X	Located to evaluate LOU 36; and for general Site coverage.
T7	IIS	M-10	43 - 63	MCcg1	no	X	X	X	X	X	X	X	X	Located to serve as an upgradient stepout for LOUs 29, 43 and segments of LOU 60 in Area II; and for general Site coverage.
Number of Field Samples:						36	36	36	36	36	36	36	36	
QA/QC Samples:														
Field Duplicates (10%)						4	4	4	4	4	4	4	4	
Field Blanks						2	2	2	2	2	2	2	2	
Equipment Rinsate Blanks						33	33	33	33	33	33	33	33	
Trip Blank Samples						0	0	0	33	0	0	0	0	
Matrix Spike (5%)						2	2	2	2	2	2	2	2	
Matrix Spike Duplicate (5%)						2	2	2	2	2	2	2	2	
Total Samples:						79	79	79	112	79	79	79	79	
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).														
IIN/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														

LOU	Closure Goal
LOU 5	Closure for future commercial and industrial uses.
LOU 7, 8, 9, 13, and 14	Closure for future commercial and industrial uses.
LOU 16, 17, 18, 19, 52, 53, and 57	Closure for future commercial and industrial uses.
LOU 20	Continuation of current use – regulatory closure not presently requested.
LOU 22 and 23	Continuation of current use – regulatory closure not presently requested.
LOU 29	Continuation of current use – regulatory closure not presently requested.
LOU 11, 12, 15, and 43	Closure for future commercial and industrial uses.
LOU 36	Closure for future commercial and industrial uses.
LOU 30 and 56	Closure for future commercial and industrial uses.
LOU 31	Closure for future commercial and industrial uses.
LOU 45	Closure for future commercial and industrial uses.
LOU 55	Restricted closure for commercial and industrial uses.
LOU 59	Continuation of current use – regulatory closure not presently requested.
LOU 60	Closure for future commercial/industrial use.

Table 5
Soil Borings Not Associated With An LOU But Included
As Part of the Site-wide Investigation

Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada

1 of 1

Soil Boring No.	Grid Location	Area
RSA N5	N-5	II
RSA N6	N-6	II
SA 150	N-6	II
SA 54	O-4	II

Table 6
Sample Containers, Analytical Methods, and Holding Times for Soil Samples
Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
 Page 1 of 1

Analyte	Method	Container (Minimum Volume)	Holding Time
Asbestos	EPA/540/R-97/028	1 kilogram in plastic bag or glass jar, no preservative	6 months
Cyanide	EPA 9012A	4-oz. glass jar	14 days
Dioxins/Furans	EPA Method 8290	4-oz. glass jar	30 days
Formaldehyde	EPA Method 8315A	4-oz. glass jar	14 days
General Chemistry Anions/Cations	Prep method 1:10 DI leach / various analytical methods****	4-oz. glass jar	None (leachate holdtime per water methods)
Hexavalent Chromium	EPA 7199 by ion chromatography, EPA 3060A for digestion	4-oz. glass jar	28 days to digestion, then 4 days to analysis of digestate
Metals*	EPA 6010 / 6020	4-oz. glass jar	6 months
Organochlorinated Pesticides	EPA Method 8081A	4-oz. glass jar	14 days
PCBs as Aroclors	EPA Method 8082	4-oz. glass jar	14 days
PCBs as congeners	EPA Method 1668A	4-oz. glass jar	1 year
SVOCs	EPA Method 8270	4-oz. glass jar	14 days
Total Organic Carbon	Lloyd Kahn method	4-oz. glass jar	28 days
TPH***	EPA 8015B (EPA 5035 for GRO fraction)	(3) Methanol preserved VOA vials for GRO; glass jar for DRO/ORO.	14 days
VOCs	EPA 8260B/5035	4 40-mL VOA vials**	14 days
Radionuclides:			
Radium-226	EPA 903.1 modified	4-oz. poly jar, no preservative	6 months
Radium-228	EPA 904.0 modified	4-oz. poly jar, no preservative	6 months
Thorium (Isotopic)	EML HASL 300 Alpha Spec	4-oz. poly jar, no preservative	6 months
Uranium (Isotopic)	EML HASL 300 Alpha Spec	4-oz. poly jar, no preservative	6 months
<p>Note:</p> <p>* Includes the metals listed on Table 1.</p> <p>For samples listing 4-oz. glass jar, one metal sleeve can be substituted.</p> <p>** Three VOA vials preserved with DI water and one VOA vial preserved with methanol.</p> <p>*** TPH includes GRO, DRO, and ORO.</p> <p>**** See analytes in GW list (except TSS, TOC, cyanide, and conductance)</p>			

Table 7
Sample Containers, Analytical Methods, and Holding Times for Groundwater Samples
Phase B Source Area Investigation Work Plan - Area II
 Tronox Facility - Henderson, Nevada
 Page 1 of 1

Analyte	Method	Container (Minimum Volume)	Holding Time
Perchlorate	EPA 314.0	(1) 125-ml plastic bottle	28 days
Formaldehyde	EPA 8315A	(1) 1-liter amber glass/ no preservative	3 days
Hexavalent Chromium	EPA 218.6	(1) 250-ml plastic bottle w/buffer, field filtered	24 hours
Metals*	EPA 6010B / 6020	(1) 500-ml plastic bottle w/ HNO ₃	6 months
Organochlorine Pesticides	EPA 8081A	(1) 1-liter amber glass/ no preservative	7 days
PCBs as Aroclors	EPA 8082	(1) 1-liter amber glass/ no preservative	7 days
PCBs as congeners	EPA 1668A	(1) 1-liter amber glass/ no preservative	1 year
SVOCs	EPA 8270	(1) 1-liter amber glass/ no preservative	7 days
VOCs	EPA 8260B	(3) 40-ml VOA vials w/HCl	14 days
General Water Chemistry			
Alkalinity	SM 2320B	500-ml plastic no preservative	14 days
Ammonia	EPA 350.1	500-ml plastic w/H ₂ SO ₄	28 days
Bromide	EPA 9056	125-ml plastic bottle/ no preservative	28 days
Chlorate	EPA 300.1	125-ml plastic bottle/ no preservative	28 days
Chloride	EPA 9056	** (2) liter plastic bottles	28 days
Cyanide	EPA 9012A	(1) 500-ml plastic bottle w/ NaOH	14 days
Electrical Conductivity	EPA 9050	125-ml plastic no preservative	28 days
Nitrate	EPA 9056	** Use same bottles	48 hours
Nitrite	EPA 9056	125-ml plastic no preservative	48 hours
pH	EPA 9040B	125-ml plastic no preservative	15 minutes
Phosphate	EPA 365.1	125-ml plastic bottle, no preservative	48 hours
Sulfate	EPA 9056	** Use same bottles	28 days
Surfactants (MBAS)	SM 5540C	125-ml plastic no preservative	48 hours
TDS	SM 2540C	125-ml plastic no preservative	28 days
Total Organic Carbon	EPA 9060	(2) 40-ml VOA vials w/H ₂ SO ₄	28 days
TSS	SM 2540D	125-ml plastic no preservative	7 days
Radionuclides:			
Radium-226	EPA 903.1	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO ₃	6 months
Radium-228	EPA 904.0	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO ₃	6 months
Thorium (Isotopic)	EML HASL 300 Alpha Spec	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO ₃	6 months
Uranium (Isotopic)	EML HASL 300 Alpha Spec	(1) 1-liter poly bottle (must be full), Preservative pH <2 HNO ₃	6 months
Note:			
* Includes the metals listed on Table.			
** Chloride, Nitrate, Nitrate, Bromide, and Sulfate use same bottle for all these samples. Sample containers are (2) liter plastic bottles.			

Table 8
Summary of Well Completion Data
Phase B Source Area Investigation Work Plan Area III
 Tronox Facility - Henderson, Nevada
 Page 7 of 7

Well ⁽¹⁾	Owner	X	Y	TOC Elevation	Ground Elevation	Casing Stickup ²	Muddy Creek Elevation ³	QAL Thickness ⁴	Hole Total Depth	Well Total Depth	Depth to Screen Top	Depth to Screen Bottom	Screen Interval	Status	Type	Aquifer
Note: Proposed Phase B wells for Area II are listed on Table 3 and are highlighted in BOLD below.																
PC-131	Kerr-McGee	828123.27800	26726725.41400	1633.58	1634.28	-0.70	1593.6	40.0	40.0	40.0	9.8	39.8	30.0	Active	Monitoring	Qal/MCf1
PC-132	Kerr-McGee	827913.94400	26726723.10200	1634.84	1635.21	-0.37	1602.8	32.0	40.0	40.0	9.8	39.8	30.0	Active	Monitoring	Qal/MCf1
PC-133	Tronox	831758.00000	26733209.00000	1553.00	1551.84	1.16	1513.8	38.0	40.2	40.2	5.0	40.0	35.0	Active	Recovery	Qal/MCf1
PC-134	Tronox	828776.17100	26728126.41500	1617.01	1617.43	-0.43	1568.4	49.0	70.0	70.0	59.7	69.7	10.0	Active	Monitoring	MCf1
PC-135	Tronox	828765.25000	26728123.17700	1617.25	1617.52	-0.27	1568.0	49.5	50.0	50.0	19.7	49.7	30.0	Active	Monitoring	Qal
PC-136	Tronox	829517.88800	26728191.37400	1615.08	1615.46	-0.38	1578.0	37.5	38.0	38.0	17.7	37.7	20.0	Active	Monitoring	Qal
PC-137	Tronox	829517.56800	26728198.97600	1614.83	1615.19	-0.36	1579.2	36.0	70.0	70.0	59.7	69.7	10.0	Active	Monitoring	MCf1
TR-1	Kerr-McGee	826168.04000	26719957.91000	1752.18	1749.41	2.77	1712.4	37.0	312.0	312.0	281.5	311.5	30.0	Active	Monitoring	MCcg2
TR-10	Kerr-McGee	827562.53000	26715739.77000	1854.06	1851.72	2.34	1806.7	45.0	102.0	100.5	80.0	100.0	20.0	Active	Monitoring	MCf1
TR-11	Kerr-McGee	825422.57000	26721918.29000	1717.12	1714.80	2.32	1664.8	50.0	255.0	230.5	210.0	230.0	20.0	Active	Monitoring	MCcg2
TR-12	Kerr-McGee	825286.37000	26723271.82000	1695.84	1693.44	2.40	1650.4	43.0	293.0	292.5	272.0	292.0	20.0	Active	Monitoring	MCcg2
TR-2	Kerr-McGee	826156.85000	26719954.57000	1751.79	1749.45	2.34	1712.5	37.0	180.0	175.0	144.5	174.5	30.0	Active	Monitoring	MCf1
TR-3	Kerr-McGee	826342.89000	26718941.61000	1772.84	1770.08	2.76	1743.1	27.0	251.5	250.0	219.5	249.5	30.0	Active	Monitoring	MCcg2
TR-4	Kerr-McGee	826342.53000	26718951.58000	1772.55	1770.04	2.51	1743.0	27.0	147.0	145.0	124.5	144.5	20.0	Active	Monitoring	MCf1
TR-5	Kerr-McGee	826595.86000	26717592.13000	1800.27	1797.45	2.82	1760.5	37.0	251.5	251.5	221.0	251.0	30.0	Active	Monitoring	MCcg2
TR-6	Kerr-McGee	826594.34000	26717608.38000	1800.36	1797.53	2.83	1760.5	37.0	80.5	80.0	60.0	80.0	20.0	Active	Monitoring	MCf1
TR-7	Kerr-McGee	826724.99000	26716525.47000	1829.03	1826.56	2.47	1783.6	43.0	292.0	290.5	260.0	290.0	30.0	Active	Monitoring	MCcg2
TR-8	Kerr-McGee	826722.81000	26716512.15000	1829.08	1826.54	2.54	1783.5	43.0	98.0	93.5	63.0	93.0	30.0	Active	Monitoring	MCcg1/fcg2
TR-9	Kerr-McGee	827560.22000	26715752.71000	1854.29	1851.75	2.54	1806.8	45.0	250.5	250.5	230.0	250.0	20.0	Active	Monitoring	MCcg2
TR-10	Kerr-McGee	827562.53000	26715739.77000	1854.06	1851.72	2.34	1806.7	45.0	102.0	100.5	80.0	100.0	20.0	Active	Monitoring	MCf1
TR-11	Kerr-McGee	825422.57000	26721918.29000	1717.12	1714.80	2.32	1664.8	50.0	255.0	230.5	210.0	230.0	20.0	Active	Monitoring	MCcg2
TR-12	Kerr-McGee	825286.37000	26723271.82000	1695.84	1693.44	2.40	1650.4	43.0	293.0	292.5	272.0	292.0	20.0	Active	Monitoring	MCcg2
CLD2-R	TIMET	828919.17500	26719962.60500	1753.790	1750.000	3.79	1717.000	33.000	42.000	0.000	0.000	0.000	0.000	Active	Monitoring	Alluvial

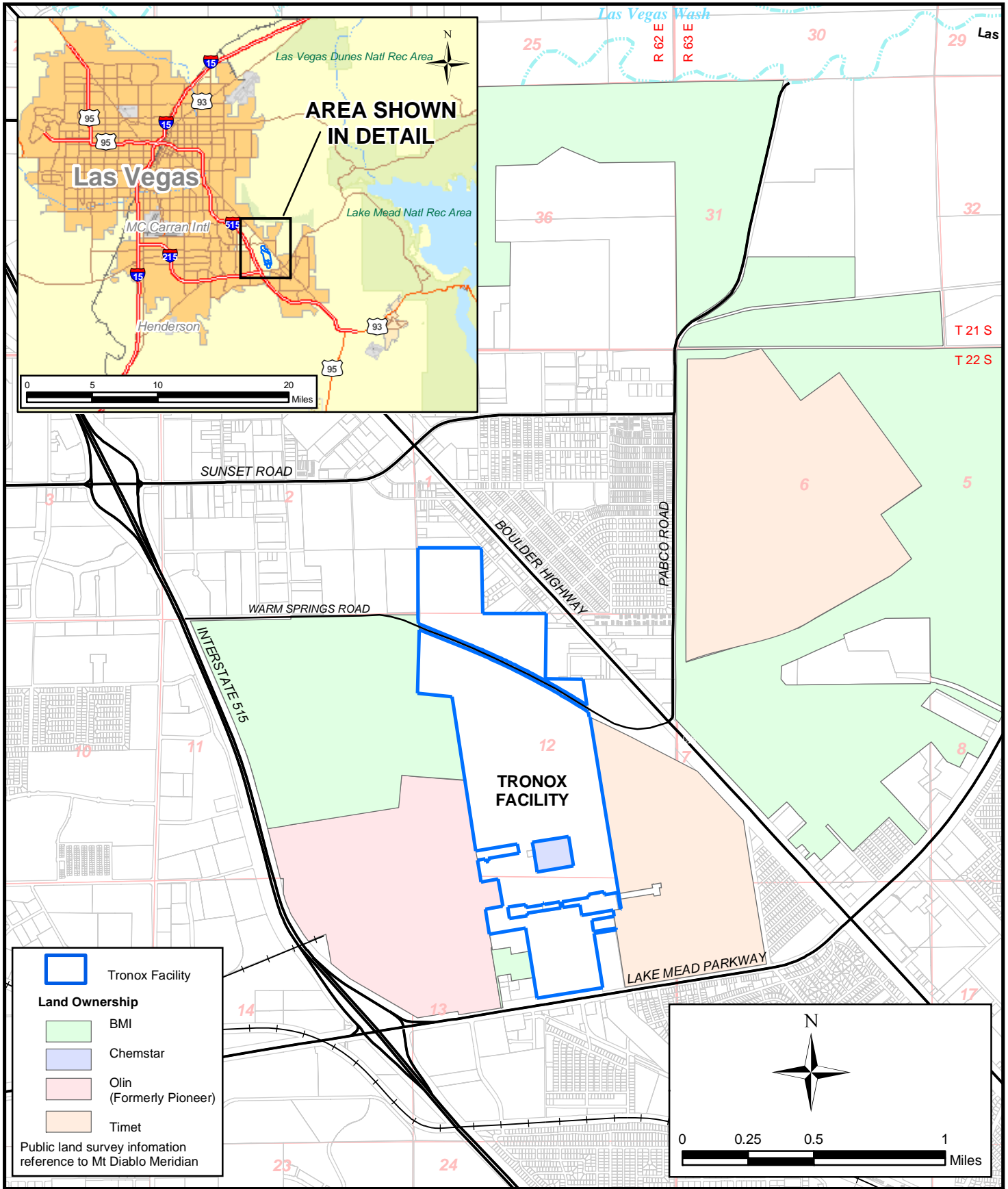
DEFINITIONS

OWNER Owner refers to the company who installed the well.
 X and Y "X" (Northing) and "Y" (Easting) - North American Datum.
 TOC Top of Casing.
 QAL Quaternary Alluvium
 STATUS The well is "Active" if it exists and has been sampled. "P&A" indicates that the well has been plugged and abandoned.
 TYPE "Monitoring" wells are used exclusively to collect groundwater samples to assess water quality. "Recovery" wells are part of the groundwater containment systems and are used to pump groundwater.
 AQUIFER Aquifer units designated by Tronox as follows:
 Qal - Alluvium (includes saturated uppermost MCf1)
 MCf1 - Muddy Creek Formation - "first" fine-grained facies
 MCcg1 - Muddy Creek Formation - "first" coarse-grained facies
 MCf2 - Muddy Creek Formation - "second" fine-grained facies
 MCcg2 - Muddy Creek Formation - "second" coarse-grained facies
 MCcg1/MCf2 - indicates that the well is screened across both units
 Alluvial - (Timet) designation for Qal.
 The aquifer unit corresponds to the screen interval of the well. In some cases, well screens straddle two aquifer units as noted above.
 -- Information not available or provided in the BMI "ALL WELLS" database - June 2008.

NOTES

- 1 Well and the associated information as listed in the BMI "All Wells" database - June 2008.
- 2 Casing stickup is measured with positive being "up" and negative numbers indicated the distance below the ground surface.
- 3 "-z" indicates that the top of the Muddy Creek was not encountered and is deeper than the elevation noted.
- 4 Quaternary alluvium thickness was measured from the ground surface to the top of the Muddy Creek.

FIGURES



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SITE LOCATION MAP

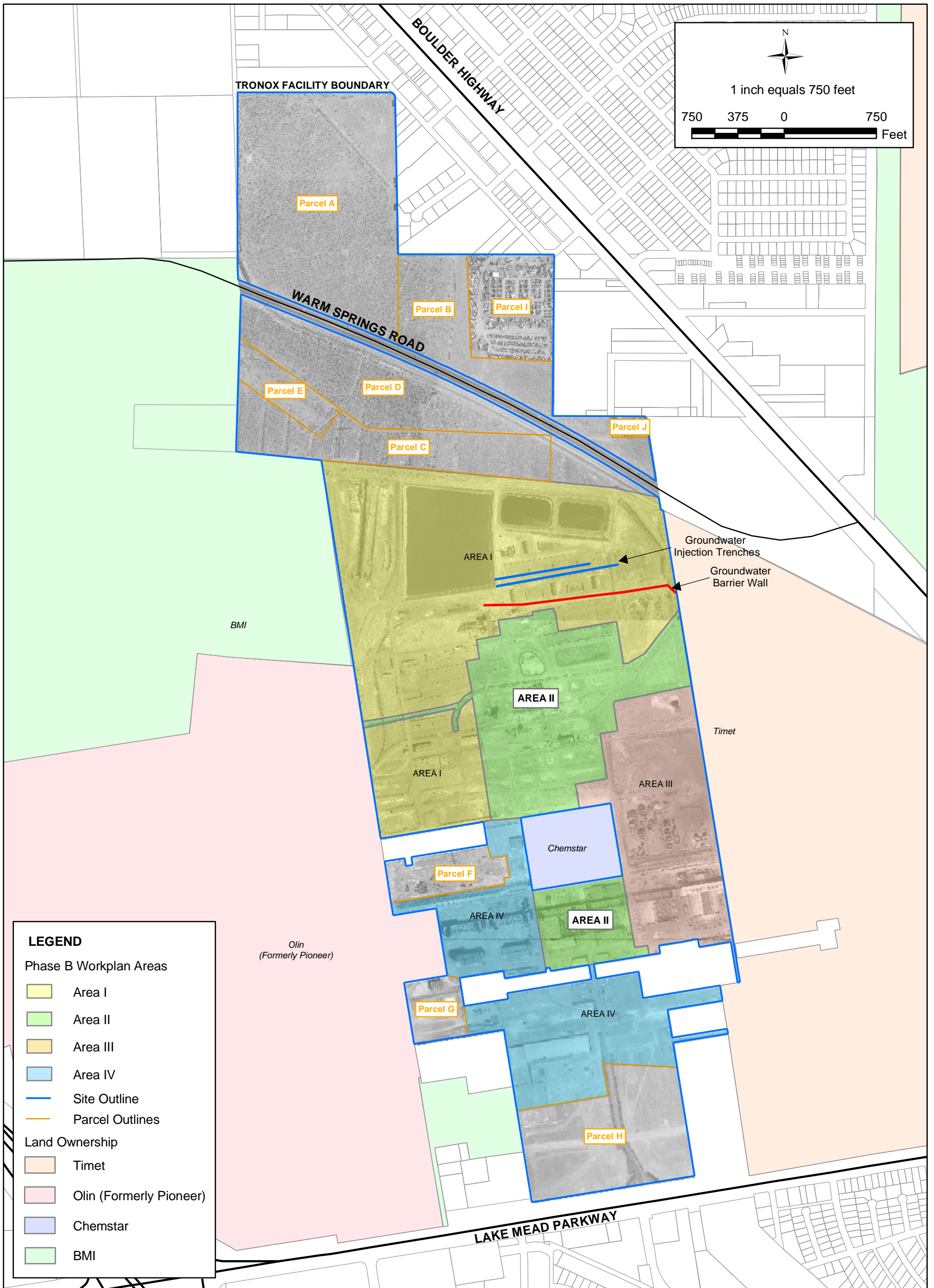
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AREA II WORKPLAN
 PHASE B SOURCE AREA INVESTIGATION
 TRONOX FACILITY
 HENDERSON, NEVADA

1

DRAWN BY: M. Scop	DATE: 6/17/2008	PROJECT NUMBER: 04020-023	SHEET NUMBER: 1 of 1
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LEGEND

Phase B Workplan Areas

- Area I
- Area II
- Area III
- Area IV
- Site Outline
- Parcel Outlines

Land Ownership

- Timet
- Olin (Formerly Pioneer)
- Chemstar
- BMI

PHASE B WORK PLAN SUB-AREAS

AREA II WORKPLAN
 PHASE B SOURCE AREA INVESTIGATION
 TRONOX FACILITY
 HENDERSON, NEVADA

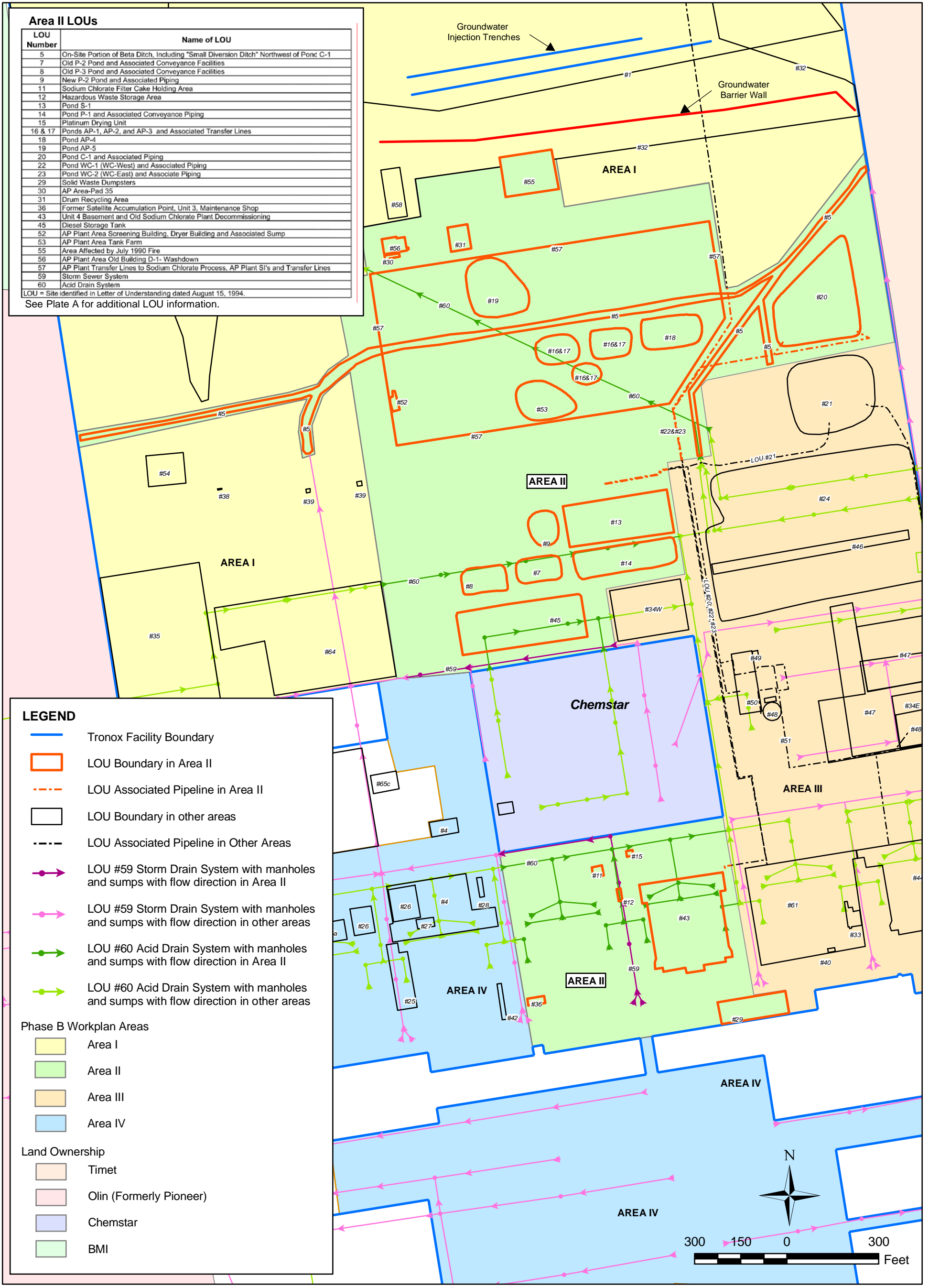
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	NO:	DESCRIPTION:	DATE:	BY:
M.F.				
DRAWN BY:				
M.S.				
CHECKED BY:				
B.H.				
APPROVED BY:				
M.F.				

SHEET NUMBER: X	2	FIGURE NUMBER:



SHEET NUMBER: X
FIGURE NUMBER: 3

PHASE B AREA II LOUs
AREA II WORKPLAN
PHASE B SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

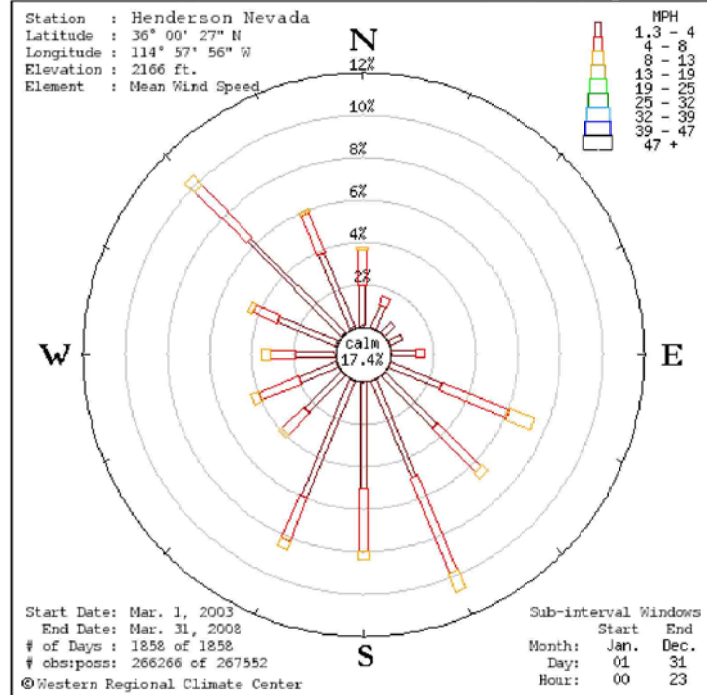
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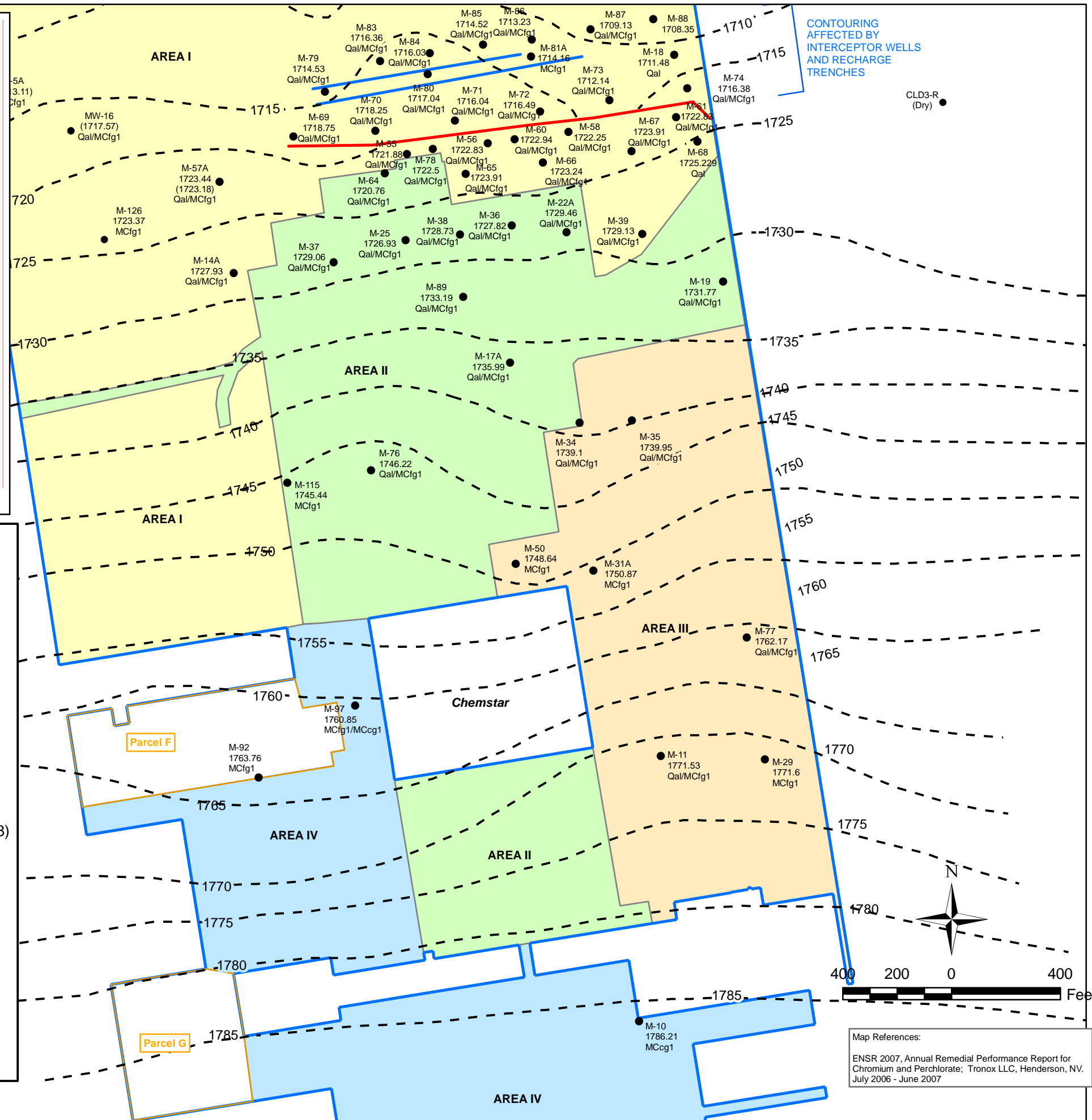
Henderson Nevada



Source: Community Environmental Monitoring Program - <http://www.cemp.dri.edu/>

Legend

- Tronox Facility Boundary
 - Parcel Boundary
 - Qal Groundwater Well Screened in Quaternary Alluvium
 - MCfg1 Groundwater Well Screened in Muddy Creek Formation - First Fine-Grained Facies
 - MCCg1 Groundwater Well Screened in Muddy Creek Formation - First Coarse-Grained Facies
 - MCfg2 Groundwater Well Screened in Muddy Creek Formation - Second Fine-Grained Facies
 - 1745.44 Water Level Elevation (feet above MSL)
 - (1723.37) Water Level Elevation (feet above MSL) Measured December 2007 (Hargis & Associates, 2008)
 - - - Groundwater Potentiometric Surface Measured in April-May 2007 (ENSR 2007)
- Phase B Workplan Areas
- Area I
 - Area II
 - Area III
 - Area IV



DESIGNED BY:	NO:	DATE:	DESCRIPTION:
M. Flack			

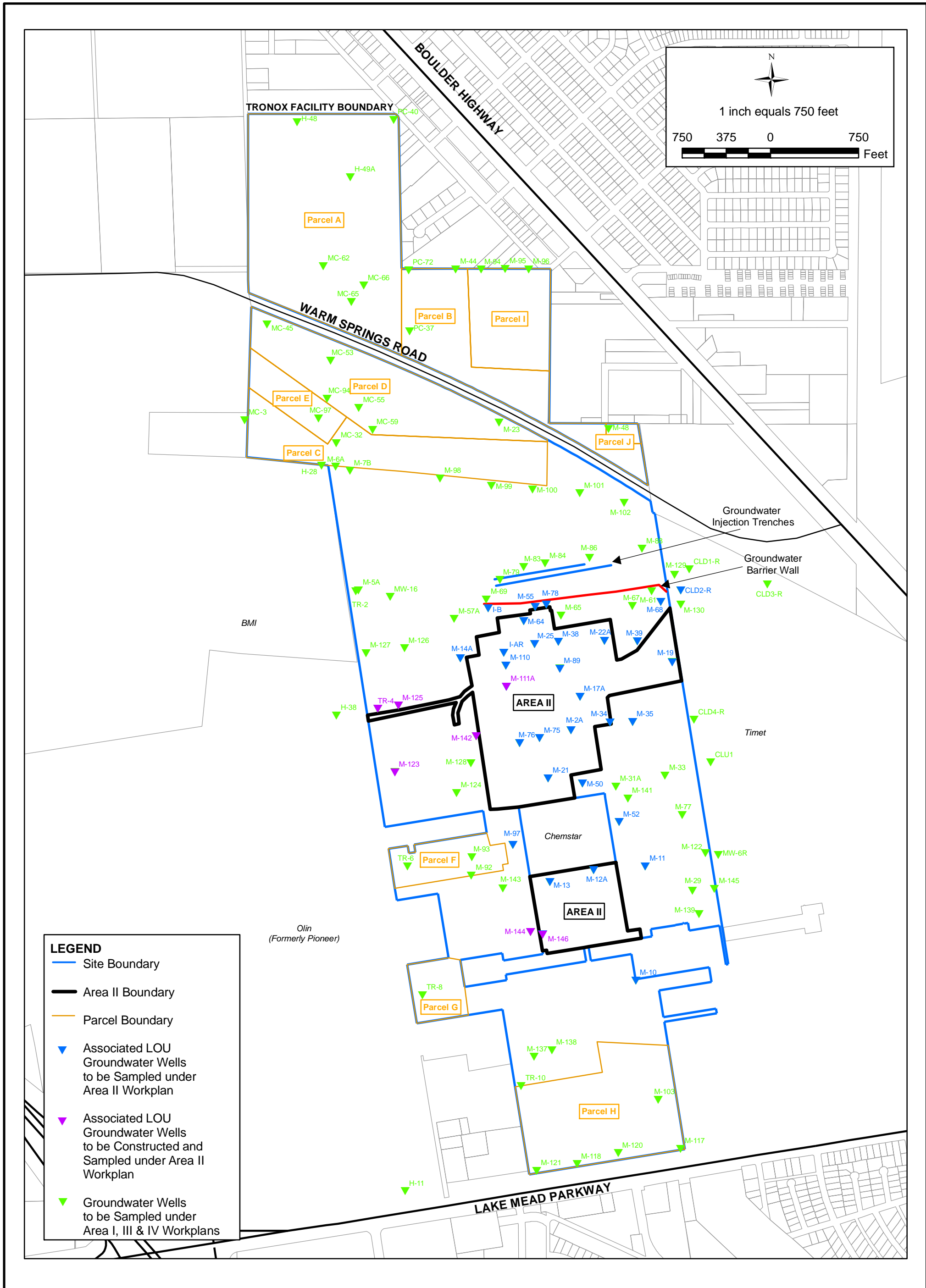
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GROUNDWATER ELEVATION	
AREA II WORKPLAN	PROJECT NUMBER: 04020-023-430
PHASE B SOURCE AREA INVESTIGATION	DATE: 6/17/2008
TRONOX FACILITY	SCALE: AS SHOWN
HENDERSON, NEVADA	

FIGURE NUMBER:	4
SHEET NUMBER:	X



SHEET NUMBER: X	FIGURE NUMBER: 5

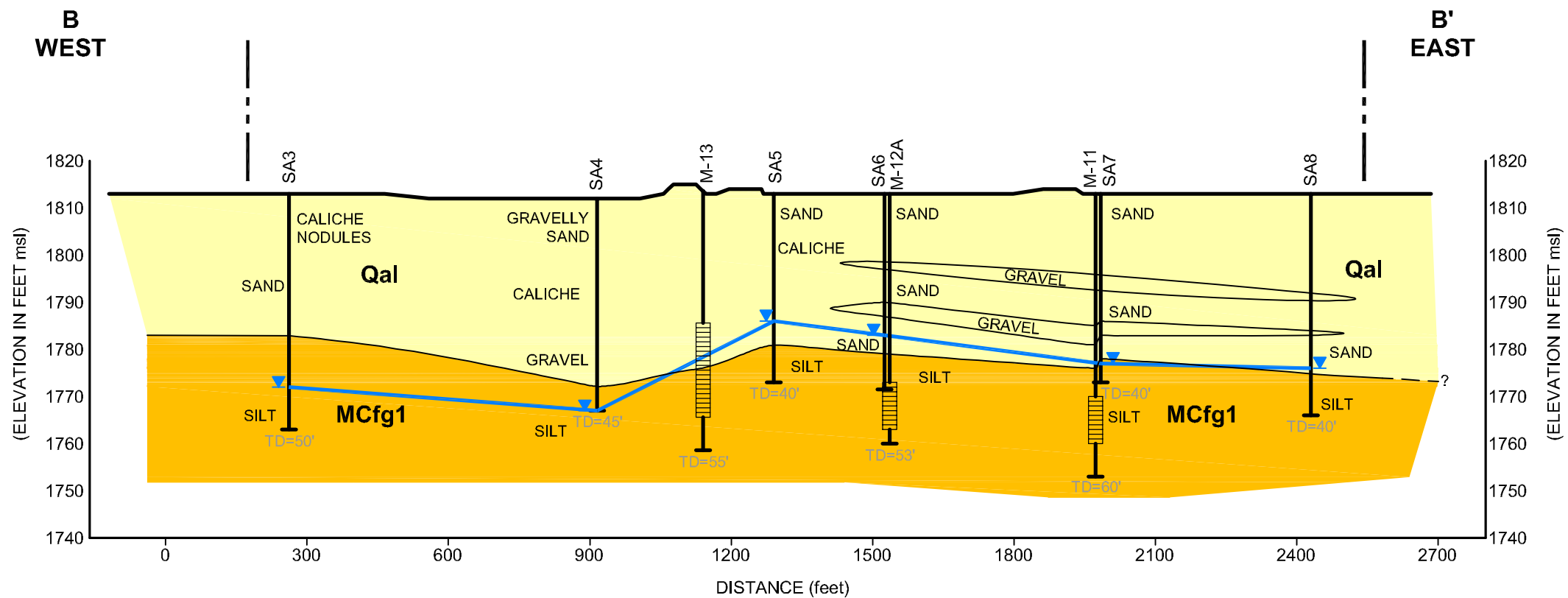
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AREA II WORKPLAN		
PHASE B SOURCE AREA INVESTIGATION		
TRONOX FACILITY		
HENDERSON, NEVADA		
SCALE:	DATE:	PROJECT NUMBER:
AS SHOWN	6/20/2008	04020-023-430

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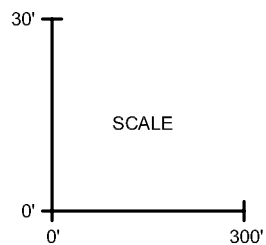
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M.F.				
DRAWN BY:				
T.M.				
CHECKED BY:				
B.H.				
APPROVED BY:				
M.F.				

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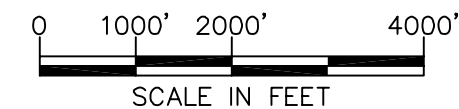
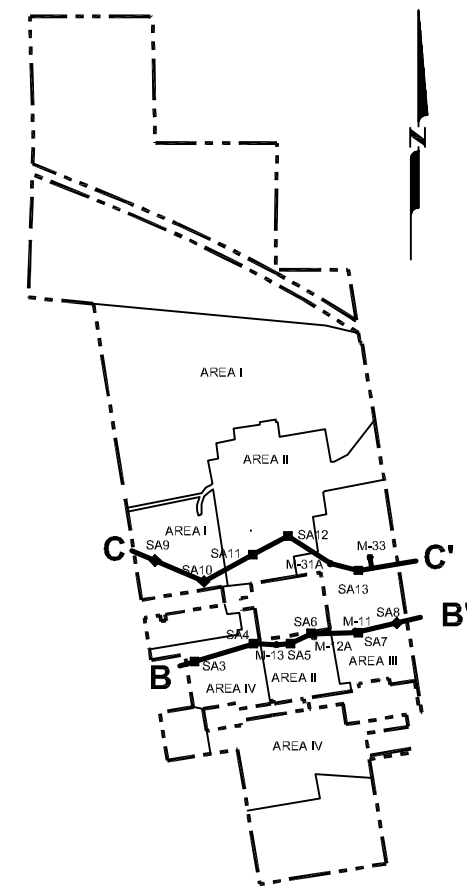


LEGEND

- GROUNDWATER LEVEL (NOVEMBER 2006)
- TRONOX FACILITY BOUNDARY
- BORING/WELL IDENTIFICATION
- SCREEN INTERVAL
- TOTAL DEPTH OF BORING/WELL
- Qal QUATERNARY ALLUVIUM
- MCfg1 MUDDY CREEK FORMATION FINE-GRAINED FACIES #1



NOTE: CROSS SECTION FROM PHASE A SOURCE AREA INVESTIGATION RESULTS, TRONOX FACILITY, HENDERSON, NEVADA SEPT. 2007



DESIGNED BY:	NO.:	DESCRIPTION:	DATE:	BY:
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DRAWN BY:				
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APPROVED BY:				
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GEOLOGICAL CROSS SECTION B-B' WEST TO EAST

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

SCALE: As Noted DATE: 6/26/2008 PROJECT NUMBER: 04020-023-430

FIGURE NUMBER:
6

SHEET NUMBER:
 X

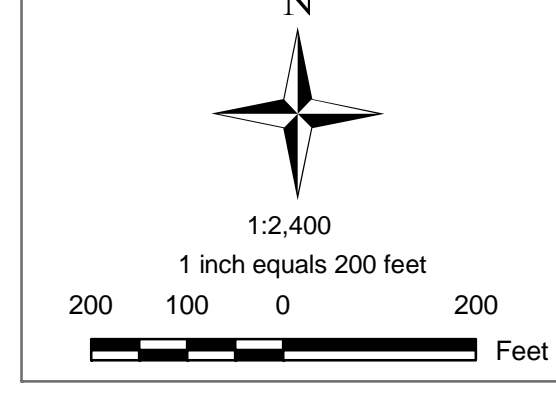
Plate A – Phase B Sample Locations and LOUs for Area II



LOU Number	Name of LOU	Grid
1	Trade Effluent Settling Ponds	Rows I-K
2	Open Area Due South of "Trade Effluent Disposal Ponds"	L-3
3	Air Pollution Emissions Associated with Industrial Processes	-
4	Former Hardesty Chemical Company Site (prior to J. B. Kelley Operations)	Q-4
5	On-Site Portion of Beta Ditch, Including "Small Diversion Ditch" Northwest of Pond C-1	M-2, M-8
6	Unnamed Drainage Ditch Segment (SM Landfill)	Office
7	Old P-2 Pond and Associated Conveyance Facilities	O-5
8	Old P-3 Pond and Associated Conveyance Facilities	O-5
9	New P-2 Pond and Associated Piping	O-6
10	On-Site Hazardous Waste Landfill (Closed)	I-2
11	Sodium Chlorate Filter Cake Holding Area	Q-6
12	Hazardous Waste Storage Area	R-6
13	Pond S-1	Q-6
14	Pond P-1 and Associated Conveyance Piping	O-6
15	Platinum Drying Unit	Q-6
16 & 17	Ponds AP-1, AP-2, and AP-3 and Associated Transfer Lines	M-6
18	Pond AP-4	M-7
19	Pond AP-5	M-5, M-6
20	Pond C-1 and Associated Piping	M-8
21	Pond Mh-1 and Associated Piping	N-8
22	Pond WC-1 (WC-West) and Associated Piping	J-6
23	Pond WC-2 (WC-East) and Associated Piping	J-7
24	Leach Beds, Associated Conveyance Facilities, and Mn Tailings Area	O-7, O-8
25	Process Hardware Storage Area	R-4
26	Trash Storage Area	Q-3
27	PCB Storage Area	R-4
28	Hazardous Waste Storage Area	R-3
29	Solid Waste Dumpsters	S-6
30	AP Area-Pad 35	L-5
31	Drum Recycling Area	L-5
32	Groundwater Remediation Unit	Rows I-L
33	Sodium Perchlorate Platinum By-Product Filter, Unit 5	R-7
34	Former Manganese Tailings Area	Q-8
35	Truck Emptying/Dumping Site	O-2, O-3
36	Former Satellite Accumulation Point, Unit 3, Maintenance Shop	R-6
37	Former Satellite Accumulation Point, Unit 6, Maintenance Shop	R-8
38	Former Satellite Accumulation Point, AP Laboratory	N-3
39	Satellite Accumulation Point-AP Maintenance Shop	N-4
40	PCB Transformer Spill	R-7
41	Unit 1 Tenant Stains	Q-3
42	Unit 2 Salt Conveyor	R-5
43	Unit 4 Basement and Old Sodium Chlorate Plant Decommissioning	R-6
44	Unit 5 Basement	R-8
45	Diesel Storage Tank	O-8
46	Former Old Main Cooling Tower and Recirculation Lines	O-7, O-8
47	Leach Plant Area Manganese Ore Piles	P-8
48	Leach Plant Anolyte Tanks	P-7
49	Leach Plant Area Sulfuric Acid Storage Tanks	P-7
50	Leach Plant Area Leach Tanks	P-7
51	Leach Plant Area Transfer Lines	P-8
52	AP Plant Area Screening Building, Dryer Building and Associated Sump	M-5
53	AP Plant Area Tank Farm	N-6
54	AP Plant Area Change House/Laboratory Septic Tank	N-3
55	Area Affected by July 1990 Fire	L-6
56	AP Plant Area Old Building D-1, Washdown	L-6
57	AP Plant Transfer Lines to Sodium Chlorate Process, AP Plant SI's and Transfer Lines	M-5
58	AP Plant Area New Building D-1 Washdown	M-5
59	Storm Sewer System	Rows N-T
60	Acid Drain System (LOU 60)	Rows K-R
61	Unit 5 Basement	R-6
62	State Industries, Inc. Site, Including Impoundments and Catch Basin	U-4, U-5
63	J. B. Kelley, Inc. Trucking Site	P-3
64	Koch Materials Company Site	O-3, O-4
65	Nevada Precast Concrete Products, Green Ventures International, Buckles Construction Company and Ebony Construction Sites	P-4, Q-3, R-3, S-3
66	Aboveground Diesel Storage Tank Leased by Flintkote Co. Located on Chemstar Property	Q-5
67	Delbert Madsen and Estate of Delbert Madsen Site	B-4
68	Southern Nevada Auto Parts Site (Pick A Part)	F-6
69	Dillon Potter Site	H-7
70	Former U.S. Vanadium Site	P-8, Q-8

Area 70: Former U.S. Vanadium Site
LOU = Site identified in Letter of Understanding dated August 15, 1994.

Sample locations in Areas III and IV are not finalized and subject to change.



LEGEND	
[Symbol]	Tronox Facility Boundary
[Symbol]	Area III Boundary
[Symbol]	Other Area Boundary
[Symbol]	LOU Boundary in Area III
[Symbol]	LOU Boundary in other areas
[Symbol]	Associate LOU Pipelines
[Symbol]	Groundwater Monitoring Well Location
[Symbol]	Proposed Phase B Boring Location
[Symbol]	Proposed Phase B Boring and Geotechnical Sample Location
[Symbol]	Proposed Phase B Soil Gas Location
[Symbol]	Phase A Boring Location (Sept. 2007)
[Symbol]	Phase II BRC Sample Location (Oct. 2007)
[Symbol]	Historic Groundwater Monitoring Well Location (Dry)
[Symbol]	Historic Sample Location (pre 2006)
[Symbol]	LOU #59 Storm Sewer System with manholes and surps with flow direction in Area III
[Symbol]	LOU #62 Storm Sewer System with manholes and surps with flow direction in other areas
[Symbol]	LOU #60 Acid Drain System with manholes and surps with flow direction in other areas
[Symbol]	LOU #63 Acid Drain System with manholes and surps with flow direction in other areas
[Symbol]	Four Area Grid Line (Cell reference displayed)
[Symbol]	Parcel Boundary
[Symbol]	Grid: Shapefiles, Nevada East, NAD83, Feet
[Symbol]	Base Aerial Photo from PBS&J, October 2006

PHASE B SAMPLE LOCATIONS AND LOUS FOR AREA II
PHASE B AREA II SOURCE AREA INVESTIGATION
TRONOX FACILITY
HENDERSON, NEVADA

SCALE: AS SHOWN DATE: 8/20/2008 PROJECT NUMBER: 04020-023-430

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