Interim Soil Removal Action Completion Report

Nevada Environmental Response Trust Site, Henderson, Nevada
August 2010 – November 2011

Prepared for:
Nevada Environmental Response Trust

Prepared by:
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Date:
January 2012

Project Number:
21-28200

Interim Soil Removal Action Completion Report

Nevada Environmental Response Trust
(Former Tronox LLC Site)
Clark County, Nevada

Nevada Environmental Response Trust Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of the Trust. Based on my own involvement and/or my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information or prepared the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Signature: Jay A Steinberg not individually but solely as President

Name: Jay A Steinberg not individually but solely as President

Title: President

Company: Lehman Bros VII, Inc. not individually but solely as Trustee

Date: 1/20/12

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Responsible Certified Environmental Manager (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. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Wendy Seider

January 20, 2012

Wendy Seider Date

Certified Environmental Manager
ENVIRON International Corporation
EM Certificate Number: 2102
EM Expiration Date: October 18, 2013

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Acronyms and Abbreviations

ACM	Asbestos Containing Material
AP&CC	American Potash and Chemical Company
Apex	Apex Regional Landfill
BCL	Basic Comparison Level
bgs	below ground surface
BT	Balance Tank
CCDAQEM	Clark County Department of Air Quality and Environmental Management
CCDDS	Clark County Department of Development Services
Converse	Converse Consultants
COPCs	Constituents of Potential Concern
CS	Confirmation Soil
CTB	cement treated base (aggregate)
cy	cubic yards
DS	Discolored Soil
DVSR	Data Validation Summary Report
ECAs	Excavation Control Areas
EE	Excavation Extent
ENVIRON	ENVIRON International Corporation
fibers/cc	fibers per cubic centimeter
ft	feet
GPS	Global Positioning System
HASP	Health and Safety Plan
HCB	Hexachlorobenzene
JCA	Joseph A. Cesare and Associates, Inc.
Kerr-McGee	Kerr-McGee Corporation
LoSo	Logistical Solutions, Inc.
LOU	Letter of Understanding
LVP	Las Vegas Paving Corporation
msl	mean sea level
NOI	Notice of Intent
Northgate	Northgate Environmental Management, Inc.
NDEP	Nevada Division of Environmental Protection
OCPs	Organochlorine Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PEL	personal exposure limit
PID	photo ionization detectors
PPE	personal protective equipment
ppm	parts per million
ppt	parts per trillion
PUF	Polyurethane Foam
QA/QC	Quality Assurance/Quality Control
RACM	Regulated Asbestos Containing Material
RAW	Removal Action Work Plan

RCI	RCI Engineering
RZ	Remediation Zone
SIM	Selective Ion Method
SRG	soil remediation goal
SVOCs	Semivolatile Organic Compounds
SWPPP	Storm Water Pollution Prevention Plan
TCLP	Toxicity Characteristic Leaching Procedure
TEM	Transmission Electron Microscopy
TEP	Trade Effluent Pond
TestAmerica	TestAmerica Laboratories, Inc.
TEQ	Toxicity Equivalent Quotient
the Trust	Nevada Environmental Response Trust
Timet	Titanium Metals Corp.
Tronox	Tronox LLC
TSI	thermal system insulation
TSP	Total Suspended Particulate
$\mu g/m^3$	micrograms per cubic meter
USEPA	United States Environmental Protection Agency
Veolia	Veolia Water North America
VOCs	Volatile Organic Compounds
WAPA	Western Area Power Administration
WECCO	Western Electrochemical Company

1 Introduction

In accordance with the Interim Consent Agreement for the Nevada Environmental Response Trust Site (the Site), ENVIRON International Corporation (ENVIRON) submits this Interim Soil Removal Action Completion Report to the Nevada Division of Environmental Protection (NDEP) on behalf of the Nevada Environmental Response Trust (the Trust).

Tronox LLC (Tronox) formerly owned and operated the Site. In conjunction with the settlement of Tronox's bankruptcy proceeding, the Trust took title to the Site on February 14, 2011. Pursuant to the terms of the Interim Consent Agreement, the Trust is required to complete the excavation activities previously commenced at the Site. Tronox maintains manufacturing operations on a portion of the Site leased from the Trust.

This report summarizes activities pursuant to a soil remediation program at the Site between August 2010 and November 2011. Specifically, this report describes:

- the general approach taken for conducting excavation work, instituting site controls, and addressing wells, utilities, and other Site infrastructure;
- the air monitoring program in place during excavation work;
- the management of waste material;
- the removal of materials within designed polygons, asbestos-containing material (ACM), and discolored soil;
- the creation of Excavation Control Areas (ECAs) in areas which could be not accessed or which were not completely remediated; and
- the site restoration process.

1.1 Site Background

The Site is located approximately 13 miles southeast of the city of Las Vegas in an unincorporated area of Clark County, Nevada, and lies in Sections 1, 12 and 13 of Township 22 S, Range 62 E (see Figure 1). The approximately 450-acre Site is located within the BMI complex, which has been the site of industrial operations since 1942 and was originally sited and operated by the U.S. government as a magnesium production plant in support of the World War II effort. Following the war, a portion of the complex was leased by Western Electrochemical Company (WECCO). By August 1952, WECCO had purchased several portions of the complex, including six of the large unit buildings, and produced manganese dioxide, sodium chlorate and various perchlorates. In addition, in the early 1950s, pursuant to a contract with the U.S. Navy, WECCO constructed and operated a plant to produce ammonium perchlorate on land purchased by the Navy. In 1956, WECCO merged with American Potash and Chemical Company (AP&CC) and continued to operate the processes, with the Navy's continued involvement in the ammonium perchlorate process.

In 1962, AP&CC purchased the ammonium perchlorate plant from the Navy, but continued to supply the Navy, and its contractors, material from the operating process. AP&CC merged with Kerr-McGee Corporation (Kerr-McGee) in 1967. This merger involved boron manufacturing operations in California, including elemental boron, boron trichloride and boron tribromide, which

were moved to Henderson and initiated at the Site in the early 1970s. In 1994, the boron tribromide process was shut down and dismantled. In 1997, the sodium chlorate process was shut down and in 1998, production of commercial ammonium perchlorate ended as well. The ammonium perchlorate production equipment was used to reclaim perchlorate from on-site materials until early 2002, when the equipment was permanently shut down.

In 2005, Kerr-McGee's name was changed to Tronox LLC, and Tronox LLC filed for bankruptcy in 2009. The Trust was established as part of the confirmation of Tronox's plan for reorganization on February 14, 2011 and is the owner of the property in Henderson, Nevada that was previously owned by Tronox. Tronox leases back a portion of the Site from the Trust for production of manganese dioxide, boron trichloride and elemental boron.

During the 1970s, the U.S. Environmental Protection Agency (USEPA), the State of Nevada, and Clark County investigated potential environmental impacts from the BMI companies' operations, including atmospheric emissions, groundwater and surface water discharges, and soil impacts (Ecology and Environment, 1982). From 1971 to 1976, Kerr-McGee modified its manufacturing process and constructed lined surface impoundments to recycle and evaporate industrial wastewater. In 1976, the facility achieved zero discharge status regarding industrial wastewater management. In 1980, the USEPA requested specific information from the BMI companies regarding their manufacturing and waste management practices by issuing Section 308 letters. In 1993, a Phase I site assessment was completed for the Site and approved by NDEP. In 1994, NDEP issued a Letter of Understanding (LOU) to Kerr-McGee that identified 69 specific areas or items of interest and indicated the level of environmental investigation Kerr-McGee was required to conduct. In 1996, Kerr-McGee completed a Phase II site assessment which included field sampling as described in an NDEP approved Phase II Work Plan.

Tronox continued to undertake environmental investigations to assess environmental conditions at the Henderson facility. A detailed discussion of the specific areas or items of interest identified in the LOU and a list the products made, years of production, and approximate waste volumes for WECCO, AP&CC, and Tronox are found in the Conceptual Site Model document (ENSR, 2005).

On December 14, 2009, NDEP issued to Tronox a Finding of Alleged Violation and Order requiring Tronox to comply with the obligations pertaining to the Henderson facility under the various Consent Agreements previously issued for the Site, and setting forth a specified schedule for such compliance (the "2009 Division Order") (NDEP, 2009). At the conclusion of a February 22, 2010 meeting, NDEP and Tronox discussed the conceptual scope and implementation of a soil remediation program needed to comply with the 2009 Division Order. A detailed scope of work, consistent with previous discussions with NDEP, was presented by Northgate Environmental Management, Inc. (Northgate) in the May 2010 *Removal Action Work Plan for Phase B Soil Remediation of Remediation Zones RZ-B through RZ-E, Tronox LLC, Henderson, Nevada*, revised May 28, 2010 (the "RAW") (Northgate, 2010c).

1.2 Site Description and Land Use

1.2.1 Physical Characteristics

The Site is a 453-acre property (Figure 2) that is generally rectangular in shape with the long side in the north-south direction. Elevations across the Site range from 1,677 to 1,873 feet (ft)

above mean sea level (msl). The land surface slopes toward the north at a gradient of approximately 0.023 ft per foot (ft/ft). The developed portions of the Site have been modified by grading to accommodate plant facility buildings, surface impoundments, access roads, a former landfill, and other Site features.

1.2.2 Current Land Use

Tronox currently operates processes on a portion of the Site (the "Facility") to produce manganese dioxide, boron trichloride, elemental boron, and batteries. The Facility includes numerous buildings, sheds, labs, ponds, tanks, and pipelines related to the production of manganese dioxide, boron trichloride, elemental boron, and batteries. The current operating areas are shown on Figure 2.

The major buildings on the Facility include Unit Buildings 1 through 6, which are aligned in a row extending in a west-east direction across the center of the Site. These buildings were constructed during World War II for magnesium production. Tronox currently uses Units 5 and 6 for production of manganese dioxide, and Unit 5 is also used for storage. Units 1 and 2, which are owned by the Trust, are no longer used and have been partially demolished. A portion of Unit 4 has been retrofitted to house an advanced industrial battery manufacturing process, which is planned to begin operation in 2012. Tronox currently uses Unit 3 for office and storage activities. In addition, Tronox produces boron products within a Boron Plant to the north of Unit 4, and production of manganese sulfate solution (for use in the manganese dioxide production process) is performed within a Leach Plant north of Units 5 and 6. Other buildings present on the Facility include an administration building, a change house, a laboratory building, a maintenance shop, a steam plant, and various storage buildings (Figure 2).

The Site is generally rectangular, but certain interior portions of the rectangle have been carved out and are owned and operated by other companies, such as L'Hoist (formerly Chemstar, a lime producer), Titanium Metals Corp. (Timet), and the Western Area Power Administration (WAPA). In addition, an area within the northwestern portion of the Site consists of groundwater treatment facilities, which are operated on behalf of the Trust by an outside contractor, Veolia Water North America (Veolia). Four lined ponds on the Site (known as WC-West, WC-East, Mn-1, and AP-5) contain process-related wastewater, and an additional lined pond (known as GW-11) collects extracted groundwater from remediation activities. In addition, the Site is traversed (from west to east) by a drainage ditch formerly known as the Beta Ditch that historically conveyed liquid wastes from the Site (and other sites in the area). The former Beta Ditch, which is currently blocked by an earthen dam near its eastern end, has been re-graded, channelized, and now includes a retention basin near the center of the Site. Storm water flow in the eastern portion of the ditch is now directed toward another retention basin in the northeastern corner of the Site.

The Site is crossed by asphalt and concrete roads, dirt roads, active utility lines, a chlorine line, and railroad spurs. An extensive network of active and inactive underground utility lines is present under the roads and open areas at the Site.

1.3 Scope of Work

Tronox performed two soil sampling programs (known as Phase A and B Source Investigations) that were completed in 2006 and 2008, respectively (ENSR-AECOM, 2006 and 2008). These

investigations identified a number of constituents in excess of state Basic Comparison Levels (BCLs) criteria within the upper 10 ft of soil, including dioxin toxicity equivilency quotient (TEQ), hexachlorobenzene (HCB), other semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), asbestos, metals, organochlorine pesticides (OCPs), and perchlorate. The 2009 Division Order directed Tronox to remove all soil containing chemicals of potential concern (COPCs) in excess of worker BCLs (or modified risk-based site-specific goals agreed upon by NDEP; See Section 2.1) from the Site, reducing the human health risks associated with contaminated soil. In the May 2010 RAW, Northgate laid out a strategy for excavating chemically impacted soil within the upper 10-foot below ground surface (bgs) horizon in contaminated portions of the Site, to the extent such soils were accessible (Northgate, 2010c). These remediation activities were commenced by Tronox in August 2010 and were completed by the Trust in November 2011.

1.4 Remediation Zones

For the purposes of soil remediation activities, the main contaminated portions of the Site were divided into the five separate remediation zones (RZs) listed below (Figure 3):

- RZ-A: an area on the southern portion of the Site
- RZ-B: the area around the Unit buildings
- RZ-C: the ammonia perchlorate production area, Koch Materials area, pond and diesel storage tank area, and manganese tailings area
- RZ-D: the Trade Effluent ponds and ammonium perchlorate pad/drum recycling area (including the hazardous waste landfill)
- RZ-E: the Beta Ditch

1.5 RZ-A Risk Assessment

The results of the *Human Health Risk Assessment for Remediation Zone A* (Northgate, 2010e) indicate that exposures to residual chemicals in the upper 10 ft of soil in RZ-A should not result in unacceptable risks for all future on-Site receptors. The results of the data quality assessment indicate that a sufficient number of samples were collected in RZ-A to support the conclusions of the health risk assessment. Therefore, excavation activities were not planned in this area (Northgate, 2010e).

2 Soil Remediation Program

2.1 General Remediation Approach

Soil remediation occurred within four different RZs (RZ-B through RZ-E) that were found to have COPCs above NDEP BCLs or site-specific remediation goals. As described in the May 2010 RAW (Northgate, 2010c), "contaminated" soil is generally defined as concentrations exceeding NDEP worker BCLs, or modified risk-based goals as agreed upon by NDEP. These criteria, collectively termed in this report soil remediation goals (SRGs) were used during the soil remediation program performed at the Site between August 2010 and November 2011. For metals where background concentrations exceed NDEP BCLs (e.g., arsenic), "contaminated" soil is defined as concentrations greater than background. There are no NDEP BCLs for asbestos; therefore, "contaminated" soil is defined as one or more long amphibole fibers and greater than five long chrysotile fibers counted per sample. Based on a bioaccessibility study performed in 2010 (Northgate, 2010b), NDEP has approved a Site-specific BCL for dioxins/furans (as 2,3,7,8-tetrachlorodibenzo-p-dioxin toxicity equivalents [2,3,7,8-TCDD TEQ]) of 2,700 parts per trillion (ppt) (NDEP, 2010). The SRGs used during the remediation program are summarized in Table 1.

Each RZ was divided into polygons based on results of soil sampling conducted by Northgate. The general remediation strategy for the Site consisted of excavation of soils within designated remediation polygons, sampling of discolored soil, removal of discolored soil if above SRGs or otherwise deemed appropriate to remove, and designation of ECAs for inaccessible remediation areas, including areas with COPCs and/or discolored soil left in place.

The soil remediation program was implemented by Tronox and managed by Northgate from August 2010 to February 14, 2011, then implemented by the Trust and managed by ENVIRON from February 15, 2011 until project completion in November 2011. Northgate and ENVIRON both retained Las Vegas Paving Corporation (LVP) to conduct remediation activities. LVP's work included soil removal, transportation, waste disposal, grading, and site restoration.

2.1.1 Remediation Program Design

From the Fall of 2006 to the Fall of 2009, Northgate conducted Phase A and B sampling at the Site. Chemical analyses of soil samples showed dioxins/furans, HCB and other SVOCs, PCBs, asbestos, metals, OCPs, and/or perchlorate exceeding SRGs within the upper 10 ft of soil (Northgate, 2010c). Using these soil analytical results, Voronoi/Thiessen polygons were generated to define areas with SRG exceedances.

Pre-confirmation sampling was also conducted by Northgate in the spring of 2010. Two types of borings were advanced during the pre-confirmation sampling program, including borings at: 1) existing locations (adjacent to Phase A and B sampling locations), and 2) new locations (Northgate, 2010c). Data from "existing locations" were used to establish polygon depths, while "new locations" were used to define the horizontal extent and vertical delineation of remediation. Results from the Phase A, B and pre-confirmation sampling plans are presented within the following Northgate reports:

- Appendix A of the *Excavation Plan for Phase B Soil Remediation of RZ-B, Addendum to the Removal Action Work Plan* (July 2010) (Northgate, 2010f).

- Appendix A of the *Revised Excavation Plan for Phase B Soil Remediation of RZ-C, Addendum to the Removal Action Work Plan* (Revised September 2010) (Northgate, 2010h).
- Appendix A of the *Excavation Plan for Phase B Soil Remediation of RZ-D, Addendum to the Removal Action Work Plan* (July 2010) (Northgate, 2010g).
- Appendix A of the *Excavation Plan for Phase B Soil Remediation of RZ-E, Addendum to the Removal Action Work Plan* (November 2010) (Northgate, 2010i).

In addition, Northgate prepared a series of RZ maps showing available analytical results used for the definition of remediation polygons, along with the polygon boundaries. Copies of these Northgate maps are included in Appendix A of this report. These maps were used by Northgate and ENVIRON during implementation of the remediation program. The remediation polygons defined by Northgate are shown on Figure 4.

To implement the remediation, LVP imported Northgate's polygon design into AgTek, a three dimensional modeling software. Within this program, the two dimensional polygon layout was fitted to the initial (pre-work) topography and modeled in three dimensions to show design depths, and an estimated volume of impacted material to be removed was determined. Three-to-one safety slopes were incorporated into the design, resulting in an additional volume of material to be removed during the excavation. This design model exhibited how adjacent excavations with varying depths would be handled, such that all safety slopes were appropriately constructed.

The three dimensional polygon design model was uploaded to global positioning system (GPS) rover units for field use. Excavation was completed with GPS-guided equipment and/or with periodic manual topography checks using the rover units to determine when the design depth had been reached. Upon completion of a given polygon or area, post-work topographic data were collected. Final certifications were also performed, in which ENVIRON or Northgate personnel selected five random locations within each polygon to record coordinates and initial/final elevations to verify that polygons had been fully excavated to design depth.

2.1.2 Discolored Soil Observations and Remediation

Discolored soil was encountered in various locations at the Site during remediation activities. These areas were identified within or outside the excavation of the polygons, and at or below the ground surface. In order to determine the extent, test pits or trenches were advanced at some locations where discolored soil was observed. If warranted based on available nearby analytical results, the anticipated extent of discolored soil, and the excavation activities currently in progress, some areas of discolored soil were immediately removed as part of the Site remediation program. Alternately, some areas of discolored soil were sampled and analyzed to evaluate if the soil should be removed or left in place.

2.1.3 Soil Sampling and Analysis During Remediation

In April 2011, ENVIRON submitted to NDEP a draft Workplan for Evaluation of Discolored Soil and Confirmation Soil Sampling in Visually-Impacted Areas to describe proposed sampling and evaluation of discolored soils at the Site during remediation activities (ENVIRON, 2011b). The

sampling plan was approved by NDEP on May 12, 2011 (NDEP, 2011b). Based on this plan, three types of samples were collected from areas where discolored soil was observed.

- "Discolored soil" (DS) samples were taken from areas of discolored soil found during remediation activities at the Site. Samples were collected and analyzed for specific constituents of concern based on nearby analytical results and historical site use of that area. The results of the samples were compared to SRGs and nearby analytical data to evaluate if remediation of the area was warranted. In general, discolored soil areas with concentrations of COPCs that were below SRGs were left in place, while those with concentrations above SRGs were either removed and disposed of offsite or left in place and included in designated ECAs (see Section 2.2).
- "Confirmation soil" (CS) samples were typically collected following the removal of discolored soil to verify that remaining concentrations of COPCs in the soil were below SRGs. If the results were above SRGs, additional soil was typically removed in the area of the sample and additional CS sampling performed. The number of CS samples collected was based on the size of the area, with one sample collected per every 100 to 200 ft in linear areas. For larger, non-linear areas, one sample was collected per each approximately 100 to 200-foot by 100 to 200-foot area.
- "Excavation extent" (EE) samples were collected from discolored soil that was inaccessible for excavation. The results from the EE samples were used in documentation of soil conditions in areas designated as ECAs (see Section 2.2).

In addition to the soil sampling by ENVIRON described above, Northgate collected nine soil samples from visually-impacted areas in February 2011 for the purposes of assessing whether visually-impacted soils had contaminant concentrations above SRGs, necessitating removal. Of the nine samples collected, four contained contaminant concentrations above SRGs. ENVIRON used this information when planning further soil sampling and eventual excavation of visually impacted soil, where required. Additionally, soil samples were collected from selected stockpiles at the Site for characterization of waste soil, as described further in Section 2.9.2.

Soil samples were collected manually using either an AMS® slide hammer and two-inch by six-inch pre-cleaned stainless steel core sampler or using a decontaminated stainless steel trowel. Soil samples collected in core tubes were capped with Teflon-lined plastic caps. Samples collected using the trowel were placed in laboratory-provided pre-cleaned glassware and capped with Teflon-lined plastic caps. Each sample was labeled with the sample ID, remediation zone ID, date, time, and sampler's initials. The labeled samples were placed in doubled zip-closure bags and stored on ice in an insulated container until transported to the analytical laboratory under chain-of-custody documentation.

Soil sampling equipment was thoroughly decontaminated between sampling locations. Refer to Section 2.6.4 for procedures used during sampling equipment decontamination.

Soil samples were analyzed for selected chemicals that were associated with known impacts identified in the sampling area or adjacent area(s) (Tables 2a and 2b). Where staining did not appear to be associated with any previously characterized areas, a broad range of chemicals suspected to be of concern was analyzed. Samples were picked up from the Site by a

laboratory courier and were shipped via overnight FedEx to TestAmerica Laboratories, Inc. (TestAmerica). Most laboratory analyses were performed in TestAmerica's laboratories in Denver, Colorado and West Sacramento, California.

Analytes and analytical methods used include the following:

- Dioxin by USEPA Method 8290;
- HCB by USEPA Method 8081A;
- OCPs by USEPA Method 8081A;
- Metals (typically arsenic, lead, manganese and/or magnesium) by USEPA Methods 6010B and/or 6020;
- SVOCs by USEPA Method 8270;
- Polycyclic Aromatic Hydrocarbons (PAHs) by USEPA Method 8270 Selective Ion Method (SIM); and
- Perchlorate by USEPA Method 314.0.

Quality Assurance/Quality Control (QA/QC) samples were collected in order to meet data quality objectives, including field duplicates and equipment blank samples (Table 2c). Sample analytical reports were tracked and reviewed by ENVIRON. Analytical results were compared to SRGs, and an evaluation was performed regarding whether or not to remove discolored soil within the area investigated, with NDEP consulted on removal decisions on an as needed basis.

2.2 Excavation Control Areas

ECAs are areas where remedial excavation work could not be performed and which contain contaminated soils from within designated remediation polygons and/or discolored soil left in place. ECAs were also designated for areas with unknown conditions and/or limited analytical test results. ECAs have been established at the Site for the following reasons:

- Contaminated and/or discolored soil areas are located beneath existing operational structures, and it is technically infeasible or cost prohibitive to access these areas for excavation.
- Contaminated and/or discolored soil areas are located in close proximity to utilities or other Site features (e.g., the active pond berms), and excavating soil in these areas poses a potential safety hazard and/or could result in damage to the utilities/features.
- Soil with unknown conditions and/or limited analytical test results is located beneath existing operational structures or facilities, and it is technically infeasible or cost prohibitive to access these areas for investigation and/or excavation.

In addition, and consistent with the May 2010 RAW (Northgate, 2010c), the excavation program conducted at the Site generally has not addressed vadose zone soils at depths greater than ten ft bgs. Therefore, vadose zone soils across the Site at depths greater than 10 ft below original grade are identified as an ECA.

At the conclusion of the soil remediation program, 38 ECAs were identified and are summarized in ENVIRON's report *Summary of Excavation Control Areas (ECAs): Areas of Known Soil Contamination Left In-Place*, dated December 2011 (ENVIRON, 2011d). This report is provided as an appendix to the *Site Management Plan (SMP)* for the Site, dated December 2011 (ENVIRON, 2011c), which provides a decision framework for the management of residual chemicals in soil and groundwater, including soil within ECAs, for the Site. The SMP describes procedures to address the known remaining environmental conditions at the Site, as well as contingency actions to be taken if previously unknown environmental conditions are encountered.

2.3 Work Area Preparation and Remediation Program Resources

2.3.1 Pre-Excavation Site Conditions

Prior to remediation activities beginning onsite, the Site was topographically surveyed, visually inspected, and photographed. A topographic aerial survey of the Site and surrounding area was performed by PBS&J for Basic Remediation Company on January 17, 2008 and a topographic map was prepared and provided to LVP prior to the start of remediation activities. LVP supplemented this survey information based on their on-site surveys prior to the initiation of remediation activities. The resulting pre-remediation topography is shown on Plate 1.

Site inspections were performed by Northgate prior to initiating remediation activities (January 12-17, May 13, and July 29, 2010), during which site photographs were taken. Excavation areas were staked and marked by LVP before beginning remediation activities in each RZ.

2.3.2 Permitting

Northgate and LVP obtained the following permits prior to beginning remediation activities at the Site:

- A Dust Control Permit for Construction Activities including Surface Grading and Trenching obtained from the Clark County Department of Air Quality and Environmental Management (CCDAQEM), Permit Number 38851 (with seven approved permit modifications);
- Acceptance of Asbestos Abatement Project documentation obtained from the Clark County Department of Business and Industry, Division of Safety and Health Relations, Project Number 2011-13;
- Permits to Transport Asbestos obtained from the Southern Nevada Health District, Permit Numbers ATP10-112302, ATP10-122001, and ATP11-050405;
- Confirmations of Notice of Intent (NOI) to comply with the Stormwater General Permit No. NVR100000, obtained from NDEP, confirmation numbers CSW-16054 and CSW-19689; and
- Grading Permits obtained from Clark County Department of Development Services (CCDDS), Permit Numbers 10-21350 GD6 and 10-33981 GD6.

Following completion of the remediation activities, permits were closed out as necessary. Permit closure documentation for the dust control permit was obtained from CCDAQEM on November 9, 2011. Notices of Termination (NOTs) were submitted to NDEP for stormwater

general permit coverage on May 18, 2010 and November 4, 2011. An updated drainage study, based on grading performed to date, is presently being prepared and will be submitted to NDEP and Clark County when completed. The updated drainage study will provide the basis for close-out of the grading permits obtained from CCDDS. Asbestos abatement project acceptance documentation and permits to transport asbestos have expired; specific permit closure documentation is not required.

Copies of permits obtained for the excavation program and associated documentation are provided in Appendix B.

2.3.3 Site Controls

Site access during remediation activities was controlled by a perimeter fence with locking gates and security personnel. An entrance was added near the LVP trailer to accommodate the entrance/exit of haul trucks and equipment. The gate near the LVP trailer was only open during work hours, and vehicle access through the gate was controlled by personnel at the LVP check-in trailer. Signs were posted on the perimeter fencing to warn visitors of unauthorized entry onto the Site. Other than designated LVP staff, all workers and visitors were required to enter at the Tronox main security gate, where security personnel were present 24 hours a day, 7 days a week.

Additional Site controls included site work requirements, protecting utilities, traffic control, and exclusion zone designation. These Site controls were necessary to direct the following:

- Remediation workers;
- Vendors and subcontractors (e.g., equipment mechanics, materials delivery, trucking subcontractors, laboratory couriers); and
- Site visitors (e.g., agency staff, elected or appointed government officials, journalists).

LVP, Northgate, and ENVIRON personnel, as well as other project subcontractor personnel, were required to complete the Tronox safety training program in order to move around the Site without a Tronox safety trained escort. Visitors were escorted by Tronox or Tronox-trained security personnel. No visitors were allowed on the Site without escorts, with the exception of NDEP representatives who had completed the Tronox safety training program and were onsite to observe the remedial work. All properly trained remediation workers, subcontractors, and NDEP personnel were required to check in at the Tronox security office and receive a badge and vehicle pass on a daily basis. All personnel were required to attend a tailgate health and safety briefing before entering any remediation exclusion zones.

Before excavations began in any particular area, the area was checked for utilities to prevent the utilities from being damaged during remediation activities. The protection of utilities consisted of checking plans, blueprints, and figures from Tronox, checking with Tronox personnel, potholing in areas with suspected utilities, and putting some known utilities within ECAs (e.g., high voltage power lines within the northwest corner of RZ-D). Tronox required LVP to obtain groundbreaking permits prior to excavation in Tronox facility areas.

Traffic control at the Site occurred at excavation entrances/exits that were difficult for large equipment to exit and along 4th Street. As an example, for backfilling and grading activities in RZ-C South around the diesel tank, flaggers were used to stop traffic while haul trucks dumping fill exited the area. Flaggers were also used any time material was being hauled offsite or when fill was being brought onto the Site along 4th Street where blind spots occur at turns.

Exclusion zones were set up around excavation areas before work began. Orange snow fence was placed around the perimeter of excavation areas with entrances for equipment and Site workers. Signs were also placed near entrances to alert workers of the exclusion zone area and proper decontamination areas.

2.3.4 Survey Equipment and Survey Control Stations

LVP utilized Trimble GPS equipment, including portable data controllers and receivers (model numbers TSC2 and SPS 780, respectively) and a base station (model number MS 750). The equipment ran SCS 900 software for real time kinematic operation with an accuracy of +/- 0.1 ft.

Northgate provided a pre-work site map including topographic information which was tied in with the local coordinate system (specific to the Site). Five widely separated control points (including one located across Interstate 515, one on Warm Springs Rd, one near the Tronox entrance, and two on Lake Mead Parkway) were provided by the surveyor PBS&J. LVP translated this map into state plane coordinates and used the five control points to calibrate their GPS equipment with the state plane coordinate system.

2.3.5 Personnel Roles and Responsibilities

Northgate was contracted by Tronox to perform remedial investigation, design and construction oversight activities associated with soil contamination across the Site. Northgate subcontracted with LVP to perform the excavation, transportation, disposal and replacement of contaminated soils. Northgate managed the removal action activities from August 2010 through February 14, 2011.

Northgate personnel and responsibilities included a Principal in Charge (regulatory interactions, client liaison, coordination with Project Managers), Senior Technical Review/Project QA Officer (QA oversight, procedures, audits, and technical assistance; communication with Project Manager; reporting on QA program), Project Manager (subcontractor coordination; task delegation; approval of plans, drawings, and reports; acting as the focus of coordination for all field and laboratory tasks), Soil Remediation Lead (reporting to the Project Manager and Senior Technical Review/Project QA Officer, managing analytical data in accordance with Quality Assurance Project Plans, soil sampling and remediation program coordination), Engineering/Construction Lead (coordinating site activities, managing design and field team members, logistics, coordinating with Project Manager), and Construction Field Manager (mobilizing/demobilizing field team and subcontractors, coordinating site activities, directing subcontractors, logistics, implementation of field quality control).

ENVIRON was contracted by the Trust to oversee the removal action beginning February 15, 2011. ENVIRON personnel and responsibilities included Managing Principals (design and planning of project; addressing technical issues; managing contracts, budget, and client interactions), Project Managers (leading site activities, addressing issues arising during

excavation work, coordinating soil sample collection, scheduling subcontractors and ENVIRON project team, managing waste profiles), and Field Staff (providing subcontractor oversight at active excavation sites, inspecting subcontractor decontamination procedures, collection of soil samples, performing final polygon certifications, perimeter dust monitoring, dust and volatile organic compound (VOC) monitoring at active excavation sites).

The NDEP program manager provided input and approval of activities which deviated from the approved work plan documents. McGinley and Associates (NDEP representative) acted as the oversight subcontractor for NDEP. McGinley and Associates was on-site during excavation activities to monitor progress and report their observations to NDEP.

LVP was subcontracted by ENVIRON to perform the excavation, transportation, disposal and backfill placement for all contaminated soils throughout the Site. During excavation and backfilling, LVP was responsible for maintaining roadways, dust control, and monitoring of truck traffic. LVP was also responsible for setting up and maintaining barriers delineating contaminant zones and decontamination zones. LVP collected topographic data across the Site and assisted with drainage design layout. LVP also performed utility repair, fencing repair, drainage control and paving, as necessary. In addition, LVP subcontracted with Greenway Inc. for most asbestos abatement tasks performed during the Site remediation. LVP also subcontracted with other firms and individuals for tasks including soil and debris hauling, electrical work, and assorted minor tasks.

Logistical Solutions, Inc. (LoSo) was subcontracted by ENVIRON and Converse Consultants (Converse) was subcontracted by Northgate to perform asbestos surveys, sampling, abatement oversight, and air monitoring during asbestos abatement activities. LoSo and Converse also assisted with the characterization and disposal of asbestos-containing waste.

RCI Engineering (RCI) provided assistance with grading plan design and development and performing engineering calculations associated with the grading plan. Joseph A. Cesare and Associates, Inc. (JCA) performed geotechnical consulting tasks including soil compaction testing and soil moisture content analysis.

2.4 Excavation Procedures

LVP was contracted to complete the soil excavations according to the Northgate RZ-specific removal action work plans (Northgate, 2010f, 2010g, 2010h, and 2010i). LVP used excavation-specific equipment that was appropriate to remove the COPCs to the proper depth and lateral extent. As material was removed from remedial excavations, it was stockpiled in a central area that was easily accessed by haul trucks. The soil was stockpiled separately if it needed to be classified under different waste profiles. Excavations progressed such that equipment would not cause further contamination to the area that was most recently scraped “clean.” The soil was transported offsite in dedicated haul trucks for direct disposal at Republic Services, Inc.’s Apex Regional Landfill (Apex). LVP’s close-out documentation for the remediation project, which includes photographic documentation combined with excavation model graphics, is provided in Appendix C. In addition, based on information provided by LVP, Plates 1 through 3 provide topographic maps of the Site at three stages of the remediation project, including 1) initial Site grade; 2) post-remedial excavation grade; and 3) final/current Site grade.

2.4.1 Excavation Equipment Used

The following equipment was used on-site for excavation and backfilling activities:

- Water Equipment:

  LVP used 8,000-gallon Water Pulls and 5,000-gallon Water Wagons in the individual remedial excavation areas to control the dust produced during excavation activities. Water Trucks also placed water on Site roads to control dust produced by traffic onsite.

- Excavating Equipment:

  A variety of excavation equipment was used within the polygons and excavation areas, including: Trackhoes, Backhoes, Dozers, and a Gradall. Some of the dozers were GPS guided to assist in excavating to final grade.

- Loaders and Rock Trucks:

  Loaders of various sizes were utilized onsite for the stockpiling and loading of excavated material. Loaders, as well as large Rock Trucks, were also used for general soil/backfill transportation onsite.

- Backfilling/Grading Equipment:

  A variety of backfilling and grading equipment was used onsite, including: a Paddlewheel Scraper, Blades, Sheeps Foot Compactors, and Graders.

- Miscellaneous Equipment:

  Other equipment used to assist in everyday site activities included lifts, light towers, compressors, kubotas, and pickup trucks.

2.4.2 Dust Control Measures

The dust control measures at the Site were implemented in accordance with Sections 90 – 94 of the *Clark County Air Quality Regulations*, which are administered and enforced by the CCDAQEM. These control measures consisted primarily of wetting the surface soil in active excavation areas and along onsite transportation routes. Short-term soil stockpiles were also sprayed with water during work hours and were covered with tarps at night. Water for dust control was obtained from two raised storage tanks that were supplied by fire hydrants on-site. To ensure the overall effectiveness of dust control measures at the Site, and to remain in compliance with Section 94 of the *Clark County Air Quality Regulations*, an LVP employee was designated the Dust Control Monitor and was present on-site for all potential dust generating activities.

2.4.3 Utilities

The Site is crossed by asphalt and concrete roads, dirt roads, and railroad spurs. One of the rail spurs is still in service. An extensive network of active and inactive underground utility lines is present under the roads and open areas at the Site. The known utilities at the Site include:

- Aboveground electric – Supplied by Nevada Power

- Natural gas – Supplied by Southwest Gas
- Fuel Oil – Aboveground tank which services on-site vehicles as well as back up for the Tronox Steam Plant
- Water – Supplied by Basic Water
- Sanitary Sewer – Connected to City of Henderson sanitary system
- Septic Systems – One active system at the groundwater treatment facility, as well as three former systems, one located in the ammonium perchlorate processing area, one associated with the maintenance shop and steam plant, and one which serviced the change house.

There were a number of utilities that required abandoning or replacing during excavation activities. The septic system located within the perchlorate processing areas as well as the system associated with the maintenance shop and steam plant were reportedly located within an area excavated at least 10 ft deep for soil remediation and/or construction of the central retention basin at the Site. Although no formal documentation of the system removal is available, it appears the septic systems were removed during excavation at the Site.

Aboveground electric supply lines which service the water treatment plant required relocation due to contaminated soil excavation and construction of the central retention basin. Other utilities encountered during construction were assessed on a case by case basis to determine if they could remain in place as is, required repair and/or replacement, or could be removed completely.

Many of the lines encountered were covered with insulation which required sampling for ACM. A certified inspector was used to sample any suspect ACM. If ACM was identified, the lines were properly abated prior to removal and disposal. In addition, soils beneath or adjacent to some of the lines exhibited visual staining and were sampled for proper handling prior to removal (if necessary).

Because of the age of many of the water lines, it was frequently discovered that the lines or joints within the lines were damaged or leaking. If the system required that it remain in place, the lines were repaired and put back in service. Some of the replacement also required the installation of new fire hydrants to maintain proper coverage throughout the Site.

Soil removal was required in the area adjacent to the aboveground fuel tank in the southern portion of RZ-C as part of the remediation program. The electrical lines to the tank were removed to allow for soil removal and the lines were replaced when remediation was completed. The associated fuel lines to and from the steam plant remained in place throughout the excavation process. The fuel tank was placed back into operation following the soil remediation activities.

As part of the separation of utilities between Tronox and the Trust, a new water meter and associated connection line were installed to service the groundwater treatment plant. Electrical service to the treatment plant is also monitored through a separate meter.

2.5 Air Monitoring Program

2.5.1 Air Monitoring Program Work Plan

Air monitoring at the Site was performed in general conformance with Northgate's *Perimeter Air Monitoring Plan for Phase B Soil Remediation of Remediation Zones RZ-B through RZ-E*, revised on May 28, 2010 (Northgate, 2010d). From August 2010 to early November 2011, onsite air monitoring typically consisted of dust and VOC monitoring at active excavation sites and dust and asbestos monitoring at the Site perimeter. Air monitoring was performed on a daily basis for dust and VOCs, and on an as-needed basis for asbestos. Additional details on the air monitoring program at the Site are provided below.

2.5.2 Meteorological Station

Site-specific meteorological conditions were measured using a Davis Instruments Vantage Pro2™ wireless weather station located southeast of the LVP field trailer (Figure 5). The station measured several meteorological conditions, including wind speed and direction, and reported real-time data to a remote console located onsite. Data gathered from August 2010 to March 2011 were logged in ten-minute intervals, and were provided to ENVIRON in spreadsheet form. Data gathered from March to November 2011 were logged in fifteen-minute intervals and were downloaded regularly to a computer in the ENVIRON field trailer. Onsite personnel used the real-time data to determine the appropriate locations for upwind and downwind dust monitoring at active excavation sites. Wind data collected during the duration of the project showed that the prevailing wind came from the south to southwest.

2.5.3 Perimeter Dust Monitoring

From August 2010 to early November 2011, onsite personnel performed perimeter dust monitoring at the Site to provide information on the effectiveness of dust control measures and to ensure that dust concentrations did not exceed the Site Action Level of 100 micrograms per cubic meter ($\mu g/m^3$) (24-hour average). To accommodate changing wind conditions and to measure both upwind and downwind concentrations, monitoring stations were established at the north, south, east, and west sides of the Site (Figure 5). From August 2010 to March 2011, perimeter dust concentrations were measured using Thermo Scientific personal DataRAM *p*DR-1000AN devices. From March to mid-April 2011, the devices were replaced by Thermo Scientific DataRAM4 particulate monitors; however, due to recurring problems with these devices, the Site eventually returned to using the earlier *p*DR-1000AN devices. During work hours, the monitors were programmed to provide real-time dust concentrations and to record the average concentration every sixty seconds from August 2010 to March 2011 and every ten minutes from March to November 2011.

After the completion of dust-generating activities at the Site, the perimeter dust monitoring data were thoroughly reviewed to ensure that dust concentrations never exceeded the Site Action Level. If the data recorded in a single day contained more than three data points above 100 $\mu g/m^3$ (ten-minute average), the data were graphed along with meteorological data and/or compared to field notes to better understand the reason for the exceedance(s). ENVIRON found that while there were some sporadic measurements over 100 $\mu g/m^3$, they were typically brief and likely due to momentary increases in wind speed or mobilization of equipment in the vicinity of an air monitoring station. Measured values above 100 $\mu g/m^3$ were uncommon and

short-lived during times when dust concentrations would be highest at the Site (i.e., during work hours). The data do not indicate there were any exceedances of the Site Action Level of 100 µg/m^3 (24-hour average) during the project.

2.5.4 Perimeter Asbestos Monitoring

Perimeter asbestos monitoring was performed whenever asbestos remediation occurred at the Site by Northgate (through February 14, 2011) and LoSo (beginning February 15, 2011). Samples were taken using GilAir5 asbestos monitors by Northgate and Gilian BDX II Personal Abatement Air Samplers by LoSo. The asbestos air sampling was performed at each of the Site's perimeter monitoring stations. According to the monitoring data, the concentration of asbestos at the project boundary was never measured above the OSHA 8-hour personal exposure limit (PEL) of 0.1 fibers per cubic centimeter (fibers/cc).

2.5.5 Particulate Air Sampling

When work began in a new RZ, air samples for particulate were taken at upwind and downwind monitoring stations for the first five days of activity. Samples were taken using two TISCH TE-1000 Polyurethane Foam (PUF) samplers, one TISCH TE-5170V Volumetric Flow Controlled Total Suspended Particulate (TSP) High Volume Air sampler, and one GilAir5 asbestos monitor at each sampling location. The samples were analyzed using the following methods:

- EPA-2 TO9 for Dioxins
- EPA-2 TO13 for HCB
- SW846 6020 for metals (arsenic and manganese)
- CFR50B APDX B for TSP
- Transmission Electron Microscopy (TEM) by NIOSH 7400 for Asbestos

Samples were analyzed by TestAmerica, and the results were reviewed. Based on the comparison of downwind results with upwind results, no significant increase in concentrations of chemicals in particulate samples was observed and further monitoring was not warranted.

2.5.6 Excavation Site Dust Monitoring

From August 2010 to November 2011, onsite personnel performed excavation site dust monitoring. The monitoring was performed using Thermo Scientific personal DataRAM *p*DR-1000AN devices which were programmed to measure the sixty-second average of real-time dust concentrations. Readings of upwind and downwind concentrations were taken approximately once every hour and were recorded in daily logs. If the difference between the upwind and downwind concentrations exceeded 100 µg/m^3, onsite personnel worked with excavation crews to ensure that additional dust control measures were implemented in a timely manner. A review of the historical daily logs found that, while there were sporadic exceedances of the 100 µg/m^3 threshold at certain excavation sites, these exceedances were brief and were typically caused by an acute dust generating activity (e.g., backfill unloaded at the excavation site) or from a momentary change in meteorological conditions (i.e., gust of wind).

2.5.7 Excavation Site Volatile Organic Compound Monitoring

Northgate performed VOC monitoring of worker breathing zones from August 2010 to March 2011. The monitoring was performed at active excavation sites using handheld photo ionization detectors (PIDs) which provided direct read-outs of real-time VOC concentrations. Data were recorded as needed when discolored soil or odors were encountered during the remediation efforts. VOC readings greater than one part per million (ppm) were observed at the western end of the Beta Ditch (RZ-E) and at a few locations in RZ-D. Work was performed in Level C personal protective equipment (PPE) when the VOC measurements deemed it necessary.

From March to October 2011, ENVIRON personnel performed periodic VOC monitoring of worker breathing zones as part of ENVIRON's Health and Safety Plan (HASP) (ENVIRON, 2011a). The monitoring was performed at active excavation sites using handheld MiniRAE (models 2000 and 3000) PIDs which provided direct read-outs of real-time VOC concentrations. The results of the VOC monitoring were recorded in daily logs.

ENVIRON's HASP describes the action level for total VOCs as a sustained (i.e., five-minute sampling period) concentration of five ppm above background levels. Should concentrations exceed the action level, Site personnel are instructed to upgrade to Level C PPE and attempt to mitigate exposure through the use of engineering controls (i.e., move upwind, increase air circulation). If the action level still could not be met, ENVIRON personnel would leave the area and contact the Site Health and Safety Officer and Project Manager for further instructions.

During the six-month monitoring period, ENVIRON rarely encountered elevated total VOC levels (i.e., greater than five ppm) and never recorded an exceedance of the action level (five ppm above background levels sustained for a five-minute period). However, there was one area on-site, RZ-E-14, in which ENVIRON personnel wore Level C PPE during excavation activities. To monitor the VOC levels in this area, ENVIRON established an exclusion zone based on a perimeter with a maximum PID reading of one ppm. Further details regarding the remediation of VOC impacted soils in the RZ-E-14 area are provided in Section 3.3.4.

2.6 Decontamination of Personnel and Equipment

During the remediation of Site soils, all personnel and equipment which came into contact with impacted material were required to undergo decontamination procedures. Initial decontamination procedures took place within exclusion zones to minimize the transport of contaminants to clean areas, with additional controls and practices in place throughout the Site to prevent transport of impacted materials offsite.

2.6.1 Personnel Decontamination

All personnel used proper PPE and were subject to all HASP rules while work was in progress at the Site. Decontamination areas were established near access points to exclusion zones. These areas included boot brushes and mats. All personnel were required to use the boot brush to remove excess soil before exiting an exclusion zone. Nitrile gloves were made readily available for personnel having to come in contact with impacted soils.

2.6.2 On-Site Excavation Equipment Decontamination

All excavation equipment was decontaminated before exiting an exclusion zone. Prior to relocating equipment, all loose and heavily caked soil was removed using brushes, flatbladed scrapers, hammers, or other suitable tools. If equipment with buckets (i.e., excavators and loaders) was relocating to areas designated as unimpacted, the insides of the buckets were also decontaminated. The scrapings were placed in the soil staging area for disposal with the excavated soils. Periodically, a high pressure washer was used to decontaminate equipment. When used, rinse water was maintained within exclusion zones, and these exclusion zones received a final surface scrape before being designated as complete.

2.6.3 Haul Truck Decontamination

While onsite, haul trucks remained on haul roads designated as unimpacted[1]. Loaders or excavators transported waste soils from stockpiles to haul trucks waiting in clean loading zones, and laborers used long-handled brooms to remove loose soil before trucks departed. Tarps and belly dump gates were inspected to determine condition. If tarps or belly dump gates were observed to be in poor condition, trucks were not allowed to transport soil. Prior to accessing unimpacted areas of the Site and public roads, the haul trucks were driven across gravel track out aprons, with mud scraping performed at the dedicated decontamination area as needed to mitigate the potential for impacted Site soils to be spread.

Upon arriving at Apex, the haul trucks travelled to the appropriate cell for placement of the waste. After dumping the waste, the haul trucks proceeded along rumble strips and/or a gravel track out road to a decontamination station located on a wide berm between treatment cells (double-lined shallow ponds used for liquid wastes received by the landfill). Trucks first passed over an under-carriage wash unit while a laborer washed off the lower portion of the haul truck cab and trailers, including tires, mud flaps, and dump gates, with a fire hose. Rinse water from the decontamination station drained directly into the treatment cells. At the end of the day's rounds and when trucks were to return to the Site with clean fill, the laborer was able to ascend a scaffolding setup in order to rinse the insides of the haul truck trailer beds.

2.6.4 Sampling Equipment Decontamination

When soil samples were collected using an AMS® slide hammer and two-inch by six-inch stainless steel core samplers, new pre-cleaned stainless steel sample liners were inserted into the decontaminated core sampler, which was then threaded onto the slide hammer. After the slide hammer was used to collect the sample, the undisturbed soil sample (contained in the metal core liner) was removed from the sampler and sealed with Teflon sheeting and new plastic end caps.

When surface soil was not compacted and only a small volume of soil was required, sampling was conducted with stainless steel sampling trowels and pre-cleaned laboratory-supplied sample jars. The stainless steel trowels and slide hammer core sampler tube were decontaminated using a Liquinox-deionized water solution in combination with a scrub brush to remove residual soil. The equipment was rinsed with deionized water after cleaning. All

[1] Haul trucks utilized were semi-trailer bottom dump ("belly dump") trucks and side dump trucks.

personnel used proper PPE including nitrile gloves when sampling Site soils and decontaminating equipment.

2.7 Well Abandonment and Repair

A number of monitoring wells were previously installed in the remediation areas as part of historical field investigations. Locations of existing monitoring wells are depicted in Figure 6. Prior to excavation which would potentially damage the monitoring wells, Northgate and ENVIRON evaluated whether protection of the existing monitoring wells in planned excavation areas and access routes was feasible. Concrete barriers were placed around wells requiring protection from construction traffic. Some of the wells were previously plugged and/or removed prior to the Trust oversight. The following table identifies the wells which were modified during excavation activities:

Monitoring Well Modifications – Excavation Activities	
Well ID	**Comments**
M-5A	Ground elevation changed; concrete pad destroyed
M-17	Plugged prior to Trust; found during excavation; to be overdrilled
M-17A	Plugged prior to Trust; found during excavation; to be overdrilled
M-18	Plugged and Abandoned prior to Trust
M-19	Concrete pad damaged
M-32	Removed as Part of Manganese Tails Removal Work
M-33	Removed as Part of Manganese Tails Removal Work
M-34	Ground elevation significantly changed, 3.5 ft of casing cut
M-35	Ground elevation significantly changed, 3.2 ft of casing cut
M-39	Damaged during excavation activities; repair or removal anticipated
M-50	Overdrilled and Removed 6/16/11 by Eagle Drilling
M-61	Damaged during excavation; overdrilled and removed 6/16/11
M-74	Damaged during excavation activities; repair or removal anticipated
M-83	Ground elevation changed
M-84	Removed prior to Trust oversight
M-85	Grouted and removed prior to Trust
M-85A	Removed prior to Trust oversight
M-86A	Removed prior to Trust oversight
M-87	Removed prior to Trust oversight
M-88	Removed prior to Trust oversight
M-89	Plugged prior to Trust oversight; need to overdrill
M-101	Damaged - Concrete pad broken
M-102	Removed prior to Trust oversight
M-111A	Overdrilled and removed 6/16/11 by Eagle Drilling
M-123	Ground elevation and access changed due to excavation
M-125	Ground elevation changed due to excavation; concrete pad broken
M-127	Damaged and removed during soil remediation
M-132	Damaged during excavation activities; repair or removal anticipated
M-133	Ground elevation changed due to excavation
M-143	Removed prior to Trust oversight

Monitoring Well Modifications – Excavation Activities	
Well ID	**Comments**
M-147	Damaged and removed during soil remediation
M-148	Abandoned and replaced by M-148A prior to Trust
M-180	Plugged and Abandoned prior to Trust oversight; need to overdrill
M-187	Overdrilled 6/16/11 by Eagle Drilling
M-188	Overdrilled 6/16/11 by Eagle Drilling
TR-1	Ground elevation changed due to excavation
TR-2	Ground elevation changed due to excavation

Additional modifications to the monitoring well network at the Site (repair, removal, and/or replacement) are anticipated to be performed following NDEP review and approval of the November 29, 2011 *Technical Memorandum on Long-Term Monitoring Optimization* for the Site (Northgate, 2011), which was submitted to NDEP in November 2011.

2.8 Asbestos-Containing Materials Encountered during Remediation

During remediation activities on-site, suspect ACMs were found within and adjacent to polygon excavations. Suspect ACM found during excavation activities was immediately covered with plastic sheeting or paint by an LVP asbestos-certified worker, and the excavation work was stopped until the ACMs were investigated and/or removed.

From August 2010 to February 14, 2011, while Northgate provided oversight of the remediation activities, the evaluation of suspect ACM was provided by Converse. After February 14, 2011, LoSo assisted ENVIRON with evaluation of suspect ACM. To determine if the pipe or debris in question contained ACM, Limited Asbestos Surveys that included a visual inspection and sampling of the material were generally performed. Limited Asbestos Surveys and sampling only occurred if the pipe or debris had not been sampled in previous investigations. If material was confirmed to contain asbestos, Greenway, an LVP subcontractor, or LVP performed the abatement of the material with oversight and air monitoring performed by Converse or LoSo. ACM was disposed of under its own waste profile at Apex (see Section 2.9). After completion of ACM abatement and disposal, visual inspections of each removal area were performed to identify any remaining ACM material. If none was present, the area received clearance and soil remediation excavation work or backfill/grading would continue. Section 3.2 contains more specific information on the removal of ACMs encountered during remediation activities. Reports prepared by LoSo and Converse during the remediation program are provided in Appendix D.

2.9 Waste Soil Management

After soils were excavated, they were loaded onto covered trucks for direct transportation to Apex. All operators and vehicles were properly licensed by the Nevada Department of Transportation. Generally, haul trucks were scheduled to run within a ten-hour shift. During portions of August, September, October and November 2010, as well as portions of January and February 2011, hauling and other tasks were performed during two 12-hour shifts. Work shifts were adjusted throughout the course of the project based on the remediation tasks being completed. Work involving ACM was typically performed at night and sometimes caused the work to extend from five to six days per week to seven days per week. Seven-day work weeks were also sometimes implemented per requests from NDEP.

2.9.1 Waste Disposal Facility

All waste was profiled as nonhazardous and, thus, was transported to Apex, which is operated by Republic Services and is located approximately 37 miles from the Site. Upon arriving at the landfill, trucks were directed to a "working face" where the contents of the trucks were uncovered and dumped. Waste was placed in several different cells within the landfill property, depending on which areas of the landfill were active. The haul truck decontamination procedures in place at the landfill are detailed in Section 2.6.3.

2.9.2 Waste Streams, Characterization, and Profiling

All Site soil excavated during remediation at the Site was characterized as nonhazardous. Initially, two profiles were set up for Site soils: one for material from RZ-B through D (3825 10 11244) and a second for material from RZ-E (3825 10 17899). Representative composite and grab samples collected between 2006 and 2010 from within the limits of the RZs were generally analyzed for RCRA 8 Metals (6020/7471A), Toxicity Characteristic Leaching Procedure (TCLP) VOCs (8260B), TCLP SVOCs (8270C), and TCLP Pesticides (8081A). The analytical results were sent to Apex for waste profile acceptance. Profile documentation, including analytical results, is provided in Appendix E. Apex approved the waste profiles and allowable disposal quantities in 2010. The approved disposal quantities have since been increased by Apex to 555,200 cubic yards (cy) for waste profile number 3825 10 11244 and 55,000 cy for waste profile number 3825 10 17899, respectively.

The majority of Site waste was of similar composition and was disposed of under one of these two profiles. However, several areas were encountered in which the waste material did not match the general profiles. Soils from these areas were stockpiled separately and sampled for characterization under new profiles. For chemical analysis, stockpiles were divided into four quadrants and a composite sample was collected from each quadrant. For most stockpiles, a four-point composite sample was collected from each quadrant; for stockpiles requiring more analysis, an eight-point composite sample was collected. Soil samples collected for these purposes were designated as "SP" samples. The analytical testing program for these samples is summarized on Table 2b. Details pertaining to these additional waste profiles are provided below.

Waste Profile Number 3825 10 11346

Waste disposed of under this profile included soil containing non-friable asbestos from the basements of Unit Buildings 1 & 2. An express waste profile was accepted on July 28, 2010 for an estimated 26,311 cy of material.

Waste Profile Number 3825 11 0022

Waste disposed of under this profile included soil containing friable and non-friable asbestos from RZ-E. Representative composite and grab samples were analyzed for RCRA 8 Metals (6010/6020), TCLP VOCs (8260B), TCLP SVOCs (8270C), TCLP Pesticides (8081A) and was sent to Converse for asbestos analysis (600-R-93-116). A waste profile was accepted on January 3, 2011 for an estimated 13,500 cy of material. On February 9, 2011, the amount was increased to 18,500 cy of material.

Waste Profile Number 3825 11 9393

Waste disposed of under this profile included soil containing friable and non-friable asbestos from the removal of former facility pipelines in RZ-B, RZ-C and RZ-D. Specifically, these wastes included former water line pipe from RZ-B, ACM-wrapped pipes from an excavation sidewall along Avenue F in the southern portion of RZ-C, pipes removed from the northwestern portion of RZ-D, and transite pipe removed from RZ-C near polygons RZ-C-10 and -18. An express waste profile was accepted on June 22, 2011 for an estimated 75 cy of material.

Waste Profile Number 3825 11 11171

Waste disposed of under this profile included material excavated from the subsurface tank structures in RZ-E-14A and related discolored soil extending into surrounding areas. Analytical results from samples DS-E14A-1 and 2 showed high concentrations of dioxin, HCB, arsenic, and several VOCs. A four-point composite sample was collected from each of four quadrants of the stockpile and sent to TestAmerica for chemical analysis of parameters including TCLP Barium/Chromium (6010B), TCLP VOCs (8260B), TCLP SVOCs (8270C), TCLP Pesticides (8081A), Reactive Cyanide (7.3.3), Reactive Sulfide (7.3.4), PCBs (8082), and Sulfur (6010B). There were two stockpiles of RZ-E-14A material. A waste profile was accepted on July 22, 2011 for an estimated 1,000 cy of material.

Waste Profile Number 3825 11 11172

Waste disposed of under this profile included soil excavated from the former pond berm in the northeast corner of RZ-D. Analytical results from sample DS-D23-1 showed high concentrations of dioxin, HCB, and magnesium. Four-point composite samples were collected from each of four quadrants of the stockpile and sent to TestAmerica for chemical analysis of parameters including RCRA 8 Metals (6010B/7471A), TCLP SVOCs (8270C), Reactive Cyanide (7.3.3), Reactive Sulfide (7.3.4), PCBs (8082), and Sulfur (6010B). A waste profile was accepted on July 28, 2011 for an estimated 1,000 cy of material.

Waste Profile Number 3825 11 11173

Waste disposed of under this profile included asbestos-containing pipes and soil excavated during removal of below-grade pipes. Representative samples were collected by LoSo and sent to Forensic Analytical Laboratories for bulk asbestos analysis (600-R-93-11). Four-point composite samples were also collected from each of four quadrants of the stockpile by LoSo and sent to TestAmerica for chemical analysis of parameters including RCRA 8 Metals (6020/7471A), TCLP VOCs (8260B), TCLP SVOCs (8270C), TCLP Pesticides (8081A), Reactive Cyanide (7.3.3), Reactive Sulfide (7.3.4), PCBs (8082), and Sulfur (6010B). A waste profile was accepted on July 26, 2011 for an estimated 1,000 cy of material.

2.9.3 Waste Manifests and Truck Tickets

Upon entering the Site, all haul trucks stopped at a check-in trailer at which time truck numbers were recorded. Haul trucks then proceeded to a designated loading area. When the trucks were loaded, LVP operators informed the check-in trailer staff by radio what material was loaded into each truck. This ensured that each truck load was manifested with the correct

waste profile number. Upon leaving the Site, haul trucks again stopped at the check-in trailer to pick up the manifest for that given waste load. Apex returned a copy of each manifest and its corresponding scale ticket to LVP after the waste was dumped. All waste manifests and truck tickets are provided in Appendix F.

3 Soil Excavation Work

3.1 Soil Excavation of Designed Remediation Polygons

Voronoi/Thiessen soil remediation polygons initially defined areas with SRG exceedances based on analytical data collected during the Phase A and B sampling programs implemented by Northgate from 2006 to 2009 (Northgate, 2010c). Based on pre-confirmation sampling conducted by Northgate in the spring of 2010, the horizontal and vertical extent of the remediation polygons were refined. The locations, shape, and depth of remediation polygon excavation areas are shown on Figure 4. In addition, Northgate's series of RZ maps showing remediation polygon boundaries and depths, as well as available analytical results used for the definition of remediation polygons, are included in Appendix A. These maps were used by Northgate and ENVIRON during implementation of the remediation program.

During the soil remediation program from August 2010 to November 2011, excavation of the designated remediation polygons was performed. LVP excavated the remediation polygon areas based on their AgTek model of the remediation areas, as described in Section 2.1.1, which was uploaded to GPS rover units for field use. Excavation was completed with GPS-guided equipment and/or with periodic manual topography checks using the rover units to determine when the design depth had been reached. LVP used three-to-one safety slopes and instructed its field crew how adjacent polygon excavations with varying depths would be handled, such that all safety slopes were appropriately constructed.

Upon completion of a given polygon or area, post-work topographic data were collected. Final certifications were also performed, in which ENVIRON or Northgate personnel selected five random locations within each polygon to record coordinates and initial/final elevations to verify that polygons had been fully excavated to design depth. If additional excavation was warranted based on the certification measurements, LVP performed additional excavation and the areas were re-certified.

The remediation polygons were generally excavated to the designed horizontal and vertical extent. However, some remediation polygons were not excavated to their design extent due to physical obstructions and/or inaccessible areas. These obstructions included subgrade and aboveground utilities, facility buildings, and roadways, parking lots, and other paved areas. ECAs were designated in these areas due to the remediation polygon soil being left in place, as further discussed in Section 3.4. Table 3 provides a summary, organized by RZ, of the remediation polygons, the excavation design depth, and a description of whether or not each polygon was excavated in its entirety. For those remediation polygons not completed per design, the table lists the corresponding ECA that was established due to the remaining polygon material left in place. Figures 9a through 9e show the locations of all established ECAs, including these locations of designated remediation polygons that could not be removed.

Remediation polygon soils were excavated and disposed of at Apex. An estimated total of 477,912 cy of remediation polygon area soils was removed from the Site and disposed of during the soil remediation program work. Approximate volumes of remediation polygon soils removed from each RZ are as follows:

- RZ-B: 23,196 cy
- RZ-C: 160,660 cy
- RZ-D: 246,627 cy
- RZ-E: 47,429 cy

Discolored soil was observed in some remediation polygon areas, which was addressed with further investigation and/or remediation, as described in Section 3.3. Total estimated volumes of material, including both remediation polygon soils and discolored soils, are provided in Section 3.4. Upon completion of remediation, polygon areas were backfilled and graded consistent with the grading plan for the site, as further described in Section 4.

3.2 Removal of Asbestos-Containing Material Encountered During Remediation

Oversight of remediation activities, including the removal of ACM at the Site, was performed by Northgate and ENVIRON, with assistance from subcontractors Converse and LoSo. A description of ACMs encountered during the remediation program is provided below. The areas where ACM materials were encountered are shown on Figures 7a through 7e. A tabular summary of ACM materials encountered and subsequent survey and abatement activities performed is provided in Table 4. Asbestos survey and visual clearance reports prepared by LoSo and Converse are provided in Appendix D.

As part of the asbestos abatement oversight, Converse and LoSo performed ACM surveys, visual clearance assessments, and perimeter asbestos monitoring (as described in Section 2.5.4). Information from ACM survey and visual clearance assessments is incorporated below. Based on the monitoring data collected, the concentration of asbestos at the project boundary was never measured above the OSHA 8-hour PEL of 0.1 fibers/cc.

3.2.1 ACM in RZ-B

Unit Buildings 1 and 2 Basements

On August 17, 2010, Greenway initiated ACM abatement in the basement of Unit Building 1 (Figure 7b). Soil and debris were removed from the basement and transported to Apex from August 17 through September 9, 2010. Following bulk removal of material, the basement floor was power washed and subsequently cleaned with vacuums equipped with high efficiency particulate air (HEPA) filters. A total of 15,587 tons of soil and debris were removed from the basement. Exit passageways in the walls of the basement were boarded up. All work was completed and the area was visually cleared of ACM on September 13, 2010 by Converse.

On November 16, 2010, Greenway initiated abatement in the basement of Unit Building 2 (Figure 7b). Soil and debris were removed from the basement and transported to Apex from November 16 through December 9, 2010. Following bulk removal of material, the basement floor was power washed and subsequently cleaned with vacuums equipped with HEPA filters. A total of 18,507 tons of soil and debris were removed from the basement. Exit passageways in the walls of the basement were boarded up. All work was completed and the area was visually cleared of ACM on December 17, 2010 by Converse.

Wrapped Pipe in RZ-B-21

On March 9, 2011, an asbestos-wrapped recirculating water line was exposed beneath 9th Street during final polygon excavations of RZ-B-21 (Figure 7b). The pipe was inactive and previously abandoned before removal. Upon discovery of the pipe, ENVIRON consulted with NDEP and confirmed that the pipe wrap did contain ACM and had been previously sampled by Northgate. LVP and ENVIRON agreed that excavation of RZ-B-21 could continue until flush with the pipe.

On May 5-6, 2011, Greenway performed asbestos abatement on the pipe, as well as a second small pipe of similar characteristics in RZ-B-21. The pipes consisted of one 20-inch diameter wrapped pipe that was approximately 80.5 ft in length and one 11-inch diameter wrapped pipe that was approximately 7 ft in length. Removal of the pipes did not continue north or south of the excavation area. The ends of the pipes were capped and marked with ACM caution tape. Immediately following abatement of the pipes, LoSo performed a final visual clearance of the area and cleared the area based on no readily identifiable visual signs of asbestos.

3.2.2 ACM in RZ-C

Various Pipes in Southern Portion of RZ-C

On April 28, 2011, various sizes of suspect ACM pipes were found while excavating discolored soil along the western and northern edges of polygon RZ-C-24. Wood debris and suspect ACM pipes were also found along Avenue F in that same area (Figure 7c). Upon discovery, ENVIRON and LVP stopped work in the area and marked off the area with caution tape. LoSo performed a limited asbestos survey on May 3-4, 2011 and collected a total of 24 bulk material samples. The suspect ACM initially identified included one 1-inch diameter wrapped pipe, three 4-inch diameter wrapped pipes, two 2-inch diameter wrapped pipes, and two 6-inch diameter wrapped pipes. Three samples collected from the one-inch diameter beige wrapped pipe and from both two-inch diameter brown/black wrapped pipes had detected concentrations of asbestos of 35%, 3%, and 2%, respectively.

On May 12-13, 2011, Greenway abated three 2-inch diameter wrapped pipes approximately 52 ft in length, three 4-inch diameter wrapped pipes approximately 52 ft in length, two 8-inch diameter wrapped pipes approximately 27 ft in length, one 2-inch diameter wrapped pipe approximately 27 ft in length, and two 8-inch diameter wrapped pipes approximately 52 ft in length (Figure 7c).[2] Though not all of the pipes were confirmed to contain asbestos, the pipes were removed at the same time because of their close proximity to the ACM pipes.[3] The RZ-C-24 area was visually cleared of ACM by LoSo on May 13, 2011.

[2] During the excavation during the abatement performed by Greenway, accessibility to the pipes was greatly improved resulting in an enhanced understanding of the number and size of the pipes as compared to those reported in the limited asbestos survey for this area.

[3] Given the close proximity of the ACM and non-ACM pipes, it was impossible to remove only the ACM pipes and leave the others in place. In addition, all the pipes in this area needed to be removed for remedial excavation in this area to proceed.

On June 14, 2011, Greenway removed one 1-inch diameter ACM-wrapped pipe and one 6-inch non-ACM wrapped pipe (both approximately 148 ft in length) located along Avenue F in polygons RZ-C-24 and RZ-C-26.[4] LoSo visually cleared the RZ-C-24 and RZ-C-26 area of ACM on June 15, 2011.

During excavations of the pipes in RZ-C-24, soil was also removed and considered to contain ACM. The soil was stockpiled to the northwest of polygon RZ-C-14 in the former pump house yard area. The stockpile was covered with a plastic tarp and the area was marked with asbestos caution tape. The pile was also frequently watered to maintain the soil in a moist condition. Removal of the stockpile occurred on July 30, 2011 by Greenway. LoSo visually cleared the area of ACM the same day.

Pipe and Insulation Materials in Excavation Sidewall Near RZ-C-14/15

On April 28, 2011, various sizes of suspect ACM pipes were found while excavating discolored soil along Avenue F in polygons RZ-C-14 and RZ-C-15 (Figure 7c). The pipes were found with wood and insulation-type material, which looked similar to shoring within a pipe trench. Upon discovery of the pipes, ENVIRON and LVP stopped work in the area until the pipes could be sampled for asbestos. On May 12 and 19, 2011, LoSo collected seven bulk material samples from suspect ACM, including black pipe wrap, beige thermal system insulation (TSI), wood, gray grout material, and soil. Three samples from the black and beige TSI, were found to have asbestos concentrations of 15% and are classified as ACM. From May 18-19, 2011, Greenway performed asbestos abatement on the area and removed one 1-inch diameter pipe that was approximately ten ft in length with about 3.5-inch thick TSI wrapping. They also removed one 1.5-inch steel pipe, one 2-inch steel pipe, and one 5-inch steel pipe that were all approximately 120 ft in length, and some soil. A total of approximately 480 linear ft of ACM and non-ACM pipes were removed from the area. Both ACM and non-ACM pipes were removed due to the close proximity and similarity of the pipes.[5] The area was visually cleared of ACM on May 19, 2011 by LoSo.

Transite Pipe in Southern Portion of RZ-C

ACM abatement efforts were performed in the southern portion of RZ-C to remove a 20-inch transite pipe that trended east-west across the Site in areas where remediation polygon excavations were to be performed (Figure 7c). Eight and ten-inch ACM-wrapped steel pipes were also identified that ran parallel to the transite pipe, which were also removed along with the 20-inch transite pipe. Five samples of suspect ACM piping were collected by Converse on December 9 and 13, 2010, two of which had asbestos reported as present. Approximately 565 linear ft each of 20-inch transite, and 8- and 10-inch ACM-wrapped steel pipes were removed from RZ-C-02B, -03, and -05A between December 27, 2010 and January 4, 2011. Between January 5, 2011 and January 10, 2011, an unspecified amount of 20-inch transite, and 8- and

[4] Similar to other pipes along Avenue F, all pipes in this area needed to be removed for remedial excavation to proceed and it was impossible to remove only the ACM pipes without also removing the non-ACM pipes,

[5] All pipes in this area needed to be removed for remedial excavation to proceed and it was impossible to remove only the ACM pipes without also removing the non-ACM pipes.

10-inch ACM-wrapped steel pipes were removed from RZ-C-07A, -07B, and -08. Between January 11, 2011 and January 14, 2011, approximately 295 linear ft each of 20-inch transite, and 8- and 10-inch ACM-wrapped steel pipes were removed from RZ-C-08 and -09. ACM abatement in the area was completed on January 15, 2011. Converse performed inspections of the remediated areas on December 23, 28, 30, and 31, 2010, and January 3, 6, and 19, 2011. The remediated areas were deemed clear of ACM by Converse.

On April 28, 2011, the transite pipe on the berm south of RZ-C-18 was cracked, exposing ACM, by an excavator that had driven over the pipe (Figure 7c). Upon discovery of the pipe, ENVIRON and LVP stopped work, LVP marked the pipe with paint, and LVP placed steel plates over the pipe to keep it from being further damaged. On May 12, 2011, LoSo collected one bulk sample from the transite pipe, which was found to have an asbestos concentration of 22%. The 18-inch diameter pipe was considered non-friable ACM, with the potential to become friable if damaged by excavation traffic and/or other disturbance in the area. From May 13-16, 2011, Greenway abated approximately 130 ft of the 18-inch diameter pipe. The area was cleared of ACM material by LoSo on May 16, 2011.

Balance Tank (BT) Tanks Pipe Rack in Northern Portion of RZ-C

Within polygon RZ-C-29, there was a large pipe rack with abandoned pipes located immediately south of the Balance Tank (BT) Tanks (Figure 7c). To complete the polygon excavation within RZ-C-29, the pipe rack needed to be removed. Based on the appearance of the pipes which contained insulating material, ENVIRON requested that LoSo sample the pipes for ACM. On July 12, 2011, LoSo collected six samples from the different pipes and gaskets associated with the pipe rack. The suspect ACM material consisted of two-inch diameter metal piping with TSI, four-inch diameter metal piping with TSI, and four-inch diameter gaskets. All analytical results associated with the pipe rack samples indicated that asbestos was not detected and, thus, did not need to be abated. The pipes and pipe rack were removed by LVP during July 19-26, 2011 and retained on-site as scrap metal for possible future sale.

Concrete Ramp Structure in Northern Portion of RZ-C

A large concrete loading ramp with black coating and white paint was located in the middle of the southern edge of polygon RZ-C-39, which needed to be removed to complete the polygon excavation (Figure 7c). ENVIRON requested that LoSo sample the concrete structure for ACM. On July 12, 2011, LoSo collected three samples from the suspect ACM black and gray paint that was covering the former concrete loading dock. All analytical results associated with the concrete ramp structure samples indicated that asbestos was not detected and, thus, did not need to be abated. The concrete loading dock was removed by LVP during July 19-26, 2011 and disposed of as nonhazardous waste.

Pipe in RZ-C-32 and -37

In November 2010, a 3-inch ACM-wrapped steel pipe was found in the northeastern portion of RZ-C within remediation polygons RZ-C-32 and -37 (Figure 7c). The pipe wrap was assumed to be asbestos since it was determined that this was a continuation of ACM-wrapped pipe previously found in the northwest corner of RZ-D. Greenway removed approximately 200 ft of

the 3-inch ACM-wrapped steel pipe from RZ-C-32 and -37 between November 10 and 11, 2010. Converse inspected and declared the remediation area clear of ACM on November 12, 2010.

Fibrous Cement Material in RZ-C-36

On August 8, 2011, a suspect ACM pipe surrounded with fibrous cement material was found approximately one foot above final grade while LVP was using the Gradall to finish the remaining excavation in the southwest portion of polygon RZ-C-36 (Figure 7c). ENVIRON and LVP stopped work upon discovery of the pipe. LVP spray painted the ends of the pipe and placed orange snow fence around the area. LoSo collected three samples from the suspect ACM fibrous cement material on August 9, 2011. All three samples contained ACM concentrations of 15%. On August 16, 2011, LVP-trained asbestos laborers performed the asbestos abatement. Several ft of soil were removed along with a ten-inch diameter fibrous cement pipe approximately ten ft in length. The area was cleared on August 16, 2011 by LoSo.

On August 29, 2011, an additional 16 inches of pipe was found within the southwest portion of RZ-C-36 during grading and backfilling activities. The pipe was abated by LVP on August 30, 2011. LoSo visually cleared the area of ACM on August 30, 2011.

Pipe in RZ-C-39C

On May 10, 2011, a north-south trending suspect ACM pipe was found just north of the process road within polygon RZ-C-39C during a walk over of the polygon area before LVP began backfilling activities (Figure 7c). Upon discovery of the pipe, it was marked with paint by LVP and backfilling activities were put on hold. LoSo collected one sample from a 4-inch suspect ACM transite pipe on May 11, 2011, which was found to have an asbestos concentration of 15%. The pipe was not considered friable material; however, excavation or disturbance of the area could have rendered the material friable. On May 10-11, 2011, the ACM transite pipe was found to be approximately 70 ft in length and was abated by Greenway. Along with the pipe, several ft of soil also needed to be excavated to remove the pipe. LoSo cleared the area of ACM on May 11, 2011.

Pipe in RZ-C-45 and -45B

On December 20, 2010 excavation began to expose a variable diameter (20- to 24-inch) ACM-wrapped pipe in the southeastern portion of RZ-C, in remediation polygons RZ-C-45 and -45B (Figure 7c). Between December 21 and December 27, 2010, the ACM-wrapped pipe was removed by Greenway under the direction of LVP. Approximately 160 linear ft of the 20/24-inch steel ACM-wrapped pipe was removed from the Site on December 30, 2010. Converse inspected the ACM remediated areas in RZ-C-45 and -45B on December 23 and 27, 2010. The areas were deemed clear of ACM by Converse.

Pipe in RZ-C-45

On August 2, 2011, LVP found a suspect ACM pipe within the southwest corner of polygon RZ-C-45 while performing a final scrape of the excavation area (Figure 7c). Upon discovery of the pipe, LVP stopped work in the area and marked the pipe with orange paint. The steel pipe was oxidized and partially decomposed in the surrounding soil. LoSo collected one sample from the

steel pipe on August 3, 2011, which did not detect asbestos. LoSo performed a visual clearance of the area and of the two-inch oxidized and decomposed steel pipe and cleared the area of suspect ACM. For final grading activities to be performed, the ten-foot long pipe was removed by LVP and disposed of as nonhazardous waste.

3.2.3 ACM in RZ-D

Pipe and Debris in Northwest Corner of RZ-D

Between August 11, 2010 and August 16, 2010, approximately 1,000 linear ft of 3- and 4-inch ACM-wrapped steel pipe was removed from the Trade Effluent Pond (TEP) berm between the GW-11 pond and the western Site boundary in the northwest portion of RZ-D (Figure 7d). Converse inspected the remediated area on August 16, 2010 and the area was deemed clear of ACM by Converse.

The paired 3- and 4-inch ACM wrapped pipes diverged at the south end of the TEP berm. The 4-inch pipe continued southwest toward the western property line and the 3-inch pipe continued southeast across RZ-D. Additional remediation was performed from August 31, 2010 to September 10, 2010 to remove the 4-inch ACM-wrapped steel pipe within and near remediation polygons RZ-D-12 and -13A. Approximately 295 linear ft of the 4-inch ACM wrapped steel pipe was removed from this area. Converse completed the final inspection on September 13, 2010 and the area was deemed clear of ACM by Converse. The 3-inch ACM-wrapped steel pipe was not further exposed during polygon remediation activities performed by Northgate in RZ-D; however, these pipes were encountered at a later date as discussed below.

Inspection of the northwest portion of RZ-D by Northgate revealed that the northernmost portions of the 3- and 4-inch ACM-wrapped steel pipes were removed from the TEP Berm prior to the start of remediation activity at the Site. Sections of ACM-wrapped pipe and ACM debris were spread throughout the western and eastern flanks of the TEP Berm between the western property boundary and the GW-11 pond. Greenway removed the ACM pipes and debris between August 11, 2010 and August 16, 2010. Converse completed an inspection of the remediated areas on September 2, 2010 and the area was deemed clear of ACM by Converse.

Two ACM-wrapped pipes were found while excavating discolored soil south of RZ-D-10A on April 4, 2011 (Figure 7d). Upon discovery of the pipes, ENVIRON and LVP stopped work in the area and marked the pipes with orange spray paint and covered the exposed pipes. To determine the location and extent of the pipes, LVP excavated a trench the length of the pipes, collected GPS locations, marked the pipes with orange paint, and then covered the pipes with soil. Orange tape and stakes were put along the trench area and work was stopped. Sampling of the pipes was deemed not necessary since it was determined that these pipes were a continuation of another section previously located to the north, which had been confirmed to contain asbestos. On May 9, 2011, Greenway performed abatement of the pipes. Along with soil, one 4-inch diameter ACM-wrapped metal pipe trending northwest-southeast and approximately 259 ft in length, as well as two 4-inch diameter ACM wrapped metal pipes trending north-south and approximately 214 ft and 14 ft in length, were removed. LoSo cleared the area of ACM on May 10, 2011.

On June 16, 2011, another section of the ACM-wrapped metal pipes trending northwest-southeast was found within polygons RZ-D-11, RZ-D-11A, and RZ-D-11B while completing additional remedial excavations in the area (Figure 7d). Upon discovery of the pipe, LVP stopped work in the area and an asbestos-trained laborer wrapped the pipe in plastic sheeting. The pipe was not sampled because previous samples from Northgate confirmed the wrapped pipe contained ACM. From June 22-23, 2011, Greenway performed asbestos abatement on a pipe wrapped in black pipe wrap, approximately 240 ft in length. Soil from the area around the pipe was also removed during the abatement. LoSo cleared the area of ACM on June 23, 2011.

Fibrous Material in Rubble Pile in Eastern Portion of RZ-D

On July 18, 2011, a white and beige fibrous deposit along the northern edge of the debris piles on the eastern side of RZ-D was identified by NDEP's Site Representative (Figure 7d). LoSo was contacted by ENVIRON and collected three samples of the suspect ACM fibrous gray and white material. All analytical results associated with the fibrous material within the rubble pile indicated that asbestos was not detected and, thus, did not need to be abated. Though there was not any visible ACM, the inspection did not include suspect ACM material that may be buried within the pile, and LoSo designated the pile as Regulated Asbestos Containing Material (RACM). The rubble pile remains at the Site.

3.2.4 ACM in RZ-E

Pipe in RZ-E-10 and -11

In November 2010, a 3-inch ACM-wrapped steel pipe was found in the central portion of RZ-E within remediation polygons RZ-E-10 and -11 (Figure 7e). The pipe wrap was assumed to be asbestos since it was determined that this was a continuation of ACM-wrapped pipe previously found in the northwest corner of RZ-D. Greenway removed approximately 52 ft of the 3-inch ACM-wrapped steel pipe from RZ-E-10 and -11 between November 10 and 11, 2010. Converse inspected and declared the remediation area clear of ACM on November 12, 2010.

Asbestos in Soil and Concrete Culverts in RZ-E

On September 9, 2010, suspected asbestos fibers were observed in the former Beta Ditch during drilling and sampling operations (Figure 7e). Samples were collected by Converse at that time. The extent of the asbestos initially appeared limited and it was assumed that removal operations would be minimal and could be performed concurrently with general excavation activities in the Beta Ditch.

Excavation activities began on December 4, 2010. On December 9, 2010, additional areas in the Beta Ditch were found to contain significant amounts of ACM. As work continued, the extent of the ACM was found to extend throughout most of the Beta Ditch west of 9th Street. Additional samples were collected on December 9 and 13, 2010 to characterize the extent of ACM in soils. Excavation of asbestos containing soils, with the exception of some soils around six concrete culverts within RZ-E, was performed between January 5, 2011 and February 14, 2011.

A total of six concrete culverts within RZ-E were located within polygons RZ-E-06, RZ-E- 09, and RZ-E-12 (Figure 7e). ENVIRON understood from LVP that the culverts were reportedly sampled by Converse prior to February 15, 2011 and found not to contain ACM; however, soil which may have accumulated within the culverts, as well as soil adjacent to the culverts, was assumed to contain asbestos since asbestos was found throughout much of the former Beta Ditch. Therefore, arrangements were made to abate both soil and culverts due to the condition of the inside of the culverts, which made it impossible to separate the asbestos-containing soil within the culverts from the culverts themselves.

From May 20-22, 2011, Greenway performed ACM abatement on the soil and culverts of RZ-E-06 and RZ-E-09 until no visual ACM was encountered within the excavation areas. A concrete pipe was also found and removed with the culvert from RZ-E-09. The soil and culverts from RZ-E-06 and RZ-E-09 were stockpiled within RZ-D-30 and RZ-D-31 until the excavation of RZ-E-12 was complete. The stockpile was covered with a plastic tarp and the area was marked with asbestos caution tape. The pile was also watered to be maintained in a moist condition.

From June 22-23, 2011, Greenway removed soil and the final culverts from polygon RZ-E-12. As with the other two culvert areas, the RZ-E-12 area was excavated until no visual ACM was encountered and the material was added to the stockpile in RZ-D-30 and RZ-D-31. LoSo cleared all of the RZ-E culvert areas of ACM on June 22-23, 2011. On June 23-24, 2011, Greenway removed the stockpile from RZ-D-30 and RZ-D-31 for disposal at Apex. The area was cleared of ACM by LoSo on June 24, 2011.

Fibrous Material at Eastern End of Beta Ditch

On July 11-12, 2011, a large area of white and beige suspect ACM was found under sand bags formerly used to avoid surface drainage off site in polygon RZ-E-16B while LVP completed the final excavation of the area (Figure 7e). Upon discovery of the material, LVP stopped work and ENVIRON requested that LoSo sample the material. On July 12, 2011, LoSo collected five bulk material samples from suspect ACMs of soil and TSI. Three samples collected from beige fibrous material in the soil and from homogenous beige fibrous TSI had asbestos concentrations of 99%, 69%, and 10%. The ACM material in RZ-E-16B was not abated, but rather it was covered in plastic sheeting with clean fill material placed over the sand bags and plastic sheeting. The asbestos-containing soil in this area is included within the boundaries of ECA E3.

3.3 Discolored Soil Observations and Remediation

During remediation activities, discolored soil was encountered at several locations, primarily in the northern half of the Site within the southern portion of RZ-C (RZ-C South) and the northwest and eastern portions of RZ-D (RZ-D Northwest and RZ-D East, respectively). Discolored soil generally was observed in the base of polygon excavations, on sidewalls of polygon excavations, and on adjacent surface soils.

Upon discovery of the discolored soil, the approximate or likely extent was investigated using trenching and test pit techniques. If the area of discolored soil was small, it typically was excavated without being further characterized. If the discolored soil area required removal of a relatively large area, the soil was typically sampled and analyzed for specific COPCs based on analytical results from borings adjacent to the discolored soil areas. Specifically, the discolored

soils were tested for chemical constituents that were reported at concentrations above SRGs in samples from the remediation polygon where the discolored soil was observed, as well as neighboring remediation polygons. Discolored soil characterization sample results with concentrations above SRGs typically resulted in removal of the soil (in addition to designated remediation polygon soils), whereas sample results below SRGs typically resulted in the soil being left in place.

The following sections describe observations and actions taken in specific discolored soil remediation areas at the Site. The locations of each of these areas of discolored soil are shown on Figures 8a through 8h. Tables 5a through 5d provide a tabular summary with additional information on the investigation and remediation of the discolored soil areas. The locations of established ECAs are shown on Figures 9a through 9e.

As described in section 2.1.3., three types of soil samples were collected during the remediation, including discolored soil characterization samples, confirmation soil samples, and excavation extent samples. QA/QC samples collected included field duplicate soil samples and equipment blank samples. Analytical results of samples collected during the remediation activities are provided in tabular format in Appendix G. Analytical laboratory reports and chain-of-custody documentation are provided in Appendix H, and a Data Validation Summary Report (DVSR) for these analytical results is in Appendix I. A Microsoft Access database of analytical results collected during the remediation program is included in Appendix J. The database also includes a table with a list of soil samples that are no longer in place at the Site because they were collected from soils which were subsequently removed as part of the soil remediation. Soil sample locations are shown on Figures 8a through 8h and analytical results for these samples are shown on Plates 4a through 4e. For further reference, analytical results for soil samples collected prior to initiating remediation activities at the Site are shown on figures prepared by Northgate and included in Appendix A.

3.3.1 Discolored Soil Areas in RZ-B

RZ-B-13 Area

During polygon excavation activities, Northgate discovered black discolored soil at the western edge of the active material processing pad (Figure 8b). After completion of the polygon excavation, Northgate oversaw the removal of the discolored soil at the western edge of the active material processing pad to a depth of 0.33 ft. On February 9, 2011, one confirmation sample (SSAQ6-02) was collected from the floor of the scraped area and analyzed for dioxins, SVOCs, arsenic, manganese, and magnesium. The results indicated that concentrations of arsenic and benzo(a)pyrene were above SRGs. Since soil removal could not be performed beneath the active material processing pad, this area is designated as ECA B5.

3.3.2 Discolored Soil Areas in RZ-C

RZ- C-01/01A Area

During excavation activities, three discolored soil layers were discovered within polygons RZ-C-01 and RZ-C-01A. The first layer was a thin (approximately six inches) brown/black layer about

one foot bgs in the north sidewall of RZ-C-1 (Figure 8c). The layer was excavated to the north up to the fence line and west to 4th Street. The layer was not completely excavated and a thin (approximately three to six inches thick) brown/black layer remains in the north sidewall of RZ-C-1, extending beneath the facility perimeter fence. One excavation extent sample (EE-C01-1) was collected from the remaining soil in the northern sidewall along the fence and was analyzed for arsenic and magnesium, concentrations of which were below SRGs.

The second layer discovered in this area was a thin (approximately three to six inches thick) brown/white layer located in the northwestern sidewall of RZ-C-1 (Figure 8c). Excavation of the layer occurred to the west and ended at 4th Street with all observed discolored soil being removed. Upon completion of the excavation, one confirmation sample (CS-C01-1) was collected from the sidewall along 4th Street and analyzed for arsenic and magnesium. Results from CS-C01-1 indicated that concentrations of both arsenic and magnesium are below SRGs and no further excavation of the area was deemed necessary.

The final layer was a black surface layer found within the southeastern area of RZ-C-1 and RZ-C-1A (Figure 8c). The layer was excavated to the southeast, with no more than a foot of material removed from the area, until all observed discolored soil was removed. One confirmation sample (CS-C01-2) was collected from the floor of the excavation and analyzed for arsenic and magnesium, concentrations of which were below SRGs and no further excavation was needed.

Although no discolored soil was observed in the western excavation sidewall along 4th Street following excavation, ECA C1 was established for the remaining polygon soil that extended under 4th Street that could not be excavated (Figure 9c). An ECA was not established for the area of discolored soil remaining in the north sidewall of RZ-C-01, extending beneath the facility perimeter fence, since sampling of this layer indicated concentrations of tested compounds were below SRGs.

RZ-C-02A Area

During polygon excavation activities, Northgate observed and removed discolored soil towards the northeast of remediation polygon RZ-C-02A, beginning at the northeastern boundary of the polygon (Figure 8c). The layer was completely removed and one confirmation sample (SSAO3-06) was collected from the floor of the excavated area and analyzed for arsenic and manganese. The results indicated that concentrations of manganese were below SRGs; however, reported arsenic concentrations were slightly above the SRG. Since the reported arsenic concentration was only slightly above the SRG and no additional discolored soil was observed in the area, in consultation with NDEP, no additional excavation of the area was deemed necessary.

Southwest of RZ-C-05B/06

In April 2011, ENVIRON observed dark brown discolored soil within the sidewall of the remediation polygon excavation area of RZ-C-05B and -06 (Figure 8c). The discolored soil was removed toward the southwest until observed discolored soil was completely removed. One confirmation soil sample (CS-C06-1) was collected within the sidewall of the excavation and

was analyzed for dioxins, HCB, and magnesium. Results from CS-C06-1 indicated that concentrations of these constituents were below SRGs and no further excavation of the area was required.

North of RZ-C-05A

In April 2011, a thin (approximately one to two inches) gray/black layer was identified along the northeast edge of polygon RZ-C-05A (Figure 8c). The layer was approximately one foot below final grade of the area and extended the entire length of the northeast edge of RZ-C-05A (about 150 ft long). The discolored soil was excavated approximately 20 ft to the northeast. On April 21, 2011, one confirmation soil sample (CS-C05A-1) was collected from the floor of the excavation and was analyzed for dioxins, HCB, and magnesium. Results from CS-C05A-1 indicated concentrations of these constituents were below SRGs and no further excavation of the area was necessary.

Area East of RZ-C-05A and West of RZ-C-09B

In April 2011, a discolored soil layer was observed, following polygon excavation, on the surface across much of the area east of RZ-C-05A and west of RZ-C-09B (Figures 8c and 8d). The discolored soil layer was a thin, black surface layer with some loose gravel material that was generally less than one foot thick. One characterization sample (DS-C08-1) of the discolored soil was collected on April 20, 2011 and analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese, and magnesium. The results of sample DS-C08-1 indicated dioxin and HCB concentrations were above SRGs. The black surface layer was removed from the eastern boundary of RZ-C-05A to the middle of polygon RZ-C-09B and from the concrete pad north, to the northern edges of RZ-C-07B, RZ-C-07A, and RZ-C-08.

Following the removal of all observed discolored soil, five confirmation soil samples (CS-07B-1, CS-07B-2, CS-07A-1, CS-C08-1, and CS-C08-2) were collected from the floor of the excavation area on April 21 & 28, 2011. These samples were analyzed for dioxins, HCB, and arsenic. Results from the confirmation samples indicated that concentrations of these constituents were below SRGs and no further excavation of the area was required.

RZ-C-09A Area

In April 2011, a gray and pink layer (generally less than six inches deep) was discovered along the northeastern sidewall of RZ-C-09B and extended beneath the excavated polygon of RZ-C-09A (Figure 8d). One discolored soil characterization sample (DS-C09A-1) was collected from the gray/pink layer along the southwestern edge of RZ-C-09A on April 20, 2011. This sample was analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese, and magnesium. Results indicated that concentrations of arsenic in the sample DS-C09A-1 were above the SRG. The discolored soil within RZ-C-09A was subsequently removed. One confirmation soil sample (CS-C09A-1) was collected from the bottom of the excavated area on April 28, 2011 and analyzed for dioxins and HCB. Results from CS-C09A-1 indicated that concentrations of these constituents were below SRGs and no further excavation was required in this area.

A small amount of gray material remained to the south of RZ-C-09A and was characterized with the collection of one excavation extent sample (EE-C09A-1) and one duplicate sample (EE-C09A-2). The samples were analyzed for dioxins and HCB and results indicated that concentrations of these constituents were below SRGs. No further excavation was required in this area.

RZ-C-11/12/13 Area

Following remedial excavation of polygons RZ-C-11, -12, and -13, a dark brown and black discolored soil layer was observed at the base of the excavation (Figure 8c). One discolored soil sample (DS-C11-1) was collected from the dark brown/black soil on April 20, 2011 and analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese and magnesium. Results indicated that concentrations of these constituents were below SRGs, with the exception that the concentration of HCB in the sample was above the SRG for HCB. Therefore, accessible discolored soil in this area was removed. A small amount of discolored soil was left in place within RZ-C-13 near the electrical power pole and other north/south trending subgrade utilities due to access constraints.

Following the removal of the discolored soil, one confirmation sample (CS-C11-1) was collected from the bottom of the excavation on June 20, 2011 and analyzed for dioxins and HCB. Results indicated that concentrations of these constituents in CS-C11-1 were below SRGs and no further excavation of the area was required.

One excavation extent (EE-C13-1) sample was collected within the black layer remaining in the southeastern sidewall of RZ-C-13 on June 20, 2011. This sample was analyzed for HCB, SVOCs/PAHs, arsenic, and manganese. Results indicated that the concentrations of these constituents were below the SRGs, with the exception of HCB, which was reported at a concentration above the SRG for HCB. ECA C5 was established for the remaining discolored soil beneath the water, fiber optic, and electricity utility lines through and near RZ-C-11 and -13 (Figure 9c).

RZ-C-10/10A Area

Northgate observed and excavated scattered discolored soil found on the ground surface within the southern portion of RZ-C-10A, extending east into the southern portion of RZ-C-10, following polygon remedial excavation in these areas (Figure 8d). The scattered discolored soil was completely removed and Northgate collected one confirmation sample (SSAO5-08) on February 9, 2011 from the floor of the excavation. The sample was analyzed for dioxins, SVOCs, arsenic, magnesium, and perchlorate. Results indicated that concentrations of these constituents were below SRGs.

Upon completion of polygon excavations at RZ-C-10/10A, ENVIRON observed an additional thin, black discolored soil layer on the ground surface (Figure 8d). One discolored soil characterization sample (DS-C10A-1) was collected at the base of the excavation area on April 20, 2011 and analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. The results of DS-C10A-1 indicated that concentrations of many of these

constituents were above SRGs. Therefore, observed discolored soil in this area was subsequently removed.

Following the removal, one confirmation soil sample (CS-D10A-1) was collected from the floor of RZ-C-10A on May 17, 2011 and analyzed for dioxins, HCB, arsenic, magnesium, and perchlorate. Results indicated that concentrations of these constituents were below SRGs and no further excavation of the area was required.

RZ-C-14/15 Area

Following completion of the polygon remedial excavations in RZ-C-14 and -15, a thick (approximately ten to twelve ft) dark brown/black layer was observed at the base of the excavations and within the excavation sidewalls (Figure 8d). The discolored soil was excavated from Avenue F north to the facility perimeter fence and from the east sidewall of RZ-C-15 to the west sidewall of RZ-C-14. Approximately twelve ft of material were removed from the area. On June 20, 2011, one confirmation sample (CS-C15-1) was collected from the floor of the excavation area and analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, manganese, magnesium, and perchlorate. Results from CS-C15-1 indicated that concentrations of these constituents were all below SRGs.

The discolored soil was not completely removed from the area and remained within the floor of the excavation, under Avenue F, and within the eastern sidewall of RZ-C-15, under the area of the former pump house yard. Excavation extent samples were collected from the material that remained within the floor of RZ-C-15 (EE-C15-2) and from the soil that remained within the eastern sidewall of RZ-C-15 under the former pump house yard (EE-C15-1). These samples were analyzed for HCB, SVOCs/PAHs, arsenic, and manganese. The results for these samples indicated concentrations of these constituents were below SRGs, with the exception of the arsenic concentration in sample EE-C15-2 which was above the SRG for arsenic. The material remaining in the sidewall of the former pump house yard is included in ECA C6, which covers discolored soil at the former pump house yard. The remaining discolored soil within the southern sidewall under Avenue F is included in ECA C7 (Figure 9c). It was determined, in consultation with NDEP, that the discolored soil remaining at depth within the RZ-C-15 area would not be included in an ECA since it is located at considerable depth and covered with a significant thickness of backfill material.

Diesel Fuel Line Area Between RZ-C-10 and RZ-C-18

Northgate and ENVIRON observed an approximately ten-foot thick, peat-like material, horizontally bedded, shaly gray/black discolored soil under the diesel fuel lines in the area between RZ-C-10 and RZ-C-18 (Figure 8d). Initially, Northgate collected a discolored soil sample (SSAO5-09) of the gray/black shaly, peat-like material on February 11, 2011. The sample was analyzed for dioxins, SVOCs, arsenic, manganese, magnesium, and asbestos. Results from SSAO5-09 indicated concentrations of HCB, arsenic, and magnesium were above SRGs for these constituents.

On April 20, 2011, ENVIRON collected a discolored soil sample (DS-C10-1) from the gray/black shaly layers within the east sidewall of RZ-C-10. The sample was analyzed for dioxins, HCB,

arsenic, lead, cobalt, manganese, magnesium, and perchlorate. Results indicated that concentrations of HCB, magnesium, and perchlorate were above SRGs for these constituents. Therefore, discolored soil within the accessible areas on both sides of the diesel fuel pipelines was removed. About a twelve-foot wide and 75-foot long section of discolored soil was inaccessible under the diesel fuel pipelines and remained in place. ECA C9 was established for discolored soil under the diesel tank and associated pipelines (Figure 9c).

Northwest of RZ-C-10B

On July 20, 2011, a thin (approximately six inches) black, tar-like layer was observed within the upper one foot of the northwestern sidewall of polygon RZ-C-10B. Test pits revealed that the layer was about 40 ft wide along the sidewall and continued 20 ft to the northwest (Figures 8c and 8d). The excavation occurred in the shape of a half circle and required the removal of the upper six inches to one foot of soil. Upon completion of the excavation, one confirmation soil sample (CS-C10B-1) was collected in the floor of the excavation and analyzed for a broad suite of constituents per NDEP's request, including dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, OCPs, perchlorate, and VOCs. Results for sample CS-C10B-1 indicated that concentrations of these constituents were below SRGs and no further excavation of the area was necessary.

Southern Portion of RZ-C-17

On May 3, 2011, a black layer of discolored soil was observed in the western portion of RZ-C-17, within an east-west trending berm between two former ponds (Figures 8c and 8d). A trench was dug to investigate the extent of the discolored soil and one characterization sample (DS-C17-1) was collected from the trench on May 6, 2011. The sample was analyzed for dioxins, HCB, arsenic, magnesium, and perchlorate. Results from DS-C17-1 indicated concentrations of dioxins and HCB were above SRGs. However, since this area was within areas where remedial excavation had been completed, it was decided, in consultation with NDEP, to leave these soils in place. ECA C10 was established to cover this and other adjacent areas of discolored soil remaining in place (Figure 9c).

Northwestern Corner of RZ-C-18

ENVIRON discovered a black and gray discolored soil layer within the northern and western sidewalls of RZ-C-18, along the former pond slope (Figures 8c and 8d). One discolored soil sample (DS-C18-1) was collected within the black layer in the northwestern corner of RZ-C-18 on May 6, 2011 and was analyzed for dioxins, HCB, arsenic, magnesium, and perchlorate. Results for sample DS-C18-1 indicated that concentrations of these constituents were below SRGs and no further excavation of the area was deemed necessary.

Eastern Side of RZ-C-18

Northgate identified and removed some scattered discolored soil on the eastern edge of RZ-C-18 (Figures 8c and 8d). Following the removal of the material, one confirmation soil sample (SSAO6-06) was collected from the floor of the excavated area on February 9, 2011. This sample was analyzed for dioxins, SVOCs, arsenic, manganese, and magnesium. Results from

this sample indicated concentrations of HCB and arsenic were above SRGs for these constituents. Therefore, additional soil excavation was performed in this area to remove the discolored soil. During the soil removal, ENVIRON observed a black discolored soil layer on the ground surface adjacent to polygon RZ-C-18 (Figures 8c and 8d). The layer was excavated to a depth of approximately six ft bgs and included the removal of a subsurface concrete drop culvert and pipe. Due to the significant depth of the material, some of the discolored soil was left in place. One excavation extent sample (EE-C18-1) was collected within the discolored soil at the base of the excavation on May 17, 2011. This sample was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, manganese, and magnesium. Results from EE-C18-1 indicated concentrations of dioxins, HCB, and benzo(a)pyrene were above SRGs. ECA C10 was established to cover this and other adjacent areas of discolored soil remaining in place (Figure 9c).

Southeast Corner of RZ-C-18

On May 2, 2011, ENVIRON observed brown discolored soil in the southeastern corner of RZ-C-18 about ten ft bgs (Figures 8c and 8d). One discolored soil sample (DS-C18-2) was collected within the brown layer on May 6, 2011 and analyzed for dioxins, HCB, arsenic, magnesium, and perchlorate. Results for this sample indicated that concentrations of these constituents were below SRGs. Although some soil was removed by LVP prior to sampling, no additional soil excavation was deemed necessary following receipt of the analytical results.

Southeastern Portion of RZ-C, Near Diesel Fuel Tank, Fuel Pipelines, and Gas Line

During excavation activities, five discolored soil layers were discovered within the polygons surrounding the diesel fuel tank, fuel pipelines, and gas line. The first layer was an approximately four-foot thick black layer in the sidewalls under the diesel tank, Avenue F, 9th Street, and the fuel and gas lines (Figures 8c and 8d). Discolored soil from this layer also appeared to have covered the ground surface in the area after polygon excavation, either as a result of erosion from the layer or transfer of discolored soil by excavation equipment.

Two characterization samples (DS-C23-1 and DS-C25-1) were collected from the black layer under the diesel fuel tank and of the discolored soil on the polygon excavation bottoms on April 20, 2011. The sample DS-C23-1 was analyzed for dioxins, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate and the sample DS-C25-1 was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, and magnesium. Results indicated that concentrations of arsenic, lead, and manganese in sample DS-C23-1 were above SRGs and the concentration of arsenic in sample DS-C25-1 were above SRGs.

In April 2011, excavation began of the black layer surrounding the diesel fuel tank, fuel pipelines and gas line. Following the removal of all accessible discolored soil, two confirmation samples (CS-C26-1 and CS-C25-1) were collected from the floor of the excavation on June 23 and 30, respectively. These samples were analyzed for HCB, SVOCs/PAHs, arsenic, and manganese. Results for these samples indicated that concentrations of these constituents were below SRGs and no further excavation of the area was necessary. Four additional confirmation samples (CS-C23-1, CS-C27-1, CS-C27-2, and CS-C27-3) were collected from the floor of the excavation on June 16, 2011 and analyzed for arsenic, lead, manganese, and perchlorate.

Results for these samples indicated that concentrations of these constituents were below SRGs, with the exception of arsenic in the sample CS-C27-1, which was reported at a concentration slightly above the SRG for arsenic. Since the majority of reported concentrations were below SRGs and arsenic was reported only slightly above the SRG, in consultation with NDEP, no further excavation of the area was deemed necessary.

The discolored soil was not able to be completely removed and material remained within the sidewalls beneath the diesel tank, Avenue F, 9th Street, gas line, and the pump house yard. Several excavation extent samples were collected in this area, including:

- Six excavation extent samples (EE-C20-1, EE-C23-1, EE-C27-1, EE-C27-2 and duplicate EE-C27-4, and EE-C27-3) were collected from the sidewalls and bottom of the excavation area underneath the diesel fuel line, gas line, and Avenue F on June 16, 2011. These samples were analyzed for arsenic, lead, manganese, and perchlorate.
- Two excavation extent samples (EE-C21-1 and duplicate EE-C21-2) were collected from the sidewall of the area underneath the gas line north of this area on June 16, 2011. These samples were analyzed for SVOCs/PAHs, arsenic, manganese, and perchlorate.
- Two excavation extent samples (EE-C24-1 and EE-C24-2) were collected from the sidewall along Avenue F and the sidewall of the former pump house yard on June 23 and 30, respectively. These samples were analyzed for HCB, SVOCs/PAHs, arsenic, and manganese.

The excavation extent sample results indicated that concentrations of various constituents were above SRGs, including:

- Benzo(a)pyrene in samples EE-C21-1 and EE-C21-2;
- Arsenic in samples EE-C20-1, EE-C21-1, EE-C21-2, EE-C23-1, EE-C27-1, EE-C27-2, EE-C27-4, EE-C24-1, and EE-C24-2;
- Lead in samples EE-C20-1, EE-C23-1 and EE-C27-1; and
- Perchlorate in samples EE-C20-1, EE-C21-1, EE-C21-2, and EE-C23-1.

Results for sample EE-C27-3 indicated that concentrations of all constituents tested were below SRGs.

The second layer observed in this area was a gray/white layer found beneath the diesel fuel line in polygon RZ-C-19 (Figures 8c and 8d). One discolored soil sample (DS-C19-1) was collected from the white/gray layer within the sidewall under the diesel fuel line on April 20, 2011. This sample was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, and magnesium. Results from DS-C19-1 indicated the concentration of arsenic was above the SRG. The discolored soil was not excavated because it was inaccessible under the diesel fuel lines.

The third layer in this area was a gray/white layer found near the top of the southern sidewall of RZ-C-24 adjacent to ACM pipes and under Avenue F (Figures 8c and 8d). Two discolored soil samples (DS-C24-1 and duplicate DS-C24-2) were collected from the layer on May 4, 2011.

These samples were analyzed for HCB, SVOCs/PAHs, arsenic and manganese. Results from these samples indicated that the concentrations of these constituents were below SRGs, with the exception of benzo(a)pyrene.

The fourth layer in this area was black discolored soil in the western corner of remediation polygon RZ-C-25 (Figures 8c and 8d). After excavation of this soil to approximately 15 ft deep, remaining discolored soil at the bottom of the excavation was sampled. One excavation extent sample (EE-C25-1) was collected of the discolored soil on May 17, 2011. The sample was analyzed for HCB, SVOCs/PAHs, arsenic, and manganese. Results from this sample indicated that concentrations of HCB and arsenic were above SRGs.

The last layer of discolored soil in this area was a dark brown layer under the black layer within the sidewall of RZ-C-22A (Figures 8c and 8d). The layer was found during the removal of a ramp that was installed during excavation activities in the northwest corner of the diesel tank area. The discolored soil was removed at the same time as the ramp. No more than a foot of material was removed from the floor of the excavation within RZ-C-22A. A small amount of material within the northern sidewall could not be excavated due to the presence of the gas line. Upon completion of the excavation, one confirmation sample (CS-C22A-1) was collected from the floor of the excavation of the southern portion of RZ-C-22A on June 23, 2011. This sample was analyzed for arsenic, lead, cobalt, manganese, and perchlorate. Results for this sample indicated that concentrations of these constituents were below SRGs and no further excavation of the area was deemed necessary.

Several ECAs were established in this area, based on the presence of remaining discolored soil and polygon excavation soil, including ECAs C6, C7, C8, C9, and C11 (Figure 9c).

Northern Portion of RZ-C-44

In May 2011, ENVIRON discovered and removed about 0.5 to 1 foot of black/gray discolored soil within the northern sidewall of RZ-C-44 (Figure 8c). The layer was excavated north to the RZ-E/RZ-C boundary. Upon completion of the excavation, one confirmation sample (CS-C44-1) was collected in the floor of the excavation near the western sidewall on May 18, 2011. This sample was analyzed for dioxins, HCB, arsenic, cobalt, and manganese. Results for this sample indicated that concentrations of these constituents were below SRGs and no further excavation of the area was deemed necessary.

RZ-C-45 Stockpile Management Area

Within the southwest portion of RZ-C-45, excavated soils from RZ-C, RZ-D, and RZ-E were stockpiled prior to being hauled offsite (Figure 8c). Following the removal of the stockpiles, a shallow excavation scrape (about six inches deep) was removed from the surface of the western side of RZ-C-45, just south and east of polygon RZ-C-44. During the scrape, patches of black discolored soil were encountered. Some of the smaller patches of discolored soil were removed. Two discolored soil samples (DS-C45-1 and DS-C45-2) were collected from the floor of the scraped area within RZ-C-45 on August 3, 2011 and were analyzed for dioxins, HCB, arsenic, cobalt, and manganese. Results for these samples indicated that concentrations of these constituents were below SRGs, with the exception of arsenic in DS-C45-2, which was

slightly above the SRG. Since the arsenic concentration was only slightly above the SRG, in consultation with NDEP, no additional excavation of the area was deemed necessary.

3.3.3 Discolored Soil Areas in RZ-D

Discolored Soil East of Former Berm in Northwest Corner of RZ-D

Northgate observed and LVP excavated discolored soil east of the former trade effluent pond berm and west of GW-11 between polygons RZ-D-5A and RZ-D-10B in an area they designated as RZ-D-A (Figure 8e). The discolored soil was over 10 ft thick and consisted of a black, dense, greasy texture soil, which began in the northwest corner of the basin and extended south to the southern boundary of RZ-D-8. Following excavation of discolored soil in this area, Northgate collected two confirmation samples (SSAI3-08 and SSAJ3-10) from the bottom of the excavation. The samples were analyzed for dioxins and SVOCs. The results from both samples indicated that concentrations of these compounds were below SRGs and no additional excavation of the area was required.

ENVIRON observed additional discolored soil in this area between the former berm and the GW-11 pond. On April 21, 2011, ENVIRON collected discolored soil samples (DS-DB-1 and duplicate DS-DB-2, and DS-DC-1) from the black discolored soil along the slope of and adjacent to the GW-11 Pond berm. These samples were analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. The results of the samples indicated that concentrations of dioxins, HCB, and magnesium were found to be above SRGs and in May 2011, excavation of the discolored soil to the south to the southern boundary of RZ-D-8 was continued. The bottom of the discolored soil layer contained process debris[6] and construction debris, which were also removed during the removal of the discolored soil layer.

ENVIRON performed a final scrape of the discolored soil removal area between the former pond berm and GW-11 in May and June of 2011, removing six inches to one foot of material from the surface. Three confirmation samples (CS-D10A-1, CS-D10B-1, and CS-DA-1) were collected on June 7, 2011 and were analyzed for dioxins, HCB, and magnesium. Results from the three samples indicated that concentrations were below SRGs and no additional excavation was required in the area.

On June 7th and 9th, 2011, three confirmation samples (CS-D10-1, CS-DB-1, and CS-DB-2) and one duplicate confirmation sample (CS-DB-3) were collected from the floor of the excavation area and were analyzed for dioxins, HCB, and magnesium. The sample results indicated that concentrations of dioxins, HCB, and magnesium were below SRGs and no further excavation was required in the area. Within the berm along the west side of the GW-11 pond, an approximately ten-foot thick section of black, dense discolored soil remains because it could not be excavated without compromising the structure and slope of the pond berm. Three excavation extent samples (EE-D10-1, EE-DB-1, and EE-DB-2) were collect from the black discolored soil on the berm and analyzed for dioxins, HCB, and magnesium. Concentrations of

[6] Process debris is debris on-site that was generated from plant processes and includes bricks, charcoal bricks, concrete, and other construction debris.

magnesium were above SRGs in the three samples. The layer within the GW-11 pond berm was placed within ECA D3, which includes the uncharacterized area beneath the GW-11 and WC ponds and other inaccessible areas beneath the pond berms (Figure 9e). As described in Section 4, the pond berms were later covered with material to reduce exposure to contaminated soils within the pond berms.

Discolored Soil West of Former Berm in Northwest Corner of RZ-D

Four different areas of discolored soil were identified west of the former trade effluent pond berm in the northwest corner of RZ-D (Figure 8e). The first area of discolored soil was identified by Northgate within the northeastern triangular portion of RZ-D-06 and extended into a small section in the south part of RZ-D-02. Following excavation of the discolored soil, Northgate collected one confirmation sample (SSAJ2-07), which was analyzed for dioxins, SVOCs, arsenic, and perchlorate. The results from the sample indicated that concentrations of these compounds were below SRGs and no additional excavation of the area was required.

The second area of discolored soil was found by ENVIRON in the east sidewall, the north sidewall and the bottom of the excavation in RZ-D-06A during final excavation of the polygon (Figure 8e). The discolored soil was a thick (3 to 4 ft), very hard, white, caliche-type material. One discolored soil samples (DS-D06A-1) was collected from the east sidewall of the excavation and was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. Results indicated that concentrations were below SRGs, with the exception of a reported arsenic concentration, slightly above the SRG. In consultation with NDEP, it was determined that no additional excavation of the area was necessary since the samples were more than ten ft below grade and the arsenic concentration was only slightly above the SRG.

The third area of discolored soil was found by ENVIRON in the bottom of the southern end of the RZ-D-06A excavation. The discolored soil was olive green in color and contained more sand than the surrounding material. One discolored soil sample (DS-D06A-2) was collected from the olive green sand and was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. Results indicated that concentrations were below SRGs, with the exception of arsenic, which was slightly above the SRG. Similar to the caliche-type material in this area, in consultation with NDEP, it was determined that no additional excavation of the area was necessary since the samples were more than ten ft below grade and the arsenic concentration was only slightly above the SRG.

The fourth area of discolored soil in this area was found within the northern sidewall of RZ-D-06A, approximately six inches to one foot bgs upon completion of the polygon excavation (Figure 8e). The discolored soil layer was thin (approximately six inches thick), mostly black and gray with some yellow and orange layers, and contained process debris. About halfway through the excavation of the layer, LVP personnel noticed a solvent-type odor within the soil and breathing space. ENVIRON stopped work within the area and recorded a maximum sustained PID reading of 0.1 ppm within the breathing space. Work was allowed to continue since the PID reading was well below 5 ppm. A maximum PID reading of 8.8 ppm was recorded within the stockpiled soil. A total of approximately two ft was excavated from the area just north of RZ-D-06A.

On May 17, 2011, one confirmation sample (CS-D02-1) was collected from the middle of this excavation area and was analyzed for dioxins, HCB, arsenic, and perchlorate.[7] The results indicated that concentrations of these compounds were below SRGs and no additional excavation was needed within the area. A small amount of material remained in place around the high voltage utility pole. Due to NV Energy safety requirements, excavation of the discolored soil stopped within 15 ft of the high voltage utility pole. An excavation extent sample (EE-D02-1) was collected from the discolored soil remaining in place under the utility pole and was analyzed for dioxins, HCB, arsenic, and perchlorate. The results indicated that the sample was above SRGs for dioxins, HCB, and arsenic. Before backfilling of the area, the layer was draped with orange snow fence. Furthermore, this area is included in ECA D1, which covers contaminated soil remaining in proximity to the NV Energy Transmission Line Towers (Figure 9d).

Discolored Soil South of Former Berm in Northwest Corner of RZ-D

Northgate identified and LVP excavated an area of discolored soil from the south boundary line of RZ-D-7 to approximately 80 ft south and from the western property line fence to approximately 120 ft east. A confirmation sample (SSAK2-02) was collected after excavation of the discolored soil. The sample was analyzed for dioxins, SVOCs, arsenic, and perchlorate. The results indicated that concentrations of these compounds were below SRGs and no additional excavation of the area was required.

Additional discolored soil was discovered by ENVIRON field personnel within the sidewalls and on the surface to the east and south of the area that Northgate had previously excavated. Most of the discolored soil in the area was discontinuous black patches on the surface or thin (no more than a few inches) black layers about 1-2 ft bgs. A thicker, approximately 3-foot thick, bright white, hard, chalky layer was found near the western polygon boundary of RZ-D-8. The thickness of the layers varied throughout the entire discolored soil area and most of the discolored soil contained process debris. The discolored soil area extended from the southern boundaries of RZ-D-7 and RZ-D-10A to the northern boundary of RZ-D-12 and from the western property line fence to the western edge of the GW-11 Pond (Figure 8e).

On April 21, 2011, one discolored soil sample (DS-DC-1) was collected from the thick, white, chalky layer along the western boundary of RZ-D-8 and was analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. Results indicated that the sample was above the SRG for HCB. As a result, further excavation of the area was performed, working from the west to the east, generally within the upper five ft bgs.

On May 3, 2011, three confirmation samples (CS-DC-1, CS-DC-2, and CS-DC-3) were collected from the western half of the discolored soil area (Figure 8e). These samples were analyzed for dioxins, HCB, SVOCs/PAHs, arsenic, lead, cobalt, manganese, magnesium, and perchlorate. Results indicated that all reported concentrations were below SRGs, with the exception that the

[7] Analysis of this confirmation sample for VOCs was not deemed necessary since PID readings from soil removed were low (less than 10 ppm) and PID readings over the surface of soil left in place following removal were not reported above 0 ppm.

dioxin TEQ value from sample CS-DC-3 was above the SRG for dioxin, resulting in an additional 0.5 to 1 foot scrape of the area from west of the sample location east, to near the edge of GW-11 Pond. After the additional excavation of the area, two additional confirmation samples (CS-DC-4 and CS-D08-1) were collected on June 2, 2011 and June 7, 2011, respectively, and were analyzed for dioxins (CS-DC-4 and CS-D08-1), HCB (CS-D08-1), and magnesium (CS-D08-1). Results from both confirmation samples were below SRGs and no further excavation of the area was necessary.

A small amount of discolored soil was left in place near one of the high voltage power lines. This area is included in ECA D1, which covers contaminated soil remaining in proximity to the NV Energy Transmission Line Towers (Figure 9d).

Gray Layer Near Remediation Polygons RZ-D-11 through -14

A thin, gray layer was found in the bottom of the excavation for remediation polygon RZ-D-11B, the southern sidewall of RZ-D-11B, and the southern and western sidewalls of RZ-D-14 after remediation polygon excavations were completed to design depths (Figure 8e). The thickness of the layer ranged from a couple of inches to about three ft thick. The observed discolored soil was gray, ashy in texture, and was mixed with small white and black debris, less than three inches in diameter. This discolored soil layer was extensive, beginning at the northwest boundary of RZ-D-14 and continuing south/southeast towards the Beta Ditch and extending from the former railroad tracks to RZ-D-11B in width. Based on test pits and sampling, this layer may also be the same gray layer found in the northern sidewalls of the western polygons of RZ-E.

Two discolored soil samples were collected from the gray layer. The first sample (DS-D11B-1) was collected within the western sidewall of RZ-D-11B and analyzed for dioxin and HCB, while the second sample (DS-D14-1) was collected within the southern sidewall of RZ-D-14 and analyzed for dioxins, HCB, and OCPs. Laboratory results indicated that DS-D14-1 had reported concentrations of dioxins, HCB, and OCPs above SRGs; however, reported concentrations of dioxins and HCB in DS-D11B-1 were below SRGs. Three discolored soil samples (DS-C39B-1, DS-D27-1, and DS-D27-2) were also collected from the gray layer north of the western polygons within RZ-E, which is presumed to be the same as the gray layer in the RZ-D-11/14 area. The samples were analyzed for dioxins, HCB, arsenic, lead, manganese, magnesium, and OCPs and reported concentrations of these constituents were below SRGs.

Since the concentrations of some compounds in sample DS-D14-1 were above SRGs, the gray layer was excavated from the south boundary of remediation polygon RZ-D-14 to the edge of the asphalt site road and from the western boundary line of RZ-D-14 to the eastern boundary line of RZ-D-12. The gray layer was also removed between the adjacent asphalt parking lot and RZ-D-13. An approximate thickness of one to three ft of material was removed from the entire area.

The remaining material extending to the south of the nearby fence line and under the site road was left in place, in consultation with NDEP. The exposed material within the sidewalls near the site road and asphalt parking lot was draped with orange snow fence and then covered with 3:1

slopes. ECA D2 was established for the area where remaining discolored soil material was left in place beneath the site road and asphalt parking area.

RZ-D-17B Area

A layer of discolored soil was uncovered within an exposed sidewall during final grading and backfilling in the area of remediation polygon RZ-D-17B (Figure 8e). The discolored soil layer was black and about 6 inches thick. The layer was not sampled because the maximum extent was limited based on previously excavated surrounding polygons. The layer was excavated in an "L" shape that was approximately ten ft wide and extended 50 ft south to north (along the east polygon boundary) and 75 ft east to west (along the north polygon boundary). An approximate thickness of five ft of material was removed from the RZ-D-17B area.

One confirmation soil sample (CS-D17B-1) was collected from the bottom of the excavation, near the hinge point of the "L", following removal of the discolored soil. The sample was analyzed for dioxins and HCB. The results indicated the concentrations of HCB were above the SRG; therefore, additional excavation of the area was warranted. To determine the depth of the additional excavation, a test pit was dug in the location of the confirmation sample and additional samples were taken from 1.5 to 2 ft bgs (CS-D17B-2; analyzed for HCB), 3 to 3.5 ft bgs (CS-D17B-3; placed on hold at laboratory), and 4.5 to 5 ft bgs (CS-D17B-4; placed on hold at laboratory). The analytical results for CS-D17B-2 confirmed that the concentration of HCB was below the SRG, which indicated that only two additional ft of material needed to be excavated from the area. The additional two ft of material were excavated in the beginning of July 2011. Backfilling continued as planned following the additional excavation of material within RZ-D-17B.

Berm Northeast of RZ-D-23/24

In March 2011, discolored soil was identified within the berm located to the northeast of remediation polygons RZ-D-23, -23A, and -24 in the northeast corner of RZ-D (Figures 8e and 8f). On April 5, 2011, test pits were dug along the berm to determine the extent and characteristics of the layer. The discolored soil layer was gray, ashy in texture, about 3 to 4 inches thick, and draped over the side of the berm about a foot bgs. On April 21, 2011, one characterization soil sample (DS-D23-1) was collected from the gray layer in the middle of the berm and analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese, and magnesium. The results of the sample indicated concentrations of dioxin, HCB, and magnesium in the discolored soil layer were above SRGs. Excavation of the layer began in mid-June and required the removal of an area about 15 ft wide by 2-3 ft deep which extended the entire length of the berm. Upon completion of the excavation, four confirmation samples (CS-D23-1, CS-D23-2, CS-D23-3, and CS-D23-4) were collected approximately every 150 ft along the berm. The sample results from all four confirmation samples indicated that the concentrations of dioxins, HCB, and magnesium were below SRGs and no further excavation of the area was necessary.

Due to high concentrations of dioxins and HCB in the initial characterization sample of the discolored soil from the berm, the soil excavated from this area was stockpiled separately and characterized for disposal under its own waste profile. To characterize the stockpiled material, four 4-point composite samples (SP-D23-1A, SP-D23-1B, SP-D23-1C, and SP- D23-1D) were

collected, with one composite sample from each of the four quadrants of the stockpile. The samples were composited at the laboratory and analyzed for HCB, TCLP SVOCs, RCRA 8 metals, reactive cyanide, reactive sulfide, PCBs, and sulfur. The stockpile analytical results were submitted to Republic Services, which provided an approved waste profile (3825 11 11172) for the soil.

Southwest of RZ-D-24

In May 2011, a gray/black layer was discovered in the southwestern sidewall of RZ-D-24 about two ft bgs (Figures 8e and 8f). To determine the extent of the layer, a trench was dug, moving southwest from the southwestern boundary of RZ-D-24, until the discolored soil was not observed. Following the digging of the trench, the area was excavated approximately twenty ft to the southwest to a depth of about two to three ft for the first ten ft and to a depth of about one foot for the last ten ft.

On June 8, 2011, one confirmation sample (CS-D24-1) was collected from the base of the excavation area and was analyzed for dioxins and arsenic. The results of the sample indicated that concentrations of dioxins and arsenic were above SRGs. To determine the depth of the additional excavation needed, a test pit was dug in the location of the confirmation sample and additional samples were collected from 1.5 to 2 ft bgs (CS-D24-2), 3 to 3.5 ft bgs (CS-D24-3), and 4.5 to 5 ft bgs (CS-D24-4). Initially, only CS-D24-2 was analyzed for dioxins and arsenic; however, since the results indicated that those constituents' concentrations were above SRGs, the next deeper sample CS-D24-3 was also analyzed for dioxins and arsenic. The analytical results for CS-D24-3 confirmed that the concentration of dioxins and arsenic were below SRGs, which indicated that only 3.5 additional ft of material needed to be excavated from the area. The additional 3.5 ft of material were excavated on July 20, 2011.

Discolored Soil and Debris Northwest of RZ-D-25A

In May 2011, discolored soil was observed along the northwest sidewall of remediation polygon RZ-D-25A. The discolored soil was dark brown to black in color and contained construction debris (concrete, rebar, wood). The discolored soil layer was located in the top approximately two ft of the sidewall. The debris and discolored soil were excavated in the northwest corner of RZ-D-25A and in the northeast corner of RZ-D-25 until only small, isolated patches of discolored soil and construction debris remained. Test pits were advanced to a depth of two to three ft in an area five to ten ft north of the discolored soil. No additional discolored soil was observed in these test pits.

On June 8, 2011, one confirmation soil sample (CS-D25-2) was collected and analyzed for dioxins and arsenic. The sample results indicated that concentrations of these constituents were below SRGs and no further excavation of the area was necessary. However, additional material was removed from this area when a deeper discolored soil layer was removed from the RZ-D-24/25/25A area, as discussed below.

RZ-D-24/25/25A Area

In May 2011, discolored soil was observed along the southern sidewall of RZ-D-24. The discolored soil was dark black when first exposed; however, the soil became gray and chalky when exposed for a period of time. The layer was approximately four inches thick at a depth of approximately three to four ft. This layer was followed and removed to the southeast approximately five to ten ft until it was six inches to one foot thick and approximately five ft deep. To further evaluate the extent of the discolored soil, two trenches were advanced, including one to the southeast and one to the south. The thick black layer continued the full extent of the trenches, and the layer was followed an additional ten ft to the south/southeast. The layer continued to extend deeper as it trended to the south/southeast.

On June 8, 2011, two soil samples were collected, including one to evaluate concentrations of chemical constituents in remaining soil following removal of discolored soil (CS-D25-1) and one of the dark black layer which was expected to remain in place (EE-D25-1). These samples were analyzed for dioxins and arsenic. The analytical results indicated that the concentration of arsenic in CS-D25-1 was above the SRG. The concentrations of both arsenic and dioxins were above the SRGs in EE-D25-1.

In late June 2011, a second, shallower layer of discolored soil was observed along the southwestern sidewall of the open discolored soil removal area excavation. This discolored soil was two inches thick, gray-brown in color, and precipitated a white crystalline material after a period of exposure. On June 30, 2011, one soil sample (EE-D25-2) was collected from this layer and analyzed for dioxins and arsenic, both of which were reported at concentrations above SRGs. Available analytical results were discussed with NDEP during a site visit in July 2011. At the request of NDEP, discolored soil excavation in this area was continued. The deep layer was excavated to the southeast into polygon RZ-D-25A, up to the eastern property boundary. The shallow layer extended a short distance and was removed as the lower layer was excavated.

Following removal of all discolored soil in this area, five soil samples (CS-D25A-1, CS-D25A-2, CS-D25A-3, EE-D25A-2, and EE-D25A-3) were collected on August 3, 2011 and analyzed for dioxins and arsenic. Analytical results for CS-D25A-1 and CS-D25A-3 indicated that concentrations of these constituents were below SRGs. Results for CS-D25A-2 showed concentrations of dioxins and arsenic slightly above SRGs. Given the significant depth of the excavation, analytical results indicating concentrations of these constituents were only slightly above SRGs, and that this area would be backfilled with approximately 10 ft of clean backfill soil, in consultation with NDEP, no additional excavation of the area was deemed necessary. Results for EE-D25A-2 and EE-D25A-3 (duplicate for EE-D25A-2) had reported concentrations of dioxins and arsenic above SRGs. Since these samples were located within the discolored soil remaining at the property line, they were left in place. The bottom of the excavation around CS-D25A-2 and the sidewall with discolored soil at the eastern property boundary were draped with orange snow fence. Based on the reported dioxin and arsenic concentrations in soil sample CS-D25A-2, ECA D9 was established to cover the presumed extent of impacted soil in this area.

Southwest of RZ-D-25A

In May 2011, a black discolored soil layer, approximately one to two ft thick, was discovered in the southwestern sidewall of RZ-D-25A about one foot bgs (Figures 8e and 8f). Given the close proximity to extraction well I-AC, additional discolored soil excavation could not be performed in this area. On May 18, 2011, one excavation extent sample (EE-D25A-1) was collected from the sidewall of the RZ-D-25A polygon excavation and analyzed for dioxins and arsenic. The results of the sample indicated that the concentration of arsenic was above the SRG; however, the dioxin TEQ value was below the SRG. The sidewall of the excavation with discolored soil was draped with orange snow fence. Since discolored soil was observed in this area and given the reported arsenic concentrations in the sample from this area, ECA D10 was established to cover the presumed extent of impacted soil in this area.

Within RZ-D-31A

In August 2011, black discolored soil was observed on the bottom of the previously excavated remediation polygons RZ-D-31A and RZ-E-15 (Figures 8e and 8h). The discolored soil was excavated to a depth of approximately 4 ft below the bottom of the remediation polygons in a north-south trending trench, approximately 8 ft wide. On August 31, 2011, one confirmation soil sample (CS-D31A-1) was collected from the base of the excavation area and was analyzed for dioxins, HCB, SVOCs, arsenic, OCPs, and perchlorate. The results of the sample indicated that concentrations of these constituents were below SRGs, with the exception of a reported arsenic concentration slightly above the SRG. In consultation with NDEP, it was determined that no additional excavation of the area was necessary since the arsenic concentration was only slightly above SRGs.

3.3.4 Discolored Soil Areas in RZ-E

Gray Layer along Western Portion of RZ-E

A continuous gray/brown layer was found within the northern sidewall of remediation polygons RZ-E-03, -04, and -06, the southern sidewall of remediation polygons RZ-E-03A and -04, as well as in the western sidewall of polygon RZ-E-05 (Figure 8g). Test pits were advanced north and south of this area to determine the extent of the layer. The discolored soil was found at shallow depths to the north into RZ-D and to the south into RZ-C. The layer had an ashy texture, was approximately two to six inches thick, and the depth ranged from the ground surface to approximately two ft bgs. To characterize the gray/brown layer, three characterization samples (DS-C39B-1, DS-D27-1, and DS-D27-2) were collected and analyzed for dioxins, HCB, arsenic, lead, manganese, magnesium, and OCPs. The results from the samples indicated that concentrations of these constituents were below SRGs and it was concluded that removal of the discolored soils was not warranted.

Central Portion of RZ-E

During excavation activities, discolored soil was observed in the central portion of RZ-E, particularly in the area just north and east of the Veolia BT tanks. In March 2011, dark grey/black discolored soil was observed along the south sidewall of RZ-E-10 and -12, and within

adjacent remediation polygons RZ-E-08B and -11. Due to excavation of adjacent polygons, this sidewall formed a ridge along the south side of the former Beta Ditch. Discolored soil within this ridge was removed, from the east edge of the BT tanks extending toward the east.

On May 4, 2011, three confirmation samples (CS-E08B-1, CS-E11-1, and CS-E11-2) were collected and analyzed for dioxins, HCB, arsenic, lead, OCPs, and perchlorate. The analytical results for CS-E08B-1 and CS-E11-2 indicated concentrations of these constituents were below SRGs, indicating that no further excavation was necessary in those areas. Analytical results for sample CS-E11-1 indicated that concentrations of dioxins, HCB, OCPs, and perchlorate were above SRGs, and thus additional excavation was warranted in this area. Based on consultation with NDEP, a removal area consisting of the remaining berm was agreed upon. The remaining portion of the berm in this area was removed during July 2011. On July 19, 2011, a confirmation soil sample (CS-E11-3) was collected in the additional removal area and analyzed for dioxins, HCB, OCPs, and perchlorate. The analytical results for this sample indicated that concentrations of these constituents of concern were below SRGs, indicating that no further excavation in this area was warranted.

In May 2011, a thin gray layer was observed in the north sidewall of RZ-E-09, the south sidewall of RZ-E-08A, near a concrete culvert at the east end of RZ-E-09, and along the east side of the BT Tanks in remediation polygons RZ-C-30 and -30A. Accessible discolored soil from these areas was removed during June 2011; however, some discolored soil could not be removed due to concerns of stability of the berm for the adjacent AP-5 pond and the concrete containment structure for the BT Tanks. Due to the physical obstructions, discolored soil remains in the AP-5 berm and adjacent to the north and east sides of the concrete containment structure surrounding the BT tanks. These areas are included in ECAs D8 and C16, respectively (Figure 9e).

On May 4, 2011, four samples (CS-E08A-1, EE-E08A-1 and duplicate sample EE-E08A-2, and EE-E09-1) were collected from RZ-E and analyzed for dioxins, HCB, arsenic, lead, OCPs, and perchlorate. The analytical results for the confirmation sample (CS-E08A-1) indicated that concentrations of these constituents were below SRGs and, thus, excavation was considered complete in that area. The analytical results for excavation extent samples EE-E08A-1 and EE-E08A-2 indicated that concentrations of dioxins, HCB, arsenic, OCPs, and perchlorate were above SRGs. The results for excavation extent sample EE-E09-1 indicated that concentrations of OCPs were above SRGs. These discolored soils, along with additional remediation polygon soils, that could not be removed due to structural concerns are included in ECA C16 (Figure 9e).

In the adjacent RZ-C, following removal of these discolored soils on the east side of the BT Tanks, an additional confirmation sample (CS-C30-1) was collected on May 4, 2011 and analyzed for dioxins and perchlorate. Analytical results for this sample indicated that concentrations of both dioxins and perchlorate were above SRGs. Due to the presence of the BT Tanks containment structure, further excavation could not be performed in this area without compromising the structure; therefore, this sample provides analytical results at the extent of the excavation. This area is also included in ECA C16 (Figure 9e).

RZ-E-13/14/14B Area

In April 2011, black and orange/rust colored soil was observed in the western sidewalls of RZ-E-13, -14, -14B, and at the bottom of the remediation polygon RZ-E-13. In addition, soil with white precipitate was observed in the bottom of RZ-E-14B (Figures 8g and 8h). Excavation within polygons was performed to within five ft of the Tronox process water pipelines in the area; further excavation toward the west in these polygons was limited by the presence of the pipelines.

On June 2, 2011, four samples (CS-E14B-1, EE-E14B-1 and duplicate EE-E14B-2, EE-E14-1) were collected and analyzed for dioxins, HCB, arsenic, and perchlorate. The analytical results for the confirmation sample (CS-E14B-1) collected from the bottom of the excavated area indicated that concentrations of these constituents were all below SRGs. The analytical results for the three excavation extent samples (EE-E14B-1, EE-E14B-2, and EE-E14-1) indicated that concentrations of dioxins, HCB, and arsenic were above SRGs. ECA E2 includes the area where discolored soil and remediation polygon soil remains beneath and adjacent to Tronox process water lines (Figure 9e).

North Sidewall of RZ-E-14C

In June 2011, black discolored soil was observed in the northern sidewall of remediation polygon RZ-E-14C. The discolored soil was excavated from the sidewall until no longer observed or until inaccessible (due to Tronox process water lines). ECA E2 includes the area where discolored soil and remediation polygon soil remains beneath and adjacent to Tronox process water lines (Figure 9e). On June 2, 2011, two samples (CS-E14C-1 and EE-E14C-1) were collected and analyzed for dioxins, HCB, SVOCs, arsenic, OCPs, and perchlorate. The analytical results for both samples indicated that concentrations of these constituents were below SRGs; therefore, additional soil removal in this area was not warranted.

Subsurface Tank Structures in RZ-E-14A Area

In April 2011, red-brown to black discolored soil was observed at the southeastern end of remediation polygon RZ-E-14A. As excavation continued, concrete and rebar belonging to two large subsurface tank structures (approximately 16 ft in diameter and nine ft deep) were encountered. The subsurface tank structures were surrounded by black discolored soil, and soil in the bottom of each structure was odorous and heavily discolored. Elevated PID readings of organic vapors, as high as approximately 700 ppm, were recorded in soil headspace samples.

On April 25, 2011, two characterization soil samples were collected, including one from within the eastern structure (DS-E14A-1) and one from within the western structure (DS-E14A-2). These samples were analyzed for dioxins, HCB, arsenic, lead, cobalt, manganese, magnesium, OCPs, RCRA 8 metals, SVOCs, and VOCs. The analytical results indicated that concentrations of dioxins, HCB, arsenic, and VOCs were above SRGs in the sample DS-E14A-1 and concentrations of dioxins, arsenic, magnesium, and VOCs were above SRGs in the sample DS-E14A-2. The structures and surrounding discolored soil were completely excavated, with the exception of a black soil seam along the southwestern edge of polygon RZ-E-14A due to the

presence of the Tronox steam line. The excavation of the tanks extended beyond the design depth of RZ-E-14A and extended south to the RZ-E/RZ-C boundary.

On May 18, 2011, three samples (CS-E14A-1, CS-E14A-2, and EE-14A-1) were collected and analyzed for dioxins, HCB, arsenic, magnesium, and VOCs. An additional confirmation soil sample (CS-C44-1) was collected in the area excavated to the south (in RZ-C) and analyzed for dioxins, HCB, arsenic, cobalt, and manganese. The analytical results for CS-C44-1 and the sample collected at the western structure (CS-E14A-2) indicated that concentrations of the constituents tested were below SRGs; therefore, no additional excavation was warranted in these areas. The analytical results for the sample collected at the eastern structure (CS-E14A-1) indicated that concentrations of dioxins and HCB were above SRGs, so an additional four ft of soil were excavated in this area. On June 2, 2011, an additional confirmation sample (CS-E14A-3) was collected after the secondary excavation and analyzed for dioxins and HCB. The analytical results for this sample indicated that concentrations were below SRGs, confirming that no further excavation was warranted in this area. The analytical results for excavation extent sample EE-14A-1 indicated that concentrations of constituents tested were below SRGs, with the exception of the dioxin TEQ value, which was reported above the SRG. This area of discolored soil remaining in place, along with remediation polygon soil from RZ-C-44 that could not be excavated, is included within ECA C13 (Figure 9e).

Due to elevated concentrations of dioxins, HCB, arsenic, magnesium, and VOCs in the initial discolored soil characterization samples collected from this area, the material excavated from the RZ-E-14A subsurface tank area was stockpiled separately and disposed of under its own waste profile. To characterize the stockpiled material, eight 4-point composite samples (stockpile #1: SP-E14A-1A, SP-E14A-1B, SP-E14A-1C, SP-E14A-1D; and stockpile #2: SP-E14A-2A, SP-E14A-2B, SP-E14A-2C, SP-E14A-2D) were collected from each of the four quadrants of two stockpiles and analyzed for TCLP barium/chromium, TCLP VOCs, TCLP SVOCs, TCLP pesticides, reactive cyanide, reactive sulfide, PCBs, and sulfur. The stockpile analytical results were submitted to Republic Services, which provided an approved waste profile (3825 11 11171) for the soil.

South of RZ-E-14C

In July 2011, an area approximately two ft bgs and three ft wide containing concrete debris and rebar and underlain by dark brown to black discolored soil was observed in the southern sidewall during site grading in the area. The debris and discolored soil were removed toward the south in an area where final grading for a drainage channel was to be performed. Gray/green to dark brown soil was also scraped from the surface along the excavation area, just west of the former adjacent process water pond.

On July 21, 2011, one confirmation soil sample (CS-E14C-2) was collected from the excavation floor where discolored soil was removed. This sample was analyzed for HCB, arsenic, lead, and manganese. The analytical results for the sample indicated concentrations of these constituents were below SRGs, following which site grading activities were continued. On July 28, 2011, a characterization soil sample (DS-E14C-1) of the discolored soil still in place was collected from the southern sidewall of the excavation that remained. This sample was analyzed for HCB, arsenic, lead, and manganese. The analytical results for the sample

indicated concentrations of these constituents were below SRGs. In consultation with NDEP, it was agreed that no further excavation of discolored soils was warranted in this area.

Southern Sidewall of RZ-E-16

In April 2011, a dark gray to black layer approximately one foot thick was observed in the southern sidewall of remediation polygon RZ-E-16 and extending into RZ-C, at a depth of approximately six to eight ft bgs. On April 14, 2011, a characterization soil sample (DS-E16-1) of the discolored soil was collected and analyzed for dioxins, HCB, SVOCs, arsenic, lead, manganese, magnesium, OCPs, and perchlorate. The analytical results indicated that concentrations of HCB, arsenic, lead, and manganese were above SRGs. Discolored soil was removed first from RZ-C, then from the sidewall of RZ-E-16. Due to the depth of the layer, clean overburden (down to approximately four ft bgs) was retained for use as backfill material on-site. On June 2, 2011, a confirmation soil sample (CS-E16-1) was collected and analyzed for HCB, arsenic, lead, and manganese. The analytical results of this sample indicated concentrations of these constituents were below SRGs.

Within RZ-E-15

Discolored soil was observed in remediation polygon RZ-E-15, along with that observed in remediation polygon RZ-D-31 (Figures 8g and 8h). A discussion of how the discolored soil in polygon RZ-E-15 was evaluated and remediated is provided above in the discussion of the discolored soil from polygon RZ-D-31.

3.4 Summary of Soil Remediation Program

The soil remediation program work took place at the Site from August 2010 through October 2011. During this time, contaminated Site soil was excavated and disposed of at Apex, operated by Republic Services, Inc. Areas of the Site were backfilled and graded with clean fill from on- and offsite sources. During onsite work, health and safety procedures were performed according to the *Health and Safety Plan for Well Installation and Subsurface Investigation and Remediation of Soils and Groundwater* (Northgate, 2010j) and the *Health and Safety Plan: Soil Remediation* (ENVIRON, 2011a), and air monitoring was performed in general conformance with the *Perimeter Air Monitoring Plan for Phase B Soil Remediation of Remediation Zones RZ-B through RZ-E*, revised on May 28, 2010 (Northgate 2010d).

Excavation and backfill quantities are provided in Table 6. An estimated total of 567,770 cy of contaminated Site soil (not including ACM) was removed from the Site and disposed of during the soil remediation program work. Approximate volumes of soil removed from each RZ, including both remediation polygon soils and discolored soils, are as follows:

- RZ-B: 23,196 cy
- RZ-C: 181,564 cy
- RZ-D: 308,557 cy
- RZ-E: 54,453 cy

An estimated 11,026 cy of asbestos-containing soil and 1,419 LF of ACM piping were also removed and disposed of as a part of the soil remediation program, including the following RZ totals:

- RZ-B: 87.5 LF of pipe
- RZ-C: 449.15 LF of pipe and 131 cy of soil
- RZ-D: 882 LF of pipe
- RZ-E: 10,895 cy of soil

Thirty-eight (38) ECAs were established following the remediation program, including 7 in RZ-B, 18 in RZ-C, 10 in RZ-D, and 3 in RZ-E. Figures 9a through 9e show the locations of all established ECAs, along with locations of remediation polygon soils and discolored soils left in place, indicating why each of the ECAs was identified.

In RZ-B, 14 polygons had inaccessible areas and were not excavated to design extent, resulting in 7 ECAs (Figure 9b). In RZ-C, approximately 40 polygons were partially inaccessible and were not excavated to design extent, approximately 12 of which also had discolored soils present. Discolored soil was also left in place in one area outside remediation polygons, and two areas in RZ-C had large areas which remain largely uncharacterized (due to the presence of the pond MN-1 and the Tronox leach plant, which have been obstructions to sampling in these areas). In total, 18 ECAs were established in RZ-C (Figure 9c). In RZ-D, approximately 20 polygons had inaccessible areas and were not excavated to design extent, resulting in 6 ECAs. An additional 3 ECAs in RZ-D were established due to the presence of discolored soil or slightly elevated dioxin results in areas with physical limitations to excavation. One additional ECA was established in RZ-D for a largely uncharacterized area (the WC and GW-11 ponds) (Figure 9d). In RZ-E, 10 polygons had inaccessible areas and were not excavated to design extent, 7 of which also had discolored soils present, resulting in 3 ECAs (Figure 9e).

Table 7 provides a tabular summary of each of the identified ECAs including: 1) ECA area descriptions; 2) the rationale for proposing each ECA; 3) the engineering controls currently in place; 4) the expected depth of contamination; and 5) the COPCs associated with each ECA. Further descriptions of each of the ECAs is provided in the report *Summary of Excavation Control Areas (ECAs): Areas of Known Soil Contamination Left In-Place*, dated December 2011 (ENVIRON, 2011d).

A total of 208,571 cy of clean fill were purchased from offsite sources for use in backfill and grading activities. Types and quantities of specific materials are as follows:

- Chat (crushed limestone, with grain size of 3/8-inch diameter or less): 113,678 cy
- Portable aggregate (alluvium, with grain size of 6-inches diameter or less): 94,893 cy

Further information regarding backfilling and grading activities is provided in Section 4.

4 Site Restoration

4.1 Development of Grading / Drainage Plans

The existing storm water management design for the Site was developed in accordance with the May 2010 RAW (Northgate, 2010c), the storm water discharge permit issued by NDEP, and the grading permit issued by Clark County. The Storm Water Pollution Prevention Plan (SWPPP), included as part of the May 2010 RAW (Northgate, 2010c), specified the use of three retention basins to contain storm water runoff at the Site. After additional review and discussions with NDEP, the design was modified to include only the central and northeast basins.

A preliminary technical drainage study was performed by RCI in October 2010, as included in Appendix K. Some of the assumptions regarding flows onto the Site in this initial study have changed. An updated drainage study, based on grading performed to date, is presently being prepared and will be submitted to NDEP and Clark County when completed. It is not anticipated that the results of the drainage study would necessitate further changes to site grades.

4.2 Final Grading Plan

Plate 3 shows the final grading plan. Due to existing roads, utility berms, or other Site features, many of the areas identified have grades inward which will keep storm water from flowing out of the area. Based on the surface areas and soil types, significant ponding is not expected to occur in these areas outside of major storm events. In addition, two main designated retention basins were constructed at the Site, as shown on Plate 3, including the following:

- Central Retention Area – Surface runoff from the off-Site area identified as C5 and from the majority of the storm sewer network within the Tronox leased area is directed to the Central Retention Area. Storm water also enters the Site from the west through surface flow, which is collected in the on-site conveyance trench that flows into the Central Retention Area.
- Northeast Retention Area (also called Retention Area D) – Surface runoff from north of the former Beta Ditch (Areas identified as D2 and D3) is directed to the Northeast Retention Area. This retention area also accepts overflow from the Central Retention Area during major storm events, through a channel constructed along the eastern side of the Site.

4.3 Erosion and Dust Control Measures

In accordance with the Storm Water Pollution Permit and Dust Permit issued to LVP for the construction activities, the following procedures were followed at the Site:

- Silt fencing was installed around the perimeter of the Site.
- Access to the Site was controlled with perimeter fencing with fully manned entrance gate open only during working hours.
- Traffic patterns were clearly established and enforced to route traffic over installed trackout rock.
- Prior to daily activities, water was applied throughout traffic areas to minimize dust generation.

- All construction areas were pre-watered and maintained in a stabilized condition during any activity.
- Vehicle speeds were limited to 15 miles per hour in the staging area and on all unpaved access routes.

4.4 Backfill Methods

JCA was subcontracted by ENVIRON to perform backfill placement oversight and soil compaction testing. The Final Grading Observation and Testing Report prepared by JCA is attached as Appendix L.

Prior to soil fill placement, LVP removed all vegetation, organic material, debris, and loose soil materials from areas to receive backfill. Onsite native soils and imported soils were used as backfill material. Imported fill materials were transported to the Site from LVP's Apex Pit, located approximately 23 miles northeast of the Site, and northeast of Las Vegas, Nevada, and from Portable Aggregate's Eldorado Pit, located approximately 9 miles southeast of the Site, and west of Boulder City, Nevada. Fill materials were placed in approximate 8-inch lifts, moisture conditioned, and compacted to a minimum of 90 percent of maximum dry density and within 3 percent of optimum moisture content.

Field density and moisture content were determined with a nuclear density gauge during site grading, in general accordance with ASTM 02922 test method. Approximate elevations and locations of the tests performed were referenced from survey elevations provided by LVP.

Based on their field observations, JCA concluded that preparation, placement and compaction of fill were performed in accordance with the geotechnical recommendations.

4.5 Barrier Wall

A bentonite-slurry barrier wall (approximately 1,600 ft long, 60 ft deep, and 3 ft wide) was installed in 2001 to enhance groundwater capture associated with the groundwater treatment system. During excavation activities of the conveyance ditch between the central and northeast retention areas, the contractor encountered the top of this existing slurry barrier wall. The design grade of the trench area at this location was approximately the same elevation as the top of the slurry wall (1739 ft msl).

To prevent any erosion of the slurry wall and to maintain the surface integrity where the trench crosses the slurry wall, an additional 5-foot cross section of the slurry wall was removed in this area. Geotextile fabric was then placed at that elevation and on-site fill material was used to backfill up to the trench design grade. The fill was placed in lifts and compacted as described in Section 4.4. The historical high groundwater level in this area since 2005 was approximately 1725 ft msl which would be approximately nine ft below the fabric and compacted fill. Figure 10 depicts the repair to the slurry wall.

4.6 Pond Berm Cover

Soils within the berm of the existing ponds (WC and GW-11) at the Site contained COPCs above SRGs. Soils within the berm could not be excavated as part of the on-going soil remediation program at the Site due to concerns related to the berm's structural integrity.

Therefore, in order to address direct contact risk concerns related to COPCs remaining at the Site, NDEP required that the berm soils be covered.

The berm cover material consisted of cement treated base (aggregate) (CTB). CTB is a mixture of aggregate material combined with measured amounts of portland cement and water that hardens after compaction and curing to form a durable paving material. The berm cover was placed in areas which were initially designated as polygon remediation areas, but could not be excavated, as well as where discolored soil remains in place on the west side of GW-11. For the WC ponds, this includes the east and south sides of the ponds.

Prior to placing the CTB, the existing slopes were prepared, which included removal of existing rock where necessary and reshaping/smoothing the slope to allow for a smoother placement of the CTB. To place the CTB, aggregate was loaded into a feed hopper by means of a front-end loader. A variable speed belt feeder brought the material from the hopper at a uniform rate and transferred it into the mixer. The cement was metered from the overhead storage silo. Water was drawn from the lower storage tank and metered by a variable speed, positive displacement pump system to the mixing chamber. The material was then placed onto the slope using a movable conveyor.

The berm cover material consisted of 4-6 inches of CTB which was shaped by hand after conveyor placement. In addition to limiting direct contact to underlying soils, the CTB cover should provide some degree of erosion control. The CTB was placed to allow storm water to drain off the top of the berms. The locations where CTB were placed are shown in Figure 11 and typical cross-sections of the CTB placement are shown in Figure 12.

4.7 Site Closeout and Demobilization

Upon completion of excavation activities, LVP performed equipment/vehicle washing to remove brown staining which had accumulated on the equipment/vehicles, prior to demobilization of equipment from the Site. The washing was performed following and separate from decontamination of the equipment in established exclusion zones. Accumulated dirt and excess grease on equipment were previously removed as part of the decontamination at each exclusion zone (grease is collected for offsite disposal). For the final wash to remove brown staining, the equipment was placed on asphalt and cleaned using a pressure washer, a biodegradable soap, and physical scrubbing. Wash water was collected in a plastic-lined depression (filled with trackout rock) adjacent to the asphalt. Wash water was allowed to evaporate from the collection area. Upon completion of the equipment washing activities, the trackout rock and plastic lining were removed from the Site and disposed at Apex.

After the majority of grading and backfilling activities were completed, the area experienced a large rainfall event (approximately 1.1 inches of rain in just under 1 hour). The rainfall runoff created areas of erosion at various locations throughout the Site. Following the storm, areas which experienced major rills and erosion were re-graded and enhanced by the installation of directional berms to move runoff to designated energy dissipating channels into adjacent drainage channels or retention basins. These higher flow channels were constructed using a nonwoven geotextile fabric covered by angular stone.

Prior to demobilization from the Site, all silt fencing placed as part of the SWPPP was removed. To assist in the control of long term dust generation, the non-paved roadways were improved with a 6-8-inch layer of chat material which was compacted and graded. In addition, any areas of disturbed soils were completely wetted down to assist in forming a protective crust. The Site continues to have access limited by perimeter fencing.

Upon completion of the Site activities, all of the equipment and ancillary operations such as office trailers, portable toilets and storage units utilized by LVP were removed from the Site.

5 References

Ecology and Environment. 1982. *Summary and Interpretation of Environmental Quality Data, BMI Industrial Complex, Henderson, Nevada.* November.

ENSR-AECOM. 2006. *Phase A Source Area Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada.* September.

ENSR-AECOM. 2008. *Phase B Source Area Investigation Work Plan, Tronox LLC Facility, Henderson, Nevada.* April.

ENSR. 2005. *Conceptual Site Model, Kerr-McGee Facility, Henderson, Nevada.* February.

ENVIRON. 2011a. *Health and Safety Plan: Soil Remediation; Nevada Environmental Response Trust Site; 560 West Lake Mead Parkway; Clark County, Nevada.* February 18. Revised April 6.

ENVIRON International Corporation (ENVIRON). 2011b. *Workplan for Evaluation of Discolored Soil and Confirmation Soil Sampling in Visually-Impacted Areas.* April 18.

ENVIRON. 2011c. *Site Management Plan (SMP), Nevada Environmental Response Trust Site, Clark County, Nevada.* December.

ENVIRON. 2011d. *Summary of Excavation Control Areas (ECAs): Areas of Known Soil Contamination Left In-Place.* December.

Nevada Division of Environmental Protection (NDEP). 2009. *Letter to Tronox, LLC re: Enforcement Action for Failure to Complete Approved Site Remediation Activities, and Show Cause Meeting, Tronox, LLC, (Tronox) Henderson, Nevada, NDEP Facility ID Number 8-000539.* December 14.

NDEP. 2010. *Letter to Tronox LLC re: Response to: Results of Bioaccessibility Study for Dioxin/Furans in Soil, Tronox LLC, Henderson, Nevada (Revised)*. May 25.

NDEP. 2011a. *User's Guide and Background Technical Document for Nevada Division of Environmental Protection (NDEP) Basic Comparison Levels (BCLs) for Human Health for the BMI Complex and Common Areas, Revision 6.* Revised January 2011.

NDEP. 2011b. *Nevada Division of Environment Protection (NDEP) response to Workplan for Evaluation of Discolored Soil and Confirmation Soil Sampling in Visually-Impacted Areas.* May 12.

Northgate Environmental Management, Inc, (Northgate). 2010a. *Final Revised Pre-Confirmation Sampling Work Plan Remediation Zones RZ-A through RZ-E Phase B Investigation, Tronox Facility, Henderson, Nevada.*

Northgate. 2010b. *Results of Bioaccessibility Study for Dioxin/Furans in Soil, Tronox LLC, Henderson, Nevada*. Revised May 24.

Northgate, 2010c. *Removal Action Work Plan for Phase B Soil Remediation of Remediation Zones RZ-B through RZ-E, Tronox LLC, Henderson, Nevada.* Revised May 28.

Northgate, 2010d. *Perimeter Air Monitoring Plan for Phase B Soil Remediation of Remediation Zones RZ-B through RZ-E.* May 28.

Northgate. 2010e. *Human Health Risk Assessment for Remediation Zone A; Tronox LLC; Henderson, Nevada.* June 22.

Northgate. 2010f. *Excavation Plan for Phase B Soil Remediation of RZ-B, Addendum to the Removal Action Work Plan.* July.

Northgate. 2010g. *Excavation Plan for Phase B Soil Remediation of RZ-D, Addendum to the Removal Action Work Plan.* July.

Northgate. 2010h. *Revised Excavation Plan for Phase B Soil Remediation of RZ-C, Addendum to the Removal Action Work Plan.* September.

Northgate. 2010i. *Excavation Plan for Phase B Soil Remediation of RZ-E, Addendum to the Removal Action Work Plan.* November.

Northgate, 2010j. *Health and Safety Plan for Well Installation and Subsurface Investigation and Remediation of Soils and Groundwater.*

Northgate. 2011. *Technical Memorandum on Long-Term Monitoring Optimization, Nevada Environmental Response Trust Site; Henderson, Nevada.* November 29.

Tables

TABLE 1
Soil Remediation Goals (SRGs)

Parameter of Interest	Chemical	Unit	NDEP 2011 Worker BCL[a] or Site-Specific Screening Level	Basis
Organic Acids	4-Chlorobenzenesulfonic acid	mg/kg	117	sat
	Benzenesulfonic acid	mg/kg	100,000	max
	Diethyl phosphorodithioic acid	mg/kg	90,800	N
	Dimethyl phosphorodithioic acid	mg/kg	100,000	max
	Phthalic acid	mg/kg	100,000	max
Organophosphate Pesticides	Azinphos-Methyl	mg/kg	--	--
	Bolstar	mg/kg	--	--
	Chlorpyrifos	mg/kg	2,050	N
	Coumaphos	mg/kg	--	--
	Demeton-O	mg/kg	--	--
	Demeton-S	mg/kg	--	--
	Diazinon	mg/kg	616	N
	Dichlorvos	mg/kg	6.6	C
	Dimethoate	mg/kg	--	--
	Disulfoton	mg/kg	27.4	N
	EPN	mg/kg	--	--
	Ethoprop	mg/kg	--	--
	Ethyl Parathion	mg/kg	4,100	N
	Famphur	mg/kg	--	--
	Fensulfothion	mg/kg	--	--
	Fenthion	mg/kg	--	--
	Malathion	mg/kg	13,700	N
	Merphos	mg/kg	--	--
	Methyl Parathion	mg/kg	171	N
	Mevinphos	mg/kg	--	--
	Naled	mg/kg	1,370	N
	Phorate	mg/kg	--	--
	Ronnel	mg/kg	34,200	N
	Stirophos	mg/kg	79.8[b]	N
	Sulfotep	mg/kg	--	--
	Thionazin	mg/kg	--	--
	Tokuthion	mg/kg	--	--
	Trichloronate	mg/kg	--	--
Organochlorine Pesticides	4,4'-DDD	mg/kg	11.1	C
	4,4'-DDE	mg/kg	7.81	C
	4,4'-DDT	mg/kg	7.81	C
	Aldrin	mg/kg	0.113	C
	Alpha-BHC	mg/kg	0.399	C
	Alpha-chlordane	mg/kg	--	--
	Beta-BHC	mg/kg	1.4	C
	Delta-BHC	mg/kg	--	--
	Dieldrin	mg/kg	0.12	C
	Endosulfan I	mg/kg	--	--

TABLE 1
Soil Remediation Goals (SRGs)

Parameter of Interest	Chemical	Unit	NDEP 2011 Worker BCL[a] or Site-Specific Screening Level	Basis
	Endosulfan II	mg/kg	--	--
	Endosulfan Sulfate	mg/kg	--	--
	Endrin	mg/kg	205	N
	Endrin Aldehyde	mg/kg	--	--
	Endrin Ketone	mg/kg	--	--
	Gamma-BHC (Lindane)	mg/kg	1.93	C
	Gamma-chlordane	mg/kg	--	--
	Heptachlor	mg/kg	0.426	C
	Heptachlor Epoxide	mg/kg	0.21	C
	Methoxychlor	mg/kg	3,420	N
	Tech-Chlordane	mg/kg	7.19	C
	Toxaphene	mg/kg	1.74	C
SVOCs	1,4-Dioxane	mg/kg	174	C
	2-Methylnaphthalene	mg/kg	--	--
	Acenaphthene	mg/kg	2,560	N
	Acenaphthylene	mg/kg	147	sat
	Anthracene	mg/kg	9,920	N
	Benz(a)anthracene	mg/kg	2.34	C
	Benzo(a)pyrene	mg/kg	0.234	C
	Benzo(b)fluoranthene	mg/kg	2.34	C
	Benzo(g,h,i)perylene	mg/kg	34,100	N
	Benzo(k)fluoranthene	mg/kg	23.4	C
	bis(2-Ethylhexyl)phthalate	mg/kg	137	C
	Butyl benzyl phthalate	mg/kg	240	sat
	Chrysene	mg/kg	234	C
	Dibenz(a,h)anthracene	mg/kg	0.234	C
	Diethyl phthalate	mg/kg	100,000	max
	Dimethyl phthalate	mg/kg	100,000	max
	Di-N-Butyl phthalate	mg/kg	68,400	N
	Di-N-Octyl phthalate	mg/kg	--	--
	Fluoranthene	mg/kg	24,400	N
	Fluorene	mg/kg	3,670	N
	Hexachlorobenzene[c]	mg/kg	1.2	C
	Indeno(1,2,3-cd)pyrene	mg/kg	2.34	C
	Naphthalene	mg/kg	17.4	C
	Nitrobenzene	mg/kg	15.1	C
	Octachlorostyrene	mg/kg	--	--
	Phenanthrene	mg/kg	24.5	sat
	Pyrene	mg/kg	19,300	N
	Pyridine	mg/kg	667	N
VOCs	1,1,1,2-Tetrachloroethane	mg/kg	20.3	C
	1,1,1-Trichloroethane	mg/kg	1,390	sat
	1,1,2,2-Tetrachloroethane	mg/kg	2.59	C

TABLE 1
Soil Remediation Goals (SRGs)

Parameter of Interest	Chemical	Unit	NDEP 2011 Worker BCL[a] or Site-Specific Screening Level	Basis
	1,1,2-Trichloroethane	mg/kg	5.80	C
	1,1-Dichloroethane	mg/kg	23.3	C
	1,1-Dichloroethene	mg/kg	1,400	N
	1,1-Dichloropropene	mg/kg	--	--
	1,2,3-Trichlorobenzene	mg/kg	--	--
	1,2,3-Trichloropropane	mg/kg	0.106	C
	1,2,4-Trichlorobenzene	mg/kg	759	N
	1,2,4-Trimethylbenzene	mg/kg	671	N
	1,2-Dibromo-3-chloropropane	mg/kg	0.0583	C
	1,2-Dichlorobenzene	mg/kg	373	Sat
	1,2-Dichloroethane	mg/kg	2.41	C
	1,2-Dichloropropane	mg/kg	4.54	C
	1,3,5-Trimethylbenzene	mg/kg	254	sat
	1,3-Dichlorobenzene	mg/kg	373	Sat
	1,3-Dichloropropane	mg/kg	71.6	N
	1,4-Dichlorobenzene	mg/kg	14.3	C
	2,2-Dichloropropane	mg/kg	--	--
	2-Butanone	mg/kg	34,100	sat
	2-Chlorotoluene	mg/kg	511	sat
	2-Hexanone	mg/kg	2,150	N
	2-Methoxy-2-methyl-butane	mg/kg	--	--
	4-Chlorotoluene	mg/kg	--	--
	4-Isopropyltoluene	mg/kg	647	Sat
	4-Methyl-2-pentanone	mg/kg	17,200	Sat
	Acetone	mg/kg	100,000	Max
	Benzene	mg/kg	4.50	C
	Bromobenzene	mg/kg	695	N
	Bromochloromethane	mg/kg	--	--
	Bromodichloromethane	mg/kg	51.3	C
	Bromoform	mg/kg	242	C
	Bromomethane	mg/kg	42.9	N
	Carbon tetrachloride	mg/kg	4.07	C
	Chlorobenzene	mg/kg	695	Sat
	Chloroethane	mg/kg	1,100	C
	Chloroform	mg/kg	1.71	C
	Chloromethane	mg/kg	8.95	C
	cis-1,2-Dichloroethene	mg/kg	791	N
	cis-1,3-Dichloropropene	mg/kg	--	--
	Dibromochloromethane	mg/kg	6.15	C
	Dibromomethane	mg/kg	210	N
	Dichlorodifluoromethane	mg/kg	340	Sat
	Ethyl t-butyl ether	mg/kg	--	--
	Ethylbenzene	mg/kg	21.0	C

TABLE 1
Soil Remediation Goals (SRGs)

Parameter of Interest	Chemical	Unit	NDEP 2011 Worker BCL[a] or Site-Specific Screening Level	Basis
	Ethylene dibromide	mg/kg	0.185	C
	Hexachlorobutadiene	mg/kg	24.6	C
	Isopropyl ether	mg/kg	--	--
	Isopropylbenzene	mg/kg	647	Sat
	m p-Xylene	mg/kg	214	Sat
	Methyl tert butyl ether	mg/kg	216	C
	Methylene chloride	mg/kg	60.4	C
	Naphthalene	mg/kg	17.4	C
	N-Butylbenzene	mg/kg	237	Sat
	N-Propylbenzene	mg/kg	237	Sat
	o-Xylene	mg/kg	282	Sat
	sec-Butylbenzene	mg/kg	223	Sat
	Styrene	mg/kg	1,730	Sat
	t-Butyl alcohol	mg/kg	21,300	Sat
	tert-Butylbenzene	mg/kg	393	Sat
	Tetrachloroethene	mg/kg	3.28	C
	Toluene	mg/kg	521	Sat
	trans-1,2-Dichloroethylene	mg/kg	600	N
	trans-1,3-Dichloropropene	mg/kg	--	--
	Trichloroethene	mg/kg	5.49	C
	Trichlorofluoromethane	mg/kg	1,980	Sat
	Vinyl Chloride	mg/kg	1.86	C
	Xylenes, total	mg/kg	214	Sat
TPH	Oil Range Organics (TPH-oil)	mg/kg	100[d]	--
	TPH-d	mg/kg	100[d]	--
	TPH-g	mg/kg	100[d]	--
PCBs	Aroclor-1016	mg/kg	23.6	C
	Aroclor-1221	mg/kg	0.826	C
	Aroclor-1232	mg/kg	0.826	C
	Aroclor-1242	mg/kg	0.826	C
	Aroclor-1248	mg/kg	0.826	C
	Aroclor-1254	mg/kg	0.826	C
	Aroclor-1260	mg/kg	0.826	C
	Total PCBs	mg/kg	0.826	C
	TCDD TEQ[e]	pg/g	2,700[f]	C
General Chemistry	Cyanide	mg/kg	13,700	N
	Perchlorate	mg/kg	795	N
Dioxins/Furans	TCDD TEQ[g]	pg/g	2,700[f]	C
Metals	Aluminum	mg/kg	100,000	Max
	Antimony	mg/kg	454	N
	Arsenic	mg/kg	7.2[h]	--
	Barium	mg/kg	100,000	Max
	Beryllium	mg/kg	2,230	N

TABLE 1
Soil Remediation Goals (SRGs)

Parameter of Interest	Chemical	Unit	NDEP 2011 Worker BCL[a] or Site-Specific Screening Level	Basis
	Boron	mg/kg	100,000	Max
	Cadmium	mg/kg	560	N
	Chromium (III)	mg/kg	100,000	Max
	Chromium (VI)	mg/kg	1,360	C
	Cobalt	mg/kg	337	N
	Copper	mg/kg	42,200	N
	Iron	mg/kg	100,000	Max
	Lead	mg/kg	800[i]	--
	Magnesium	mg/kg	100,000	Max
	Manganese	mg/kg	100,000	Max
	Mercury	mg/kg	182	N
	Molybdenum	mg/kg	5,680	N
	Nickel	mg/kg	21,800	N
	Platinum	mg/kg	--	--
	Potassium	mg/kg	--	--
	Selenium	mg/kg	5,680	N
	Silver	mg/kg	5,680	N
	Sodium	mg/kg	--	--
	Strontium	mg/kg	100,000	Max
	Thallium	mg/kg	79.5[i]	--
	Tin	mg/kg	100,000	Max
	Titanium	mg/kg	100,000	Max
	Tungsten	mg/kg	8,510	N
	Uranium	mg/kg	3,400	N
	Vanadium	mg/kg	5,680	N
	Zinc	mg/kg	100,000	Max
Asbestos	Long amphibole fibers Long chrysotile fibers	fibers	1 or more[j] More than 5[j]	--

a - From User's Guide and Background Technical Document for Nevada Division of Environmental Protection (NDEP) Basic Comparison Levels (BCLs) for Human Health for the BMI Complex and Common Areas, Revision 6, January 2011 (http://ndep.nv.gov/bmi/technical.htm). Values listed are for the outdoor industrial/commercial worker.

b - BCL based on mixed isomer.

c - Hexachlorobenzene analyzed using both EPA Methods 8081 and 8270. Data reported based on EPA 8270 as it was deemed to be the superior method.

d - 100 mg/kg total TPH value used for screening.

e - TCDD equivalents based on WHO 2005 TEFs for the 12 co-planer PCBs; the detection limit was used for non-detect values.

f - Site-specific value.

g - TCDD equivalents based on WHO 2005 TEFs for the 17 dioxin and furan congeners.

h - Based on regional background concentrations.

i - A basis for the lead and thallium BCLs are not identified by NDEP.

j - Site-specific value.

C = Cancer

N = Noncancer
Sat = soil saturation
Max = risk-based value is greater than 100,000 mg/kg
-- = undefined

Table 2a: Soil Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Type	Sample Date	Dioxin TEQ EPA Method 8280/8290/Screen	HCB EPA Method 8270/8081A	SVOCs / PAHs EPA Method 8270/8270 SIM	As EPA Method 6020	Pb EPA Method 6020	Co EPA Method 6010	Mn EPA Method 6010	Mg EPA Method 6010	Cr EPA Method 6010	OCPs EPA Method 8081A	Perchlorate EPA Method 314.0	RCRA 8 Metals EPA Method 6010	VOCs EPA Method 8260B	Asbestos EPA 540-R-97-028	pH EPA Method 150.1
RZ-B																			
B	B13	SSAQ6-02	Northgate	2/9/2011	X	X	X	X			X	X							
B	B21	EE-B21-1	EE	5/17/2011		X		X							X				
RZ-C																			
C	C01	CS-C01-1	CS	4/21/2011				X				X							
C	C01	CS-C01-2	CS	4/21/2011				X				X							
C	C01	EE-C01-1	EE	4/21/2011				X			X								
C	C02A	SSAO3-06	Northgate	2/9/2011				X			X								
C	C05A	CS-C05A-1	CS	4/21/2011	X	X						X							
C	C06	CS-C06-1	CS	4/14/2011	X	X						X							
C	C07A	CS-C07A-1	CS	4/28/2011	X	X		X											
C	C07A	EB-C07A-1	EB	4/28/2011	X	X		X											
C	C07B	CS-C07B-1	CS	4/21/2011	X	X		X				X							
C	C07B	CS-C07B-2	CS	4/21/2011	X	X		X				X							
C	C08	DS-C08-1	DS	4/20/2011	X	X		X	X	X	X	X							
C	C08	CS-C08-1	CS	4/28/2011	X	X		X											
C	C08	CS-C08-2	CS	4/21/2011	X	X		X											
C	C09A	DS-C09A-1	DS	4/20/2011	X	X		X	X	X	X	X							
C	C09A	CS-C09A-1	CS	4/28/2011	X	X													
C	C09A	DS-C09A-1	DS	4/20/2011	X	X		X	X	X	X	X							
C	C09A	CS-C09A-1	CS	4/28/2011	X	X													
C	C09A	EE-C09A-2	EE	6/20/2011	X	X													
C	C09A	EE-C09A-3	EE	6/20/2011	X	X													
C	10/10A	SSAO5-08	Northgate	2/9/2011	X	X	X					X			X				
C	C10	DS-C10-1	DS	4/20/2011	X	X		X	X	X	X	X			X				
C	C10A	DS-C10A-1	DS	4/20/2011	X	X		X	X	X	X	X			X				
C	C10A	CS-C10A-1	CS	5/17/2011	X	X		X				X			X				
C	C10B	CS-C10B-1	CS	7/28/2011	X	X	X	X	X	X	X	X		X	X		X		
C	C11	DS-C11-1	DS	4/20/2011	X	X		X	X	X	X	X							
C	C11	CS-C11-1	CS	6/20/2011	X	X													
C	C13	EE-C13-1	EE	6/20/2011		X	X	X			X								
C	C15	CS-C15-1	CS	6/20/2011	X	X	X	X			X	X			X				
C	C15	EE-C15-1	EE	6/20/2011		X	X	X			X								
C	C15	EE-C15-2	EE	6/20/2011		X	X	X			X								
C	C15	EB-C15-1	EB	6/20/2011	X	X					X	X							
C	C17	DS-C17-1	DS	5/4/2011	X	X		X				X			X				
C	C18	SSAO6-06	Northgate	2/9/2011	X	X		X			X	X							
C	C18	SSAO5-09	Northgate	2/11/2011	X	X		X			X	X						X	
C	C18	DS-C18-1	DS	5/4/2011	X	X		X				X			X				
C	C18	DS-C18-2	DS	5/4/2011	X	X		X				X			X				
C	C18	EE-C18-1	EE	5/17/2011	X	X	X	X			X	X							
C	C19	DS-C19-1	DS	4/20/2011	X	X	X	X	X	X	X	X							
C	C20	EE-C20-1	EE	6/16/2011				X	X		X				X				
C	C21	EE-C21-1	EE	6/16/2011			X	X			X				X				
C	C21	EE-C21-2	EE	6/16/2011			X	X			X				X				
C	C22A	CS-C22A-1	CS	6/16/2011				X	X		X				X				
C	C23	DS-C23-1	DS	4/20/2011	X		X	X	X	X	X	X			X				
C	C23	CS-C23-1	CS	6/16/2011				X	X		X				X				
C	C23	EE-C23-1	EE	6/16/2011				X	X		X				X				
C	C24	DS-C24-1	DS	5/4/2011		X	X	X			X								

Table 2a: Soil Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Type	Sample Date	Dioxin TEQ EPA Method 8280/8290/Screen	HCB EPA Method 8270/8081A	SVOCs / PAHs EPA Method 8270/8270 SIM	As EPA Method 6020	Pb EPA Method 6020	Co EPA Method 6010	Mn EPA Method 6010	Mg EPA Method 6010	Cr EPA Method 6010	OCPs EPA Method 8081A	Perchlorate EPA Method 314.0	RCRA 8 Metals EPA Method 6010	VOCs EPA Method 8260B	Asbestos EPA 540-R-97-028	pH EPA Method 150.1
C	C24	EE-C24-1	EE	6/23/2011		X	X	X											
C	C24	EE-C24-2	EE	6/30/2011		X	X	X			X								
C	C25	DS-C25-1	DS	4/20/2011	X	X	X	X	X	X	X	X							
C	C25	CS-C25-1	CS	6/30/2011		X	X	X			X								
C	C25	EE-C25-1	EE	5/17/2011		X	X	X			X								
C	C26	CS-C26-1	CS	6/23/2011		X	X	X			X								
C	C27	CS-C27-1	CS	6/16/2011				X	X		X				X				
C	C27	CS-C27-2	CS	6/16/2011				X	X		X				X				
C	C27	CS-C27-3	CS	6/16/2011				X	X		X				X				
C	C27	EE-C27-1	EE	6/16/2011				X	X		X				X				
C	C27	EE-C27-2	EE	6/16/2011				X	X		X				X				
C	C27	EE-C27-3	EE	6/16/2011				X	X		X				X				
C	C27	EE-C27-4	EE	6/16/2011				X	X		X				X				
C	C30	CS-C30-1	CS	5/4/2011	X										X				
C	C39B	DS-C39B-1	DS	4/14/2011	X	X		X	X		X	X		X					
C	C42	CS-C42-1	CS	6/7/2011	X	X		X							X				
C	C42	CS-C42-2	CS	6/21/2011		X													
C	C44	CS-C44-1	CS	5/18/2011	X	X		X		X	X								
C	C45	DS-C45-1	DS	8/3/2011		X		X		X	X								
C	C45	DS-C45-2	DS	8/3/2011		X		X		X	X								
RZ-D																			
D	D02/D06	SSAJ2-07	Northgate	2/9/2011	X	X	X	X							X				
D	D02	CS-D02-1	CS	5/17/2011	X	X		X							X				
D	D02	EE-D02-1	EE	5/17/2011	X	X		X							X				
D	D04/D05	SSAI3-08	Northgate	2/11/2011	X		X												
D	D06A	DS-D06A-1	DS	4/28/2011	X	X	X	X	X	X	X	X			X				
D	D06A	DS-D06A-2	DS	5/10/2011	X	X	X	X	X	X	X	X			X				
D	D07	SSAK2-02	Northgate	2/9/2011	X		X	X											
D	D08	CS-D08-1	CS	6/7/2011	X	X						X							
D	D10	CS-D10-1	CS	6/7/2011	X	X						X							
D	D10	EE-D10-1	EE	6/7/2011	X	X						X							
D	D10A	CS-D10A-1	CS	6/7/2011	X	X						X							
D	D10B	CS-D10B-1	CS	6/7/2011	X	X						X							
D	D11B	DS-D11B-1	DS	6/20/2011	X	X													
D	D14	DS-D14-1	DS	7/19/2011	X	X								X					
D	D17B	CS-D17B-1	CS	6/14/2011	X	X													
D	D17B	CS-D17B-2	CS	6/20/2011		X													
D	D17B	CS-D17B-3	CS	6/20/2011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	D17B	CS-D17B-4	CS	6/20/2011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D	D23	DS-D23-1	DS	4/21/2011	X	X		X	X	X	X	X							
D	D23	CS-D23-1	CS	6/30/2011	X	X		X				X							
D	D23	CS-D23-2	CS	6/30/2011	X	X		X				X							
D	D23	CS-D23-3	CS	6/30/2011	X	X		X				X							
D	D23	CS-D23-4	CS	6/30/2011	X	X		X				X							
D	D24	CS-D24-1	CS	6/8/2011	X			X											
D	D24	CS-D24-2	CS	6/20/2011	X			X											
D	D24	CS-D24-3	CS	6/20/2011	X			X											
D	D24	CS-D24-4	CS	6/20/2011	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 2a: Soil Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Type	Sample Date	Dioxin TEQ EPA Method 8280/8290/Screen	HCB EPA Method 8270/8081A	SVOCs / PAHs EPA Method 8270/8270 SIM	As EPA Method 6020	Pb EPA Method 6020	Co EPA Method 6010	Mn EPA Method 6010	Mg EPA Method 6010	Cr EPA Method 6010	OCPs EPA Method 8081A	Perchlorate EPA Method 314.0	RCRA 8 Metals EPA Method 6010	VOCs EPA Method 8260B	Asbestos EPA 540-R-97-028	pH EPA Method 150.1
D	D25	CS-D25-1	CS	6/8/2011	X			X											
D	D25	CS-D25-2	CS	6/8/2011	X			X											
D	D25	EE-D25-1	EE	6/8/2011	X			X											
D	D25	EE-D25-2	EE	6/30/2011	X			X											
D	D25A	CS-D25A-1	CS	8/3/2011	X			X											
D	D25A	CS-D25A-2	CS	8/3/2011	X			X											
D	D25A	CS-D25A-3	CS	8/3/2011	X			X											
D	D25A	EE-D25A-1	EE	5/18/2011	X			X											
D	D25A	EE-D25A-2	EE	8/3/2011	X			X											
D	D27	DS-D27-1	DS	4/14/2011	X	X		X	X		X	X		X					
D	D27	DS-D27-2	DS	4/14/2011	X	X		X	X		X	X		X					
D	D31A	CS-D31A-1	CS	8/31/2011	X	X	X	X						X	X				
D	DA	SSAJ3-10	Northgate	2/11/2011	X		X												
D	DA	CS-DA-1	CS	6/7/2011	X	X						X							
D	DB	DS-DB-1	DS	4/21/2011	X	X	X	X	X	X	X	X			X				
D	DB	CS-DB-1	CS	6/9/2011	X	X						X							
D	DB	CS-DB-2	CS	6/7/2011	X	X						X							
D	DB	CS-DB-3	CS	6/9/2011	X	X						X							
D	DB	EE-DB-1	EE	6/7/2011	X	X						X							
D	DB	EE-DB-2	EE	6/7/2011	X	X						X							
D	DC	DS-DC-1	DS	4/21/2011	X	X	X	X	X	X	X	X			X				
D	DC	CS-DC-1	CS	5/3/2011	X	X	X	X	X	X	X	X			X				
D	DC	CS-DC-2	CS	5/3/2011	X	X	X	X	X	X	X	X			X				
D	DC	CS-DC-3	CS	5/3/2011	X	X	X	X	X	X	X	X			X				
D	DC	CS-DC-4	CS	6/2/2011	X														
D	GWL	CS-GWL-1	CS	7/11/2011									X		X				
D	GWL	CS-GWL-2	CS	7/11/2011									X		X				
RZ-E																			
E	E08A	CS-E08A-1	CS	5/4/2011	X	X		X	X					X	X				
E	E08A	EE-E08A-1	EE	5/4/2011	X	X		X	X					X	X				
E	E08B	CS-E08B-1	CS	5/4/2011	X	X		X	X					X	X				
E	E09	EE-E09-1	EE	5/4/2011	X	X		X	X					X	X				
E	E11	CS-E11-1	CS	5/4/2011	X	X		X	X					X	X				
E	E11	CS-E11-2	CS	5/4/2011	X	X		X	X					X	X				
E	E11	CS-E11-3	CS	7/19/2011	X	X								X	X				
E	E14	EE-E14-1	EE	6/2/2011	X	X		X							X				
E	E14A	DS-E14A-1	DS	4/25/2011	X	X	X	X	X	X	X	X		X		X	X		X
E	E14A	DS-E14A-2	DS	4/25/2011	X	X	X	X	X	X	X	X		X		X	X		X
E	E14A	CS-E14A-1	CS	5/18/2011	X	X		X				X					X		
E	E14A	CS-E14A-2	CS	5/18/2011	X	X		X				X					X		
E	E14A	CS-E14A-3	CS	6/2/2011	X	X													
E	E14A	EE-E14A-1	EE	5/18/2011	X	X		X				X					X		
E	E14B	CS-E14B-1	CS	6/2/2011	X	X		X							X				
E	E14B	EE-E14B-1	EE	6/2/2011	X	X		X							X				
E	E14B	EE-E14B-2	EE	6/2/2011	X	X		X							X				
E	E14C	CS-E14C-1	CS	6/2/2011	X	X	X	X						X	X				
E	E14C	CS-E14C-2	CS	7/21/2011		X		X	X		X								
E	E14C	DS-E14C-1	DS	7/28/2011		X		X	X		X								

Table 2a: Soil Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Type	Sample Date	Dioxin TEQ EPA Method 8280/8290/Screen	HCB EPA Method 8270/8081A	SVOCs / PAHs EPA Method 8270/8270 SIM	As EPA Method 6020	Pb EPA Method 6020	Co EPA Method 6010	Mn EPA Method 6010	Mg EPA Method 6010	Cr EPA Method 6010	OCPs EPA Method 8081A	Perchlorate EPA Method 314.0	RCRA 8 Metals EPA Method 6010	VOCs EPA Method 8260B	Asbestos EPA 540-R-97-028	pH EPA Method 150.1
E	E14C	DS-E14C-2	DS	8/31/2011	X														
E	E14C	EE-E14C-1	EE	6/2/2011	X	X	X	X						X	X				
E	E16	DS-E16-1	DS	4/14/2011	X	X	X	X	X		X	X		X	X				
E	E16	CS-E16-1	CS	6/2/2011		X		X	X		X								

Notes:
-- = Sample collected and placed on laboratory hold but not analyzed
As = Arsenic
Co = Cobalt
Cr = Chromium
CS = Confirmation Sample
DS = Discolored Soil Sample
EB = Equipment Blank Sample
EE = Excavation Extent Sample
EPA = Environmental Protection Agency
HCB = Hexachlorobenzene
Mg = Magnesium
Mn = Manganese
OCPs = Organochlorine Pesticides
PAHs = Polycyclic Aromatic Hydrocarbons
Pb = Lead
RCRA = Resource Conservation and Recovery Act
SIM = Selective Ion Mode
SVOCs = Semivolatile Organic Compounds
TEQ = Toxicity Equivalent
VOCs = Volatile Organic Compounds

Table 2b: Stockpile Soil Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Type	Sample Date	TCLP Extractions Only	TCLP Ba	TCLP Cr	TCLP SVOC	SVOC	TCLP VOC	VOC	TCLP OCPs	OCPs	TCLP RCRA 8 Metals	RCRA 8 Metals	Reactive Cyanide	Reactive Sulfide	PCBs	Sulfur
					EPA Method 1311	EPA Method 1311/6010	EPA Method 1311/6010	EPA Method 1311/8270	EPA Method 8270	EPA Method 1311/8260B	EPA Method 8260B	EPA Method 1311/8081A	EPA Method 8081A	EPA Method 1311/6010B /6020	EPA Method 6010B/6020	SW846 7.3.3.2	SW846 7.3.4.1	EPA Method 8082	EPA Method 6010B
RZ-C																			
C	C24	SP-C24-1A	SP	6/8/2011	X			e	X	e	X	e	X	e	X				
C	C24	SP-C24-1B	SP	6/8/2011	X			e	X	e	X	e	X	e	X				
C	C24	SP-C24-1C	SP	6/8/2011	X			e	X	e	X	e	X	e	X				
C	C24	SP-C24-1D	SP	6/8/2011	X			e	X	e	X	e	X	e	X				
C	C24	SP-C24-1E	SP	6/30/2011												X	X	X	X
C	C24	SP-C24-1F	SP	6/30/2011												X	X	X	X
C	C24	SP-C24-1G	SP	6/30/2011												X	X	X	X
C	C24	SP-C24-1H	SP	6/30/2011												X	X	X	X
RZ-D																			
D	D23	SP-D23-1A	SP	6/30/2011				X							X	X	X	X	X
D	D23	SP-D23-1B	SP	6/30/2011				X							X	X	X	X	X
D	D23	SP-D23-1C	SP	6/30/2011				X							X	X	X	X	X
D	D23	SP-D23-1D	SP	6/30/2011				X							X	X	X	X	X
RZ-E																			
E	E14A	SP-E14A-1A	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-1B	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-1C	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-1D	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-1E	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-1F	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-1G	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-1H	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-2A	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-2B	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-2C	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-2D	SP	6/6/2011		X	X	X		X		X							
E	E14A	SP-E14A-2E	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-2F	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-2G	SP	6/30/2011												X	X	X	X
E	E14A	SP-E14A-2H	SP	6/30/2011												X	X	X	X

Notes:
Ba = Barium
Cr = Chromium
e = TCLP extraction performed but not analyzed
EPA = Environmental Protection Agency
OCPs = Organochlorine Pesticides
PCBs = Polychlorinated Biphenyls
RCRA = Resource Conservation and Recovery Act
SIM = Selective Ion Mode
SVOCs = Semivolatile Organic Compounds
TCLP = Toxicity Characteristic Leaching Procedure
VOCs = Volatile Organic Compounds

Table 2c: QA/QC Sample Analytical Testing Program
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	Polygon Name	Sample ID	Sample Description	Sample Date	Dioxin TEQ EPA Method 8280/8290/Screen	HCB EPA Method 8270/8081A	SVOCs / PAHs EPA Method 8270/8270 SIM	As EPA Method 6020	Pb EPA Method 6020	Co EPA Method 6010	Mn EPA Method 6010	Mg EPA Method 6010	Cr EPA Method 6010	OCPs EPA Method 8081A	Perchlorate EPA Method 314.0
RZ-C															
C	C24	DS-C24-2	dup of DS-C24-1	5/4/2011			X								
C	C27	EB-C27-1	Equipment Blank	6/16/2011			X	X	X	X	X	X			X
C	C45	DS-C45-3	dup of DS-C45-2	8/3/2011		X		X		X	X				
C	C45	EB-C45-1	Equipment Blank	8/3/2011		X		X		X	X				
RZ-D															
D	D25A	EE-D25A-3	dup of EE-D25A-2	8/3/2011	X			X							
D	D25A	EB-D25A-1	Equipment Blank	8/3/2011	X			X							
D	DB	DS-DB-2	dup of DS-DB-1	4/21/2011	X	X	X	X	X	X	X	X			X
RZ-E															
E	E08A	EE-E08A-2	dup of EE-E08A-1	5/4/2011	X	X		X	X					X	X
E	E14A	EB-E14A-2	Equipment Blank	5/18/2011	X	X		X				X			
E	E14B	EB-E14B-1	Equipment Blank	6/2/2011	X	X		X							X

Notes:
As = Arsenic
Co = Cobalt
Cr = Chromium
dup = Field Duplicate Sample
EB = Equipment Blank Sample
EPA = Environmental Protection Agency
HCB = Hexachlorobenzene
Mg = Magnesium
Mn = Manganese
OCPs = Organochlorine Pesticides
PAHs = Polycyclic Aromatic Hydrocarbons
Pb = Lead
RCRA = Resource Conservation and Recovery Act
SIM = Selective Ion Mode
SVOCs = Semivolatile Organic Compounds
TEQ = Toxicity Equivalent
VOCs = Volatile Organic Compounds

Table 3: Summary of Polygon Excavations
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Polygon	Excavation Design Depth (ft)	Completed to Design Vertical and Horizontal Extent?	ECA
RZ-B			
RZ-B-1	2	NO	ECA B1
RZ-B-2	10	YES	
RZ-B-3	7	YES	
RZ-B-4A	0.33	NO	ECA B1
RZ-B-4B	0.67	NO	ECA B1
RZ-B-4C	0.33	NO	ECA B2
RZ-B-4D	0.67	NO	ECA B1
RZ-B-4E	0.33	YES	
RZ-B-5	5	NO	ECA B2
RZ-B-6	1.67	NO	ECA B1
RZ-B-7	9	YES	
RZ-B-7A	10	NO	ECA B4
RZ-B-7B	10	NO	ECA B1
RZ-B-8	10	NO	ECA B4
RZ-B-9	10	NO	ECA B2, B4
RZ-B-9A	4	NO	ECA B2
RZ-B-10	1	NO	ECA B4
RZ-B-11	3	NO	ECA B2, B3
RZ-B-12	6	NO	ECA B1
RZ-B-13	0.33	NO	ECA B5
RZ-B-14	0.33	YES	
RZ-B-15	8	YES	
RZ-B-16	1	YES	
RZ-B-17	0.33	YES	
RZ-B-18	8	YES	
RZ-B-19	1.5	YES	
RZ-B-20	6	YES	
RZ-B-21	6	YES	
RZ-B-22	2	NO	ECA B7
RZ-B-23	0.33	YES	
RZ-B-23A	0.33	YES	
RZ-B-23B	0.33	YES	
RZ-B-24A	0.33	YES	
RZ-B-24B	0.33	YES	
RZ-C			
RZ-C-1	2	NO	ECA C1
RZ-C-1A	4	NO	ECA C1
RZ-C-2A	3	YES	
RZ-C-2B	5	YES	
RZ-C-3	1	NO	ECA C2
RZ-C-4	2	NO	ECA C2
RZ-C-5A	5	NO	ECA C2
RZ-C-5B	12	YES	
RZ-C-6	9	NO	ECA C3, C4
RZ-C-7A	5	YES	

Table 3: Summary of Polygon Excavations
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Polygon	Excavation Design Depth (ft)	Completed to Design Vertical and Horizontal Extent?	ECA
RZ-C-7B	0.5	YES	
RZ-C-8	3	YES	
RZ-C-9A	0.33	YES	
RZ-C-9B	3	NO	ECA C4, C7
RZ-C-10	10	YES	
RZ-C-10A	0.33	YES	
RZ-C-10B	5	YES	
RZ-C-11	10	NO	ECA C5
RZ-C-12	11	NO	ECA C7
RZ-C-13	2	NO	ECA C5, C7
RZ-C-13A	3	NO	ECA C7
RZ-C-14	1.5	NO	ECA C7
RZ-C-15	2	NO	ECA C7
RZ-C-16	1	NO	ECA C11, C12
RZ-C-16A	2	NO	ECA C12
RZ-C-17	0.33	YES	ECA C10, C11
RZ-C-18	1	YES	
RZ-C-19	2	NO	ECA C9, C11
RZ-C-20	3	NO	ECA C11
RZ-C-21	4	YES	
RZ-C-22	6	NO	ECA C7, C11
RZ-C-22A	0.66	NO	ECA C8, C11
RZ-C-22B	8	NO	ECA C8
RZ-C-23	6	NO	ECA C11
RZ-C-24	2	NO	ECA C7
RZ-C-25	4	YES	
RZ-C-26	1	NO	ECA C7
RZ-C-27	10	NO	ECA C7, C11
RZ-C-28	10	YES	
RZ-C-28A	5	YES	
RZ-C-28B	4	NO	ECA C14
RZ-C-28C	10	YES	
RZ-C-28D	10	YES	
RZ-C-28E	5	YES	
RZ-C-28F	10	NO	ECA C16
RZ-C-29	10	NO	ECA C16
RZ-C-30	10	NO	ECA C16
RZ-C-30A	10	YES	
RZ-C-31	10	YES	
RZ-C-31A	1	YES	
RZ-C-32	2	YES	
RZ-C-32A	8	YES	
RZ-C-32B	8	YES	
RZ-C-33	1	YES	
RZ-C-34	3	NO	ECA C14
RZ-C-35	6	YES	

Table 3: Summary of Polygon Excavations
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Polygon	Excavation Design Depth (ft)	Completed to Design Vertical and Horizontal Extent?	ECA
RZ-C-36	3	NO	ECA C14
RZ-C-37	1.5	NO	ECA C14
RZ-C-38	4	NO	ECA C14
RZ-C-39	0.33	NO	ECA C14
RZ-C-39A	2	NO	ECA C14
RZ-C-39B	10	YES	
RZ-C-39C	0.33	NO	ECA C14
RZ-C-40	1.5	NO	ECA C14
RZ-C-40A	0.5	NO	ECA C14
RZ-C-40B	11	YES	
RZ-C-41	1	NO	ECA C14
RZ-C-42	1	NO	ECA C14, C15
RZ-C-44	10	NO	ECA C13
RZ-C-45	0	YES	
RZ-C-45A	0.33	NO	ECA C18
RZ-C-45B	1	YES	
RZ-C-45C	3	YES	
RZ-C-45D	1	YES	
RZ-C-46	4	YES	
RZ-C-46A	0.5	YES	
RZ-C-47	2	YES	
RZ-C-47A	0.5	YES	
RZ-D			
RZ-D-1A1	25	YES	
RZ-D-1A2	28.5	YES	
RZ-D-1B	16	NO	ECA D1
RZ-D-1C	15	YES	
RZ-D-1D1	11	YES	
RZ-D-1D2	11	YES	
RZ-D-2	3	NO	ECA D1
RZ-D-2A	14	YES	
RZ-D-2B	3	YES	
RZ-D-3	4	NO	ECA D1
RZ-D-4	10	YES	
RZ-D-4A	3	YES	
RZ-D-5	8	YES	
RZ-D-5A	10	YES	
RZ-D-6	2	YES	
RZ-D-6A	10	YES	
RZ-D-7	10	YES	
RZ-D-8	1	YES	
RZ-D-8A	1.5	YES	
RZ-D-10	0.33	YES	
RZ-D-10A	1	YES	
RZ-D-10B	2	YES	
RZ-D-11	1	YES	

Table 3: Summary of Polygon Excavations
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Polygon	Excavation Design Depth (ft)	Completed to Design Vertical and Horizontal Extent?	ECA
RZ-D-11A	0.5	YES	
RZ-D-11B	2	YES	
RZ-D-12	10	NO	ECA D1
RZ-D-13	5	YES	
RZ-D-13A	3	YES	
RZ-D-14	1	YES	
RZ-D-15	10	NO	ECA D3
RZ-D-16	9	NO	ECA D4
RZ-D-16A	9	NO	ECA D4
RZ-D-17	0.33	NO	ECA D7
RZ-D-17A	4	YES	
RZ-D-17B	1	YES	
RZ-D-17C	0.33	YES	
RZ-D-18	5	YES	
RZ-D-19	3	YES	
RZ-D-20	1.5	YES	
RZ-D-21A	11	NO	ECA D3
RZ-D-21B	6	NO	ECA D3
RZ-D-21C	11	YES	
RZ-D-21D	10	NO	ECA D3
RZ-D-21E	14	NO	ECA D3
RZ-D-21F	10	NO	ECA D3
RZ-D-22	5	NO	ECA D3
RZ-D-23	6	NO	ECA D3
RZ-D-23A	10	NO	ECA D3
RZ-D-24	3	YES	
RZ-D-24A	1	YES	
RZ-D-25	1	YES	
RZ-D-25A	3	YES	
RZ-D-26	0.33	NO	ECA D5, D6
RZ-D-27	0.67	YES	
RZ-D-28	10	NO	ECA D8
RZ-D-28A	0.33	NO	ECA D7
RZ-D-29	1.5	NO	ECA D8
RZ-D-30	1	YES	
RZ-D-31	0.33	YES	
RZ-D-31A	1	YES	
RZ-E			
RZ-E-1	5	NO	ECA E1
RZ-E-2	19	YES	
RZ-E-3	8	NO	ECA E1
RZ-E-3A	2	YES	
RZ-E-4	11	YES	
RZ-E-5	2	YES	
RZ-E-6	5	YES	
RZ-E-7	10	YES	

Table 3: Summary of Polygon Excavations
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Polygon	Excavation Design Depth (ft)	Completed to Design Vertical and Horizontal Extent?	ECA
RZ-E-8	4	YES	
RZ-E-8A	2	NO	ECA C16
RZ-E-8B	8	NO	ECA C16
RZ-E-9	3	YES	
RZ-E-10	0.33	YES	
RZ-E-11	8	YES	
RZ-E-12	1	NO	ECA E2
RZ-E-13	2	NO	ECA E2
RZ-E-14	9	NO	ECA E2
RZ-E-14A	3	YES	
RZ-E-14B	6	NO	ECA E2
RZ-E-14C	8	NO	ECA E2
RZ-E-15	1	YES	
RZ-E-16	10	YES	
RZ-E-16A	7	YES	
RZ-E-16B	5	NO	ECA E3

Notes:
ft = feet
ECA = Excavation Control Area

Table 4: Asbestos Containing Materials Removed
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Asbestos Areas	Remediation Zone	Polygon	How found? (when was it found, what was found)	Action taken by LVP/ENVIRON/Northgate	Survey of area conducted? (when was it conducted, suspect ACM, samples taken, results, where asbestos found)	Asbestos Abatement? (When, what was removed?)	Pass Final Visual Clearance? (when occurred)
RZ-B							
Unit Buildings 1 and 2 Basements	RZ-B	RZ-B-15, RZ-B-18	Northgate reviewed historical information on the buildings and found that the basements were used for disposal of demolition materials that reportedly contain ACM*	Northgate sampled with pre-confirmation sampling to confirm historical information	Northgate sampled soil and debris with pre-confirmation sampling in 2009	Greenway Industries; August 17 to September 9, 2009 (Unit Building 1) and November 16 to December 9, 2010 (Unit Building 2); removed soil and debris from both basements	Unit Building 1: passed on September 13, 2010; Unit Building 2: passed on December 17, 2010; by Converse Consultants
Wrapped Pipe in RZ-B-21	RZ-B	RZ-B-21	March 9, 2011; found inactive recirculating water line (wrapped in asbestos) within 9th Street while completing excavation of polygon RZ-B-21	ENVIRON- talk with NDEP about removal, spray paint pipe until removed; LVP- continue excavation to pipe;	Yes; pipe was sampled prior to ENVIRON taking over the project and was confirmed to contain ACM	Greenway Industries; May 5-6, 2011; removed one 20" pipe approx. 80.5' and one 11" pipe approx. 7'; Pipe only removed within excavation area, capped ends and marked as ACM	Yes; conducted on May 5-6, 2011 by LoSo
RZ-C							
Various Pipes in Southern Portion of RZ-C	RZ-C	RZ-C-14, RZ-C-15, RZ-C-24, RZ-C-26, RZ-C-19	April 28, 2011; found different sizes of pipes while chasing discolored soil along Avenue F, near diesel tank fuel lines, and along the eastern side of the former pump house yard	Northgate- Identified the pipes as ACM; ENVIRON/LVP- stopped work in area and had pipes sampled for asbestos	Yes; May 3 & 4, 2011; Suspect ACM= 1" metal piping with pipe wrap, 2" metal piping with pipe wrap, 4" metal piping with pipe wrap, 6" metal piping with pipe wrap, foreign or discolored soil materials; 24 bulk material samples; 3 samples (T-4, T-7, T-8) had asbestos concentrations of 35%, 3%, and 2%, respectively; Beige wrap, 1" pipe in nw corner of RZ-C-24, brown/black wrap in eastern 2" pipe near RZ-C-24, and brown/black wrap in western 2" pipe near RZ-C-24 (confirmed ACM)	Greenway Industries; May 12-13, 2011; removed two 8" pipes approx. 52' in length, three 2" pipes approx. 52' in length, three 4" pipes approx. 52' in length, two 8" pipes approx. 27' in length, one 2" pipe approx. 27' in length; Also removed a large amount of ACM soil	Yes; conducted on May 13, 2011 by LoSo
						Greenway Industries; June 14, 2011; removed one asbestos-wrapped 1" pipe and one 6" non-asbestos pipe; asbestos containing map was approx. 148'	Yes; conducted on June 15, 2011 by LoSo
Pipe and Insulation Materials in Excavation Sidewall Near RZ-C-14/15	RZ-C	RZ-C-14, RZ-C-15			May 12 and 19, 2011; Suspect ACM= black pipe wrap, beige TSI, and grey grout material; collected 7 bulk material samples; 3 samples (T-26, T-27, and T-28) had asbestos concentrations of 15%	Greenway Industries; May 18-19, 2011; excavated soil along pipe, one 1" pipe had approx. 10' of 3.5" thick TSI, one 1.5" pipe, one 2" pipe, and one 5" pipe, all approx. 120' long, removed a total 480' of ACM and non-ACM, all located north of Avenue F	Yes; conducted on May 19, 2011 by LoSo
Transite Pipe in Southern Portion of RZ-C	RZ-C	RZ-C-02B, RZ-C-03, RZ-C-05A, RZ-C-07, RZ-C-08, RZ-C-09, RZ-C-19, RZ-C-20	Northgate found three pipes during the excavation of polygons 02B, -03, -05A, -07, -08, -09 and -20; April 28, 2011; The pipe was found within berm south of RZ-C-18 when a piece of excavating equipment drove over the pipe and cracked it.		Northgate: Sampled pipe in RZ-C-03; collected 5 samples; 2 of 5 samples had detected ACM; ENVIRON: May 12, 2011; Suspect ACM= 18" transite pipe was identified as suspect ACM; 1 sample collected; T-25 had ACM concentrations of 22%	Greenway Industries; Northgate: December 27, 2010 to January 14, 2011; removed three segments of 20" transite pipe, 8" and 10" ACM wrapped steel pipes approx. 565' in length, an unspecified length, and 295' in length; ENVIRON: May 13-16, 2011; excavated several feet of soil to reach pipe, 18" pipe approx. 130' long	Yes; Northgate: conducted on December 23, 2010 thru January 19, 2011 by Converse Consultants; ENVIRON: conducted on May 16, 2011 by LoSo
RZ-C Stockpile	RZ-C	Stockpile (RZ-C-24)	Stockpile within ECA C5	NA	NA	Greenway Industries; July 30, 2011; stockpile of removed soil that contained ACM soil and debris from RZ-C-24 area	Yes; conducted on July 30, 2011 by LoSo
BT Tanks Pipe Rack in Northern Portion of RZ-C	RZ-C	RZ-C-29	Pipe rack that need to be removed to finish polygon excavation	Had sampled due to the fact that most pipes and buildings on-site contain ACM	Yes; July 12, 2011; Suspect ACM= 2" metal piping with TSI, 4" metal piping with TSI, 4" gasket material; 9 bulk material samples collected; All samples were non-detect for Asbestos	No asbestos abatement needed; Pipes/pipe rack were removed by LVP on 7/19-7-26	No Final Visual Clearance needed

Table 4: Asbestos Containing Materials Removed
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Asbestos Areas	Remediation Zone	Polygon	How found? (when was it found, what was found)	Action taken by LVP/ENVIRON/Northgate	Survey of area conducted? (when was it conducted, suspect ACM, samples taken, results, where asbestos found)	Asbestos Abatement? (When, what was removed?)	Pass Final Visual Clearance? (when occurred)
Concrete Ramp Structure in Northern Portion of RZ-C	RZ-C	RZ-C-39	Structures within polygons (buliding for RZ-C-39 and Pipes and Pipe rack for RZ-C-29) that need to be removed to finish polygon excavation	Had sampled due to the fact that most pipes and buildings on-site contain ACM	Yes; July 12, 2011; Suspect ACM= Painted surfacing material; 3 bulk material samples collected; All samples were non-detect for Asbestos	No asbestos abatement needed; Structure with paint were removed by LVP on 7/19-7-26	No Final Visual Clearance needed
Pipe in RZ-C-32 and -37	RZ-C	RZ-C-32, RZ-C-37	Northgate found one 3" ACM pipe during excavation activities	Northgate removed pipes since they were a continuation of the pipes on the TEP Berm and were historically ACM	No; continuation of pipe found in RZ-D Northwest corner.	Greenway Industries; November 10-11, 2010; removed one 3" ACM wrapped steel pipe approx. 200' in length	Yes; conducted on November 12, 2010 by Converse Consultants
Fibrous Cement Material in RZ-C-36	RZ-C	RZ-C-36	August 8, 2011; found cement and pipe approx. 1' above final grade while using grade all to finish remaining excavation	ENVIRON/LVP- stopped work, snow fenced area, and spray painted ends of pipe	August 9, 2011; Suspect ACM= bottom half of a fibrous cement material was identified as suspect ACM; 3 samples collected; All samples reported ACM concentrations of 15%; approx. 5' of fibrous cement material	Las Vegas Paving Corp.; August 16, 2011; removed several feet of soil to reach pipe (10" pipe approx 10' in length) southwest portion of polygon	Yes; conducted on August 16, 2011 by LoSo
Pipe in RZ-C-39C	RZ-C	RZ-C-39C	May 10, 2011; found while walking over polygon area as LVP prepares for backfill activities	ENVIRON- LoSo samples to see if pipe contains asbestos	May 11, 2011; Suspect ACM= 4" transite pipe; 1 sample collected; T-24 had asbestos concentration of 15%	Greenway Industries; May 10-11, 2011; excavated several feet of soil and removed 4" transite pipe approx. 70' in length	Yes; conducted on May 11, 2011 by LoSo
Pipe in RZ-C-45 and -45B	RZ-C	RZ-C-45, RZ-C-45B	December 20, 2010; found pipe during excavation activities	LVP contacted Greenway Industries to assist in the abatement	No	Greenway Industries; December 21-27, 2010; removed on 20"/24" steel ACM wrapped pipe approx. 160' in length	Yes; conducted on December 30, 2010 by Converse Consultants
Pipe in RZ-C-45	RZ-C	RZ-C-45	August 2, 2011; found pipe while performing final scrape of polygon	ENVIRON- have LoSo inspect pipe for ACM	August 3, 2011; Suspect ACM= steel pipe that was oxidized and partially decomposed in surrounding soil; 1 sample collected; Sample was not found to contain ACM	No asbestos abatement needed; Pipes were removed by LVP with discolored soil	No Final Visual Clearance needed
RZ-D							
Pipes in Northwest Corner of RZ-D	RZ-D	TEP Berm	Northgate observed ACM material and ACM wrapped pipes before beginning remediation activity	Northgate stated in RZ-D excavation work plan that ACM would be removed before beginning remediation activities	No; sampling not needed due to information gathered by Northgate prior to remediation activities	Greenway Industries; August 11-16, 2010; removed one 3" ACM wrapped pipe approx. 500' in length and one 4" ACM wrapped pipe approx. 500' in length	Yes; conducted on August 16, 2010 by Converse Consultants
						Greenway Industries; August 11-16, 2010; removed loose ACM wrapped pipe and debris on and around the TEP Berm	Yes; conducted on September 2, 2010 by Converse Consultants
	RZ-D	RZ-D-12, RZ-D-13A	Northgate found pipes split from the TEP Berm to the southwest and southeast; Pipe to the southwest was exposed during excavation activities	Northgate removed pipes since they were a continuation of the pipes on the TEP Berm and were historically ACM		Greenway Industries; August 31 to September 10, 2010; removed 4" ACM wrapped steel pipe approx. 295' in length	Yes; conducted on September 13, 2010 by Converse Consultants
	RZ-D	RZ-D-10A	April 4, 2011; found while chasing discolored soil within the RZ-D-C area; pipe in asbestos pipe wrap	ENVIRON\LVP- stop work in area, GPS location of pipe and covered with orange spray paint until abatement took place		Greenway Industries; May 9, 2011; removed soil and one 4" metal pipe with pipe wrap approx. 259' in length and two 4" metal pipes with pipe wrap approx. 214' and 14' in length	Yes; conducted on May 10, 2011 by LoSo
	RZ-D	RZ-D-11, RZ-D-11A, RZ-D-11B	June 16, 2011; found while completing additional polygon excavation in RZ-D-11B	LVP- stop work in area, Asbestos trained laborer wraps pipe in plastic sheeting		Greenway Industries; June 22-23, 2011; removed soil around asbestos-wrapped pipe, also removed pipe that was wrapped in black pipe wrap (approx. 240' long)	Yes; conducted on June 23, 2011 by LoSo
Fibrous Material in Rubble Pile in Eastern Portion of RZ-D	RZ-D	RZ-D Debris Piles	July 18, 2011; Identified by NDEP Representative; white/beige fibrous deposit within the debris pile	ENVIRON- LoSo to sample the material	July 28, 2011; Suspect ACM= fibrous gray/white material, total volume about 2-3 cubic yards; 3 samples collected; All samples were non-detect for asbestos	No asbestos abatement needed; though no visible ACM, the inspection did not include material that may be buried within the pile; piles should be considered RACM	No Final Visual Clearance needed

Table 4: Asbestos Containing Materials Removed
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Asbestos Areas	Remediation Zone	Polygon	How found? (when was it found, what was found)	Action taken by LVP/ENVIRON/Northgate	Survey of area conducted? (when was it conducted, suspect ACM, samples taken, results, where asbestos found)	Asbestos Abatement? (When, what was removed?)	Pass Final Visual Clearance? (when occurred)
RZ-E							
Pipe in RZ-E-10 and -11	RZ-E	RZ-E-10, RZ-E-11	Northgate found the pipe during excavation activities in the area	Northgate removed pipes since they were a continuation of the pipes on the TEP Berm and were historically ACM	No; continuation of pipe found in RZ-D Northwest corner.	Greenway Industries; November 10-11, 2010; removed one 3" ACM wrapped steel pipe approx. 52' in length	Yes; conducted on November 12, 2010 by Converse Consultants
Asbestos in Soil and Concrete Culverts in RZ-E	RZ-E	Beta Ditch Soil	September 9, 2010; Northgate found suspected asbestos fibers in soil throughout the Beta Ditch west of 9th Street; Culverts were present before excavations started and needed to be removed to complete polygon excavations	NA	September 9, 2010; Converse sampled the suspected asbestos soil; Additional samples were collected on December 9-13, 2010 and were found to contain asbestos (concentration of 22%); ACM soil was found to extend throughout the Beta Ditch west of 9th street; the culverts were found to not contain ACM but the sediment that accumulated in the culverts did contain ACM; due to the sediment containing ACM, it was decided to remove the culverts	LVP; December 4, 2010 to February 14, 2011; excavated and removed soil within the Beta Ditch	Yes; conducted on June 22, 2011 by LoSo
		RZ-E-6				Greenway Industries; May 20-22, 2011; excavated soil from the Beta Ditch culvert until no visual ACM was encountered	
		RZ-E-9				Greenway Industries; May 22, 2011; excavated soil from the Beta Ditch culvert until no visual ACM was encountered and removed concrete pipe material	
		RZ-E-12				Greenway Industries; June 22-23, 2011; excavated soil from the Beta Ditch culvert until no visual ACM was encountered and removed concrete pipe material	
Fibrous Material at Eastern End of Beta Ditch	RZ-E	RZ-E-16B	July 11-12, 2011; Found with Gradall while completing excavation of the polygon	ENVIRON- LoSo to sample the material	July 12, 2011; Suspect ACM= Soil and TSI; collected 5 bulk material samples; 3 samples (BD-3, BD-4, and BD-5) had asbestos concentrations of 99%, 10%, and 69%; ACM= beige fiborous material in soil/ homogenous beige fibrous TSI	ACM soil and TSI is left in place and is placed with ECA E3; when the material was discovered, it was wrapped in plastic and covered with soil; since it was already an ECA due the culvert, fence and sandbag dam, it was decided to leave it in place	No Final Visual Clearance needed
RZ-E Stockpile	RZ-E	Stockpile (RZ-D-30, RZ-D-31)	Stockpiled material containing ACM removed from RZ-E culvert removal	NA	NA	Greenway Industries; June 23-24, 2011; removed soil stockpile that contained ACM soil and debris from several adjacent RZ-C locations	Yes; conducted on June 24, 2011 by LoSo

Notes:
ACM = Asbestos containing material
ECA = Excavation control area
LoSo = Logistical Solutions
LVP = Las Vegas Paving
NA = Not applicable
NDEP = Nevada Department of Environmental Protection
RACM = Regulated asbestos containing material
RZ = Remediation zone
TEP = Trade Effluent Pond
* = Northgate Environmental Management, Inc. 2010. Excavation Plan for Phase B Soil Remediation of RZ-B, Addendum to the Removal Action Work Plan. July.

Table 5a: Discolored Soil Remediation Area Summary - RZ-B
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place?	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-B-13	RZ-B-13	Black staining at edge of active pad; western edge of active material processing pad; about 0.33' deep	None	Removed all black staining at western edge of active material processing pad to a depth of 0.33'	None	SSAQ6-02; collected from floor of scraped area; February 9, 2011; analyzed for dioxins, SVOCs, Arsenic, Manganese, and Magnesium; Above BCLs for Arsenic and benzo(a)pyrene	None	Unknown (need additional information from LVP)	Proposed ECA B1: Unit Buildings 1-6 including soil within 50 feet of Unit Buildings 1-6 ECA B5: Sodium Chlorate Filter Cake Process Area
RZ-B-21	RZ-B-21	Southeastern corner of RZ-B-21, where soil within polygon cannot be excavated due to presence of active water line; No discolored soil observed	None	None	A small amount of polygon material remained in place because it could not be removed due to presence of an active water line that was found after the inactive (and asbestos-containing) old water line was removed.	None	EE-B21-1; collected within left over polygon material; May 17, 2011; 1 sample; Analyzed for HCB, Arsenic, and Perchlorate; All below BCLs	None	ECA B6: Soils Beneath Approximately 6 Feet Deep in Polygons RZ-B-20 and RZ-B-21

Table 5b: Discolored Soil Remediation Area Summary - RZ-C
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-C-1A Area	RZ-C-1, RZ-C-1A	1. In the north sidewall of RZ-C-1, a thin (~6") thick brown/black layer, about 2'-3' bgs; 2. In the upper sidewall along 4th St., a thin (~3"-6") thick brown/white layer; 3. In southeastern area, black layer on surface	None	1. Layer in North sidewall of RZ-C-1: excavated north and west up to fence line and 4th Street, stopped chasing; 2. Layer in sidewall along 4th St: excavated west toward 4th Street with all observed discolored soil removed; 3. Layer on surface in southeastern corner, chased to the southeast, removed all observed discolored soil (thickness was less than 1 ft).	Thin (~3"-6") thick brown/black layer in RZ-C-1 northwest corner, extends under NERT property fence and 4th street	CS-C01-1, CS-C01-2; collected in southwestern sidewall along 4th Street (CS-C01-1) and floor of excavation in center of RZ-C-1; April 21, 2011; 2 samples; Analyzed for Arsenic and Magnesium; Below BCLs	EE-C01-1; collected in Northwest corner of RZ-C-1 along fence; April 21, 2011; 1 sample; analyzed for Arsenic and Magnesium; Below BCLs	None	ECA C1: Portion of RZ-C-1A beneath 4th Street;
		1. A thin (~6") thick brown/black layer, less than 1 ft bgs			Thin (~3"-6") thick brown/black layer in RZ-C-1 northern sidewall, extends north under NERT fence				Established because polygon material extended under 4th street and was not excavated; does not cover material under fence line because it was found to be below BCLs
Southwest of RZ-C-05B/06	RZ-C-05B, RZ-C-06	April 2011: dark brown stained soil in sidewall of polygon excavation area; in area shown on figure.	None	Stained soil fully chased to the southwest, beyond the polygon limits of RZ-C-05B & 06	None	CS-C06-1; collected in sidewall of excavation; April 14, 2011; 1 sample; Analyzed for dioxin, HCB, and Magnesium; Below BCLs	None	None	None
North of RZ-C-05A	RZ-C-05A	April 2011: thin (1"-2") gray/black layer identified along NE edge of polygon RZ-C-05A; approx. 1' deep	None	Thin layer fully removed along entire length of NE edge of polygon RZ-C-05A (~150' long, ~20' to the NE)	None	CS-C05A-1; collected in floor of excavation; April 21, 2011; 1 sample; Analyzed for dioxin, HCB, and Magnesium; Below BCLs	None	None	None
Area East of RZ-C-05A & West of RZ-C-09B	RZ-C-05A, C-07B, C-07A, C-08, C-09B	April 2011: thin black surface layer w/ some loose gravel material & on surface across entire area, generally less than 1 ft deep, observed following polygon excavation. NOTES indicate that 7A & B were in process of excavation when soil located (p.35, 47, 50)	DS-C08-1; collected in black surface layer ; April 20, 2011; 1 sample; Analyzed for dioxin, HCB, Arsenic, Lead, Cobalt, Manganese, and Magnesium; Above BCLs for dioxin, HCB	Entire area scraped to remove surface black layer (C-05A eastern boundary EAST to midway through C-09B; Concrete pad NORTH to northern edges of C-07B, C-07A,C-08) Discolored soil removal was generally limited in depth to 1 ft deep; aerial extent included polygons and areas outside polygons, as shown on the figure.	None	CS-07A-1, CS-C08-2, CS-C08-1; collected in floor of excavation; April 21 & 28, 2011; 3 samples; Analyzed for dioxin, HCB, and Arsenic; Below BCLs; CS-C07B-1, CS-C07B-2; collected in floor of excavation; April 21, 2011; Analyzed for dioxin, HCB, Arsenic, and Magnesium; Below BCLs - could get original elevations for these to determine depth of stained material	None	None	None
RZ-C-09A area	RZ-C-09A, RZ-C-11	April 2011: grey and pink layer (generally <6" deep) along northeastern sidewall of RZ-C-09B, extending beneath excavated polygon RZ-C-09A.	DS-C09A-1; collected in discolored soil layer along southwestern edge of RZ-C-09A; April 20, 2011; 1 sample; Analyzed for dioxin, HCB, Arsenic, Lead, Cobalt, Manganese, and Magnesium; Above BCLs for Arsenic	Discolored soil removed from southwestern portion of RZ-C-09A following polygon excavation.	None	CS-C09A-1; collected on bottom of excavation in southwestern portion of RZ-C-09A; April 28, 2011; 1 sample; Analyzed for dioxin and HCB; Below BCLs	EE-C09A-1, EE-C09A-2 (Dup); collected of grey layer generally south of RZ-C-09A; June 20, 2011; 2 sample; analyzed for dioxin and HCB; Below BCLs	None	None
RZ-C-11/12/13	RZ-C-11, RZ-C-12, RZ-C13	Dark brown, black discolored soil	DS-C-11-1; Collected from dark brown/black soil; April 20, 2011; 1 sample; analyzed for dioxins, HCB, Arsenic, Lead, Cobalt, Manganese and Magnesium; Above BCLs for HCB	Accessible discolored soil removed	Discolored soil was left in place in RZ-C-13 near electrical power pole and other north/south trending utilities.	CS-C11-1; collected from bottom of excavation following removal of discolored soil; June 20, 2011; 1 sample; analyzed for dioxins and HCB; All below BCLs	EE-C13-1; Collected in black layer in southeastern sidewall, near electrical utility pole; June 20, 2011; 1 sample; Analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; Above BCLs for HCB	None	Proposed ECA C4: Water, fiber optic, and electricity utility lines through and near RZ-C-11/13
									Proposed ECA C4: Water, fiber optic, Electric pole, and electricity utility lines through and near RZ-C-11/13

Table 5b: Discolored Soil Remediation Area Summary - RZ-C
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-C-10/10A Area	RZ-C-10, RZ-C-10A	Thin black discolored soil on ground surface following polygon excavations.	DS-C10A-1; Collected from black soil at base of polygon excavation; April 20, 2011; Analyzed for dioxin, HCB, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for dioxin, HCB, Arsenic, Magnesium, and Perchlorate	All discolored soil removed.	None	CS-D10A-1; collected from bottom of excavation following removal of discolored soil; May 17, 2011; 1 sample; analyzed for dioxin, HCB, Arsenic, Magnesium, and Perchlorate; All below BCLs	None	None	None
			Question in comment refers to confirmation sample by Northgate; addressed in confirmation sample column			SSAO5-08; collected from floor of RZ-C-10 at the border of RZ-C-10A; February 9, 2011; 1 sample; Analyzed for dioxins, SVOCs, Arsenic, Magnesium, and Perchlorate; All below BCLs			
RZ-C-14/15 Area	RZ-C-14, RZ-C-15	Very thick (~10' to 12') dark brown/black layer in base of polygon excavations and sidewalls; extended north toward the facility fence	None	Removed about 12' of discolored soil; chased from southern sidewall along road north to facility fence and from the eastern sidewall of RZ-C-15 to the western sidewall of RZ-C-14	Some dark brown/black soil remains in the floor of the excavation of RZ-C-15, under Avenue F, in the northeastern corner of this area, and under the area of the former pump house yard to the east.	CS-C15-1; Collected from the bottom of the excavation following removal of discolored soil; June 20, 2011; 1 sample; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Manganese, Magnesium, and Perchlorate; All below BCLs	EE-C15-1 and EE-C15-2; Collected from black layer in eastern sidewall adjacent to pump house yard (EE-C15-1) and collected from black layer remaining in the base of the deep (approx. 20 ft) excavation (EE-C15-2); June 20, 2011; 2 samples; Analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; EE-C15-1: All below BCLs, EE-C15-2: Above BCLs for Arsenic	None	Proposed ECA C6: Avenue F utilities, Railroad line, and Roadway
									Also, ECA C5: Discolored soil at former pump house yard
Diesel Fuel Line Area Between RZ-C-10 and RZ-C-18	RZ-C-10, RZ-C-18	Shaly gray/black material found under diesel fuel line; approx. 10' thick, appears to be deposited in layers	DS-C10-1; collected from gray/black shaly layers east sidewall of RZ-C-10; April 20, 2011; Analyzed for dioxin, HCB, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for HCB, Magnesium, and Perchlorate	Some discolored soil in accessible areas was removed.	About 10' thick, about 10' wide and 100' long section under the Diesel tank pipelines	None	None, DS sample (and Northgate sample) provide information instead.	None	Proposed ECA C8: Diesel tank and Pipelines
		Peat-like material, horizontally bedded	SSAO5-09; collected from gray/black shaly peat-like material; February 11, 2011; Analyzed for dioxins, SVOCs, Arsenic, Manganese, Magnesium, and Asbestos; Above BCLs for HCB, Arsenic, and Magnesium		About 10' thick, about 12' wide and 75' long section under the Diesel tank pipelines				
RZ-C-10B	RZ-C-10B	July 20, 2011; in the NW sidewall of polygon, about 1' bgs; thin (about 6") black, tar-like layer, when very hot, layer becomes liquid and drips like tar; about 40' wide and 20' long, area is a half circle	None	Excavated black tar layer in a half circle, took off about (6" to a 1') from the top of grade; Half circle shape on NW side of polygon; about 40' wide (SW to NE) and 20' long (NW to SE); took off about a 1'	The layer was completely excavated	CS-C10B-1; collected in floor of excavated area; July 28, 2011; 1 sample; Analyzed for a broad suite of constituents per NDEP request, including dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, OCPs, Perchlorate, VOCs; All below BCLs	None	None	None
Southern Portion of RZ-C-17	RZ-C-17	May 3, 2011; in southern portion of RZ-C-17, black layer of discolored soil first discovered on western side, then found to extend to the east within the berm between two former ponds	DS-C17-1; Collected from a trench in southwestern portion of RZ-C-17; May 6, 2011; 1 sample; Analyzed for dioxin, HCB, Arsenic, Magnesium, and Perchlorate; Dioxins and HCB above BCLs	None	Black discolored soil	None	None	None	Proposed ECA C9: Areas with discolored soil
Northwestern Corner of RZ-C-18	RZ-C-18	Black and grey discolored soil observed in sidewall of excavation and along former pond slope	DS-C18-1; collected in black layer in northwestern corner of RZ-C-18; May 6, 2011; 1 sample; Analyzed for dioxin, HCB, Arsenic, Magnesium, and Perchlorate; All below BCLs	None	Discolored soil was left in place since characterization sample results indicated constituents were all below BCLs.	None	None	None	None

Table 5b: Discolored Soil Remediation Area Summary - RZ-C
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
Eastern side of RZ-C-18	RZ-C-18	Black discolored soil observed on ground surface following excavation of adjacent polygon RZ-C-18	None	Excavation of discolored soil performed a depth of approximately 6 feet; subsurface culvert structure and pipe removed	Some discolored soil left in place due to significant depth of discolored soil.	None	EE-C18-1; collected from bottom of excavation left of discolored soil left in place; May 17, 2011; 1 sample; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Manganese, and Magnesium; Above BCLs for dioxins, HCB?, and Benzo(a)Pyrene	None	Proposed ECA C9: Areas with discolored soil
		Northgate removed some scattered surface staining on the eastern edge of RZ-C-18	None	Excavated stained soil (Need more information from Northgate)	Unknown (need additional information from LVP)	SSAO6-06; collected in floor of excavation; February 9, 2011; 1 sample; Analyzed for dioxins, SVOCs, Arsenic, Manganese, and Magnesium; Above BCLs for HCB and Arsenic	HCB is not detected but the detection limit was above BCL and was marked as above BCLs	Unknown (need additional information from LVP)	
Southeast Corner of RZ-C-18	RZ-C-18	May 2, 2011; in southeastern corner of RZ-C-18, about 10' bgs; brown discolored soil	DS-C18-2; collected from brown discolored soil in southeast corner of RZ-C-18; May 6, 2011; 1 sample; Analyzed for dioxin, HCB, Arsenic, Magnesium, and Perchlorate; All below BCLs	Although some soil removed by LVP prior to sampling, no additional soil was excavated following receipt of analytical results indicating no exceedances of BCLs.	Brown discolored soil	None	None	None	None

Table 5b: Discolored Soil Remediation Area Summary - RZ-C
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Southeastern Portion of RZ-C, Near Diesel Fuel Tank, Fuel Pipelines, and Gas Line	RZ-C-24, RZ-C-25, RZ-C-26, RZ-C-19, RZ-C-22, RZ-C-20, RZ-C-23, RZ-C-27, RZ-C-22A, RZ-C-22B, RZ-C-21	Gray/white layer in sidewall along 9th Street and Avenue F (?)	DS-C24-1, DS-C24-2 (dup); Collected from white/gray layer; May 4, 2011; analyzed for: HCB, SVOCs/PaHs, Arsenic and Manganese; Above BCLs for Benzo(a)Pyrene	Unknown	Grey/white discolored soils in Avenue F sidewall	None	None	None	Proposed ECA C6: Avenue F utilities, Railroad line, and Roadway; Proposed ECA C7: 9th Street Utilities and Roadway; Proposed ECA C10: Natural Gas Pipeline
		Gray/white layer in southern sidewall of RZ-C-24; near the top of the sidewall and ACM pipes		None					
		Dark brown layer under black layer north of diesel tank (?)	None	Accessible black discolored soil removed	A small amount of dark brown colored soil	CS-C22A-1; Collected from in the floor of the southern portion of the excavation area; June 23, 2011; 1 sample; analyzed for Arsenic, Lead, Manganese, and Perchlorate; All Below BCLs	None	None	
		Dark brown layer under black layer in RZ-C-22A; found under ramp that was installed during excavation activities in the northwest corner of the diesel tank area		Dark brown soil was removed that was located on the floor of the excavation of RZ-C-22A; no more than a foot of material was removed; may have extended under berm of the diesel tank pipelines					
		Black discolored soil at base of deep "pothole" excavation (blue area on map in RZ-C-25)	None	Area excavated to a depth of approximately 15 feet below original grade.	Black discolored soil at bottom of excavation	None	EE-C25-1; in black discolored soil in bottom of excavation; May 17, 2011; analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; Above BCLs for HCB and Arsenic	None	
		Grey/white layer beneath diesel fuel line	DS-C19-1; April 20, 2011; analyzed for: dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, and Magnesium; Above BCLs for Arsenic The sample was above BCLs for Arsenic (As= 47.5 mg/kg)	None	White/grey discolored soil	None	None, DS-C19-1 provides information.	None	
		Approximately 4' thick Black layer in sidewalls under diesel tank and throughout the sidewalls in the area of the diesel tank, Avenue F and 9th Street, and underneath the gasline; as well as thin layer of discolored soil on ground surface after excavation of polygons.	DS-C23-1, DS-C25-1; Collected from black layer under the diesel tank island and pipelines; April 20, 2011; analyzed for: DS-C23-1: dioxin, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; DS-C25-1: dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, and Magnesium; DS-C23-1: Above BCLs for Arsenic, Lead and Manganese; DS-C25-1: Above for Arsenic	Accessible discolored soil removed	Discolored soil in sidewalls beneath Diesel AST, Avenue F, 9th Street, gas line, and pump house yard.	CS-C25-1; Collected from bottom of excavation following discolored soil removal; June 30, 2011; 1 sample; analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; All Below BCLs CS-C23-1, CS-C27-1, CS-C27-2, CS-C27-3; Collected from base of excavation following removal of discolored soil; June 16, 2011; 4 samples; analyzed for Arsenic, Lead, Manganese, and Perchlorate; CS-C27-1 above BCLs for Arsenic; CS-C26-1; Collected from base of excavation following removal of discolored soil; June 23, 2011; 1 sample; analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; All below BCLs	EE-C23-1, EE-C27-1, EE-C27-2, EE-C27-3, EE-C27-4 (dup); Collected from sidewall of excavation underneath diesel fuel line (EE-C23-1) and Avenue F (4 others); June 16, 2011; analyzed for Arsenic, Lead, Manganese and Perchlorate; EE-C23-1: Above BCLs for Arsenic, Lead and Perchlorate; EE-C27-1: Above BCLs for Arsenic and Lead; EE-C27-2: Above BCLs for Arsenic; EE-C27-3: All below BCLs; EE-C27-4: Above BCLs for Arsenic EE-C24-1, EE-C24-2; Collected from sidewalls of excavation along Avenue F and pump house yard; June 30, 2011 and June 23, 2011; analyzed for HCB, SVOCs/PaHs, Arsenic, and Manganese; Above BCLs for Arsenic EE-C20-1, EE-C21-1 and EE-C21-2 (dup); collected within the western sidewall of RZ-C-21 and southern sidewall of RZ-C-20; 6/16/11; 2 samples + dup; EE-C21-1 and EE-C21-2 (dup): Analyzed for SVOCs/PaHs, Arsenic, Manganese, and Perchlorate; Above BCLs for Benzo(a)Pyrene, Arsenic, and Perchlorate; EE-C20-1: Analyzed for Arsenic, Lead, Manganese, and Perchlorate; Above BCLs for Arsenic, Lead, and Perchlorate	None	Also, ECA C8: Diesel Tank and Pipelines; and ECA C5: Discolored soil at former pump house yard

Table 5b: Discolored Soil Remediation Area Summary - RZ-C
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
Northern Portion of RZ-C-44	RZ-C-44	Black/gray material in northern sidewall of RZ-C-44; excavated about 0.5 feet to 1 foot towards the north/northeast of RZ-C-44 to the RZ-E/RZ-C boundary	None	About 0.5 to 1 foot of black/gray material was removed in the area	None	CS-C44-1; Collected in floor of excavation near the western sidewall; May 18, 2011; Analyzed for dioxin, HCB, Arsenic, Cobalt, and Manganese; All below BCLs	None	None	None
RZ-C-02A Area	RZ-C-02A	Scattered staining of soil within polygon and surface staining to the northeast of the polygon	None	Stained soil was scraped and till stained soil was removed	None	SSAO3-06; collected in floor of excavation; February 9, 2011; Analyzed for Arsenic and Manganese; All below BCLs	None	None	None
RZ-C-45 Stockpile Management Area	RZ-C-45	Within this area, polygon material and discolored soil material was stockpiled from RZ-C, RZ-E, and RZ-D(?); following the removal of the stockpiles, the area was scraped (~6" scraped off the surface). During the scrape, patches of black stained soil was encountered (different than discolored soil). Smaller patches were chased while the larger patches were sampled	DS-C45-1 and DS-C45-2; collected from floor of scraped area within RZ-C-45; August 3, 2011; 2 samples; Analyzed for dioxins, HCB, Arsenic, Cobalt, and Manganese; DS-C45-1: all below BCLs; DS-C45-2: Arsenic above BCLs	Removed about 6" of material from western side of RZ-C-45, south of RZ-C-44	Some patches of black stained material was left in place because it did not need to be excavated since it was below BCLs (except Arsenic, which was just slightly above BCLs)	None	None	None	None

Table 5c: Discolored Soil Remediation Area Summary - RZ-D
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Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-D-7 Area (Northgate)	RZ-D-7	Discolored soil found south of RZ-D-7 by Northgate (Same as RZ-D-C Area?)	None	Excavated discolored soil within area; need more from Northgate	Unknown (need more information from LVP)	SSAK2-02; 2/9/11; 1 sample; Analyzed for dioxins, SVOCs, Arsenic, and Perchlorate; All below BCLs	None	None	None
Discolored Soil East of Berm in Northwest Corner of RZ-D	RZ-D-4, RZ-D-5, RZ-D-5A, RZ-D-10, RZ-D-10A, RZ-D-10B, RZ-D-8, RZ-D-8A	Exposed from Polygon excavations completed by Northgate and remained uncovered at time ENVIRON took over project; Thick, black layer and Construction/Process Debris layer extend the length of the berm of pond GW-11 and is about 200' wide; Black Layer: Thick (majority of height of GW-11 berm, about 15' to 20'), black, greasy, cohesive, dense; Construction/Process** Debris: black soil mixed with bricks, concrete, rebar, plastic tarp, process bricks, black cylinder bricks	DS-DB-1 (and duplicate DS-DB-2); within black layer along GW-11 berm; 4/22/11; 2 samples; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for dioxins and Magnesium	Excavated over 10' from ground surface, over entire area within RZ-D-B area; rectangle shape (length= length of GW-11 Pond and width= from GW-11 berm to berm used as fill material, just over 200'; over 10' of material was removed from entire area	About 10' thick section of black, greasy, dense material in sidewall of entire length of GW-11 Pond berm; could not excavate into pond berm any further because it could compromise the structure of the pond	CS-D10-1, CS-D10A-1, CS-D10B-1, CS-DA-1, CS-DB-1, CS-DB-2, and CS-DB-3 (duplicate of CS-DB-1); 6/7/11 to 6/9/11; Collected on floor of excavation and spaced throughout all of the RZ-D-B Area; 7 samples; Analyzed for dioxins, HCB, and Magnesium; All below BCLs; Northgate collected a confirmation sample (SSAJ3-10) from the base of the excavation; analyzed for dioxins and SVOCs; below NDEP BCLs	EE-D10-1, EE-DB-1, and EE-DB-2; 6/7/11; collected in sidewall of GW-11 Pond berm within thick, black, greasy, dense layer; 3 samples; Analyzed for dioxins, HCB, and Magnesium; Above BCLs for Magnesium	Additional excavation was performed in the floor of the excavation near the southern end of GW-11 Pond berm; Additional black, greasy, dense layer found while final grading was occurring in area; Due to similar texture as black material in area and small extent, layer was excavated and about 2-3' of material was removed and about 80' North to South and about 50' East to West; western edge of area is shared with RZ-D-C area	Proposed ECA D2: GW-11 and WC Ponds and Berms

Table 5c: Discolored Soil Remediation Area Summary - RZ-D
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
Discolored Soil West of Berm in Northwest Corner of RZ-D	RZ-D-6A, RZ-D-2	Found at completion of Polygon 6A; located at the top of the north side wall of 6A within RZ-D-2; About 6" thick and found about 6" to 1' bgs, extended just north of high voltage lines near 6A (about 20') and was the length of the northern boundary of 6A (about 50'); Thin black layer, also had yellow/orange layers, and process debris (wood, concrete, bricks, black cylinder bricks); Smelled of solvents (Max PID of breathing space=0.1 ppm; max PID of Pile= 8.8 ppm)	None	Excavated about 2' bgs; trapezoid shape with longer end to the east (Direction of Berm used as fill; about 20') and shorter side to the west (about 10'-15'), there is about 50' from east to west; removed about 2'-3' of soil	Small amount remained in place around high voltage utility pole; layer extended underneath pole but for safety of the crew, we could only excavate to within 15' in all directions around pole	CS-D02-1; 5/17/11; center of area scraped, even with utility pole but west of it; 1 sample; Analyzed for dioxins, HCB, Arsenic, and Perchlorate; below BCLs	EE-D02-1; 5/17/11; collected in layer that is within 15' of the high voltage utility pole, may extend under pole; 1 sample; Analyzed for dioxin, HCB, Arsenic, and Perchlorate; Above BCLs for dioxins, HCB, and Arsenic	None	Proposed ECA D1: NV Energy Transmission Line Towers
		Thick, very hard, white, "caliche" type layer found in east side, north side, and base of RZ-D-6A	DS-D06A-1; within thick, white, caliche type layer; 4/28/11; 1 sample; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for Arsenic	None; arsenic was only slightly above the background value of 7.2 mg/kg, and nothing else exceeded BCLs. We discussed these areas with NDEP and received their concurrence that these materials could be left in place since they were going to be buried (a significant amount of fill here – more than 10 ft). We further agreed to address the slightly elevated arsenic concentrations in an upcoming risk assessment for the site.	The entire layer remained in place because NDEP agreed that these materials could be left in place since they were going to be buried (a significant amount of fill here – more than 10 ft) and the level of Arsenic was only slightly above BCLs	None	None	None	None
		Olive green sand on bottom of the southern end of RZ-D-6A	DS-D06A-2; within olive green sand layer in bottom of RZ-D-6A; 5/10/11; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for Arsenic			None	None	None	None
		Discolored soil under excavation of RZ-D-6 and part of RZ-D-2 chased by Northgate	None	Excavated discolored soil within area; need more from Northgate	None	SSAJ2-07; 2/9/11; 1 sample; Analyzed for dioxins, SVOCs, Arsenic, and Perchlorate; All below BCLs	None	None	None
Discolored Soil South of Berm in Northwest Corner of RZ-D	RZ-D-7, RZ-D-10A, RZ-D-8A, RZ-D-8, RZ-D-11, RZ-D-12, RZ-D-C	Discontinuous black patches on the surface soil in whole area, thin black layer in southern sidewall near RZ-D-7; Extend from Property line fence east to GW-11 Pond berm and from southern polygon boundary at RZ-D-10A to Northern boundaries of RZ-D-12 and RZ-D-11; Varied according to location: Most thin discontinuous black layers, construction/process debris**, also a thicker bright white, hard, chalky layer	DS-DC-1; within thick, white layer; 4/21/11; 1 sample; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; Above BCLs for HCB	Performed a general scrape of the area, removing no more than 5' from an area; began at the Northwestern corner near the property line and moved to the southeast; no more than 5' of soil was removed from a given area	None	CS-DC-1, CS-DC-2, CS-DC-3, and CS-DC-4, CS-D08-1; 5/3/11 and 6/2/11 (CS-DC-4 only) and 6/9/11 (CS-D08-1 only); 4 samples; Analyzed for dioxins, HCB, SVOCs/PaHs, Arsenic, Lead, Cobalt, Manganese, Magnesium, and Perchlorate; CS-DC-4 was only analyzed for dioxins; CS-DC-3 detected dioxins above BCLs; all other samples were below BCLs; Confirmation sample by Northgate: SSAK2-02; Analyzed for dioxins, SVOCs, Arsenic, and Perchlorate; all below NDEP BCLs	None	The entire RZ-DC area east of CS-DC-3 was scraped an additional 0.5' to 1' because results from that sample were above BCLs for dioxins; the area was resampled (CS-DC-4) and found to be below BCLs for dioxins	Proposed ECA D1: NV Energy Transmission Line Towers

Table 5c: Discolored Soil Remediation Area Summary - RZ-D
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-D-13/14	RZ-D-13, RZ-D-14, RZ-D-12, RZ-D-11, RZ-D-11B	A thin gray layer was found in the bottom of RZ-D-11B, the southwestern sidewall of RZ-D-11B and in the southern and western sidewall of RZ-D-14 after polygon excavations were completed to design depths; Layer ranges in thickness from a couple inches to about 3' thick; gray, ashy layer with small white and black process debris (<3"); Layer is extensive and may extend to the Beta Ditch (based on test pits and other sampling), goes from RZ-D-14 and RZ-D-11B and continues south/southeast towards the Beta Ditch	DS-D11B-1, DS-D14-1; within thin gray layer in sidewalls; 6/20/11 and 7/19/11; Analyzed for dioxins, HCB, and OCPs (DS-D14-1) and Analyzed for dioxins and HCB (DS-D11B-1); Only DS-D14-1 was above BCLs for dioxins, HCB, and OCPs	The thin gray layer was excavated around RZ-D-14. The gray layer was excavated from the south boundary line of RZ-D-14 to the edge of the asphalt site road and also from the western boundary line to the eastern boundary line of RZ-D-12. The gray layer was also removed between the asphalt parking lot and RZ-D-13 where the excavation continued north of the road and ended at the Tronox fence line. between 1' and 3' of material was removed from the entire area	Thin layer (3" to 4") of gray material that extends under the road, asphalt lot, and fence line. Layer most likely extends south to the Beta Ditch and east to RZ-D-11B	None	None	None	Proposed ECA D2; snow fence was placed over the sidewalls and 3:1 slopes were built with fill
		This layer is suspected to be continuous to the beta ditch and related to the gray layer along the western portion of RZ-E and extends north into RZ-D	DS-C39B-1, DS-D27-1, DS-D27-2; within thin gray layer in sidewalls; 4/14/11; Analyzed for dioxins, HCB, Arsenic, Lead, Manganese, Magnesium, and OCPs; All below BCLS						
RZ-D-17B Area	RZ-D-17B, RZ-D-18	Found around time ENVIRON took over project; In sidewall of excavation, revealed while conducting final grading of area; about 6 inches thick; black layer	None	Removed visible black layer; Excavated in a "L" Shape: about 10' wide, about 50' South to North (east side of Polygon) and about 75' east to west (north side of polygon); layer about 3'bgs, removed about 5' of soil during excavation	None	CS-D17B-1; 6/14/11; center of area on east to west arm of "L"; 1 sample; Analyzed for dioxin and HCB; Above BCLs for HCB	None	Test Pit dug in location of confirmation sample (CS-D17B-1); Three confirmation samples were collected from different depth intervals of the pothole: 1.5' to 2' bgs (CS-D17B-2), 3' to 3.5' bgs (CS-D-17B-3), and 4.5' to 5' bgs (CS-D17B-4); The first sample was run for HCB and the others put on hold (if first sample above BCLs, next sample would be analyzed, so on until the sample was below BCLs--excavation would then occur to that depth interval); CS-D17B-2 below BCLs; no additional analysis; removed an additional 2' of material from area	None
		Uncovered in the sidewall during final grading of area							

Table 5c: Discolored Soil Remediation Area Summary - RZ-D
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-D-24	RZ-D-24	May 2011; along eastern sidewall of 24; layer located ~2' deep; gray/black layer	None	Trenched into area w/ discolored layer observed; excavated toward the southwest ~10' to a depth of ~2-3', then additional 10' to a depth of ~1'	None	Sampled at 1-1.5' foot intervals, which were progressively analyzed, until we received results < BCLs; CS-D24-1 (above BCLs for Dioxin, As), CS-D24-2 (above BCLs for Dioxin, As), CS-D24-3 (below BCLs for Dioxin, As)	None	Area excavated an additional 2' due to results of CS-D24-1 and CS-D24-2.	Snow fence will be draped over the remaining material and backfilled to grade
		Layer found in southwestern sidewall				CS-D24-1; 6/8/11; 1 sample; collected from floor of excavation in center; Analyzed for dioxins and Arsenic; above BCLs for Dioxin, Arsenic		Test Pit dug in location of confirmation sample (CS-D24-1); Three confirmation samples were collected from different depth intervals of the pothole: 1.5' to 2' bgs (CS-D24-2), 3' to 3.5' bgs (CS-D24-3), and 4.5' to 5' bgs (CS-D24-4); The first sample was run for dioxins and Arsenic and the others put on hold (if first sample above BCLs, next sample would be analyzed, so on until the sample was below BCLs--excavation would then occur to that depth interval); CS-D24-2 above BCLs for dioxins and Arsenic; CS-D24-3 below BCLs; no additional analysis; removed an additional 3' of material from area	Backfilled to grade
RZ-D -25A Debris	RZ-D-25A, RZ-D-25	May 2011; along the northeast sidewall of polygon 25A; top ~2' of sidewall; construction (concrete/rebar/wood) debris and deep brown/black material.	None	Removed debris and discolored soil until only small, isolated patches of discolored soil remained; potholed 2'-3' deep in area 5'-10' north of impacted area and did not observe additional discolored soil.	Small amounts of construction debris.	CS-D25-2 (All below BCLs)	None	Further excacated in July/August 2011 when RZ-D-24 deep layer was chased to the fence line near the Eastern property boundary	None
		Along the northwest side of polygon 25A				CS-D25-2; 6/8/11; 1 sample; Analyzed for dioxins and Arsenic; All below BCLs			
RZ-D-24/25/25A	RZ-D-24, RZ-D-25, RZ-D-25A	May 2011; along southern sidewall of RZ-D-24; ~4" thick intially; ~ 3-4' deep; gray w/ chalky texture when dry/exposed for a period of time and black w/ grainy texture when newly unconvered.	None	Layer chased to the southeast until it was ~6"+ thick and ~5' deep; trenched to SE and SW and noted that thick black layer continued. Material chased an additional ~10' to the south.	Material in eastern sidewall, along fence line near eastern property line.	CS-D25-1 (above BCL for As), CS-D25A-1 (below BCLs), CS-D25A-2 (above BCLs for Dioxins & As), CS-D25A-3 (below BCLs)	EE-D25-1 (deep layer, above BCLs for Dioxins & As, soil since been removed)	Chased discolored layers to the southeast, up to the fence line near the eastern property line.	D9, D10, and fence line near eastern property line; snow fence will be draped over the remaining material and backfilled to grade
						4 samples collected; all analyzed for dioxins and Arsenic; CS-D25-1, 6/8/11, above BCL for As; CS-D25A-1, 8/3/11, below BCLs; CS-D25A-2, 8/3/11, above BCLs for Dioxins & As; CS-D25A-3, 8/3/11, below BCLs	EE-D25-1; 6/8/11; 1 sample; collected from the black deeper layer; Analyzed for dioxins and Arsenic; above BCLs for dioxins and Arsenic; was later excavated from the area		
	RZ-D-24, RZ-D-25, RZ-D-25A	July 2011; along southern sidewall of RZ-D-24; ~2' deep (located above black layer described above); ~2" thick gray-brown layer which precipitated white crystalline material after period of exposure.	Black layer dove deeper as further chased. After significant removal of black layer, it was thought that overburder could be separated and considered "clean". Shallower layer identified at this point and sampled to determine if overburden could be separated. [EE-D25-2 (above BCLs for Dioxins, As)]	Layer removed as deeper black layer was chased. Layer extended a short distance toward eastern property line, but ended well before the fence was reached. [Per JMP, did not stretch very far.]	None	Removed to well below this shallow layer due to deeper black layer.	EE-D25-2 (shallow, above BCLs for Dionxins & As, soil since been removed); EE-D25A-2 (above BCLs for Dioxins, As), EE-D25A-3 (DUP; also above BCLs for Dioxins, As)		
							EE-D25-2; 6/30/11; 1 sample; collected from the black shallow layer; Analyzed for dioxins and Arsenic; above BCLs for dioxins and Arsenic; was later excavated from the area; EE-D25A-2 and EE-D25A-3 (DUP to EE-D25A-2); 8/3/11; 2 samples; analyzed for dioxins and Arsenic; above BCLs for Dioxins and Arsenic; located within the soil remaining at the property line (on Timet's property)		D9 and fence line near eastern property line; snow fence was placed over the sidewalls and the area was backfilled to grade

Table 5c: Discolored Soil Remediation Area Summary - RZ-D
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
RZ-D Northeast Corner Berm	RZ-D-23A, RZ-D-23, RZ-D-24	March 2011; along the berm northeast of polygons 23A, 23, and 24; about 3 to 4 inches thick, length of berm, about 10 feet wide and begins about 1' bgs surface material; thin, gray, ashy texture Initially discovered in March 2011; The layer was sampled in late April and test pits were dug in early April 2011	DS-D23-1; 4/22/11; collected in middle of berm; one sample; tested for dioxins, HCB, Arsenic, Lead, Cobalt, Manganese, Magnesium; Above BCLS for dioxins, HCB, Arsenic, and Magnesium	Removed whole layer along berm; excavtion was about 15' wide and extended the length of the berm; removed about 2' to 3' of material from top of berm	None	CS-D23-1, CS-D23-2, CS-D23-3, and CS-D23-4; 6/30/11; Along berm, about 150' apart; 4 samples; Analyzed for dioxins, HCB, Arsenic, and Magnesium; All Below BCLs	None	Sampling was performed on the stockpile to see if it needed to be disposed of under a different profile; The stockpile from the berm material was divided into four quadrants and an eight point composite sample was collected from the stockpile. Samples sent to lab to be composited and analyzed for TCLP SVOCs, RCRA 8 Metals, Reactive Cyanide, Reactive Sulfide, PCBs, and Sulfur.	None
RZ-D-25A Southern Tip		Dark brown to black soil and wood debris observed in southern portion of RZ-D-25A; 1'-2' thick discontinuous layer	None	All discolored soil within polygon boundaries was excavated, but was not chased beyond polygon borders.	A 1'-2' thick layer remained in place in the southwest sidewall of RZ-D-25A beneath the well located nearby.		EE-D25A-1; 5/18/2011; collected from SW sidewall below well; analyzed for dioxins, As; above BCLs for As		ECA D10 was established over stained soil left in place due to location of well SW of RZ-D-25A

Table 5d: Discolored Soil Remediation Area Summary - RZ-E
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
Subsurface Tank Structures in RZ-E-14A area	RZ-D-E14A	April 2011: Black/red-brown soil observed in SE corner of E-14A; later encountered concrete and rebar of 2 large subsurface tank structures, surrounded by stained soil and underlain by black soil; soil in bottom of structures is odorous and heavily stained w/ high PID readings	DS-E14A-1 (eastern structure: above BCLs for dixin, HCB, As, VOCs) & DS-E14A-2 (western structure: above BCLs for dixin, HCB, As, Mg, VOCs)	each structure ~16' diam. X 9' deep; stained material around structures completely excavated	Stained soil remained in place along the southwestern edge of E-14A, where the polygon is bordered by the Tronox steam line [Black discolored soil seam, side wall near steam vent]	2 samples collected on 5/18/11: analyzed for dioxins, HCB, As, Mg; CS-E14A-1 (eastern structure: above BCLs for dioxin, HCB); CS-E14A-2 (western structure: below BCLs); CS-C44-1 (5/18/11; analyzed for dioxins, HCB, As, Co, Mn; below all BCLs)	EE-E14A-1; 5/18/11; analyzed for dioxin, HCB, As, Mg (above BCLs for dioxin)	Excavated additional ~4' below sample location CS-E14A-1 due to high results. CS-E14A-3 came out below BCLs	Near C12 (steam line)
South of RZ-E-14C	RZ-E-14C	July 2011: Discolored (black) soil located below concrete debris/rebar observed in the southern sidewall during grading; ~2' bgs, ~3' wide.	DS-E14C-1; 7/28/11; analyzed for HCB, As, Pb, & Mn (all below BCLs); collected after material removed passed hingepoint.	Discolored material was removed to ~5' south of the hingepoint of the slope so that grading of the south sidewall of E-14C could continue; gray/green/dark brown soil also scraped from surface along beta ditch, just west of former basin.	Discolored soil in southern sidewall of excavation	CS-E-14C-2; 7/21/11; analyzed for HCB, As, (below BCLs) collected below material already removed. [DS-E14C-1 (below BCLs) collected after material removed passed hingepoint.]	None, DS-E14C-1 provides excavation extent info.	None	None
North sidewall of RZ-E-14C	RZ-E-14C	June 2011: discolored (black) soil observed in northern sidewall of E-14C.	None	Scraped off sidewall until no longer observed or until inaccessible (due to process lines)	Discolored soil beneath and adjacent to Tronox process water lines	CS-E14C-1; 6/2/11; analyzed for dioxins, HCB, SVOCs, As, OCPs, Perchlorate (all below BCLs)	EE-E14C-1; 6/2/11; analyzed for dioxins, HCB, SVOCs, As, OCPs, Perchlorate (all below BCLs)	None	E2 overlies a portion of E-14C, due to the presence of Tronox process lines.
Gray Layer along Western Portion of RZ-E and North into RZ-D	RZ-E-03A, 04, 05, 07	Potholes were advanced north and south of RZ-E-3/4 to determine extext of layer. Continuous gray/brown to gray layer; 2" - 6" thick around RZ-E (ranging from at surface to 2' bgs) and up to ~2' to the North in RZ-D; ashy texture	DS-C39B-1: 4/14/11: analyzed for dioxins, HCB, As, Pb, Mn, Mg, & OCPs (all below BCLs); DS-D27-1: 4/14/11: analyzed for dioxins, HCB, As, Pb, Mn, Mg, & OCPs (all below BCLs); DS-D27-2: 4/14/11: analyzed for dioxins, HCB, As, Pb, Mn, Mg, & OCPs (all below BCLs)	None	tested and determined to be below BCLs so material was not removed.	None	None	None	None
RZ-E-09	RZ-E-09	May 2011; along bottom of RZ-E-09 excavation; 2 rectangular areas of gray stained soil, each is ~2' wide and majority of length of polygon (about 2' apart)	None	Gray stained soil removed to a depth of ~1' at deepest location; see cross section below	None	None; this discolored soil was determined to be similar to that along the sidewalls of RZ-E-08A and RZ-E-09 near the Veolia tanks, where confirmation samples were taken.	None	None	C15 was established to cover the Veolia Tank area
Beta ditch sidewalls near Veolia tanks	RZ-E-08A, 09	May 2011; north sidewall of RZ-E09, south sidewall of RZ-E08A, and culvert area to east,	None	Thin gray layer removed up to concrete pad (Veolia tank pad) on south sidewall of E-08A; and up to berm for AP-5 pond on north sidewall of RZ-E-09; also chased to east side of Veolia tanks near C-30.	Material in south sidewall of RZ-E-08A; north sidewall of RZ-E-09; and along the east side of the Veolia tanks	CS-E08A-1 (below BCLs for Dioxin, HCB, As, Pb, OCP, Perchlorate); CS-C30-1: 5/4/11: analyzed for dioxins, perchlorate (all above BCLs)	2 samples collected 5/4/11 analyzed for dioxins, HCB, As, Pb, OCPs, Perchlorate: EE-E08A-1 (above BCLs for Dioxin, HCB, As, Perchlorate); EE-E08A-2 (DUP) (above BCLs for Dioxin, HCB, As, OCPs, Perchlorate); EE-E09-1 (analyzed for dioxins, HCB, As, Pb, OCPs, Perchlorate; above BCLs for OCPs); CS-C30-1 also acted as EE sample: CS-C30-1: 5/4/11: analyzed for dioxins, perchlorate (all above BCLs)	None	C15 was established to cover the Veolia Tank area

Table 5d: Discolored Soil Remediation Area Summary - RZ-E
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Excavation Area	Polygons (included and adjacent)	Initial observations of DS (when, where, how much, what it looked like)	Characterization samples (DS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation performed (how much, where, what directions, how deep)	What remained in place	Confirmation samples (CS samples) collected (names, where, when, how many, what tested for, results, above BCLs or below)	Excavation extent samples collected (names, where, how many, what tested for, results, above BCLs or below)	Additional excavation performed (if any) and additional sampling performed (if any)	Excavation control area defined
Ridge along south side of beta ditch	RZ-E-08B, RZ-E-11, RZ-E-10, RZ-E-12	March 2011: Dark stained soil noted in ridge remaining along south sidewall of RZ-E-10 and RZ-E-12, within RZ-E-08B and RZ-E-11; periodically noted throughout entire length of ridge	None	Ridges removed from area on east side of Veolia tanks to east of RZ-E-11; small area removed near concrete pipe casing crossing beta ditch	None	3 samples collected on 5/4/11 analyzed for dioxin, HCB, As, Pb, OCPs, Perchlorate: CS-E-08B (below BCLs), CS-E11-1 (above BCLs for dioxin, HCB, OCPs, perchlorate), CS-E11-2 (below BCLs). CS-E11-3 (7/19/11; below BCLs)	None	Since CS-E11-1 was above BCLs, additional excavation in this area was performed (based on consulting with NDEP), then an additional confirmation sample CS-E11-3 was collected, which was below BCLs and excavationw as deemed complete.	None
RZ-E-06 near culvert	RZ-E-06	Areas of stained soil with intermittent areas of white and tan soil; N & S sidewalls of E-06, just east of culvert running through 'utility berm'	None	Stained areas scraped off	None	None; impacted soil was very limited in extent; therefore confirmation sampling not warranted	None	None	None
RZ-E-13/14/14B Area	RZ-E-13, -14, -14B	Black and orange discolored soil in western sidewalls of RZ-E-14, RZ-E-14B, RZ-E-13, and bottom of RZ-E-13; soil w/ white precipitate observed in bottom of RZ-E-14B	None	Excavation within polygons performed to within five feet of Tronox process water pipelines	Discolored soil beneath and adjacent to Tronox process water lines	CS-E14B-1 (bottom of excavation); 6/2/11; analyzed for dioxin, HCB, As, Perchlorate (below BCLs)		None	E2 overlies a portion of E-13/14/14B, due to the presence of Tronox process lines.
Southern Sidewall of RZ-E-16	RZ-E-16	Layer (~1' thick) of dark gray/black stained soil located in southern sidewall of E-16 and into RZ-C, ~6-8' bgs	DS-E16-1 (above BCLs for HCB)	Gray material removed from RZ-C first, then soil from RZ-E-16 sidewall; clean soil overlaying layer was pushed into the beta ditch before gray layer was excavated.	None	CS-E16-1; 6/2/11; analyzed for HCB, As, Pb, Mn (all below BCLs)	None	None	None

Table 6: Quantities Excavated and Disposed (by Remediation Zone)
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

	Excavation Amounts						Grand Total Excavated All Areas/Types	
	Soil Removed From Polygons		Soil Removed From Discolored Areas		ACM Soil Removed			
Remediation Zone	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*
RZ-B	38,279	23,196	0	0	0	0	**930,461**	**578,796**
RZ-C	267,146	160,660	31,983	20,904	201	131		
RZ-D	392,429	246,627	94,907	61,930	0	0		
RZ-E	75,890	47,429	10,747	7,024	18,879	10,895		
Total	**773,744**	**477,912**	**137,637**	**89,858**	**19,080**	**11,026**		

	Backfill Amounts						Grand Total Backfill All Areas/Types	
	Portable Aggregate Backfill		Chat Material Backfill		Haul Road Import			
Remediation Zone	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*	*Tons*	*CY (Estimated)*
RZ-B	11,400	5,708	21,060	10,544	4,096	2,051	**407,072**	**208,571**
RZ-C	52,616	28,441	28,270	15,084				
RZ-D	102,489	51,602	156,616	78,756				
RZ-E	16,913	9,142	13,610	7,243				
Total	**183,418**	**94,893**	**219,557**	**111,627**	**4,096**	**2,051**		

Notes:
ACM soil removed from RZ-C includes ACM-containing pipe.
ACM = Asbestos containing material
CY = Cubic yards
Est. = Estimated

Table 7: Excavation Control Area Summary
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	ECA #	ECA Area Description	Rationale for Proposing ECA	Engineering Controls In Place	Expected Depth(s) of Contamination	Known Chemicals of Concern/Minimum Required Analyses	Comments
RZ-B							
RZ-B	B1	Unit Buildings 1 through 6 including soil within 50 feet of Unit Buildings 1 through 6	Unit Building 1: Remediation zone extends beneath the former Chlorination Building footprint.	Concrete foundations for Unit Buildings 1 through 6	Unknown	Asbestos, Metals, OCPs, Hexavalent Chromium, VOCs, SVOCs/PaHs, HCB, Dioxins, Furans, PCBs, Perchlorate, Chlorate, Ammonia, TPH, Acids, Caustics, Surfactants, Sodium Hexametaphosphate, wet chemistry	Remediation polygon soil remains in place
			Unit Building 2: Remediation zone extends beneath the former Chlorination Building footprint.				
			Unit Building 3: Remediation zone extends beneath a small portion of the former Chlorination Building footprint.				
			Unit Building 4: Remediation zone extends beneath the electrical substation and basement portions of the building.				
			Unit Building 5: Soils uncharacterized				
			Unit Building 6: Soils uncharacterized				
			Approx. 50 ft around all Unit Buildings: Soils generally uncharacterized				
RZ-B	B2	Portions of Polygon RZ-B-04C/05/09A/11/12/13 Extending into Avenue G	Existing roadway and utilities	Asphalt roadway	Varies by location	Asbestos, Arsenic, Dioxins, SVOCs/PaHs, VOCs, TPH, HCB, OCPs, Acids, Surfactants, wet chemistry	Remediation polygon soil remains in place
RZ-B	B3	Fire Hydrant	Fire hydrant and water line	Asphalt pavement	<3'	Arsenic, Perchlorate, SVOCs/PaHs	Remediation polygon soil remains in place
RZ-B	B4	Former Hazardous Waste Storage Area	Current Tronox Bulk Storage Area	High density polyethylene sheeting caps most of the area	10'	Asbestos, Metals, Hexavalent Chromium, Dioxins, SVOCs/PaHs, VOCs, TPH, HCB, OCPs, Perchlorate, Acids, wet chemistry	Remediation polygon soil remains in place
RZ-B	B5	Sodium Chlorate Filter Cake Process Area	A thick concrete slab used in a process operation in the sodium chlorate filter cake process area cannot be removed at this time.	Approximately 12 inch thick concrete slab and underlying membrane	<0.33'	Asbestos, Arsenic, Hexavalent Chromium, SVOCs/PaHs, wet chemistry	Remediation polygon soil remains in place
RZ-B	B6	Soils beneath approximately 6 feet deep in polygons RZ-B-20 and RZ-B-21	Access for excavation of soils beneath 6 feet (and to surface east of Tronox water line) is limited by the presence of several subgrade utilities.	Asphalt pavement for 9th Street and a minimum of 6 feet of clean backfill material	Unknown	Arsenic, Hexavalent Chromium, Manganese, Boron, HCB, SVOCs/PaHs, Perchlorate, Chlorate, Ammonia, wet chemistry	Remediation polygon soil remains in place
RZ-B	B7	Soils within polygon RZ-B-22	Access for excavation of soils within this area is limited by the presence of subgrade utilities, building foundation, asphalt roadway, and other surface features.	Asphalt pavement for Avenue H covers most of the area	<2'	Arsenic, Hexavalent Chromium, Manganese, Boron, Perchlorate, Chlorate, Ammonia, wet chemistry	Remediation polygon soil remains in place

Table 7: Excavation Control Area Summary
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	ECA #	ECA Area Description	Rationale for Proposing ECA	Engineering Controls In Place	Expected Depth(s) of Contamination	Known Chemicals of Concern/Minimum Required Analyses	Comments
RZ-C							
RZ-C	C1	Portion of RZ-C-01A beneath 4th Street	Existing roadway	Asphalt pavement for 4th Street	<4'	Metals, Hexavalent Chromium, SVOCs, VOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-C	C2	Portion of RZ-C-03/04/05A beneath 5th Street	Existing roadway	Asphalt pavement for 5th Street	<5'	Metals, Hexavalent Chromium, HCB, SVOCs, VOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-C	C3	Portion of RZ-C-06 beneath fire hydrant, water line, and Avenue F	Existing roadway, hydrant, and utilities	Asphalt pavement for Avenue F covers most of the area	<9'	Magnesium, Dioxins, HCB	Remediation polygon soil remains in place
RZ-C	C4	Concrete foundation	Concrete foundation	Concrete foundation	<9'	Metals, Hexavalent Chromium, HCB, SVOCs, VOCs, TPH, OCPs, Perchlorate, Dioxins, wet chemistry	Remediation polygon soil remains in place
RZ-C	C5	Water, fiber optic, and electric utility lines through and near RZ-C-11/13	Existing below and above ground utilities	Clean backfill covers most of the area	<10'	Asbestos, HCB	Remediation polygon soil remains in place
RZ-C	C6	Discolored soil at former pump house yard	Discolored soil from ground surface down to at least 10 feet; limited access due to facility security fencing and former pump house equipment and utilities.	None currently	Unknown	Asbestos, Metals, Hexavalent Chromium, Dioxins, Furans, SVOCs/PaHs, VOCs, TPH, HCB, OCPs, Perchlorate, Radionuclides, wet chemistry	Discolored soil layer extends under facility security fencing and former pump house equipment and utilities.
RZ-C	C7	Avenue F Utilities, Railroad line, and Roadway	Existing fragile utilities (water and gas), railroad line, and Avenue F roadway	Asphalt pavement for Avenue F covers most of the area	Unknown	Asbestos, Metals, Hexavalent Chromium, Dioxins, Furans, SVOCs/PaHs, VOCs, TPH, HCB, OCPs, Perchlorate, Radionuclides, wet chemistry	Remediation polygon soil remains in place and discolored soil extending under Avenue F
RZ-C	C8	9th Street Utilities and Roadway	Existing utilities and roadway	Asphalt pavement for 9th Street covers most of the area	<8'	Asbestos, Metals, Perchlorate, wet chemistry	Remediation polygon soil remains in place and discolored soil extending under Avenue F
RZ-C	C9	Diesel Tank and Pipelines	Existing diesel tank and pipelines to Steam Plant	Concrete tank containment structure covers most of the area beneath the tank	<7'	Asbestos, Metals, Hexavalent Chromium, SVOCs/PaHs, Perchlorate, wet chemistry	Remediation polygon soil remains in place and discolored soil (about 4' thick) extends under the Diesel tank and pipelines
RZ-C	C10	Areas with Discolored Soil	Several areas with discolored soil	None currently	Unknown	Asbestos, Metals, Hexavalent Chromium, Dioxins, HCB, SVOCs/PaHs, wet chemistry	Discolored soil remains in place

Table 7: Excavation Control Area Summary
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	ECA #	ECA Area Description	Rationale for Proposing ECA	Engineering Controls In Place	Expected Depth(s) of Contamination	Known Chemicals of Concern/Minimum Required Analyses	Comments
RZ-C	C11	Natural Gas Pipeline	Existing natural gas pipeline to Steam Plant	None currently	>5'	Asbestos, Metals, Hexavalent Chromium, Dioxins, Perchlorate, SVOCs/PaHs, wet chemistry	Remediation polygon soil remains in place and discolored soil (about 4' thick) extends under the natural gas pipelines
RZ-C	C12	Steam Plant and Associated Features	Existing Steam Plant, pipe-racks, piping south of Plant, power pole & vault, and transformer pad	Existing Steam Plant building foundation and associated features cover most of the area	<2'	Dioxins	Remediation polygon soil remains in place
RZ-C	C13	Steam Line	Active Steam Line for facility process support	None currently	<10'	Arsenic, Chromium, Cobalt, Manganese, HCB	Remediation polygon soil remains in place
RZ-C	C14	Process Road	Existing process roadway	Process road is covered with clean crushed limestone backfill material	<4'	Asbestos, Metals, Hexavalent Chromium, Dioxins, HCB, Perchlorate, Chlorate, Ammonia, Caustics, wet chemistry	Remediation polygon soil remains in place
RZ-C	C15	Steam Plant Roadway	Existing Steam Plant roadway	Steam Plant asphalt roadway covers most of the area	<1'	Arsenic	Remediation polygon soil remains in place
RZ-C	C16	BT Tanks	BT Tanks and containment structure in use by Veolia	Tanks and concrete containment structure cover most of the area	Unknown	Asbestos, Dioxins, Perchlorate	Remediation polygon soil remains in place
RZ-C	C17	MN-1 Pond	Existing MN-1 Pond currently in use	Pond and pond liner cover most of the area	Unknown	Metals, wet chemistry	Unknown soil under existing MN-1 Pond
RZ-C	C18	Leach Plant Equipment and Facilities	Existing Leach Plant Equipment and Facilities	Asphalt pavement covers portions of the area	Unknown	Asbestos, Metals, wet chemistry	Remediation polygon soil remains in place
RZ-D							
RZ-D	D1	NV Energy Transmission Line Towers	Existing NV Energy Transmission Line Towers. Excavation can not be performed within 10 ft of towers. Must slope excavation away from towers.	None currently; A spray applied asphaltic coating or asphaltic chip seal is proposed to cover soils	<16'	Asbestos, Metals, Hexavalent Chromium, Dioxins, HCB, VOCs, SVOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil and discolored soil remains in place
RZ-D	D2	Asphalt Pavement Area	Discolored soil beneath asphalt pavement	Asphalt pavement covers the area	<3'	Metals, Hexavalent Chromium, Dioxins, HCB, VOCs, SVOCs, TPH, OCPs, wet chemistry	Gray layer (6" to 3' thick) remains about 6" below ground surface
RZ-D	D3	GW-11 and WC Ponds and Berms	Existing GW-11 and WC ponds and berms; soils uncharacterized; discolored soil in berm on west side of GW-11	Cement treated Aggregate covers the portions of the berms where discolored soil was observed and within and adjacent to previously defined remediation polygons	Unknown	Asbestos, Metals, Hexavalent Chromium, Dioxins, HCB, VOCs, SVOCs, TPH, OCPs, Perchlorate, wet chemistry	GW-11 and WC ponds and berms; discolored soil in berm on west side of GW-11

Table 7: Excavation Control Area Summary
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

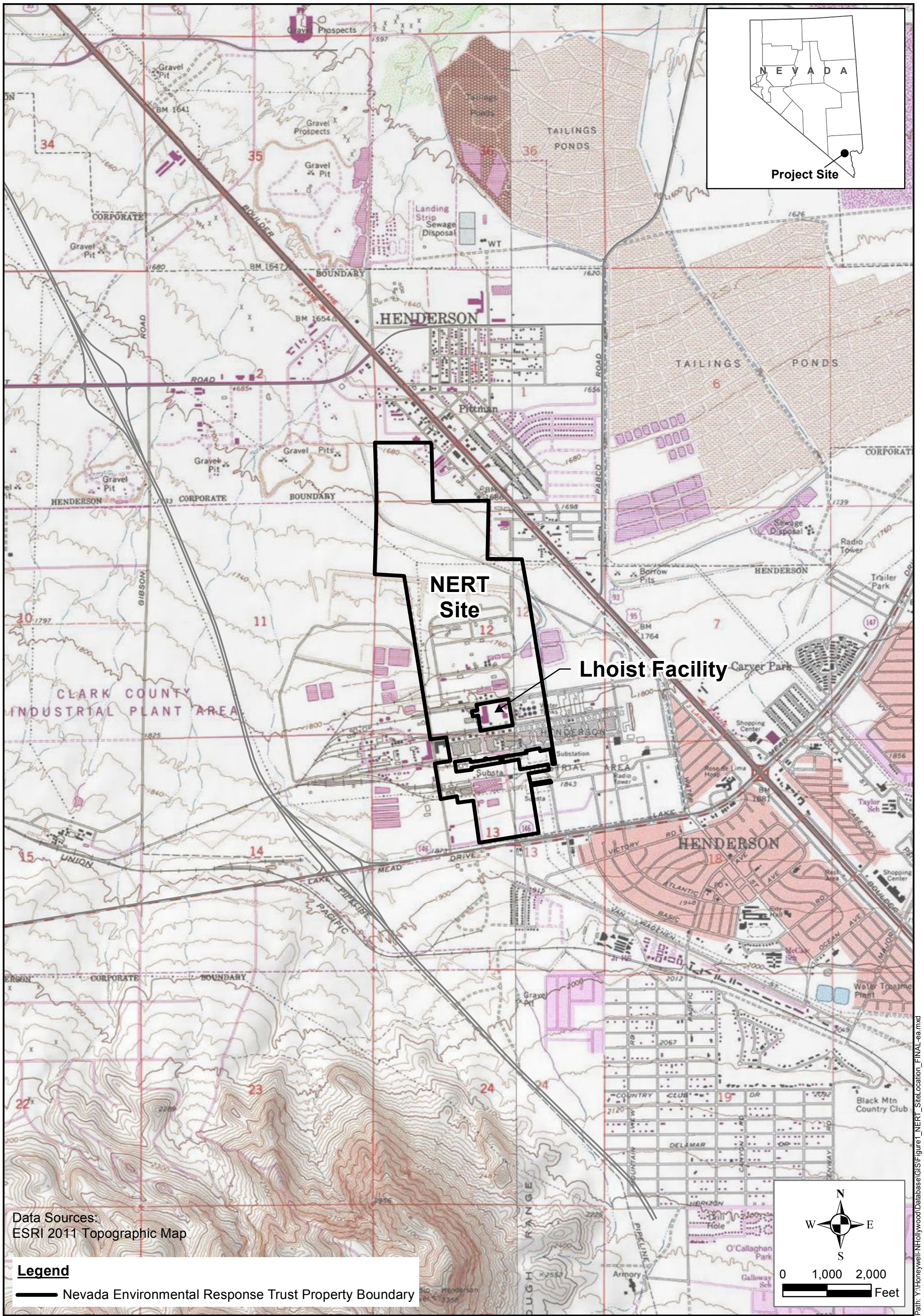
Remediation Zone	ECA #	ECA Area Description	Rationale for Proposing ECA	Engineering Controls In Place	Expected Depth(s) of Contamination	Known Chemicals of Concern/Minimum Required Analyses	Comments
RZ-D	D4	Groundwater Treatment System Equilization Tanks & Associated Piping	Existing treatment system equilization tanks and associated piping	Concrete containment structure covers soils beneath the tanks; clean crushed limestone backfill material covers the area with utilities.	<9'	Asbestos, Metals, Hexavalent Chromium, Dioxins, HCB, VOCs, SVOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-D	D5	Treatment Plant Chemical Storage Area	Asphalt paved chemical storage area	Asphalt pavement covers the area	Unknown	Asbestos, Metals, Hexavalent Chromium, VOCs, SVOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-D	D6	Facility Roadway	Existing roadway	Asphalt pavement covers the area	Unknown	Asbestos, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-D	D7	Asphalt Pavement, Office Trailers, Cr Treatment Plant, Quonset Hut, and Utilities	Existing paved area, office trailers, and treatment plant facilities	Asphalt pavement and facility structures cover most of the area	<0.33'	Asbestos, Metals, Hexavalent Chromium, Dioxins, Furans, VOCs, SVOCs, TPH, OCPs, Perchlorate, wet chemistry	Remediation polygon soil remains in place
RZ-D	D8	AP-5 Pond and Associated Utilities	Existing pond and existing subgrade and overhead utilities related to AP-5 pond; soils beneath pond uncharacterized	Pond and pond liner, and clean crushed limestone backfill material cover most of the area	Unknown	Asbestos, Metals, Hexavalent Chromium, Dioxins, Furans, SVOCs, Perchlorate, Chlorate, Ammonium Perchlorate, Ammonia, Sodium Chloride and Sodium Hypochlorite, wet chemistry	Remediation polygon soil remains in place; AP 5 Pond and berm soils
RZ-D	D9	Dioxin TEQ above Site-Specific BCL approximately 9-10 feet deep	Dioxin TEQ above Site-Specific BCL approximately 9-10 feet deep	More than 10 feet of clean backfill material covers the area	10'	Arsenic, Dioxins	Soil with Dioxin TEQ > BCL remains at depth of ~9-10 ft
RZ-D	D10	Groundwater Extraction Well and Related Piping	Existing groundwater extraction well and related piping, with discolored soil observed in southwest sidewall of polygon RZ-D-25A	None currently	<3'	Arsenic	Discolored soil layer with debris near groundwater extraction well
RZ-E							
RZ-E	E1	Portions of RZ-E-01 and RZ-E-03 beneath 4th Street and Facility Roadway	Existing roadways	Asphalt pavement for 4th Street and clean crushed limestone for facility roadway	<8'	Dioxins, HCB, OCPs	Remediation polygon soil remains in place
RZ-E	E2	Tronox Process Water Lines	Existing process water lines	None currently	<9'	Asbestos, Metals, Hexavalent Chromium, Cyanide, Dioxins, Furans, HCB, VOCs, SVOCs/PaHs, OCPs, TPH, PCBs, Perchlorate, Radionuclides, wet chemistry	Remediation polygon soil remains in place; Discolored soil along the western sidewall of the excavation performed within RZ-E-14B

Table 7: Excavation Control Area Summary
Nevada Environmental Response Trust Remediation Project Site
Henderson, Nevada

Remediation Zone	ECA #	ECA Area Description	Rationale for Proposing ECA	Engineering Controls In Place	Expected Depth(s) of Contamination	Known Chemicals of Concern/Minimum Required Analyses	Comments
RZ-E	E3	Facilities at East End of Beta Ditch	Existing sandbag diversion structure, drainage culverts, perimeter fenceline, and elevated walkway structure	None currently	<5'	Asbestos, Metals, Hexavalent Chromium, Cyanide, Dioxins, Furans, HCB, VOCs, SVOCs, OCPs, TPH, Perchlorate, Radionuclides, wet chemistry	Remediation polygon soil and discolored soil remains in place

Notes:
ECA = Excavation control area
HCB = Hexachlorobenzene
OCPs = Organochlorine pesticides
PaHs = Polycyclic aromatic hydrocarbons
PCBs = Polychlorinated biphenyls
RZ = Remediation zone
SVOCs = Semivolatile organic compounds
TPH = Total petroleum hydrocarbons
VOCs = Volatile organic compounds

Figures



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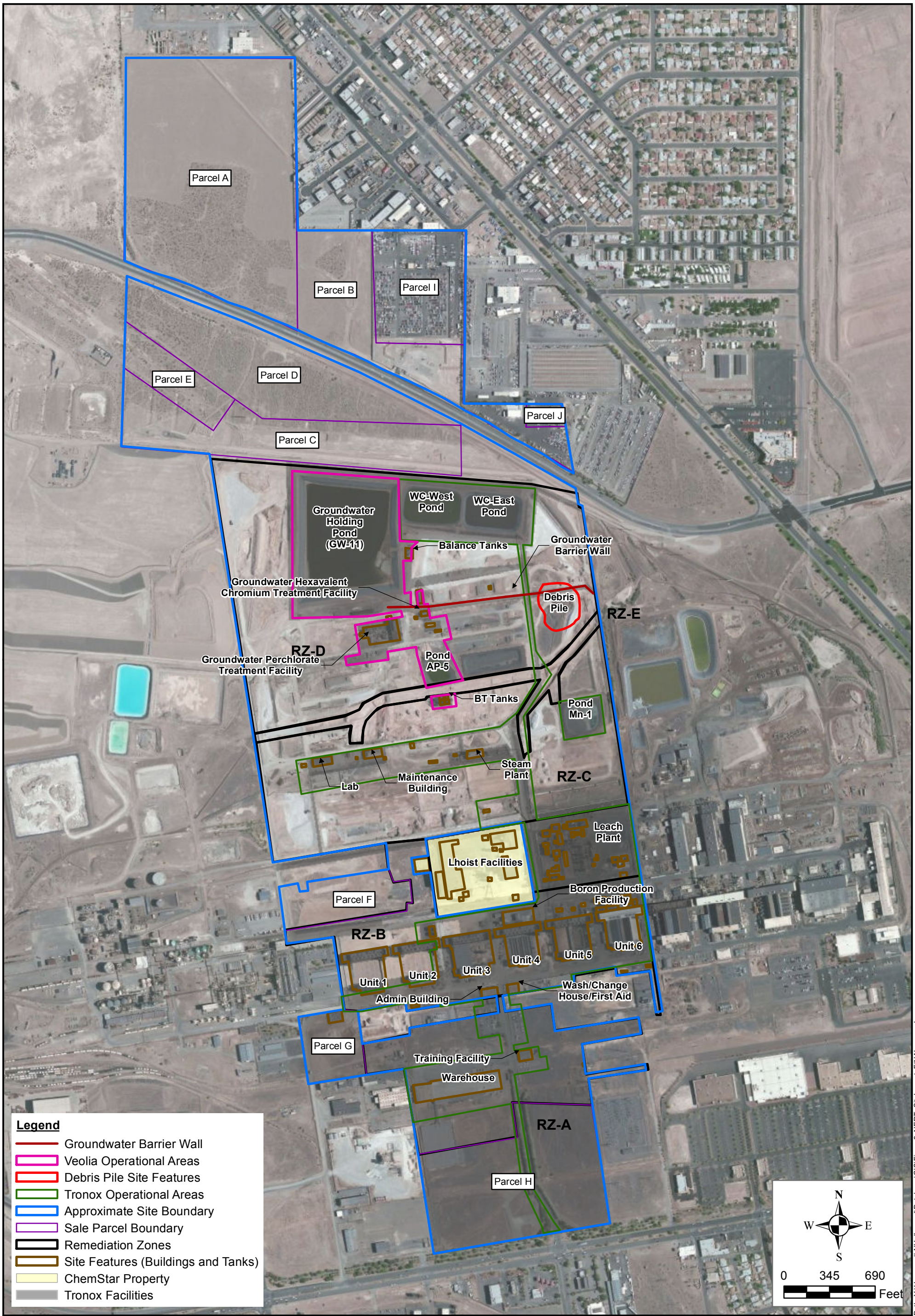
Site Location Map

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure 1

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



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Site Features

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **2**

Drafter: EA | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

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RZ-D

RZ-E

RZ-C

RZ-B

Data Sources:
ESRI 2010 Bing Maps

Legend

Soil Remediation Zones

N
W E
S

0 187.5 375
Feet

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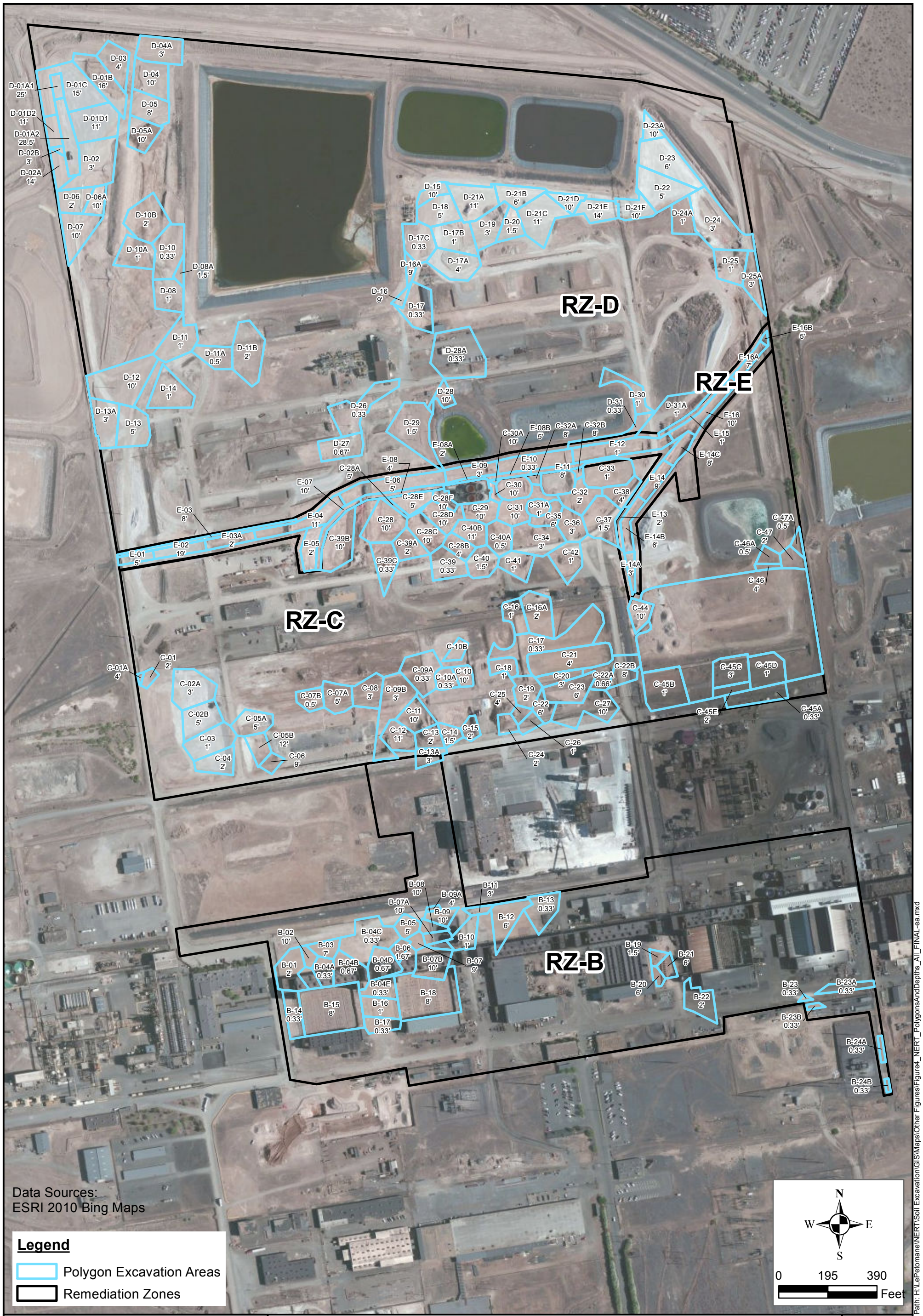
Soil Remediation Zones

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure
3

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



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Remediation Polygons and Planned Excavation Depths

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure 4

Drafter: EMcC	Date: 1/20/12	Contract Number: 21-28200	Approved by: DR	Revised:

North Air Monitoring Station
(P3)

RZ-D

East Air Monitoring Station
(P4)

RZ-E

West Air Monitoring Station
(P2)

Meteorological Monitoring Station

RZ-C

RZ-B

South Air Monitoring Station
(P1)

Data Sources:
ESRI 2010 Bing Maps

Legend

Air Monitoring Stations
- Perimeter Monitors
- Meteorological Monitor
- Remediation Zone Boundary

N
W E
S

0 187.5 375
Feet

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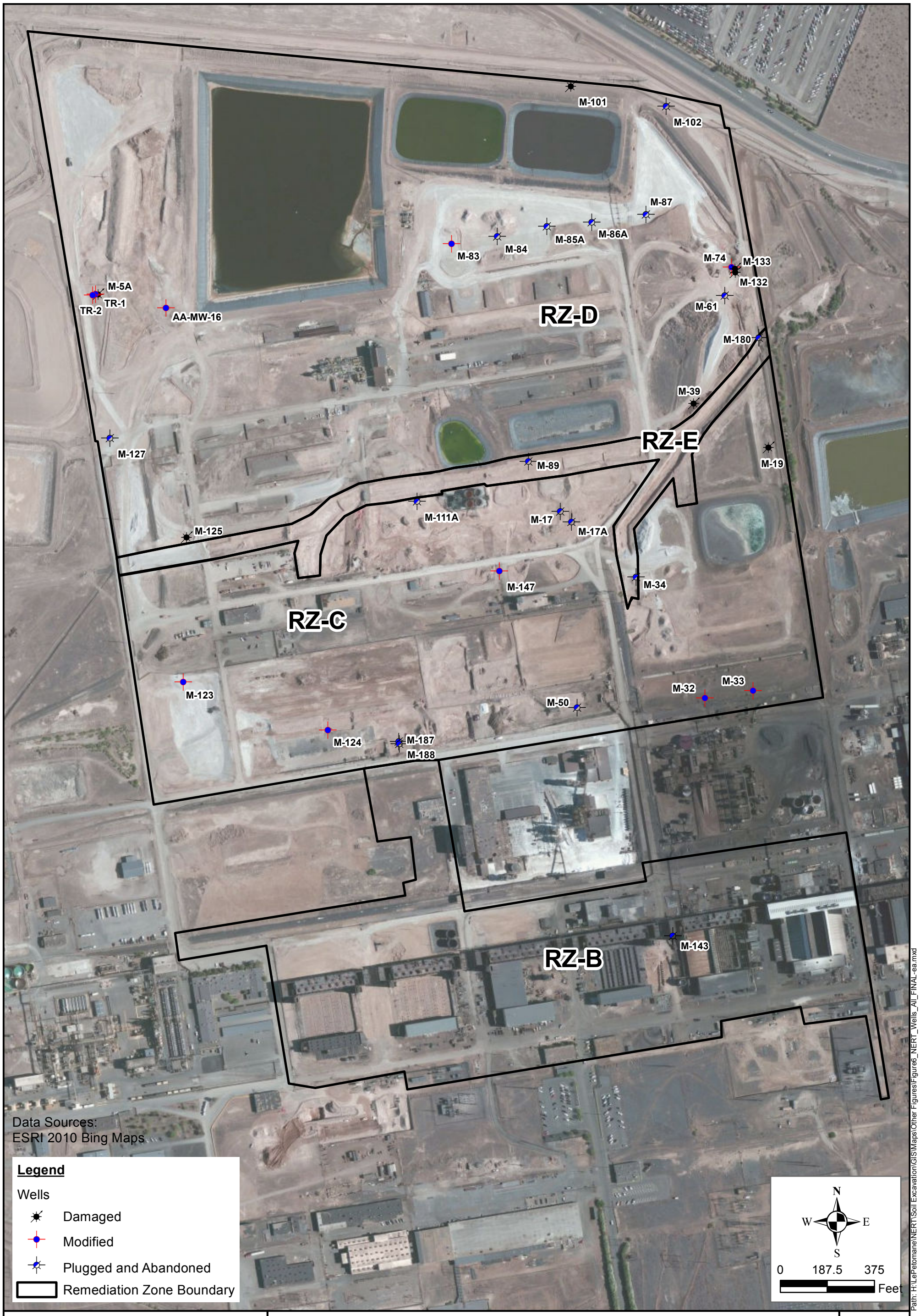
Air and Meteorological Monitoring Stations

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure
5

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



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Monitoring Well Abandonment and Repair

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure 6

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

See Figures 7b-7e for descriptions of asbestos pipes and debris, stockpiles, and asbestos/lead work areas.

RZ-D

RZ-E

RZ-C

RZ-B

Data Sources:
ESRI 2010 Bing Maps

Legend

- Asbestos Pipe
- Debris Pile
- Soil Stockpiles
- Asbestos/Lead Work Areas
- Polygon Excavation Areas
- Remediation Zones

N
W E
S
0 185 370
Feet

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Asbestos-Containing Materials Removal Areas - All Remediation Zones

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **7a**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

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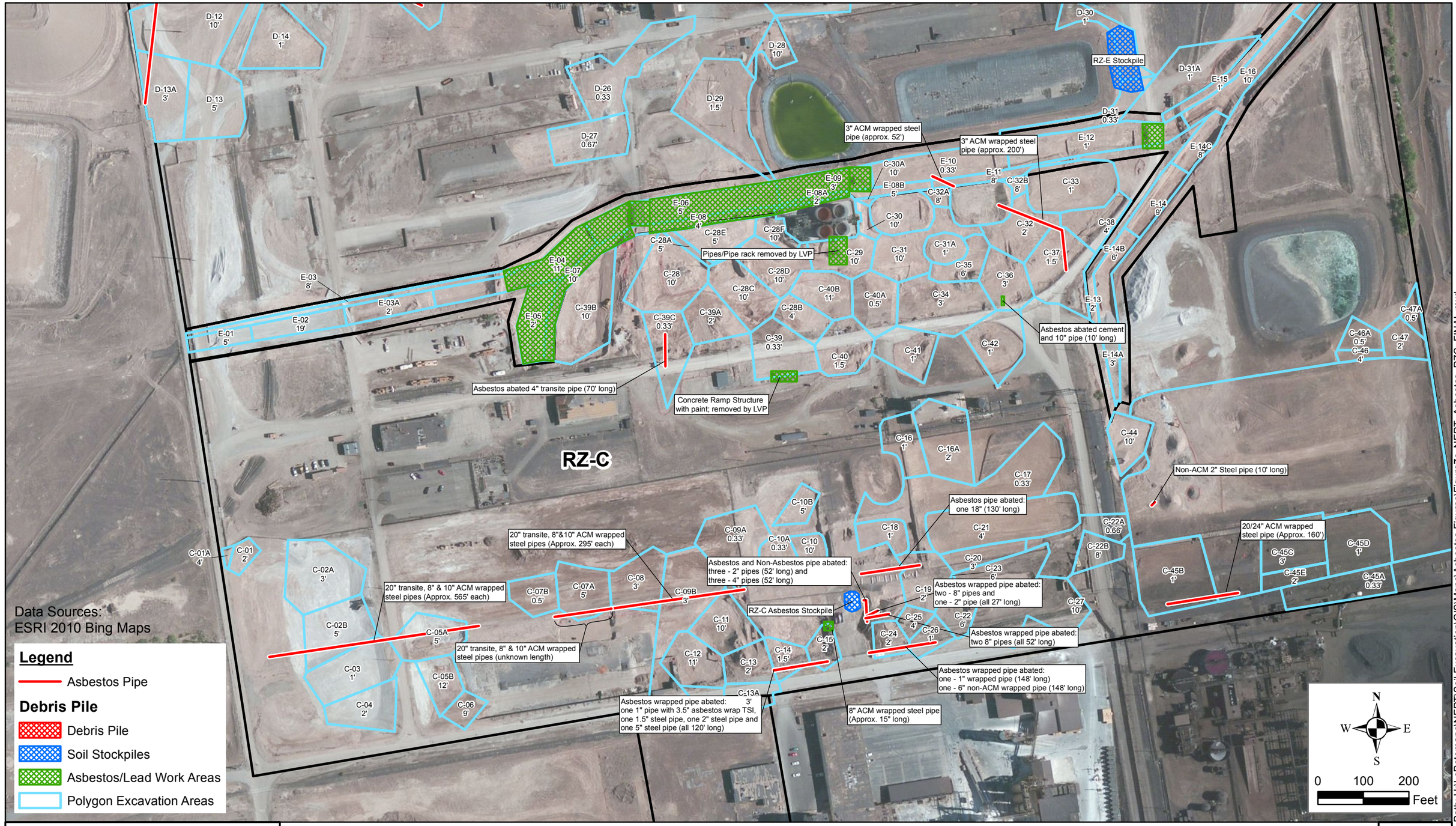
Asbestos-Containing Material Removal Areas - RZ-B

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **7b**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



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Asbestos-Containing Material Removal Areas - RZ-C

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **7c**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

Loose ACM pipe wrap & discarded 3" and 4" wrapped pipe

Loose ACM pipe wrap & discarded 3" and 4" wrapped pipe

3" and 4" ACM wrapped steel pipe (approx. 500' each)

Asbestos abated 4" pipe (259' long)

Asbestos abated 4" pipe (14' long)

Asbestos abated 4" pipe (214' long)

Asbestos abated 4" pipe (240' long)

4" ACM wrapped steel pipe (~295' long)

RZ-D

RZ-D Debris Piles

RZ-E Stockpile

Asbestos soil and TSI

D-01A1 25'
D-01B 16'
D-01C 15'
D-01D1 11'
D-01D2 11'
D-01A2 28.5'
D-02B 3'
D-02A 14'
D-02 3'
D-03 4'
D-04 10'
D-04A 3'
D-05 8'
D-05A 10'
D-06 2'
D-06A 10'
D-07 10'
D-08 1'
D-08A 1.5'
D-10 0.33'
D-10A 1'
D-10B 2'
D-11 1'
D-11A 0.5'
D-11B 2'
D-12 10'
D-13 5'
D-13A 3'
D-14 1'
D-15 10'
D-16 9'
D-16A 9'
D-17 0.33'
D-17A 4'
D-17B 1'
D-17C 0.33
D-18 5'
D-19 3'
D-20 1.5'
D-21A 11'
D-21B 6'
D-21C 11'
D-21D 10'
D-21E 14'
D-21F 10'
D-22 5'
D-23 6'
D-23A 10'
D-24 3'
D-24A 1'
D-25 1'
D-25A 3'
D-26 0.33
D-27 0.67'
D-28 10'
D-28A 0.33'
D-29 1.5'
D-30 1'
D-31 0.33'
D-31A 1'
E-01 5'
E-02 19'
E-03 8'
E-03A 2'
E-04 11'
E-05 2'
E-06 5'
E-07 10'
E-08 4'
E-08A 2'
E-08B 5'
E-09 3'
E-10 0.33'
E-11 8'
E-12 1'
E-13 2'
E-14 9'
E-14A 3'
E-14B 6'
E-14C 8'
E-15 1'
E-16 10'
E-16A 7'
E-16B 5'
C-28 10'
C-28A 5'
C-28B 4'
C-28C 10'
C-28D 10'
C-28E 5'
C-28F 10'
C-29 10'
C-30 10'
C-30A 10'
C-31 10'
C-31A 1'
C-32 2'
C-32A 8'
C-32B 8'
C-33 1'
C-34 3'
C-35 6'
C-36 3'
C-37 1.5'
C-38 4'
C-39 0.33'
C-39A
C-39B 10'
C-39C 0.33'
C-40 1.5'
C-40A 0.5'
C-40B 11'
C-41 1'
C-42 1'
C-46 4'
C-46A 0.5'
C-47 2'
C-47A 0.5'

Data Sources:
ESRI 2010 Bing Maps

Legend

- Asbestos Pipe
- Debris Pile
- Soil Stockpiles
- Asbestos/Lead Work Areas
- Polygon Excavation Areas

N
W E
S

0 125 250
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Asbestos Figures\Figure7d_NERT_Asbestos_RZD_FINAL.mxd

ENVIRON

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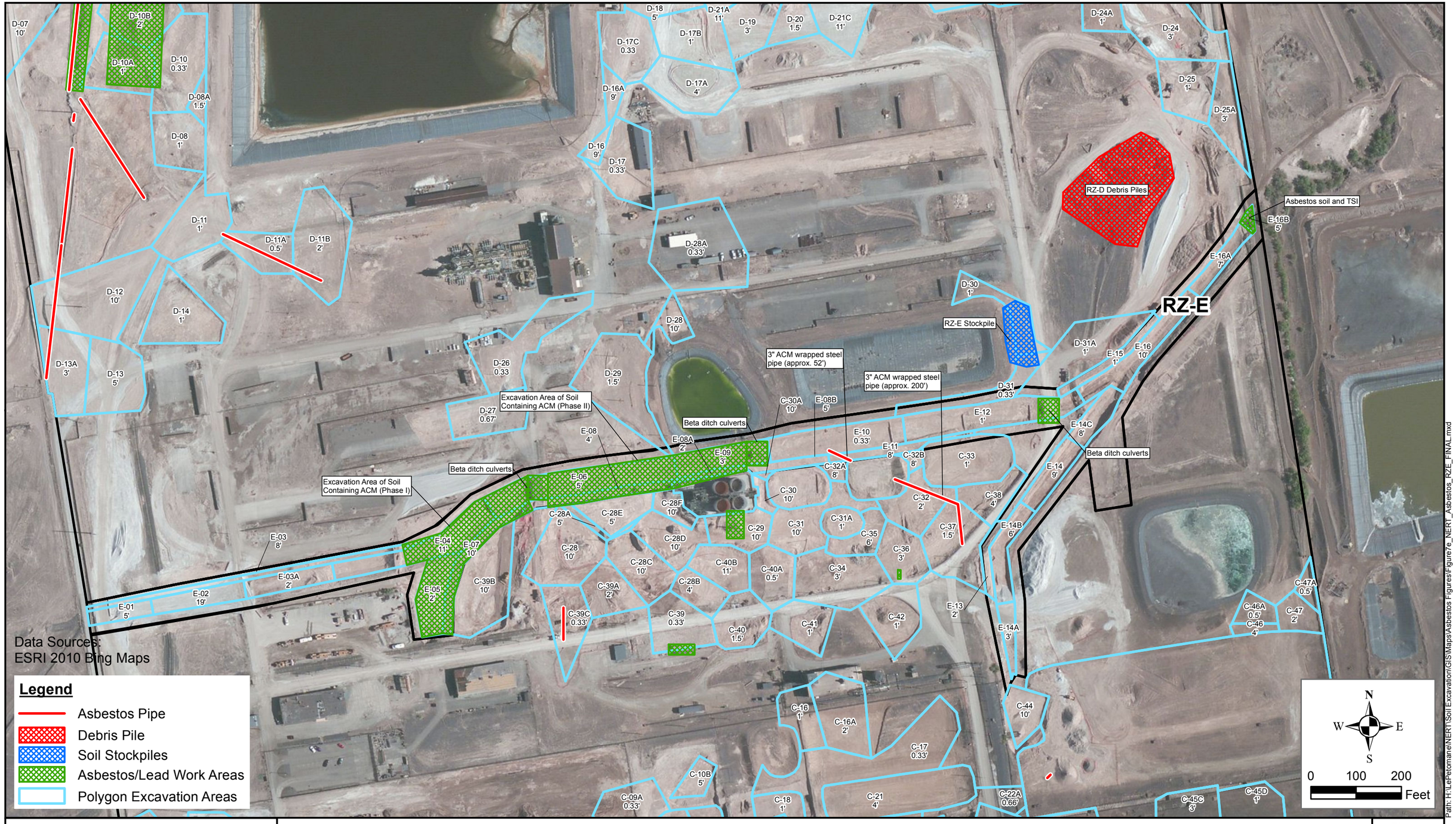
Asbestos-Containing Material Removal Areas - RZ-D

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **7d**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Asbestos Figures\Figure7e_NERT_Asbestos_RZE_FINAL.mxd

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Asbestos-Containing Material Removal Areas - RZ-E

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **7e**

Drafter: EMcC	Date: 1/20/12	Contract Number: 21-28200	Approved by: DR	Revised:

For sample IDs, see Figures 8b-8h.

RZ-D

RZ-E

RZ-C

RZ-B

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Areas
- Remediation Zones

Soil Sample Locations

- ENVIRON Collected
- Northgate Collected

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

N
W E
S

0 195 390
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Soil Sample Locations\Figure8a_DiscoloredSoil_All_FINAL-ea.mxd

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Discolored Soil Observations and Soil Sample Locations

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8a**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

B-09A 4'
B-11 3'
B-13 0.33'
B-09 10'
B-12 6'
SSAQ6-02 (Primary/Duplicate)
B-05 5'
B-08 10'
B-04C 0.33'
B-10 1'
B-07A 10'
B-07 9'
B-03 7'
B-06 1.67'
B-02 10'
B-04D 0.67'
B-07B 10'
B-01 2'
B-04A 0.33'
B-04B 0.67'
B-19 1.5'
B-21 6'
EE-B21-1
B-20 6'
B-04E 0.33'
B-18 8'
B-22 2'
B-23 0.33'
B-23A 0.33'
RZ-B
B-15 8'
B-16 1'
B-14 0.33'
B-23B 0.33'
B-17 0.33'
B-24A 0.33'
B-24B 0.33'

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Areas
- Remediation Zones

Soil Sample Locations

- ENVIRON Collected
- Northgate Collected

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

Note:
1. Excavation depths are listed in feet below original ground surface.

N
W E
S
0 100 200
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Soil Sample Locations\Figure8b_DiscoloredSoil_FINAL.mxd

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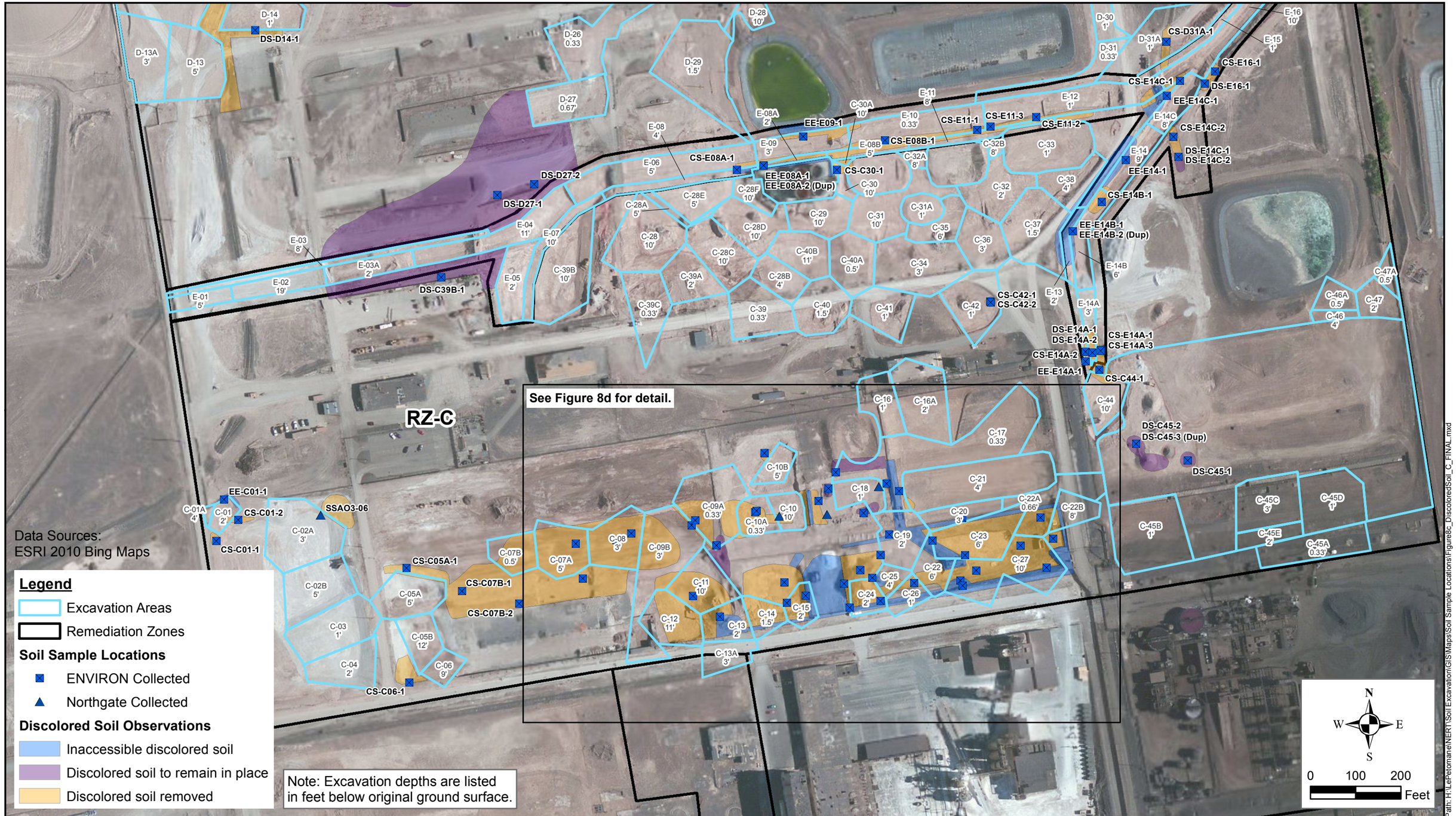
Discolored Soil Observations and Soil Sample Locations - RZ-B

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8b**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



ENVIRON

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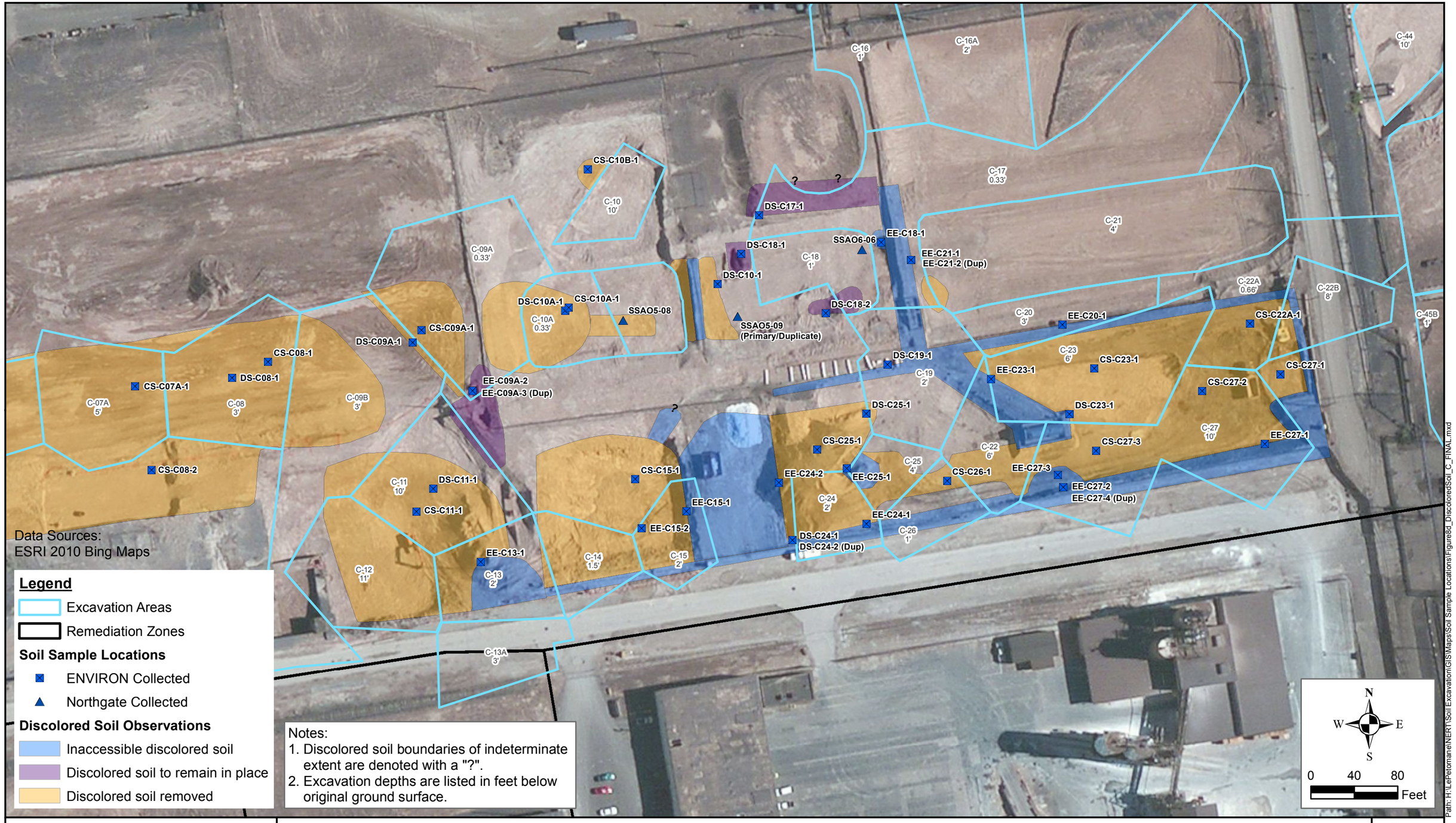
Discolored Soil Observations and Soil Sample Locations - RZ-C

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8c**

Drafter: EMcC	Date: 1/20/12	Contract Number: 21-28200	Approved by: DR	Revised:



Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Areas
- Remediation Zones

Soil Sample Locations

- ENVIRON Collected
- Northgate Collected

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

Notes:
1. Discolored soil boundaries of indeterminate extent are denoted with a "?".
2. Excavation depths are listed in feet below original ground surface.

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Soil Sample Locations\Figure8d_DiscoloredSoil_C_FINAL.mxd

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Discolored Soil Observations and Soil Sample Locations - RZ-C Southeast

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8d**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

See Figure 8f for detail.

RZ-D

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Areas
- Remediation Zones

Soil Sample Locations

- ENVIRON Collected
- Northgate Collected

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

Note: Excavation depths are listed in feet below original ground surface.

N W E S

0 125 250 Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Soil Sample Locations\Figure8e_DiscoloredSoil_D_FINAL.mxd

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Discolored Soil Observations and Soil Sample Locations - RZ-D

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8e**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Soil Sample Locations\Figure8f_DiscoloredSoil_D_FINAL.mxd

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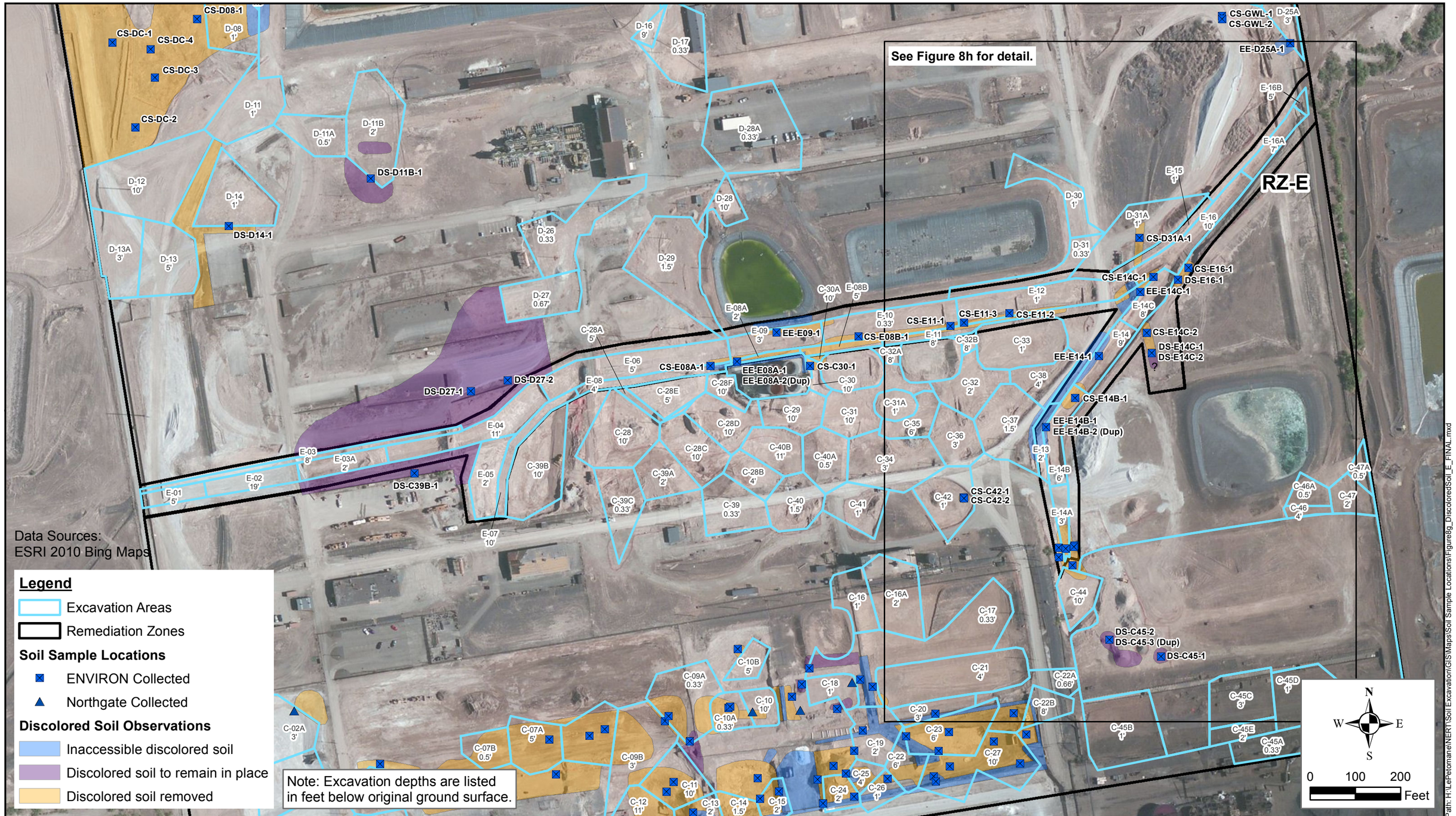
Discolored Soil Observations and Soil Sample Locations - RZ-D Northeast

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8f**

Drafter: EMcC	Date: 1/20/12	Contract Number: 21-28200	Approved by: DR	Revised:



ENVIRON

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Discolored Soil Observations and Soil Sample Locations - RZ-E

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure 8g

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Asbestos Figures\Figure8h_DiscoloredSoil_D_FINAL-ea.mxd

ENVIRON

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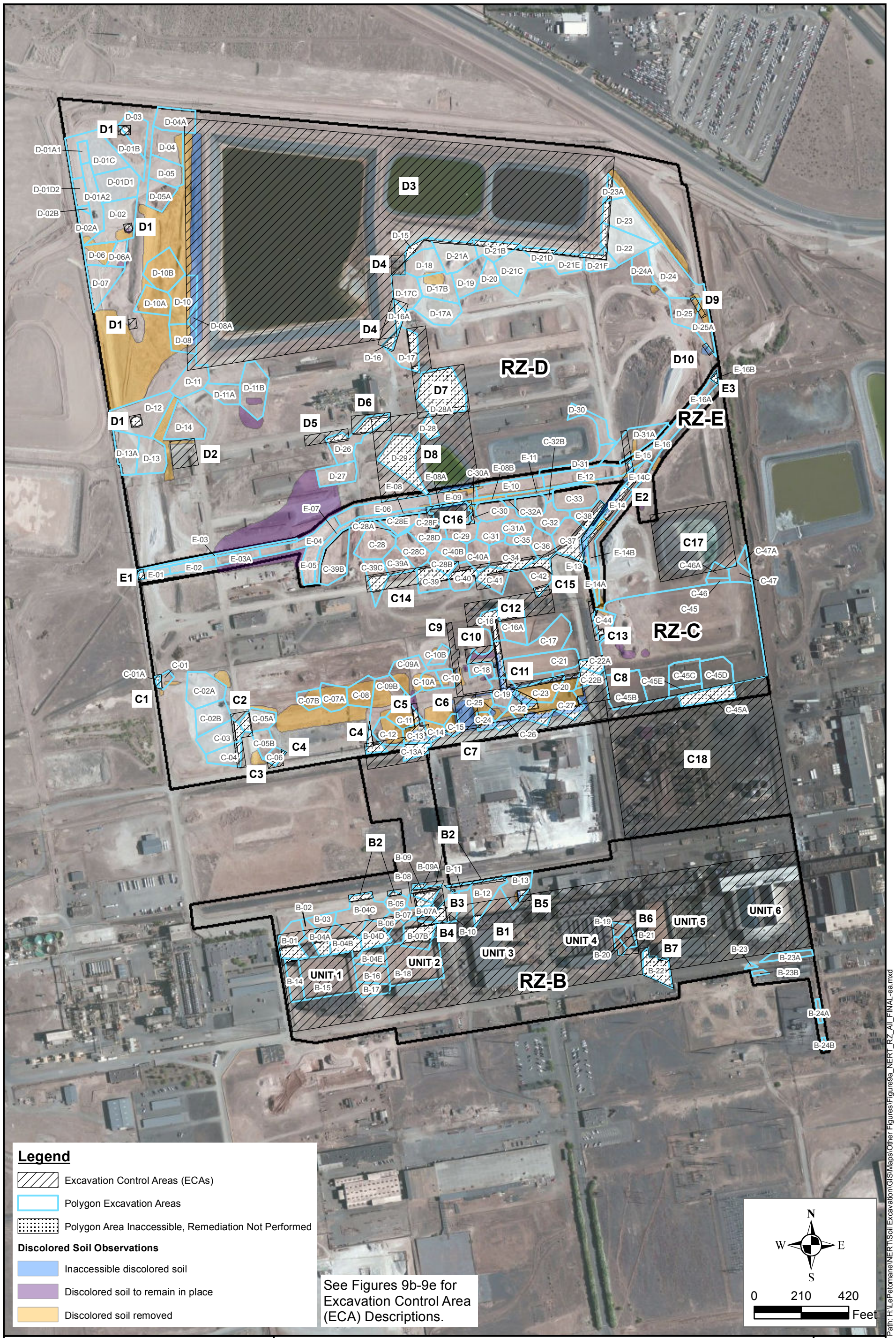
Discolored Soil Observations and Soil Sample Locations - RZ-E East

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **8h**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:



Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure9a_NERT_RZ_All_FINAL-ea.mxd

ENVIRON

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Excavation Control Area Designations - All Remediation Zones

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **9a**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

ECA #	ECA Description
B1	Unit Buildings 1-6 Including Soil Within 50 feet of Unit Buildings 1-6
B2	Portions of Polygons RZ-B-04C/05/09A/11/12/13 Extending into Avenue G
B3	Fire Hydrant
B4	Former Hazardous Waste Storage Area
B5	Sodium Chlorate Filter Cake Process Area
B6	Soils Beneath Approximately 6 Feet Deep in Polygons RZ-B-20 and RZ-B-21
B7	Soils Within Polygon RZ-B-22

B-01 2'
B-02 10'
B-03 7'
B-04A 0.33'
B-04B 0.67'
B-04C 0.33'
B-04D 0.67'
B-04E 0.33'
B-05 5'
B-06 1.67'
B-07 9'
B-07A 10'
B-07B 10'
B-08 10'
B-09 10'
B-09A 4'
B-10 1'
B-11 3'
B-12 6'
B-13 0.33'
B-14 0.33'
B-15 8'
B-16 1'
B-17 0.33'
B-18 8'
B-19 1.5'
B-20 6'
B-21 6'
B-22
B-23 0.33'
B-23A 0.33'
B-23B 0.33'
B-24A 0.33'
B-24B 0.33'

B1
B2
B3
B4
B5
B6
B7

UNIT 1
UNIT 2
UNIT 3
UNIT 4
UNIT 5
UNIT 6

RZ-B

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Control Areas (ECAs)
- Polygon Excavation Areas
- Polygon Area Inaccessible, Remediation Not Performed

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

N
W E
S

0 100 200
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure9b_NERT_ECA_RZB_FINAL.mxd

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Excavation Control Area Designations – RZ-B

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **9b**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

ECA #	ECA Description
C1	Portions of RZ-C-01/01A Beneath 4th Street
C2	Portions of RZ-C-03/04/05A Beneath 5th Street
C3	Portions of RZ-C-06 Beneath Fire Hydrant, and Utilities along Avenue F
C4	Concrete Foundation
C5	Water, Fiber Optic, and Electric Utility Lines Through and Near RZ-C-11/13
C6	Discolored Soil at Former Pump House Yard
C7	Avenue F Utilities, Railroad line, and Roadway
C8	9th Street Utilities and Roadway
C9	Diesel Tank and Pipelines
C10	Areas with Discolored Soil
C11	Natural Gas Pipeline
C12	Steam Plant and Associated Features
C13	Steam Line
C14	Process Road
C15	Steam Plant Roadway
C16	BT Tank Area
C17	MN-1 Pond
C18	Leach Plant Equipment and Facilities

RZ-C

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Control Areas (ECAs)
- Polygon Excavation Areas
- Polygon Area Inaccessible, Remediation Not Performed

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

N
W E
S
0 100 200
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure9c_NERT_ECA_RZC_FINAL.mxd

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Excavation Control Area Designations – RZ-C

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **9c**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

ECA #	ECA Description
D1	NV Energy Transmission Line Towers
D2	Asphalt Pavement Area
D3	GW-11 and WC Ponds and Berms
D4	Groundwater Treatment System Equalization Tanks & Associated Piping
D5	Treatment Plant Chemical Storage Area
D6	Facility Roadway
D7	Asphalt Pavement, Office Trailers, Cr Treatment Plant, Quonset Hut, and Utilities
D8	AP-5 Pond and Associated Utilities
D9	Dioxin TEQ above Site-Specific BCL Approximately 9-10 feet deep
D10	Groundwater Extraction Well and Related Piping

RZ-D

RZ-E

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Control Areas (ECAs)
- Polygon Excavation Areas
- Polygon Area Inaccessible, Remediation Not Performed

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

N W E S

0 125 250 Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure9d_NERT_ECA_RZD_FINAL.mxd

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Excavation Control Area Designations – RZ-D

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **9d**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

ECA #	ECA Description
E1	Portions of RZ-E-01 and RZ-E-03 Beneath 4th St
E2	Tronox Process Water Lines
E3	Facilities at East End of Beta Ditch

RZ-D

RZ-E

Data Sources:
ESRI 2010 Bing Maps

Legend

- Excavation Control Areas (ECAs)
- Polygon Excavation Areas
- Polygon Area Inaccessible, Remediation Not Performed

Discolored Soil Observations

- Inaccessible discolored soil
- Discolored soil to remain in place
- Discolored soil removed

N W E S

0 100 200 Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure9e_NERT_ECA_RZE_FINAL.mxd

ENVIRON

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Excavation Control Area Designations – RZ-E

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **9e**

Drafter: EMcC | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

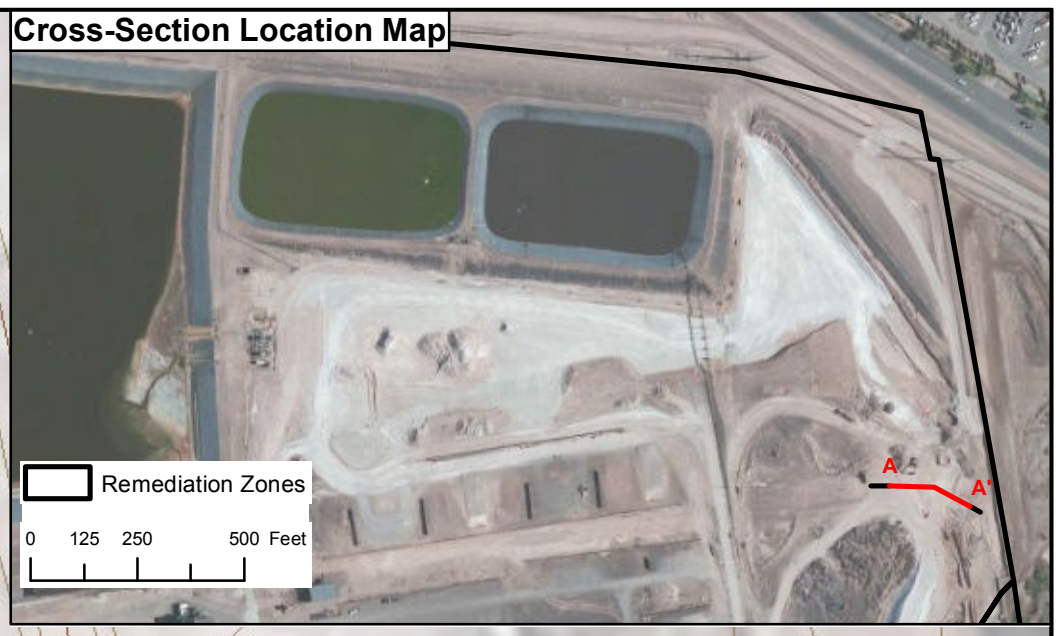
N
W E
S

Contours represent topographic surface in feet above mean sea level. Cross-section and topographic contours provided by Las Vegas Paving. Contour interval = 1 foot.

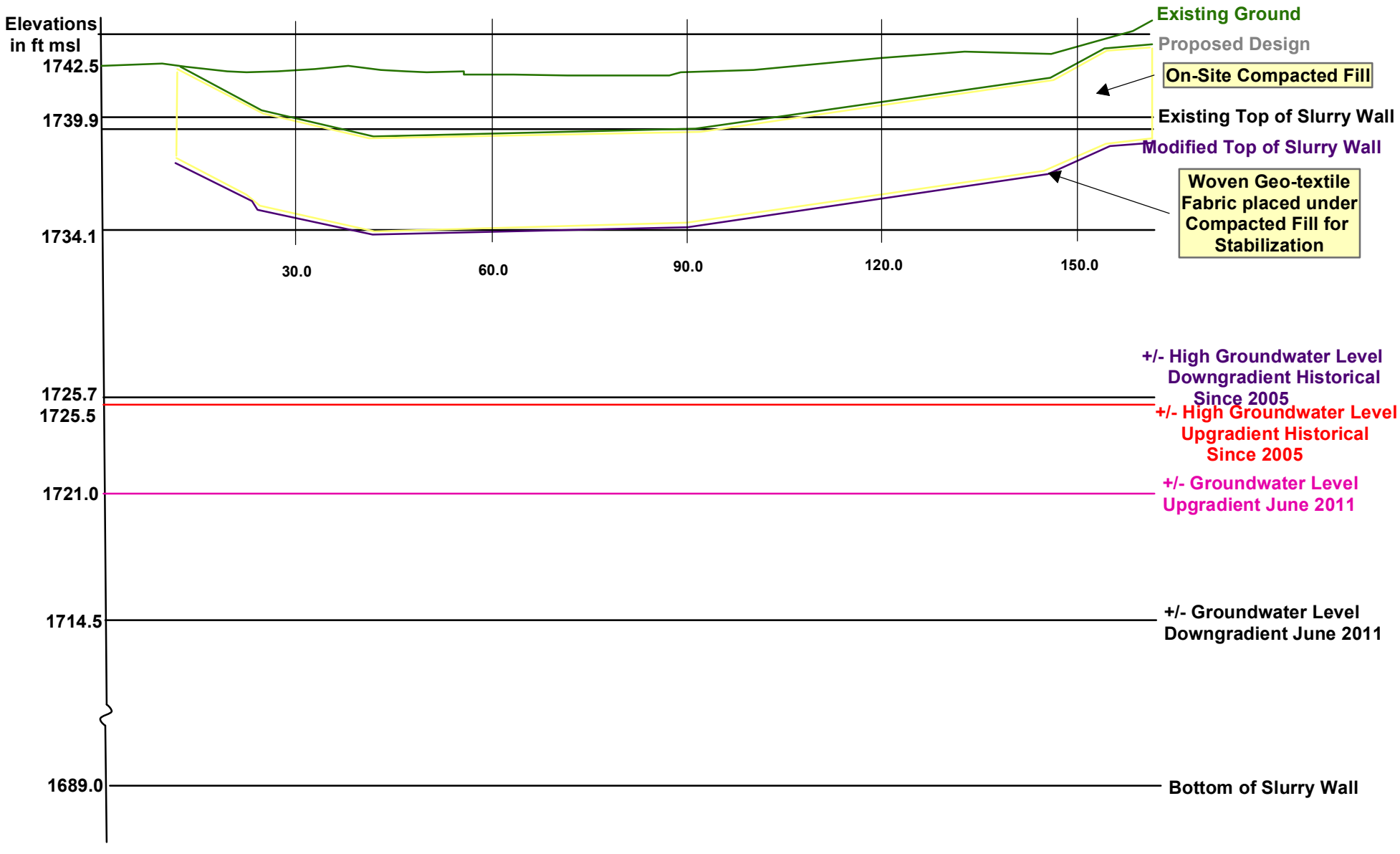
0 12.5 25 50 Feet

Data Sources:
ESRI 2010 Bing Maps

Cross-Section Location Map



Cross Section A-A'



Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure10_NERT_DitchCrossingSlurryWall_FINAL-ea.mxd

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Barrier Wall Repair

Nevada Environmental Response Trust Site, Henderson, Nevada

Figure 10

Drafter: EA | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

Legend

Pond Berm Cover

Pond berm covered with cement treated aggregate

Slope previously covered with new "Chat" backfill material

Data Sources:
ESRI 2010 Bing Maps

N
W E
S

0 60 120
Feet

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure11_NERT_PondBermCover_FINAL.mxd

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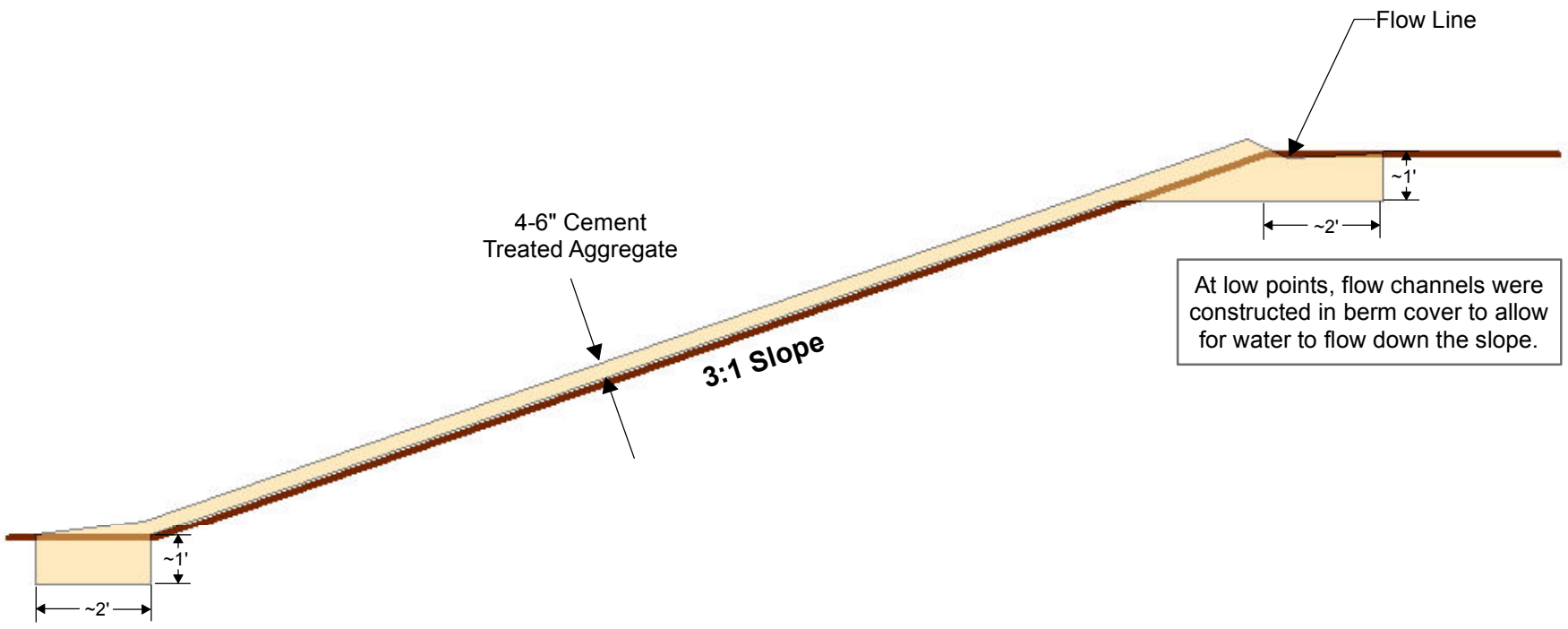
Cement Treated Base Pond Berm Cover Locations

Nevada Environmental Response Trust Site, Henderson, Nevada

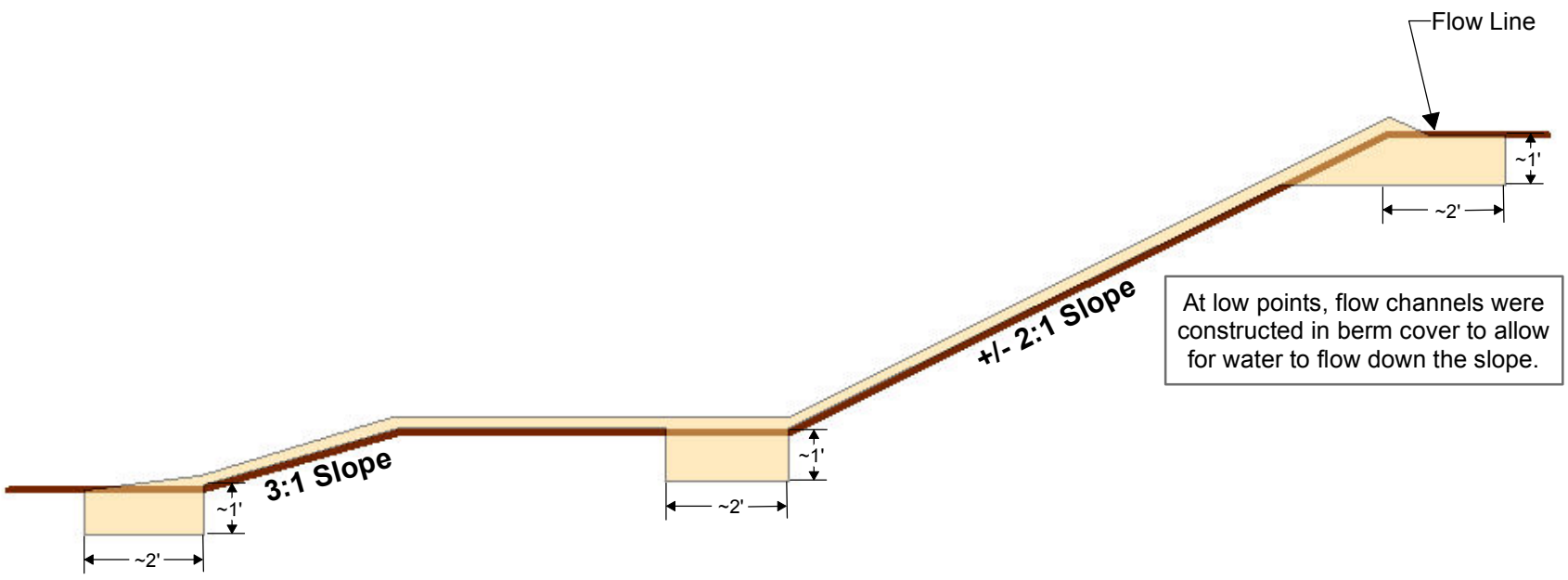
Figure
11

Drafter: EA	Date: 1/20/12	Contract Number: 21-28200	Approved by: DR	Revised:

Typical Cross Section for 3:1 Slopes
Cement Treated Aggregate Cover for Berms



Typical Cross Section for 2:1 Slopes
Cement Treated Aggregate Cover for Berms



ENVIRON

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Typical Cross-Sections of Cement Treated Base Cover for Pond Berms
Nevada Environmental Response Trust Site, Henderson, Nevada

Figure **12**

Drafter: RS | Date: 1/20/12 | Contract Number: 21-28200 | Approved by: DR | Revised:

Path: H:\LePetomane\NERT\Soil Excavation\GIS\Maps\Other Figures\Figure12_TypicalPondBerm_FINAL-ea.mxd