MANAGEMENT PLAN

FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN STREET
LOUISVILLE, KENTUCKY
AGENCY INTEREST # 51784

Submitted to:

KENTUCKY DIVISION OF WASTE MANAGEMENT
SUPERFUND BRANCH

Prepared for:

Robert Bosch Tool Corporation
1800 W. Central Road
Mount Prospect, Illinois 60056

Prepared by:

MACTEC Engineering & Consulting, Inc.
2456 Fortune Drive
Lexington, Kentucky 40509

May 20, 2010

MACTEC Project No. 6680-08-9635

MACTEC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The Former Vermont American facility, located at 500 Main Street in Louisville, Jefferson County, Kentucky, was sold by Vermont American Corporation (VAC) to 500 Associates, Inc. (the current Owner) in 1987. Investigations performed after the property transfer revealed evidence of potential contamination, and the site has been the object of litigation between the parties as well as administrative action by the Energy and Environment Cabinet (Cabinet, formerly the Environmental and Public Protection Cabinet and the Natural Resources and Environmental Protection Cabinet).

The investigations performed since 1987 have been summarized in multiple reports and documents submitted to the Superfund Branch of the Kentucky Division of Waste Management (KDWM, a Division within the Cabinet). A portion of the property (referred to as the Jackson Street parcel) was granted managed closure status by the KDWM in early 2004. A draft Management Plan (Plan) for the balance of the property, referred to as the Eastern Parcel (*Management Plan Update, Former Vermont American Facility*, December 2007) was submitted by Linebach Funkhouser, Inc. (LFI), on behalf of the current Owner, in early January 2008. The KDWM provided comments on this Plan in a letter dated January 24, 2008.

On March 11, 2008, a Secretary's Final Order was issued requiring VAC to characterize the extent of the releases on the site, and remedy the releases by complying with a remedial proposal submitted to and approved by the KDWM. At that time, Robert Bosch Tool Corporation (RBTC, successor to VAC) retained MACTEC Engineering and Consulting, Inc. (MACTEC) to develop a plan for complying with the order. In subsequent conversations and correspondence, the following facts were identified by MACTEC and agreed to by the KDWM (letter from Jeff Grow of the KDWM to Alison Dunn of MACTEC dated April 11, 2008):

- Characterization efforts at the site are considered to have been completed by previous investigations.

- The Jackson Street parcel has been successfully closed under a site management plan pursuant to Kentucky Revised Statutes (KRS) 224.01-400(18)(b).

- A similar approach is contemplated for the bonded warehouse (eastern) parcel.

- Due to uncertain future ownership of the property and potential Ohio River Bridge/I-65 construction planned on or near the property, its ultimate land use cannot be determined at this time.

On June 20, 2008, MACTEC (on behalf of RBTC) submitted a proposed Management Plan to the KDWM in order to meet a deadline set by that agency. Subsequently, on September 23, 2008, the KDWM met with the current Owner and RBTC as well as their respective consultants. It was agreed at that meeting that the two parties would submit a joint Management Plan for the Eastern Parcel. However, the parties have not been able to arrive at a settlement since that time. Therefore, on February 23, 2009, RBTC submitted a Plan independently for review by the KDWM, outlining an approach that could be applied as soon as access to the property is granted by the current Owner. On February 26, 2010, the KDWM issued a letter to MACTEC indicating that the soil handling elements of the Plan should be revised. On April 20-21, 2010, the Kentucky Transportation Cabinet (KYTC) provided MACTEC with updated information and drawings related to future construction of the Interstate 65 (I-65) expansion on the property.

This Plan incorporates elements of the previous Plans prepared by LFI and MACTEC, modified in response to the KDWM letter of February 26, 2010 and the updated information provided by the KYTC.

1.2 ENVIRONMENTAL COVENANT

The Environmental Covenant required for managed closure of a site is an instrument attached to the deed for the property that spells out use restrictions and certain general provisions affecting property use and reporting requirements to the Cabinet. Previously proposed Environmental Covenants for the Eastern Parcel have prohibited residential use of the property as well as use of groundwater at the property for drinking water or other domestic uses.

As described in more detail in Section 4.1, Property Use Restrictions, RBTC proposes that the final Environmental Covenant for the property prohibit residential use of the property at the ground and subgrade levels, as well as groundwater use at the property.

2.0 SITE BACKGROUND

This Section provides background information and context for the proposed Management Plan.

2.1 DESCRIPTION OF SITE

The Former Vermont American site is located at 500 East Main Street, Louisville, Jefferson County, Kentucky. The general location is shown on the topographic map in Figure 1. The site's latitude and longitude are 38° 15' 18"N, 85° 44' 36"W (38.2550, -85.7432). The site has been assigned Agency Interest # 51784 in the Cabinet's TEMPO system.

The original property (including the Jackson Street Building) consisted of a parcel approximately 1.5 acres in size, bounded by East Main Street to the north, I-65 to the east, an alley (Billy Goat Strut) to the south, and Jackson Street to the west. Except for a small open area just east of the Jackson Street Building, the property was entirely occupied by one and two-story buildings, and was used from the 1950s to 1986 for the manufacture of saw blades and drill bits.

The property was purchased by the current Owner on August 1, 1987, and has been mostly vacant since that time. The northern building along Main Street (formerly a manufacturing shop building) was used for an unknown period after 1987 as a bonded warehouse. Buildings in the center of the property were demolished in 1990, to form a larger courtyard opening on the alley, within a "U" formed by the Jackson Street Building on the west, the Main Street Building (Bonded Warehouse/Administrative) on the north, and the East Shop Building on the east (Figure 2).

In 2003 or 2004, the western parcel (Jackson Street parcel) was subdivided out and placed under a separate managed closure. It includes the building along Jackson Street and a concrete pad on the west side of the courtyard. The approximate location of the subdivision boundary is shown on the site layout map in Figure 2, where the Jackson Street parcel is shaded in yellow. The balance of the property (approximately 1.1 acres in size) is the portion covered by this Management Plan. It includes most of the open courtyard, the Administrative Building, the Bonded Warehouse, and the East Shop.

2.2 SITE VICINITY

The site is located about 2,000 feet south of the Ohio River, and less than 1,000 feet south-southwest of "spaghetti junction", a major interchange where Interstates 64 and 72 meet I-65 at the south end of a regional bridge that crosses from Louisville to Jeffersonville, Indiana. The bridge and the approach to the bridge are planned by joint agreement between Kentucky and Indiana to be expanded in the future, and the approximate edge of the future interstate right-of-way is shown on the site map in Figure 2.

Figure 3 is an aerial photograph showing the site vicinity. Most of the properties in the vicinity of the subject site have historically been commercial and industrial, although some properties have recently (within the last 15 years) been converted to combined commercial and residential uses.

The building south of the alley along Jackson Street was formerly owned by VAC, and housed the Delux Saw and Tool Company. It is part of five tracts of land also purchased by the current Ower from VAC in 1987 (ERCE, 1990a). To the east of that building (south of the alley, opposite the open courtyard) is a building formerly occupied by Baer Fabrics. A small triangular parking lot is present south of the East Shop, between the Baer Fabrics building and I-65. The Baer Fabrics lot was purchased by the KYTC for the I-65 expansion in 2009, and is currently vacant.

North and northwest across Main Street is Louisville Slugger Field, a minor league baseball field owned by the City of Louisville. The stadium and associated parking lots were built over several formerly industrial parcels, including two parcels with documented contamination: the Jackson Street Manufactured Gas Plant and Louisville Scrap and Metal (LSM) yard. The Louisville Slugger Field has had ongoing groundwater remediation and monitoring associated with managed closure since August 1998. The chemicals monitored in groundwater at the Louisville Slugger Field are: the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene and xylenes (BTEX); selected polynuclear aromatic hydrocarbons (PAHs), and four Resource Conservation and Recovery Act (RCRA) metals (nickel, chromium, lead and arsenic), as total (not dissolved) concentrations.

2.3 PHYSICAL SETTING

As described in previous reports, the area of the site is relatively flat and lies at an elevation of about 460 feet above National Geodetic Vertical Datum of 1929 (NGVD). The Ohio River, approximately 2,000 feet north of the site, has a mean pool (lower) elevation of about 420 feet NGVD in this reach, and a seasonal fluctuation of 25 to 40 feet vertically.

Bedrock occurs at a depth of 60 to 100 feet below ground surface (bgs), and consists of the Louisville Limestone of Silurian age. It is overlain in this area by thick, relatively permeable glaciofluvial deposits consisting of sand and gravel, with a thin layer of finer-grained (silty sand) alluvial material near the surface. Based on the urban setting of the site, one or more feet of fill and/or disturbed native soil would be expected at the surface.

Groundwater occurs under unconfined conditions in the glaciofluvial deposits below a depth of 40 to 45 feet bgs. The water table elevation is close to the low river elevation at about 420 feet NGVD. Groundwater flow is generally to the north toward the river, although short-term gradient reversals can occur in response to high-stage events (flooding) in the river.

Groundwater flow directions may also be influenced locally by pumping from production wells used for cooling water or other commercial/industrial uses. The closest known production wells were two wells operated by Grocers Ice, located at 609 East Main Street, about 1,000 feet east of the former Vermont American facility. According to Kentucky Division of Water (KDOW) files for Grocers Ice reviewed by MACTEC, these wells were taken out of operation permanently in early 2008. The Grocers Ice parcel was also purchased by KYTC for the I-65 expansion in 2009.

2.4 SITE HISTORY

The subject property was purchased by American Saw and Tool Company from American Elevator and Machine Company in 1955 (ERCE, 1990a). American Saw and Tool Company, which became a Division of VAC, occupied the property from 1955 until 1986, and used it for the manufacture of saw blades and drill bits. Operations at the site included metal milling, metal heat treatment, degreasing, plating, and painting. Chemicals associated with these operations included acids,

bases, cyanide, heavy metals, chlorinated solvents, and petroleum products, including cutting oils and diesel fuel.

The site layout is shown on the diagram in Figure 2. The Administrative Building on Main Street was used for offices. The Jackson Street Building was used for metal stamping and cutting, and contained a degreasing pit in its lower level. The Bonded Warehouse housed the Bow Saw Department and included electroplating and painting operations. The East Shop housed metal finishing operations. The previously existing buildings in the courtyard (demolished in 1990) included a machine shop, a heat treat department, a blaze room, a plating shop and the packing and shipping departments.

As part of investigations that began in 1990, several areas of concern (AOCs) were identified on the property. For discussion purposes, the AOCs can be grouped as follows:

- The Jackson Street Building (not included in this Management Plan);
- The East Shop (ES) and the Former Aboveground Storage Tank (FAST, located on the southeast corner of the property);
- The Bonded Warehouse including the East Main Plater (EMP, location of a former nickel/chrome plating line);
- Three plating lines, referred to as the Circular Saw Plater (CSP), Plater #2 (P2) and Chrome Plater #3 (CP-3), all located in the northeast corner of the previously existing buildings that were demolished in 1990, now part of the open courtyard;
- The original Open Courtyard, between the Jackson Street parcel and the previously existing buildings, was reportedly a storage area for waste treatment sludge and possibly included a degreasing pit in the southern part of the open area.

2.5 PROPOSED FUTURE PROPERTY USES

The former Vermont American facility has been mostly vacant for over 20 years. Due to planned expansion of the Ohio River bridge and the I-65 interchange, it is expected that all or part of the Eastern Parcel (the property addressed in this Plan) will be acquired by the KYTC in 2010 or 2011. Preliminary plans for the area of the former VAC site were provided to MACTEC in April 2010 by the KYTC. Selected portions of the materials provided are included in Appendix A.

Based on conversations with the KYTC and a review of the materials provided, I-65 in the vicinity of the site will be expanded westward, to include two new southbound ramps, Ramp 10 and Ramp 26. A compacted soil berm more than 30 feet high will be constructed over the eastern portion of the subject property to support the new ramps. The berm will be supported by a vertical mechanically stabilized earth (MSE) retaining wall that will cross the property from south to north, and an abutment that will run from west to east along the south side of Main Street. North of Main Street, the new ramps will be supported by an elevated superstructure. The approximate edge of the planned right-of-way (ROW) line is shown on Figures 2, 4 and 5, and the approximate planned location of the outside facing of the retaining wall is shown just east of the ROW line on Figure 5. Prior to construction, the East Shop and at least a portion of the Main Street Building will have to be demolished. To support the MSE retaining wall, soil will be excavated along the line of the retaining wall and replaced by a granular fill embankment (foundation). The planned excavation for this foundation will be between 5 and 10 feet deep (below current grade), and approximately 30 feet wide (approximately 5 feet west and 25 feet east of the retaining wall line). In addition, surface soils (approximately down to 2 feet below current grade, or more if manmade fill or structures are encountered) will be scraped off the property under the whole footprint of the expanded berm, in preparation for backfill placement. The KYTC plans to stockpile the excavated material, and reuse as much of it as possible, as compacted backfill behind (east of) the retaining wall.

This Management Plan has been developed to cover the planned activities associated with the highway expansion project, as well as possible future re-development of the balance of the property for combined commercial and residential uses.

3.0 SITE MANAGEMENT STATEGIES

The information in this Section provides the rationale and the regulatory and technical bases for the proposed Management Plan.

3.1 PREVIOUS INVESTIGATIONS

Previous investigations at the site, and associated reports, have included the following:

- *Level I Preaquisition Site Assessment* by ERC Environmental and Energy Services Company (ERCE), July 1990. No sampling performed.
- *Level II Preaquisition Site Assessment*, ERCE, November 1990. Included the collection of samples from pits and trenches, advancement of nine soil borings and installation of three monitoring wells (W-1, W-2, and W-3), plus completion of indoor air sampling. Building surface residue sampling was also performed.
- *Report of Soil Sampling and Analysis*, Law Environmental, January 1991. Included soil sampling and completion of a soil gas survey.
- KDWM, Laboratory Report, March 1996. KDWM sampled the three existing monitoring wells (W1 through W3) in March 1996.
- *Site Investigation Report*, KDWM, March 1997. KDWM performed a site investigation on the property which included soil sampling in the circular saw plater areas, plating area #2, and the east main plating area.
- KDWM, Laboratory Report, June 1997. KDWM sampled the three existing monitoring wells in June 1997.
- *Site Investigation Report*, Global Environmental Solutions, Inc. (GESI), July 1999. GESI performed a site investigation which included collection of 34 soil samples from 17 locations and collection of groundwater samples from the three existing monitoring wells.
- *Supplemental Groundwater Sampling (Task 220), Management Plan Implementation*, Tetra Tech EM Inc. (TTEMI), October 2003. Monitoring well W4 installed offsite on the north side of Main Street in September 2003. Subsequently all four monitoring wells were sampled by TTEMI.

Detailed discussions of sample collection methods and analytical results have been provided in the reports and plans referenced above. The primary chemicals detected in the soil, groundwater, and waste samples collected at the site have been metals and VOCs.

3.2 CONSTITUENTS OF CONCERN

Based on the findings of previous investigations, including the frequency of detection and the concentrations detected, the constituents of concern (COCs) for the site have been established in previous correspondence between the KDWM and the consultant for the current Owner, LFI, as follows:

- Soil
  - Chromium (total)
  - Chromium (hexavalent)
  - Lead (total)
- Groundwater
  - Chromium (total)
  - Chromium (hexavalent)
  - Lead (total)
  - Tetrachloroethene (also known as perchloroethylene, or PCE)
  - Trichloroethene (TCE)

3.3 COC OCCURRENCE

Available analytical results for the constituents of concern have been summarized from previous reports in Tables 1 and 2, for soil and groundwater, respectively. Sampling locations are shown on the site diagram in Figure 4. In addition, a map and tables from a previous report (ERCE, 1990b), summarizing waste material sampling locations and results, are included in Appendix B.

Also included in Tables 1 and 2 are current regulatory screening levels, for comparison to the sample analytical results. For soil, the screening levels, as promulgated by the State of Kentucky, are the United States Environmental Protection Agency (USEPA) Region 9 Preliminary Remediation Goals (PRGs) of October 1, 2002. The PRGs are provided for both residential and industrial use soils. Soil analytical results exceeding the corresponding residential PRG are shaded in Table 1.

For groundwater, the applicable screening levels are the Federal drinking water Maximum Contaminant Levels (MCLs). Analytical results for groundwater that exceed the corresponding MCL are shaded in Table 2. The table contains analytical results for groundwater samples collected from October 1990 through February-March 2008. Note that, due to incomplete

information, no distinction has been made in Table 2 between analytical results for groundwater samples that were filtered, and samples that were not filtered.

The following paragraphs briefly summarize the occurrence of the COCs, by media sampled, based on historical sampling results.

3.3.1 Soil

Metals that have been detected in soil at the site have included chromium, hexavalent chromium, copper, cyanide, lead, nickel and zinc. VOCs detected in soil have included TCE, PCE, 1,1,1-trichloroethane (1,1,1-TCA) and toluene. The COCs identified for soil at the site, based on frequency of detection and concentrations, are chromium (total), hexavalent chromium, and lead.

As shown by the data summarized in Table 1, levels of total and hexavalent chromium exceeding PRGs have been detected in two areas: the Bonded Warehouse (east end of Main Street Building), in the vicinity of the East Main Plater (EMP-6 through EMP-10 and BW-1 through BW-5: total chromium 256 milligrams per kilogram [mg/kg] to 1,500 mg/kg; hexavalent chromium 36 mg/kg to 140 mg/kg); and the Circular Saw Plater and Plater #2 area in the open courtyard (CSP-1 through CSP-8 and P2-2: total chromium 1,400 mg/kg to 11,000 mg/kg; hexavalent chromium 43.2 mg/kg to 96 mg/kg). Of the 11 samples that exceeded residential PRGs for total and/or hexavalent chromium in these two areas, eight also exceeded the industrial PRGs.

Only one sample had a reported concentration of lead above the screening level, in the area of Plater #2 in the open courtyard: sample P2-2, with a lead concentration of 420 mg/kg, just above the residential PRG of 400 mg/kg.

3.3.2 Groundwater

Metals detected in groundwater at the site have included chromium, cadmium, lead, arsenic and nickel. VOCs detected in groundwater have included PCE, TCE, 1,2-dichloroethene (1,2-DCE), and 1,1,1-TCA. The COCs identified by the KDWM for groundwater are the same metals as for soil (total chromium, hexavalent chromium, and lead), and the VOCs, PCE and TCE.

Based on the analytical results in Table 2, chromium (total and hexavalent) has been consistently below the MCL of 0.100 milligrams per liter (mg/L) in well W-1, and has exceeded the MCL in most of the samples collected from W-2 and W-3. Chromium was not detected in the duplicate samples collected once (in September 2003) from W-4. Lead has typically been below the MCL of 0.015 mg/L in samples from all four monitoring wells, but has exceeded the MCL twice (out of seven samples) in W-1 and W-2, and three times in W-3.

TCE has been detected consistently in all groundwater samples, at concentrations ranging from 0.051 to 0.780 mg/L, compared to the MCL of 0.005 mg/L. PCE has been detected in most of the samples from the three onsite monitoring wells, generally at concentrations about an order of magnitude lower than TCE. PCE concentrations have ranged from <0.0050 to 0.034 mg/L, compared to the MCL of 0.005 mg/L. PCE was detected at a concentration below the MCL in the duplicate samples collected from well W-4 in September 2003, and was not detected in the sample collected in February 2008.

3.3.3 Waste Material

Appendix C contains information extracted from the *Level II Preacquisition Site Assessment* (ERCE, 1990b) concerning four samples of waste materials (sludges and other substances collected from pits and trench drains) collected by ERCE in 1990. These samples were collected from the Bonded Warehouse (P1), the East Shop (P2 and P3), and the Jackson Street Building (P4). Sampling locations and additional information are provided in Appendix C. Two tables in that Appendix summarize the analytical results for the samples.

The chemicals detected in these samples included metals, cyanide, VOCs, semi-volatile organic compounds (SVOCs, also known as acid and base-neutral extractables), and pesticides. Of 13 priority pollutant metals analyzed, 11 were detected, including:

- Chromium (total), 575 to 24,500 parts per million (ppm)
- Hexavalent Chromium, non-detect (ND) to 40 ppm
- Lead, 320 to 13,750 ppm
- Nickel, 350 to 25,000 ppm
- Copper, 475 to 3,500 ppm

VOCs reported in pit and trench samples included PCE, TCE, BTEX, 1,2-dichloroethane, 4-methyl-2-pentanone, trichlorofluoromethane, acetone, and methylene chloride. SVOCs included bis (2-ethylhexyl) phthalate, fluoranthene, phenanthrene, and pyrene. Pesticides detected were aldrin, 4.4'-DDD, 4,4' DDE, dieldrin, endrin, endosulfane sulfate, and endrin aldehyde.

Some of the pits and trench drains sampled in 1990 may have been subsequently backfilled with concrete, based on notes made by the KDWM during an inspection and site investigation they conducted in March 1997. The current condition of any remaining pits and trench drains at the site should be fully assessed by inspection prior to implementation of this plan.

3.4 CONCEPTUAL SITE MODEL AND MANAGEMENT STRATEGIES

A conceptual site model (CSM) for the subject parcel at the former Vermont American facility has been developed to integrate the known information on chemical concentrations and physical setting with potential exposure pathways and receptors, given the planned uses for the site. The CSM, summarized in Table 3, has formed the basis for developing the most appropriate management strategies for the site, also summarized in Table 3.

As shown in Figures 2, 4, and 5, the eastern portion of the site is in the future ROW for the I-65 expansion, and this area of the site will ultimately be covered by a soil berm greater than 30 feet thick. Future uses of the balance of the property are most likely to be mixed commercial and residential. Assuming residential uses will be excluded from the ground and subgrade levels, no long-term exposures would be expected for residential populations at this site.

The potential receptors for residual contamination at the site would be: long-term site workers (e.g., employees of stores and/or offices built at ground level on the site), transient visitors (e.g., trespassers currently, and shoppers, meeting attendees, repairmen, etc. in the future), and temporary construction workers involved with construction of the expanded Intersate highway or redevelopment (i.e., demolition and construction activities) of the balance of the property.

Exposure to potential contamination can be minimized for long-term site workers, transient visitors, and most short-term construction workers through use of passive engineering controls such as temporary barricades during construction and long-term capping material (floors and pavement)

that would prevent contact with impacted soil. Construction workers involved in some demolition and excavation activities during Interstate construction or site redevelopment could potentially be at risk for short-term exposure to the contaminants of concern; therefore, special precautions have been incorporated into this Site Management Plan for those activities.

The following paragraphs review the CSM in more detail, and provide the rationale for the corresponding site management strategies, by medium.

3.4.1 Waste Materials

Trenches, drains, and pits associated with manufacturing and wastewater operations at the plant were reportedly cleaned out at the time the facility was vacated by VAC in 1987. However, subsequent testing has shown that residual plating wastes may have been left in, or seeped back into, some pits and floors through the concrete. As a result, it is anticipated that some near-surface materials in the former plating areas, that would have to be handled and disposed during future demolition/construction, could contain metals from contact with former plating solutions and/or wastewater.

It is proposed that potentially impacted surface materials be cleaned or removed prior to demolition to minimize the risk of worker contact, and to confirm that the remaining construction materials (whether they are demolished or renovated) can be handled as standard construction materials or debris. These pre-demolition cleaning and removal activities (referred to as "Initial Removals") will target specifically the floors, trenches, and pits in identified former plating areas. Concrete surfaces in these areas would be either cleaned and/or removed, along with underlying gravel and/or near-surface soil that is visibly stained.

Additional information concerning the initial removal activities that are planned for implementation prior to demolition and/or construction activities at the site is provided below in Section 4.3.

3.4.2 Soil

Some near-surface soils at the site may contain metals (specifically total chromium, hexavalent chromium, and lead) above the PRGs, and/or detectable concentrations of VOCs. However, under a management-in-place scenario, it is not necessary to remove all soils having constituents above the PRGs, as long as engineered barriers can be emplaced as controls, to prevent contact by potential receptors with these soils.

To prevent long-term (chronic) human exposure to the residual constituent concentrations in soil, either by ingestion, dermal absorption, or inhalation of soil particulates, a use restriction preventing residential use of the property on the ground floor and at subsurface levels has been incorporated into the proposed Environmental Covenant for the site. Due to the urban setting of the site, it is not anticipated that agricultural use of the site will occur, or that ingestion of contaminants via plant uptake is a viable pathway for this site.

In addition to the restriction on residential use at ground level, controls consisting of engineered barriers should be used to prevent direct contact during commercial use of the site. After highway construction and/or site re-development, direct contact with the soil can be prevented by the presence of buildings, pavement, and/or new topsoil in landscaped areas. In addition, a geotextile fabric can be used as a visual separator between the residual site soil and any clean fill that is brought on to the site for final grading or landscaping purposes, to prevent future commingling of the two.

In the event that contaminated soil is encountered during future construction/excavation activities, a contingency plan for handling contaminated soil has been incorporated into this Management Plan (Section 6.2, and refer also to Sections 4.4.2 and 4.4.3).

3.4.3 Groundwater

Groundwater under many areas of Louisville, including the area of the subject site, contains VOCs at varying concentrations. COCs in groundwater at the subject site are the VOCs PCE and TCE, as well as the metals chromium (total), hexavalent chromium and lead.

At the site, groundwater typically occurs at a depth of about 40 feet. Four groundwater monitoring wells have previously been installed at the site, including one in the alley to the south of the site (W-1), two in the Main Street Building on the northern site boundary (W-2 and W-3), and one across Main Street to the north (W-4). It is anticipated that wells W-2 and W-3 will be abandoned and replaced with wells outside the building, approximately 20 feet to the north in the East Main Street right-of-way.

Consistent with other properties in Louisville that have had detectable groundwater impacts, the management strategy for groundwater at the former Vermont American facility is to prohibit (in the Environmental Covenant) all use of groundwater from the site for potable and other domestic uses. No wells (other than wells used for groundwater monitoring as part of this Management Plan) will be allowed on the site.

Vapor intrusion into buildings can sometimes be associated with VOCs in soil and groundwater. Based on the concentrations and the depth to groundwater at this site, there may be no need to mitigate for vapor intrusion in future construction at the site. However, the field of vapor intrusion studies is a rapidly evolving area. It is recommended that intervening data developed from groundwater monitoring at the site be reviewed prior to finalizing the design of any future buildings at the site, to determine if vapor mitigation should be incorporated into the design.

3.4.4 Surface Water

There are no bodies of surface water on or adjacent to the site, and surface runoff is directed into the municipal stormwater system operated by the Metropolitan Sewer District. The management strategy for surface water at the site will be to minimize the potential for contact between surface runoff and soils with residual constituents, through appropriate surface grading, pavement and/or piping.

4.0 SITE USE RESTRICTIONS AND CONTROLS

This section spells out the site use restrictions and controls (including the planned Initial Removals) that will apply to the property. The basis and rationale for these restrictions and controls have been provided and discussed in detail in the previous section of this Plan.

4.1 PROPERTY USE RESTRICTIONS

The following use would be prohibited according to the proposed Environmental Covenant:

- Residential use of the property on the ground and subgrade levels. "Residential Use" includes single family or multi-family residences; child or adult care facilities; nursing home or assisted living facilities, and any type of educational purpose for children/young adults in grades kindergarten through twelfth grade.

The following activities would be prohibited according to the proposed Environmental Covenant:

- Use of groundwater for drinking or other domestic purposes. Wells and groundwater on the site shall not be used for any purpose other than water level and water quality monitoring.

- Disturbance of soil or engineered barriers. Soil handling during demolition/construction shall be consistent with the provisions in this Management Plan. Once redevelopment of the site is complete, the engineered barriers put in place to prevent contact with soil shall not be disturbed except in a manner that is consistent with this Management Plan.

4.2 SOIL MANAGEMENT AREAS

A review of historic soil sampling data indicates that all exceedances of the PRGs (indicated by a red symbol on the map in Figure 4) have been confined to the areas associated with the former plating lines. These former plating areas, shown as three contiguous colored rectangles on the map in Figure 5, include the following:

- Platers # 2 and #3. This area (indicated by a pink rectangle on Figure 5) is located mostly outside of the future I-65 right-of-way. The previously existing buildings in this area were torn down in 1990, and it has since become overgrown with vegetation. Test trenching performed by the KDWM in 1997 encountered old foundation materials in the shallow

subsurface. Subsurface soil samples collected on the eastern half of this area, close to the future ROW line, had concentrations of COCs above the residential PRGs (Table 1).

- Circular Saw Plater (CSP). This area (indicated by a blue rectangle on Figure 5) is located outdoors, in the area of previously demolished buildings, and is heavily overgrown. It is entirely within the future I-65 ROW. Only one of five soil samples collected in this area (CSP-4, collected directly beneath the former floor) had concentrations of COCs above the residential PRGs (Table 1).

- East Main Plater (EMP). This area (indicated by an orange rectangle on Figure 5) is located in the east end of the Main Street (Bonded Warehouse) Building, and is still under roof. It is located almost entirely within the future I-65 right-of-way. Sample P1, collected in 1990 from a sump in this area, had a yellow crystalline appearance, and several subsurface soil samples had concentrations above the residential PRGs (Table 1).

In addition to these former plating areas, the East Shop Building, which is still under roof, is located entirely within the future I-65 right-of-way. Subsurface soil sampling in this area did not detect COCs above the residential PRGs (Table 1). However, sludges collected in 1990 from pits and trenches in the floor (Samples P2 and P3, Appendix B) had concentrations of metals above the PRGs.

Therefore, based on previous sampling information, limited removals may be required ahead of demolition to remove impacted surface debris from the East Shop and the east end of the Main Street Building (Bonded Warehouse).

In addition, the soil underlying the former plating areas will require management in place, and the colored rectangles in Figure 5 correspond to the three soil management areas associated with former platers. Assuming future construction activities will require removal of soil from all or some of these management areas, the following section describes the procedures to be followed.

4.3 INITIAL REMOVALS

Figure 5 is an enlarged site map showing the approximate locations of three boundary lines relative to the previous sampling locations on the property: the edge of the future Interstate ROW, the probable outside edge of future vertical walls on or in the vicinity of the site (western edge of the future retaining wall and northern edge of the abutment along Main Street), and the probable limit of the foundation excavations that will be associated with the retaining wall and abutment.

Based on the current Interstate construction plan, it is likely that existing soil will be scraped down to about 2 feet across the entire area east of the retaining wall and south of the abutment, and will be excavated down to 5 to 10 feet below current grade in the area of the foundations for the retaining wall and abutment. Once the retaining wall and abutment are built, the grade to the east of the wall will be raised more than 30 feet by placement of new fill and stockpiled soil over the current ground surface.

Site preparation activities to be performed prior to the highway construction will include demolition of selected buildings, including the East Shop and the east end of the Main Street Building. It is recommended that initial removals of selected materials be performed on the property prior to the demolition. The objective of the initial removals will be to take away surface and near-surface waste materials and debris that are residually contaminated with plating solutions, so that the remaining building materials can be handled as typical demolition debris. In addition, a limited soil removal will be performed prior to excavation for highway construction in the areas designated as soil management areas.

4.3.1 Well Relocation and Surface Debris Removal Activities

The activities listed below will be performed prior to demolition of the East Shop or the east end of the Main Street Building:

- All of the monitoring wells (W-1, W-2, W-3 and W-4) will be properly abandoned by a Kentucky Certified Well Driller. A replacement monitoring well network will be installed after completion of the highway construction.

- The interior concrete floor and drain surfaces in the East Shop and the east end of Main Street Building will be pressure-washed to remove visible sludges, plating salts, and staining to the extent possible. The washwater will be collected in drums, labeled, and staged onsite pending proper disposal (see Section 4.3.3 below).

- The concrete floor under the former East Main Plater will be broken up and removed. Any obviously stained gravel beneath the floor and up to six inches of soil (where soil is obviously stained) will also be removed. The concrete debris, gravel, and soil will be managed and disposed according to the procedures described below in Section 4.3.3.

4.3.2 Soil Removal Activities

In order to facilitate the removal of soil that will require special handling from the soil management areas, a soil sampling program will first be performed to define the extent of soil to be treated as waste. The soil sampling program will be implemented after removal of vegetation in the open courtyard and demolition of the buildings on the eastern portion of the site. The soil sampling program will focus on the soil management areas (the former plating areas shown by the colored rectangles on the map in Figure 5). The objective will be to define the extent of the soil where COCs exceed the residential PRGs. Soil borings will be advanced on approximately 15-foot centers (up to a maximum number of 35 borings) and to a depth that is consistent with the excavations planned for highway construction (up to an estimated maximum depth of 10 feet). Soil samples will be collected at appropriate depths (up to three intervals per boring). All of the soil samples will be analyzed for the soil COCs (total chromium, hexavalent chromium, and lead).

Upon completion of the soil sampling program, a report documenting the methods and findings will be prepared for submittal to the KDWM. The report will include a site plan showing the sampling locations and an outline of the area with soil results exceeding the PRGs, a table summarizing the results, and laboratory reports. The report will accompany a request to the KDWM that all soil with COC concentrations below the residential PRGs be considered to no longer contain hazardous constituents, and therefore be treated as soil, not waste.

The soil sampled within the former plating areas that contains COCs at concentrations greater than the residential PRGs will be excavated prior to the main excavation activities to be performed for highway construction. This soil will treated as a listed hazardous waste and will be managed and disposed according to the procedures described below in Section 4.3.3.

4.3.3 Waste Management During Removals

It is anticipated that the following waste streams will be generated during the initial removals:

- Washwater from pressure-washing concrete surfaces in the East Shop and the east end of the Main Street Building;

- Concrete and masonry debris from floor removal in the East Main Plater area, and from old foundations under the ground surface in former plating areas currently located outdoors in the courtyard area.

- Soil that is residually contaminated with plating solutions, from beneath the former plating lines in the soil management areas.

All washwater generated in pressure washing concrete surfaces will be containerized and labeled, and the washwater generated in the vicinity of the former East Main Plater will be stored and labeled separately from the washwater generated in areas away from the former plating lines. The stored washwater will be sampled and an application will be made for discharge in the Metropolitan Sewer District (MSD) sanitary sewer. If discharge to the sewer is not approved, the waste will be profiled appropriately and removed for offsite treatment and disposal.

Materials that have been in contact with plating solutions will be treated as listed hazardous waste. Technically, structures used for wastewater (rather than plating solution) storage or conveyance would not be considered hazardous. In practice, however, it will probably be difficult to make this distinction within the identified former plating areas. Concrete debris and gravel to be removed from the area of the East Main Plater, and from beneath the ground surface in any of the soil management areas with remnant foundations, will be segregated initially based on staining, and all materials with obvious colored staining will be disposed offsite as a listed hazardous waste. Any material that is questionable will be tested, and disposed offsite as hazardous waste only if it is found to contain elevated levels of RCRA metals. All other concrete debris from the management areas will be handled as demolition debris, and disposed with the other debris generated from building demolition.

Soil identified in the soil sampling program as containing COCs above the residential PRGs, if located in the area and at depth requiring excavation for highway construction, will be excavated and removed for offsite disposal ahead of the rest of the excavation. Soil from beneath the plating areas with COC concentrations exceeding residential PRGs will be considered listed hazardous waste, and profiled and disposed accordingly.

Any waste (including soil with COC concentrations exceeding residential PRGs) generated outside the former plating areas that must be disposed offsite, including cuttings generated during monitoring well relocation, will not be considered a listed hazardous waste, but will be profiled on

the basis of generator knowledge, and tested for toxicity, if necessary, in order to arrange for disposal.

4.4 LONG-TERM SITE CONTROLS

Inside (east of) the Interstate ROW boundary, the new Interstate ramps and associated retaining wall, abutment and berms will be considered long-term controls for any contaminants left in place beneath the currently existing grade.

Outside (west of) the Interstate ROW boundary, the site controls described below will apply to portions of the soil management areas (if any) that may still contain soil with COC concentrations exceeding the residential PRGs. If the soil sampling program demonstrates that none of the soil in the soil management areas outside the Interstate ROW actually contains COCs in excess of the residential PRGs, then the balance of the property (excluding the Jackson Street parcel) may be developed without restrictions or long-term site controls.

4.4.1 Grading and Drainage

The following objectives, in addition to all State and local requirements that are in effect at the time of site development, shall be met by future site grading and drainage plans in any remaining soil management area on the property:

- Insure that surface runoff from the site is directed to existing municipal storm drains.
- Prevent contact between surface water and soil with residual concentrations of contaminants that are being managed in place.
- Prevent soil erosion and transport of soil/sediment offsite or into surface water/storm water drains, through implementation of best management practices (BMPs).
- Prevent direct contact with site soils by preventing disturbance of capping materials in the soil management areas of the site.
- Separate soils already onsite from new fill materials and topsoil brought onto the site, and prevent future commingling of the two, by placing a geotextile fabric between the old and new materials. The geotextile fabric should be installed as a visual marker in case of future excavations/disturbances.

- Insure that landscaped areas of the site (i.e., areas not covered by buildings or pavement) have a minimum of 18 inches (1.5 feet) of topsoil placed at the surface from a documented offsite source.

4.4.2 Excavations

All soil excavated from the site outside of the soil management areas designated in this plan will be assumed to be "clean" (free of COCs above the residential PRGs) unless unexpected subsurface structures (buried sumps, tanks or drums) are encountered, or unless the soil exhibits evidence of contamination (such as staining or odor).

The following provisions should be made in case of excavations during future redevelopment of the site that are advanced in any remaining soil management areas, or that encounter unexpected subsurface structures or evidence of contamination:

- For planned excavations in the long-term AOC, notify KDWM in advance. In the event that unexpected conditions are encountered outside the long-term AOC, notify KDWM within 24 hours of discovery.

- Prepare a Site Health and Safety Plan (HASP) that is consistent with the Occupational Safety and Health Administration (OSHA), Hazardous Waste Operations (HAZWOPER) standard (29 CFR 1910.120) – see Section 6.1 below.

- Use workers trained for hazardous waste operations under OSHA, and communicate the provisions of the HASP to the workers involved.

- Implement the work zones, decontamination procedures, and all other requirements specified by the HASP.

- Use appropriate personal protective equipment (PPE) as specified in the HASP, and (if VOCs are suspected) implement monitoring for organic vapors in the breathing zone using a field photoionization detector (PID) or other appropriate instrument specified by the HASP.

- Temporarily stockpile all excavated soil on plastic sheeting to segregate it from surface materials, and cover it to prevent contact or runoff.

- If possible, once the subsurface work is complete, return soil to excavation and repair or replace the capping material to prevent future contact.

- Alternatively, if all of the soil cannot be returned to the excavation, it may be disposed offsite as a waste at a properly licensed disposal facility. It will be characterized on the

basis of generator knowledge and tested for toxicity, if necessary, in order to arrange for disposal.

4.4.3 Pit Water

In the event that dewatering is required of an excavation advanced into a soil management area, or into residually contaminated soil from a previously unknown source, the following measures will be taken:

- All pumped water will be containerized in labeled containers (drums or tank). Onsite storage of wastewater will not exceed 90 days.
- If prior documented approval is obtained from MSD, the wastewater may be discharged to the municipal sewer. All sampling and analyses shall be according to the requirements of the MSD.
- If the wastewater cannot be discharged to the municipal sewer, it shall be characterized and disposed at an offsite facility licensed to receive this type of waste. All sampling and analyses shall be according to the requirements of the disposal facility.

Documentation of all offsite disposal involving wastes generated during excavation or handling of pumped water shall be maintained by the contractor performing the excavation activities, and copies shall be provided to the current Owner within 90 days of waste generation, for incorporation into the Annual Report to the Cabinet.

4.5 SITE MAINTENANCE, INSPECTIONS AND REPORTING

Once the initial removal of surface waste materials (Section 4.3) has been implemented and documented, the current Owner of each parcel will be responsible for all site maintenance, inspections, and associated reporting to the Cabinet, as required by the Environmental Covenant, including an Annual Report and a Five-Year Review Report.

Groundwater monitoring will be the responsibility of RBTC, unless that responsibility is transferred by agreement to another party, and the transfer is approved by the KDWM. Additional information on groundwater monitoring is provided in Section 5.0.

5.0 PROPOSED GROUNDWATER MONITORING PLAN

Assuming access to the property is provided by the current Owner, groundwater monitoring will be performed by RBTC (or approved successor) for an initial period of five years, or until the existing wells are abandoned immediately prior to highway construction. Data collected during that interval will be reviewed, and (based on the results) a proposal will be made to discontinue groundwater monitoring, or continue it at a modified frequency. The provisions of the groundwater monitoring plan for the former Vermont American site are described in this Section.

5.1 GROUNDWATER MONITORING NETWORK

The groundwater monitoring network for the site consists of four existing monitoring wells (W-1 through W-4), two of which (W-2 and W-3) are located inside the Main Street building. Current well locations are shown in Figures 2 and 4, and monitoring well construction details are provided in Table 4. Based on the planned demolition and construction activities related to the Interstate expansion, it is anticipated that all of the wells will have to be abandoned immediately prior to the start of those activities. A replacement monitoring well network will be installed once the highway construction activities are complete. Final locations of the long-term monitoring wells will be approved by the KDWM prior to installation.

5.2 WELL ABANDONMENT AND REPLACEMENT

As the wells included in the monitoring network for the site require abandonment, a letter identifying the well(s) to be abandoned and the reason will be submitted to the KDWM by RBTC for approval prior to implementation.

All well abandonments (and any new well installations) will be performed by a Kentucky Certified Monitoring Well Driller. All well abandonment and installation procedures will be in accordance with 401 KAR 6:310, or with the statutes and regulations governing monitoring well construction that are in effect at the time of abandonment/relocation. Waste generated in the course of monitoring well abandonment or installation will not be considered a listed hazardous waste, but will be profiled on the basis of the concentrations of COCs in the material.

After new wells are installed, or following any repairs or modifications affecting the elevation of a well head, the new top of casing elevation(s) will be surveyed and tied by survey to NAVD (the site datum).

5.3 MONITORING FREQUENCY

Each groundwater monitoring event will include water level gauging and groundwater sample collection. Assuming access is provided by the current Owner, groundwater monitoring will be performed two times the first year after approval of the Management Plan, and then at a two-year frequency (i.e., three years and five years after approval of the Management Plan).

At the conclusion of the fifth year of monitoring (or after all of the wells have been abandoned due to demolition/construction), the data will be reviewed for long-term hydraulic and water quality trends. An assessment of trends will be included in the report to the KDWM, which will also include recommendations (if any) for discontinuing monitoring or changing the sampling frequency.

5.4 ANALYTICAL AND SAMPLING PROTOCOLS

All groundwater samples collected as part of long-term groundwater monitoring at the site will be analyzed for the metals chromium, total (Method 6020), chromium, hexavalent (Method 3060A/7196A), and lead (Method 6020), and for VOCs by USEPA SW846 Method 8260B. Sampling will be performed using low-flow sampling methods to insure that a low-turbidity sample, that is representative of actual metal concentrations in groundwater, is obtained for analysis from each well.

The field methods to be followed for collection of gauging data and groundwater samples will be the following:

- Prior to gauging, all monitoring wells will be opened and allowed to equilibrate with atmospheric conditions for at least 20 minutes.

- Depth to water measurements will be collected in all wells from the north edge of the inner well casing, to an accuracy of +/- 0.01 ft, using a clean electronic water level indicator with a graduated tape.

- After the water level measurements are made, the wells will be purged and sampled using a low-flow submersible sampling pump (bladder pump or equivalent), set approximately in the middle of the screened interval. New polyethylene tubing will be used at each well, and the pump will be decontaminated between wells.

- Water will be purged from the well at a low rate (100 to 300 milliliters per minute) and readings will be made of turbidity and selected additional field parameters (pH and specific conductance at a minimum), approximately five minutes apart. Depth to water in the well will be monitored also, to insure that excessive drawdown does not occur.

- The sample will be collected from the pump discharge when a turbidity below 10 nephelometric turbidity units (NTUs) or lower has been reached and the other field parameters have reached equilibrium (i.e., three successive readings are within 10 percent or less of each other).

- Samples will be containerized in appropriate containers (i.e., a 500-milliliter [mL] high-density polyethylene [HDPE] bottle, preserved with nitric acid for total chromium and lead; a 250-mL HDPE bottle with no preservative for hexavalent chromium; and two or three 40-mL glass vials with Teflon-lined septa, preserved with hydrochloric acid, for the VOCs). Sample containers will be maintained in a cooler and chilled with ice during sample collection.

- After sample collection is complete, the sample containers will be secured and packed in ice, and shipped or delivered to a qualified laboratory with appropriate chain-of-custody documentation. Note: the holding time for hexavalent chromium is 24 hours; therefore, delivery to the laboratory immediately after sampling is required.

- The chain of custody documentation, and all relevant information on sample condition upon receipt, will be included in the laboratory's report along with the analytical results for the samples.

Should changes in analytical method or field procedures be required in the future for consistency with current regulations and/or standard practices, the changes will be recommended in a letter or report to the KDWM for approval prior to implementation.

5.5 WASTEWATER MANAGEMENT

It is anticipated that only low volumes of wastewater will be generated from low-flow sampling, on the order of five gallons or less per well. The wastewater will not be considered a listed waste, but will be profiled on the basis of the concentrations of COCs in the monitoring wells sampled.

RBTC (or approved successor) will arrange for disposal of this wastewater as it generated, either into the MSD sewer or to an appropriately licensed facility. Long-term staging of the wastewater onsite is not anticipated.

5.6 REPORTING

Groundwater sampling methods, analytical results and gauging data will be documented in a report to be submitted concurrently to the current Owner and the KDWM approximately 60 days after completion of each sampling event. The report will include updated tables of gauging and analytical data, hydrographs for the wells, and an interpreted water level elevation contour map for the date of the sampling event.

After five years of monitoring, a detailed review of groundwater quality trends will be made, and (if appropriate) recommendations will be made for changes in the groundwater monitoring plan.

6.0 HEALTH AND SAFETY AND CONTINGENCY PLANS

6.1 SITE HEALTH AND SAFETY PLAN (HASP)

As discussed in previous sections, most future site activities, including commercial uses and occupancy of any buildings on the site, will not require special safety precautions or a site-specific HASP. However, preparation of a HASP will be required in the event that excavations are advanced in any remaining soil management areas, or encounter unexpected subsurface structures or evidence of contamination, as described in Section 4.4.2 above.

The contractor performing the excavations will be required to use personnel trained for hazardous waste operations under the OSHA HAZWOPER Standard (29 CFR 1910.120), and will be responsible for preparing the HASP. The HASP shall be consistent with 29CFR 1910.120 and, as a minimum, shall address each of the following elements required by 29CFR 910.120(b)(4)(ii):

- A safety and health risk or hazard analysis for each site task/operation.
- Employee training.
- Personal protective equipment.
- Medical surveillance requirements.
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.
- Site control measures.
- Decontamination procedures.
- An emergency response plan.
- Confined space entry procedures (if applicable).
- Spill containment program.
- Pre-entry briefing.
- HASP effectiveness assessment.

6.2 CONTINGENCY PLAN

Previously unknown conditions could be encountered during future excavations, and could include buried sumps, drums, tanks or machine parts, or soil with locally elevated residual contamination. In the event that buried containers or soil with concentrated contamination are encountered during

excavation, the procedures outlined above in Sections 4.4.2 and 4.4.3 (including notification of the KDWM) should be followed in handling soil and water.

If a buried container is encountered, the container should be emptied (if appropriate), carefully removed, placed on plastic sheeting, and either placed in an over-pack drum or emptied and cleaned following standard underground storage tank (UST) removal procedures (depending on the size and condition of the container). The container should be disposed following the appropriate procedures, and documentation of proper disposal should be maintained by the contractor and provided to the current Owner for transmittal to the KDWM.

7.0 REFERENCES

ERC Environmental and Energy Services Company (ERCE), 1990a. *Level I Preaquisition Site Assessment, 500 East Main Street, Louisville, Kentucky*, Report prepared for Doe Anderson Advertising Agency, July 1990.

ERCE, 1990b. *Level II Preaquisition Site Assessment, Former Vermont American Facility, 500 East Main Street, Louisville, Kentucky,* Report prepared for Doe Anderson Advertising Agency, November 1990.

Global Environmental Solutions, Inc. (GESI), 1999. *Site Investigation Report, Former Vermont American Facility, 500 East Main Street, Louisville, Kentucky*, July 1999.

KDWM, 1996. Laboratory Report for W-1, W-2, W-3, March 1996.

KDWM, 1997. *Site Investigation Report,* March 1997.

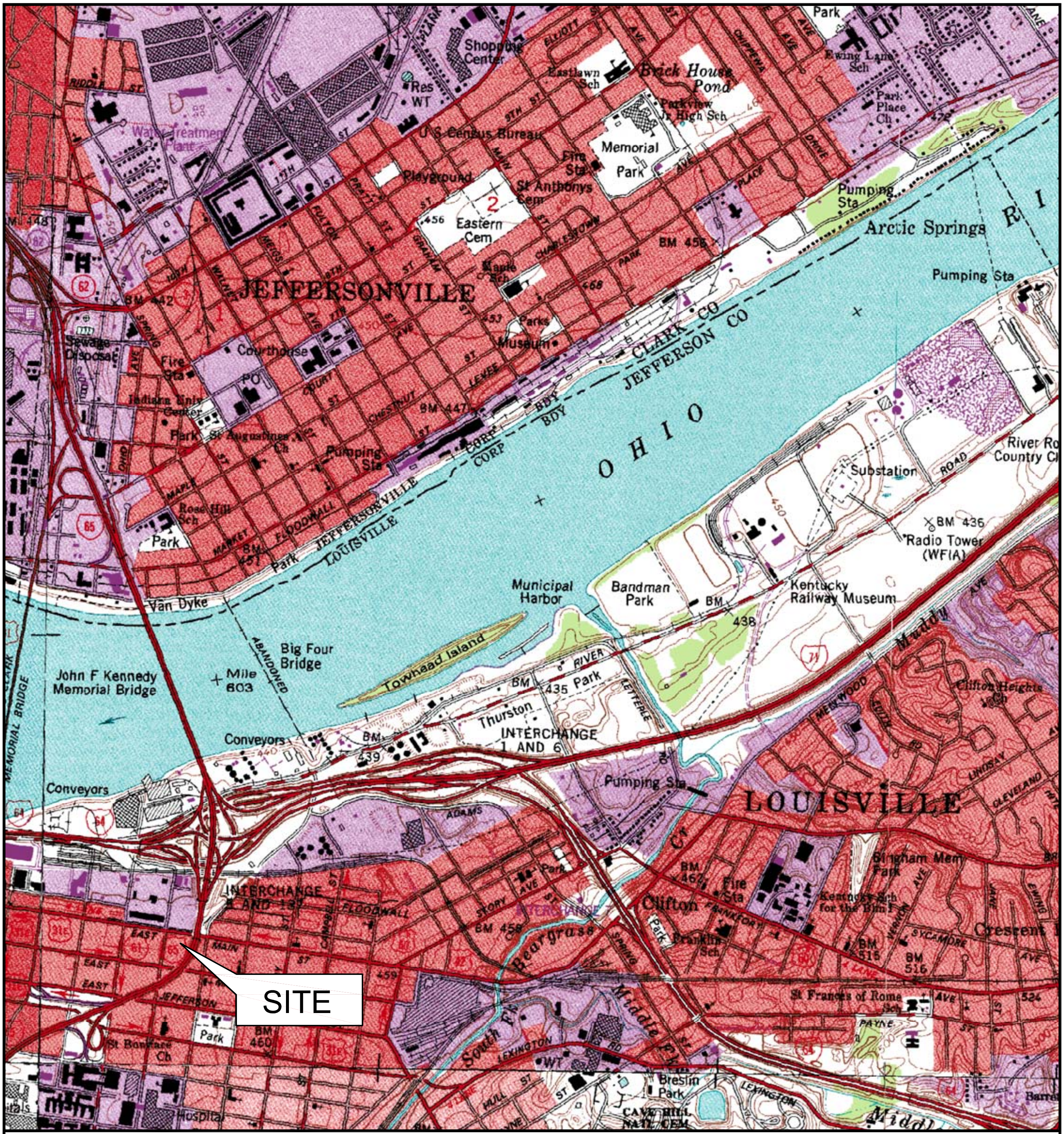
KDWM, 1997. Laboratory Report for W-1, W-2, W-3, June 1997.

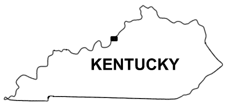
Law Environmental, Inc., 1991. *Report of Soil Sampling and Analysis, , Former Vermont American Facility, 500 East Main Street, Louisville, Jefferson County, Kentucky,* Report prepared for 500 Associates, January 1991.

Linebach Funkhouser Inc. (LFI), 2007. *Management Plan Update, Former Vermont American Facility, 500 East Main Street, Louisville, Jefferson County, Kentucky*. Plan prepared from Greenbaum Doll & McDonald, PLLC. December 2007.

Tetra Tech EM Inc. (TTEMI), 2003. *Supplemental Groundwater Sampling (Task 220), Management Plan Implementation, Former Vermont American Facility, 500 East Main Street, Louisville, Kentucky,* Letter Report prepared for 500 Associates, October 21, 2003.

FIGURES





QUADRANGLE LOCATION

SOURCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE MAP, JEFFERSONVILLE, INDIANA, 1993

0 1000 2000
SCALE IN FEET

NORTH

MACTEC
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

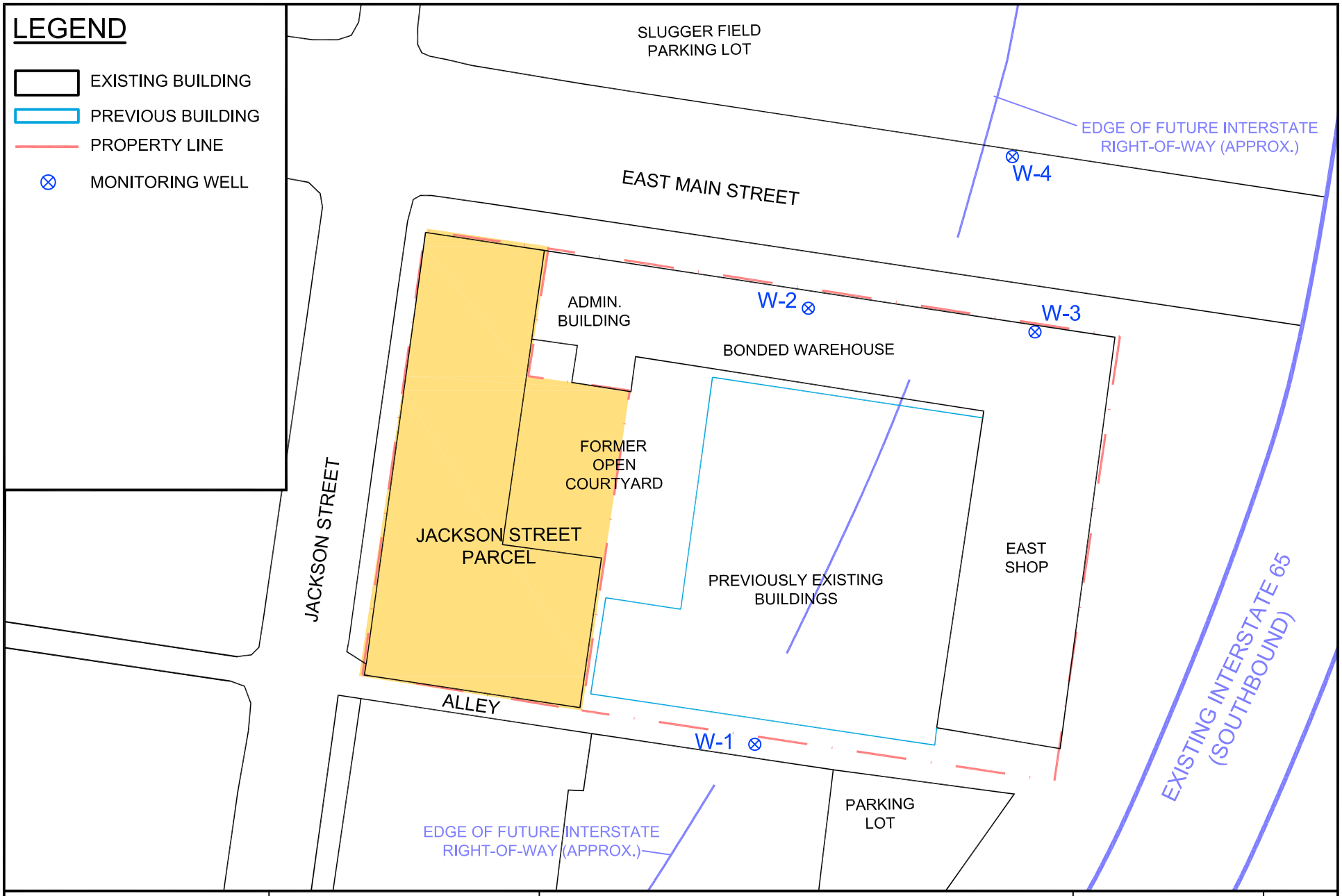
TOPOGRAPHIC MAP

FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN STREET, LOUISVILLE, KENTUCKY

PROJECT NUMBER: 6680-08-9635

SCALE	1" = 2000'
DATE	06/17/2008
DRAWN BY	ALD
APPROVED BY	WCG

FIG. 1



MACTEC
2456 Fortune Drive, Suite 100
Lexington, KY 40509
(859) 255-3308

SITE LAYOUT AND MONITORING WELL LOCATIONS

FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN STREET, LOUISVILLE, KENTUCKY

PROJECT NUMBER: 6680-08-9635

APPROX. SCALE	1" = 60'
DATE	05/09/2010
DRAWN BY	SMD
APPROVED BY	ALD

FIG. 2

SOURCE: KENTUCKY DIVISION OF GEOGRAPHIC INFORMATION (DGI), AIR PHOTO FROM FARM SERVICES ADMINISTRATION (2004)

0 500 1000
APPROX. SCALE IN FEET

NORTH

MACTEC
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

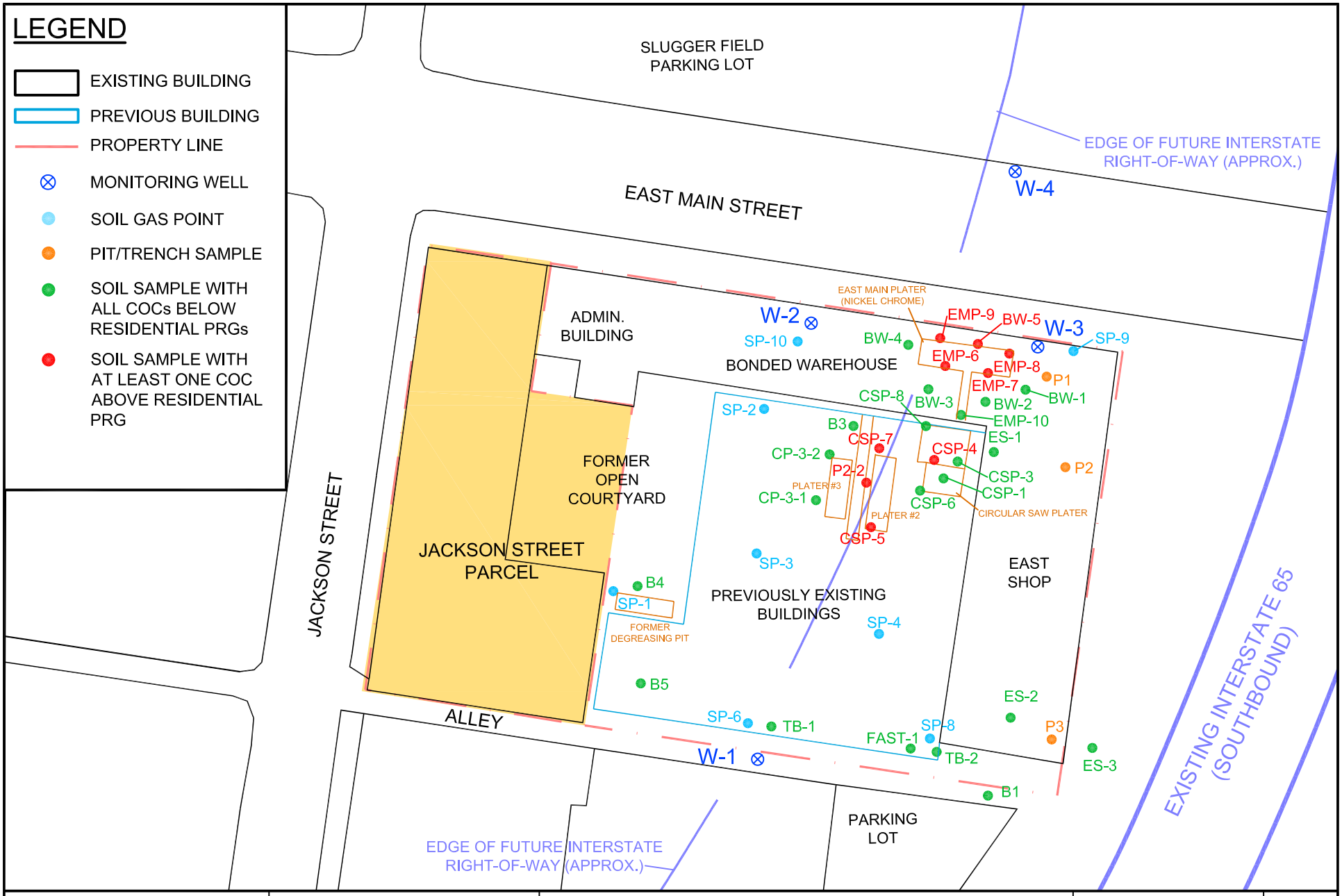
SITE VICINITY

FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN STREET, LOUISVILLE, KENTUCKY

PROJECT NUMBER: 6680-08-9635

APPROX. SCALE	1" = 500'
DATE	06/19/2008
DRAWN BY	KDR
APPROVED BY	ALD

FIG. 3


LEGEND
EXISTING BUILDING
PREVIOUS BUILDING
PROPERTY LINE
MONITORING WELL
SOIL GAS POINT
PIT/TRENCH SAMPLE
SOIL SAMPLE WITH ALL COCs BELOW RESIDENTIAL PRGs
SOIL SAMPLE WITH AT LEAST ONE COC ABOVE RESIDENTIAL PRG
SLUGGER FIELD PARKING LOT
EDGE OF FUTURE INTERSTATE RIGHT-OF-WAY (APPROX.)
EAST MAIN STREET
W-4
W-2
W-3
ADMIN. BUILDING
BONDED WAREHOUSE
EAST MAIN PLATER (NICKEL CHROME)
FORMER OPEN COURTYARD
JACKSON STREET PARCEL
JACKSON STREET
PREVIOUSLY EXISTING BUILDINGS
EAST SHOP
FORMER DEGREASING PIT
PLATER #3
PLATER #2
CIRCULAR SAW PLATER
ALLEY
W-1
PARKING LOT
EXISTING INTERSTATE 65 (SOUTHBOUND)
SP-1
SP-2
SP-3
SP-4
SP-6
SP-8
SP-9
SP-10
B1
B3
B4
B5
BW-1
BW-2
BW-3
BW-4
BW-5
CP-3-1
CP-3-2
CSP-1
CSP-2
CSP-3
CSP-4
CSP-5
CSP-6
CSP-7
CSP-8
EMP-6
EMP-7
EMP-8
EMP-9
EMP-10
ES-1
ES-2
ES-3
FAST-1
P1
P2
P2-2
P3
TB-1
TB-2
0
30
60
APPROX. SCALE IN FEET
NORTH
MACTEC
2456 Fortune Drive, Suite 100
Lexington, KY 40509
(859) 255-3308
SAMPLING LOCATIONS
FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN STREET, LOUISVILLE, KENTUCKY
PROJECT NUMBER: 6680-08-9635
APPROX. SCALE 1" = 60'
DATE 05/09/2010
DRAWN BY SMD
APPROVED BY ALD
FIG. 4

LEGEND

- EXISTING BUILDING
- PREVIOUS BUILDING
- PROPERTY LINE
- MONITORING WELL
- SOIL GAS POINT
- PIT/TRENCH SAMPLE
- SOIL SAMPLE WITH ALL COCs BELOW RESIDENTIAL PRGs
- SOIL SAMPLE WITH AT LEAST ONE COC ABOVE RESIDENTIAL PRG
- MANAGEMENT AREA

SLUGGER FIELD PARKING LOT

EDGE OF FUTURE INTERSTATE RIGHT-OF-WAY (APPROX.)

NORTH

EAST MAIN STREET

W-4

EDGE OF FUTURE ABUTMENT (APPROX.)

EAST MAIN PLATER (NICKEL CHROME)

ADMIN. BUILDING

W-2

SP-10

BW-4

EMP-9

BW-5

W-3

SP-9

BONDED WAREHOUSE

EMP-6

EMP-8

P1

EMP-7

BW-1

CSP-8

BW-3

BW-2

SP-2

EMP-10

B3

ES-1

CSP-7

CSP-4

CP-3-2

P2

PLATER #3

CSP-3

CSP-1

CP-3-1

CSP-6

CIRCULAR SAW PLATER

PLATER #2

APPROX. LIMIT OF RETAINING WALL AND ABUTMENT FOUNDATION

CSP-5

FORMER OPEN COURTYARD

JACKSON STREET

JACKSON STREET PARCEL

SP-3

EAST SHOP

B4

SP-1

FORMER DEGREASING PIT

PREVIOUSLY EXISTING BUILDINGS

SP-4

B5

ES-2

SP-6

TB-1

SP-8

P3

FAST-1

TB-2

ES-3

ALLEY

W-1

B1

EDGE OF FUTURE RETAINING WALL (APPROX.)

PARKING LOT

EDGE OF FUTURE INTERSTATE RIGHT-OF-WAY (APPROX.)

EXISTING INTERSTATE 65 (SOUTHBOUND)

0' 20' 40' 60'

SOIL MANAGEMENT AREAS

FORMER VERMONT AMERICAN FACILITY
500 EAST MAIN ST, LOUISVILLE, KENTUCKY

PROJECT NUMBER: 6680-08-9635

SCALE	1" = 40'
DATE	05/11/10
DRAWN BY	ALD
APPROVED BY	SMD

FIG. 5

MACTEC
2456 Fortune Drive, Suite 100
Lexington, Kentucky 40509
Phone: (859) 255-3308

TABLES

Table 1
Summary of Soil Analytical Results
Former Vermont American Facility
Louisville, Jefferson County, Kentucky
MACTEC Project No. 6680-08-9635

Sample Name	Sample Depth	Sample Date	Total Chromium	Hexa-valent Chromium	Lead	Tetrachlo-roethene (PCE)	Trichlo-roethene (TCE)
		Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	PRGs (Residential/Industrial):		*210/450*	*30/64*	*400/750*	*1.5/3.4*	*0.053/0.11*
Monitoring Wells							
VAW-1 (W-1)	unknown	9/26/1990	**3.0**	<0.50	<6.5	**0.033**	**0.065**
VAW-2 (W-2)	unknown	9/28/1990	**5.5**	<0.50	<6.5	<0.010	<0.010
VAW-3 (W-3)	unknown	9/27/1990	**110**	<0.50	<6.5	<0.011	<0.011
Bonded Warehouse/East Main Plater							
EMP-6	beneath concrete floor	3/13/1997	**37**	**58**	**92**	**0.010**	**0.160**
EMP-7	beneath concrete floor	3/13/1997	**480**	**36**	**33**	**0.004 J**	**0.053**
EMP-8	beneath concrete floor	3/13/1997	**1,500**	**66**	**56**	<0.006	**0.004 J**
EMP-9	beneath concrete floor	3/13/1997	**790**	**140**	**23**	<0.006	**0.009**
EMP-10	beneath concrete floor	3/13/1997	**11**	**6**	**120**	**0.006**	**0.097**
BW-1	3-4	5/19/1999	**10.1**	<2.00	**7.07**	--	--
BW-1	6.9-7.9	5/19/1999	**26.7**	<2.00	**7.19**	--	--
BW-2	3-4	5/19/1999	**12.6**	<2.00	**13.4**	--	--
BW-2	7.7-8.7	5/19/1999	**12.6**	<2.00	**8.70**	--	--
BW-3	3-4	5/17/1999	**14.1**	<2.00	**11.6**	<0.0020	<0.0020
BW-3	6.8-7.8	5/17/1999	**8.16**	<2.00	**7.85**	--	--
BW-4	3-4	5/17/1999	**10.5**	<2.00	**7.81**	--	--
BW-4	8-8.8	5/17/1999	**8.57**	<2.00	**8.98**	--	--
BW-5	3-4	5/19/1999	**256**	**216**	**14.1**	<0.0020	<0.0020
BW-5 DUP	3-4	5/19/1999	**271**	**210**	**10.1**	<0.0020	<0.0020
BW-5	7.9-8.9	5/19/1999	**98.0**	**62.4**	**6.14**	--	--
East Shop							
B1 (VAB-1)	--	9/26/1990	4	<0.50	<6.5		
TB-2	20-21.5	1991	--	--	--	0.005	0.006
TB-2	40-41.5	1991	--	--	--	0.016	0.029
ES-1	3-4	5/19/1999	**13.0**	<2.00	**22.6**	--	--
ES-1	6.9-7.9	5/19/1999	**10.4**	<2.00	**9.79**	--	--
ES-2	3-4	5/19/1999	**13.6**	<2.00	**11.5**	<0.0020	**0.0053**
ES-2	7-8	5/19/1999	**10.6**	<2.00	**9.43**	<0.0020	<0.0020
ES-3	3-4	5/19/1999	**11.0**	<2.00	**8.11**	**0.0411**	**0.0733**
ES-3	7-8	5/19/1999	**5.53**	<2.00	**4.96**	<0.0020	<0.0020
Former AST Area							
FAST-1	3-4	5/17/1999	--	--	--	<0.0020	<0.0020
FAST-1 (DUP)	--	5/17/1999	--	--	--	<0.0020	<0.0020
FAST-1	6-7	5/17/1999	--	--	--	<0.0020	<0.0020

Table 1
Summary of Soil Analytical Results
Former Vermont American Facility
Louisville, Jefferson County, Kentucky
MACTEC Project No. 6680-08-9635

Sample Name	Sample Depth	Sample Date	Total Chromium	Hexa-valent Chromium	Lead	Tetrachlo-roethene (PCE)	Trichlo-roethene (TCE)
		Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		PRGs (Residential/Industrial):	*210/450*	*30/64*	*400/750*	*1.5/3.4*	*0.053/0.11*
Circular Saw Plating Area							
CSP-1	beneath concrete floor	3/13/1997	**36**	--	**21**	--	--
CSP-3	--	3/13/1997	**150**	**20**	**8.6**	--	--
CSP-4	beneath concrete floor	3/13/1997	**11,000**	--	**270**	--	--
CSP-5	3-4	5/17/1999	**157**	**96.0**	**8.59**	--	--
CSP-5	6.8-7.8	5/17/1999	**88.6**	**27.0**	**6.94**	--	--
CSP-6	3-4	5/17/1999	**19.4**	**5.20**	**8.53**	--	--
CSP-6	6.9-7.9	5/17/1999	**90.1**	**8.80**	**6.68**	--	--
CSP-7	3-4	5/17/1999	**94.4**	**29.6**	**31.2**	--	--
CSP-7	6.5-7.5	5/17/1999	**170**	**43.8**	**88.0**	--	--
CSP-8	3-4	5/17/1999	**97.3**	**4.20**	**11.4**	--	--
CSP-8 (DUP)	3-4	5/17/1999	**123**	<2.00	**7.24**	--	--
Chrome Plater #2							
P2-2	2-3 (from test trench)	3/13/1997	**1,400**	**9.7**	**420**	--	--
Chrome Plater #3							
B3 (VAB-3B)	--	9/25/1990	**100**	<0.50	<6.5	--	--
CP-3-1	3-4	5/17/1999	**28.1**	<2.00	**8.59**	--	--
CP-3-1	6.7-7.7	5/17/1999	**38.8**	<2.00	**8.06**	--	--
CP-3-2	3-4	5/17/1999	**40.4**	<2.00	**12.3**	--	--
CP-3-2	6.7-7.7	5/17/1999	**64.1**	**2.40**	**11.0**	--	--
Open Courtyard							
B2 (VAB-2)	--	9/24/1990	**16**	<0.50	<6.5		
B4 (VAB-4)	--	9/24/1990	**3.5**	<0.50	<6.5	<0.011	<0.011
B5 (VAB-5)	--	9/24/1990	**3.5**	<0.50	<6.5		
TB-1	15-16.5	1991	--	--	--	ND	ND
TB-1	40-41.5	1991	--	--	--	**0.013**	**0.009**

Notes:

Prepared by: SMD 6/14/08

Checked by: ALD 6/18/08

Sample depths in feet below ground surface

mg/kg = milligrams per kilogram, or parts per million (ppm)

-- = not analyzed or not available

ND = not detected

Detected values shown in **bold**

Values exceeding the Residential Preliminary Remediation Goal (PRG) are shaded

Soil sample results compiled from tables included in various reports including the following:

Global Environmental Solutions, Inc., *Final Site Investigation* dated July 26, 2000

Kentucky Division of Waste Management, *Site Investigation* dated March 14, 1997

ERCE, *Draft Level II Preaquisition Site Assessment* , dated November 15, 1990

Law Environmental, letter report (partial) dated July 9, 1991

Table 2
Summary of Groundwater Analytical Results
Former Vermont American Facility,
Louisville, Jefferson County, Kentucky
MACTEC Project No. 6680-08-9635

Well/Date	Total Chromium	Hexavalent Chromium	Lead	Tetrachloroethene (PCE)	Trichloroethene (TCE)
Units:	mg/L	mg/L	mg/L	mg/L	mg/L
MCL:	*0.100*	*0.100*	*0.015*	*0.005*	*0.005*
W-1					
Oct-90	**0.030**	--	**0.006**	**0.010**	**0.081**
Nov-90	--	--	--	--	**0.219**
Jun-96	**0.005**	--	**0.009**	ND	**0.548**
Jun-97	**0.030**	--	**0.046**	**0.007**	**0.248**
17-May-99	**0.008**	--	**0.010**	**0.004**	**0.062**
23-Sep-03	ND	ND	ND	**0.0064**	**0.0987**
29-Feb-08	--	--	--	<0.0050	**0.0505**
4-Mar-08	**0.0356**	<0.010	**0.0563**	--	--
18-Mar-08	<0.0100	--	<0.0100	--	--
W-2					
Oct-90	**0.07**	--	ND	**0.032**	**0.343**
Nov-90	NA	--	NA	--	**0.333**
Jun-96	**0.744**	--	**0.018**	**0.023**	**0.240**
Jun-97	**0.390**	--	**0.011**	**0.021**	**0.281**
19-May-99	**0.119**	--	**0.004**	**0.023**	**0.165**
23-Sep-03	**1.68**	**1.41**	ND	**0.0092**	**0.179**
29-Feb-08	--	--	--	**0.0059**	**0.0782**
4-Mar-08	**0.125**	**0.019**	**0.0537**	--	--
18-Mar-08	**1.310**	--	<0.0100	--	--
W-3					
Oct-90	**0.12**	--	ND	**0.034**	**0.538**
Nov-90	--	--	--	**0.028**	**0.780**
Jun-96	**1.420**	--	**0.044**	ND	**0.132**
Jun-97	**1.300**	--	**0.018**	ND	**0.100**
19-May-99	**0.978**	--	**0.009**	**0.008**	**0.165**
23-Sep-03	**1.97**	**1.56**	**0.008**	**0.0054**	**0.088**
29-Feb-08	--	--	--	<0.0050	**0.0515**
4-Mar-08	**0.118**	**0.024**	**0.0843**	--	--
18-Mar-08	<0.0100	--	<0.0100	--	--
W-4					
23-Sep-03	ND	ND	**0.007**	**0.0042**	**0.213**
23-Sep-03 (dup)	ND	ND	**0.007**	**0.0040**	**0.215**
29-Feb-08	--	--	--	<0.005	**0.284**
4-Mar-08	<0.0100	<0.010	<0.0100	--	--
18-Mar-08	<0.0100	--	<0.0100	--	--

Notes:
Prepared by: SMD 9/22/08
Checked by: ALD 9/22/08

mg/L = milligrams per liter, or parts per million (ppm)
-- = not analyzed or not available
ND = not detected
Detected values shown in **bold**
Values exceeding the MCL are shaded
Results in this table are summarized from tables included in previous reports (2003 *Management Plan* submitted by TTEMI and *Supplemental Groundwater Sampling Letter*, *TTEMI*, 23-Oct-03), and 2008 analytical laboratory reports provided by LFI

Table 3
Conceptual Site Model and Site Management Strategies
Former Vermont American Facility, 500 East Main Street, Louisville, Kentucky
MACTEC Project No. 6680-08-9635

Medium	Potential Exposure Pathway Assuming Commercial Use	Potential Receptors Assuming Commercial Use	Management Strategy
Contaminated Waste Materials/Debris	Direct Contact (Ingestion of soil, Dermal absorption, Inhalation of particulates)	Transient Site Visitors Temporary Construction Workers	Removal from Site
Soil	Direct Contact (Ingestion of soil, Dermal absorption, Inhalation of particulates)	Transient Site Visitors Temporary Construction Workers Long-term Site Workers	Prohibition of residential uses at ground and subsurface levels. Long-term contact with site soil limited by visual barrier (geotextile fabric) and engineered barriers (such as building construction, paving materials, and/or new topsoil over geotextile). Landscaping uses limited to new topsoil.
Groundwater	Ingestion from drinking Dermal absorption Inhalation of volatiles	Transient Site Visitors Temporary Construction Workers Long-term Site Workers	Prohibition of onsite groundwater use for domestic, drinking water, and landscape watering purposes.
Subsurface Vapor (volatiles from soil and groundwater)	Inhalation of volatiles (may be NA)	Long-Term Site Workers in Occupied (Commercial) Areas at Ground or Subsurface Levels	May be not applicable, based on VOC concentrations and depth to water table. If necessary, address soil vapor mitigation in future building design.
Surface Water	NA (no impacted surface water)	NA	Surface water (runoff and stormwater) contact with soil to be avaoided with engineered bariers. No contact between surface water and groundwater anticipated, based on typical depth to groundwater.

Table 4
Monitoring Well Construction Summary
Formern Vermont American Facility
Louisville, Jefferson County, Kentucky
MACTEC Project 6680-08-9635

Well ID	KDOW AKGWA #	Completion Date	Inner Casing Diameter (in)	Boring Depth (ft BGS)	Sounded Well Depth (ft BMP)	Length of Perforated Section (ft)	Ground Surface Elevation (ft NGVD)	Measuring Point Elevation (ft NGVD)	Casing Stick-Up (ft AGS)	Top of Screen Elevation (ft NGVD)	Bottom of Well Elevation (ft NGVD)
W-1	8001-6703	9/26/1990	2	50.0	50.5	30	---	461.69	---	441.2	411.2
W-2	8001-6704	9/26/1990	2	55.0	53.8	30	---	462.12	---	438.3	408.3
W-3	8001-6705	9/26/1990	2	55.0	51.6	30	---	462.31	---	440.7	410.7
W-4	---	9/16/2003	2	70.0	---	10	---	---	---	---	---

Notes

Prepared by: ALD 6/19/08
Checked by: KDR 6/20/08

--- = not available
NGVD = National Geodetic Vertical Datum of 1929 (MSL)
MP = measuring point
GS = ground/floor surface
in = inches
ft = feet
BMP = below measuring point
BGS = below ground surface

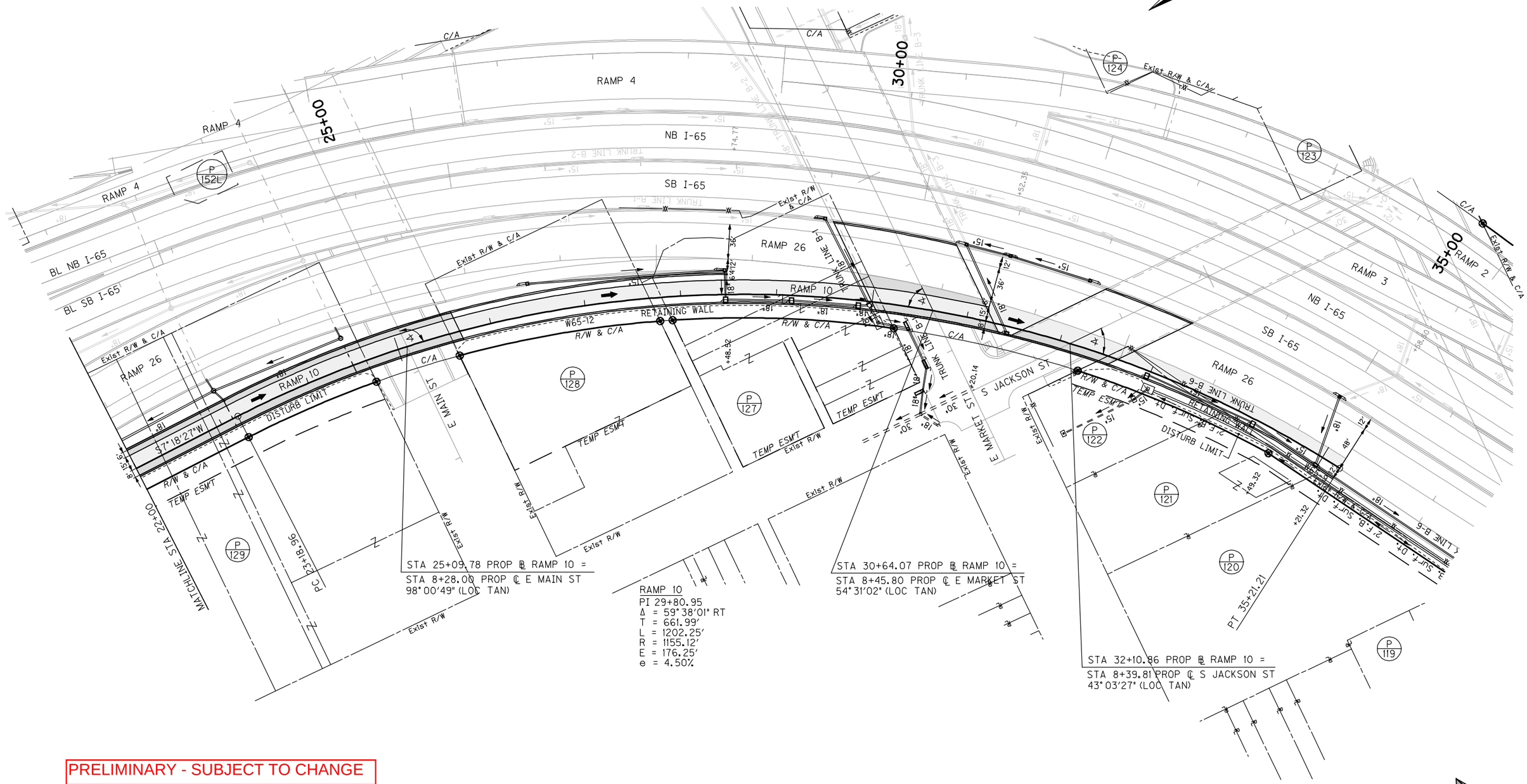
Sources: ERCE (1990b), KDWM Iwell nspection Forms (1996), TTEMI (2003)

APPENDIX A

KENTUCKY TRANSPORATION CABINET PRELIMINARY PLAN

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON	5-118.18	PL58

PREPARED BY ____ DATE ____
CHECKED BY ____ DATE ____
APPROVED BY ____ DATE ____



PRELIMINARY - SUBJECT TO CHANGE

CONSTRUCT RETAINING WALL		
STATION - STATION	SIDE	RET. WALL NO.
25+68.44 - 30+05.74	RT	W65-12
32+53.82 - 35+21.21	RT	W65-9

CONSTRUCT CONCRETE SHOULDER BARRIER			
STATION - STATION	TYPE	SIDE	L.F.*
25+62.68 - 28+48.52	A	LT	286

* NOTE: EXCLUDES SHOULDER BARRIER BOX INLETS

SEE THE FOLLOWING RIGHT OF WAY GRID SHEETS FOR RIGHT OF WAY DETAILS:

RW-C2-NW
RW-C2-SW

0′ 50′ 100′

THE OHIO RIVER BRIDGES

Kentucky Transportation Associates

KENNEDY INTERCHANGE
RAMP 10 PLAN SHEET
STA 22+00 TO END

DATE: November 24, 2006
FILE NAME: r10_pl2200.dgn
E-SHEET NAME:

COUNTY OF	ITEM NO.	SHEET NO.
JEFFERSON	5-118.18	PL59

PREPARED BY — DATE
CHECKED BY — DATE
APPROVED BY — DATE

DATUM

560 550 540 530 520 510 500 490 480 470 460 450 440 430 420 410 400 390 380 370

BRIDGE B65-28
7'-3" SUPERSTRUCTURE

VPI 26+50.00
Elev 497.17

VPI 28+75.00
Elev 492.95

SPLINE GRADE - RAMP 26

2.54%

-1.88%

L 400 FT
SD 445 FT

BRIDGE B65-9
6'-3"
SUPERSTRUCTURE

BRIDGE B65-8
6'-3"
SUPERSTRUCTURE

E MAIN ST

Ex TV
Ex Elec
Ex Tele
Ex 16" Water
Ex Elec
Ex TV
Ex Tele

E MARKET ST

Ex Elec
Ex 12" Water
Ex 15" Comb

S JACKSON ST

Ex 12" Water
Ex 30" Comb
Ex Elec

DESIGN SPEED: 40 MPH

22+00	22+50	23+00	23+50	24+00	24+50	25+00	25+50	26+00	26+50	27+00	27+50	28+00	28+50	29+00	29+50	30+00	30+50	31+00	31+50	32+00	32+50	33+00	33+50	34+00	34+50	35+00	35+50
463.8	464.8	465.0	464.3	463.6	462.3	462.2	461.7	462.2	462.0	462.4	462.3	462.1	462.7	462.3	461.7	461.2	461.1	459.9	461.5	460.1	460.4	461.3	462.0	462.3	463.2	464.2	
486.03	487.04	488.29	489.56	490.83	492.10	493.23	494.09	494.66	494.97	495.00	494.75	494.22	493.42	492.52	491.75	491.15	490.64	490.25									

PRELIMINARY - SUBJECT TO CHANGE

SCALE: 1"=50' HORIZ
1"=10' VERT

THE OHIO RIVER BRIDGES

Kentucky Transportation Associates

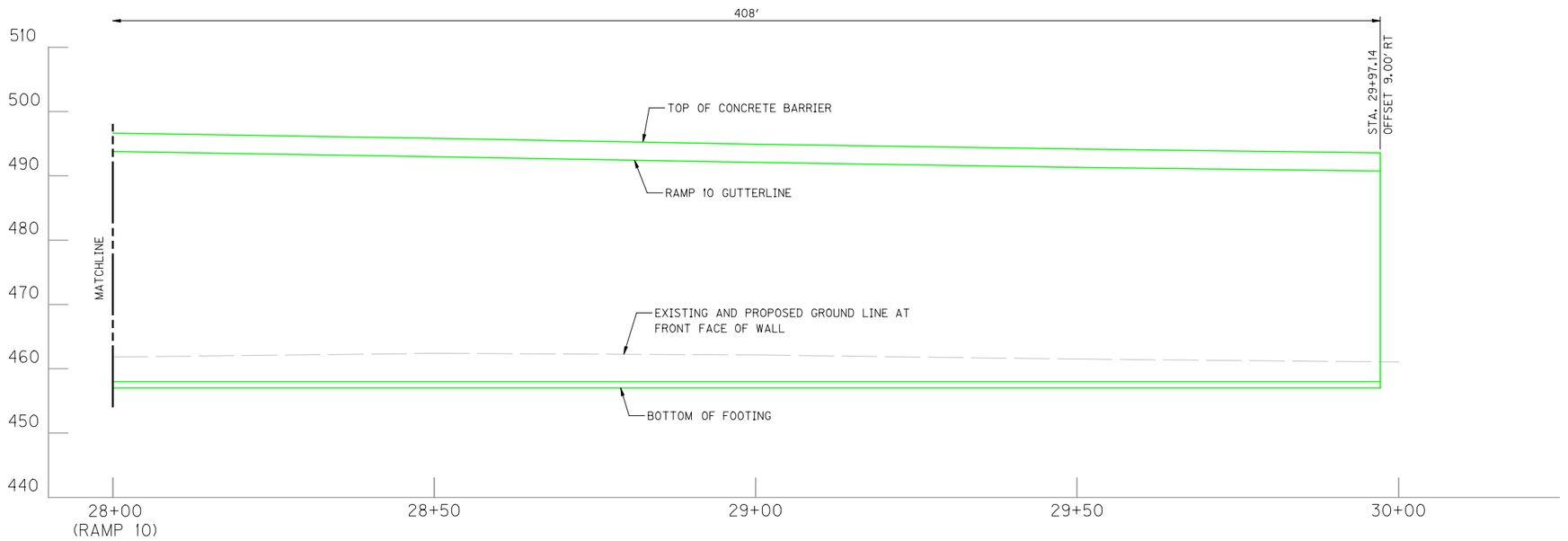
KENNEDY INTERCHANGE
RAMP 10 PROFILE SHEET
STA 22+00 TO END

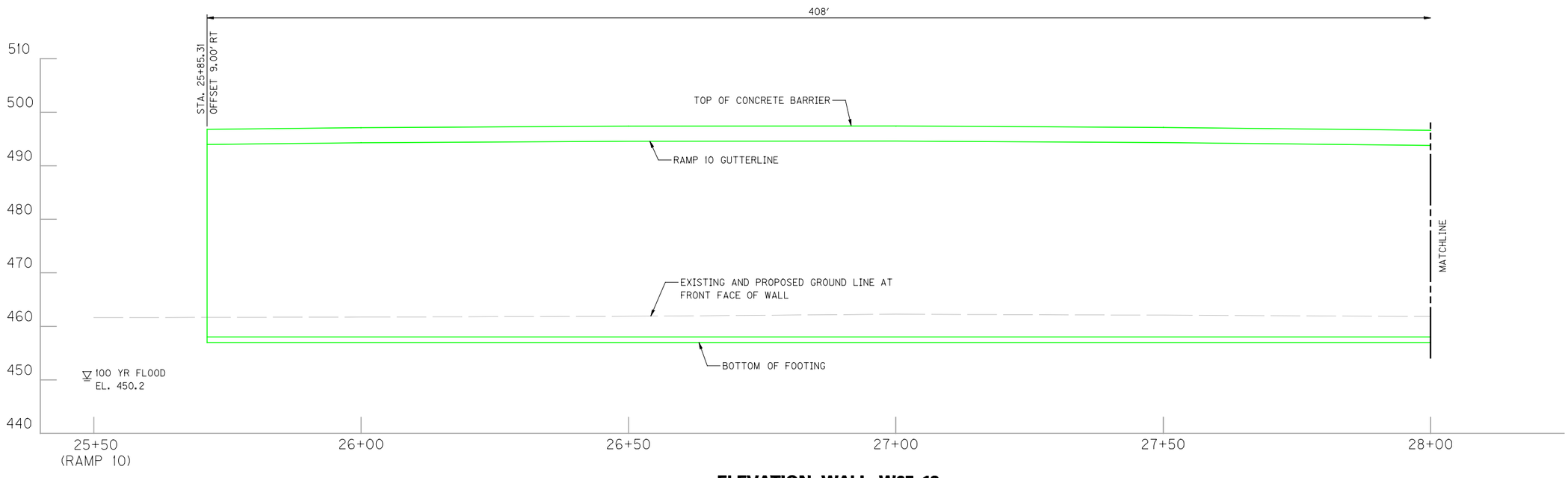
DATE: November 24, 2006
FILE NAME: ramp10_pr2200.dgn
E-SHEET NAME:

PRELIMINARY - SUBJECT TO CHANGE

COUNTY OF	ITEM NO.	SHEET NO.
		32

PREPARED BY ____ DATE ____
CHECKED BY ____ DATE ____
APPROVED BY ____ DATE ____





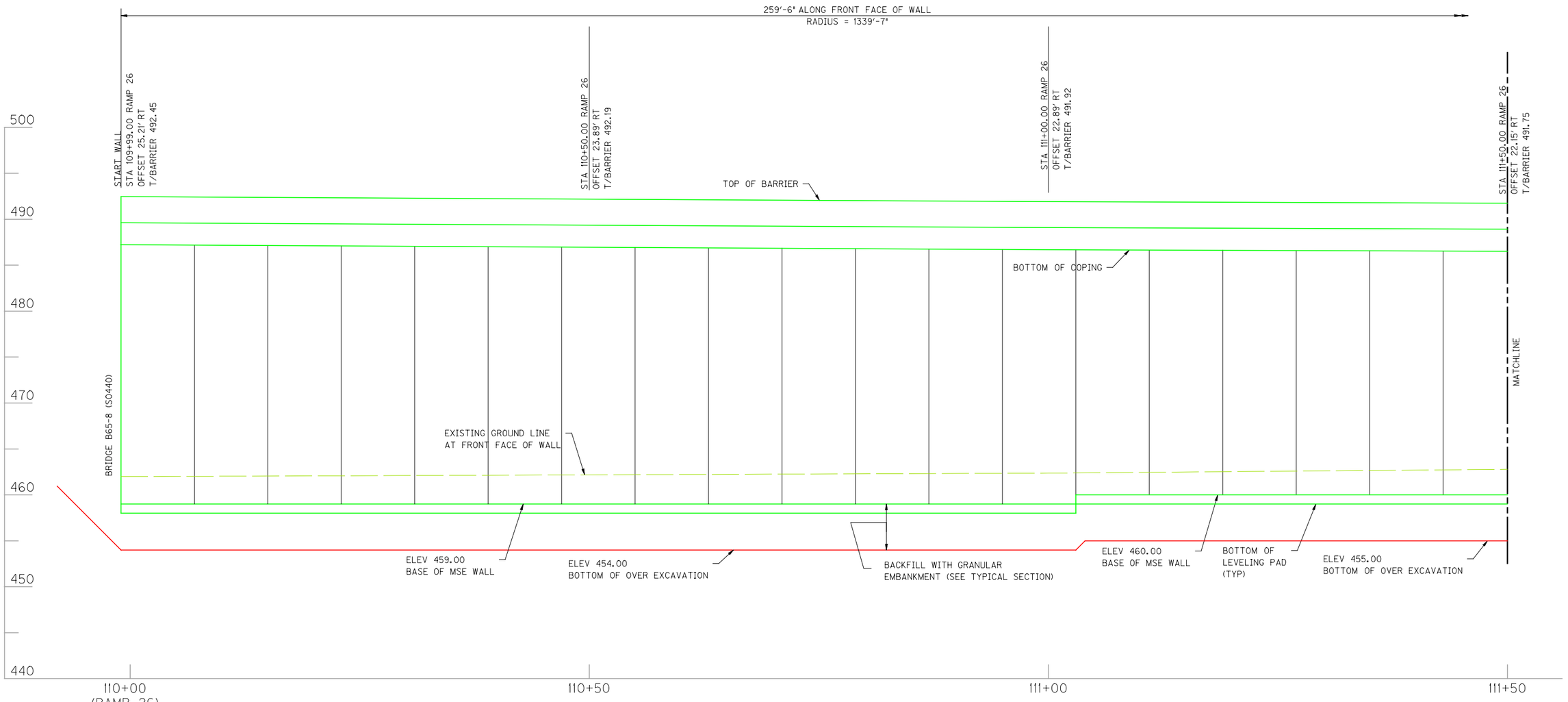
ELEVATION WALL W65-12

Total Wall Length: 408'

NOTE:
- OFFSETS GIVEN TO FRONT FACE OF RETAINING WALL

WALL W65-12

USER: 2gillier
DATE: 6/5/2007
FILE NAME: ...\dms05607\9300_W65-12.dgn
E-SHEET NAME:



ELEVATION WALL W65-9

Total Wall Length: 544'

NOTES:
- OFFSETS GIVEN TO FRONT FACE OF RETAINING WALL.
- DIMENSIONS INDICATE LENGTH ALONG FRONT FACE OF RETAINING WALL.
- FASCIA SHALL NOT BE INSTALLED UNTIL PRIMARY SETTLEMENT HAS OCCURED. INSPECTION PLATFORMS SHALL BE PROVIDED TO MONITOR SETTLEMENT.
- BIAXIAL GEOGRID REINFORCEMENT SHALL BE INCORPORATED INTO THE GRANULAR REPLACEMENT OF THE OVER EXCAVATED FOUNDATION SOILS.
- USE VERTICAL SLIP JOINTS IN WALL PANELS AT LOCATIONS OF STEPS IN LEVELING PAD.

PRELIMINARY - SUBJECT TO CHANGE

REVISION	DATE

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: JEFFERSON

ROUTE: RAMP 12

CROSSING: W65-9 RETAINING WALL

PRELIMINARY PLANS

ITEM NUMBER: 5-118.18 & 5-118.19

PREPARED BY: The Ohio River Bridges; Kentucky Transportation Associates

SHEET NO.

DRAWING NO.

GEOTECHNICAL NOTES

for MSE Walls

20. If the placement of an obstruction in the wall reinforcement zone such as drainage structures, signal or sign foundations, guardrail posts, or the bridge foundation system (piles or drilled shafts/caissons) cannot be avoided, the design of the wall near the obstruction shall be modified using one of the following alternatives:

    a. Place a structural frame (collar or yoke) around the obstruction which is capable of carrying the load from the reinforcement in front of the obstruction to the reinforcement connected to the structural frame behind the obstruction.

    b. If the soil reinforcements consist of discrete strips or bar mats rather than continuous sheets, depending on the size of the obstruction, it may be possible to splay the reinforcements around the obstruction.

    c. Reinforcement layers shall not be structurally connected to any foundation elements.

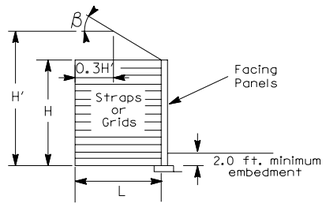
21. Settlement analyses were performed along the planned wall alignment in order to develop settlement profiles for the proposed structure. It is FMSM's understanding that the wall will be constructed and allowed to settle prior to the attachment of the permanent fascia. Time rate of settlement calculations indicate 90 percent of primary consolidation will occur in about 42 days (6 weeks). In order to monitor the settlement of the wall, settlement platforms shall be furnished and installed by the Contractor at the following approximate locations. Installation of the platforms shall be in accordance with Section 216 of the current Standard Specifications for Road and Bridge Construction and Standard Drawing RGX-015.

Alignment	Station
Ramp 26	110+50, 19' Right
Ramp 26	111+93, 18' Right
Ramp 12	120+50, 34' Right
Ramp 12	121+50, 37' Right
Ramp 12	122+50, 40' Right

The exact locations shall be determined by the Engineer and a representative of the Division of Structural Design, Geotechnical Branch once wall layouts have been finalized. Settlement readings shall begin with an initial reading upon placement of the platform prior to beginning embankment/retaining wall construction. Readings shall continue periodically during and following completion of the subject roadway embankments and retaining structures. The settlement platforms shall be left in place for future readings after the project is completed Necessary forms for recording settlement measurements can be obtained from the Geotechnical Branch at the request of the Engineer. The Engineer will be responsible for reading and recording the settlement data. The Geotechnical Branch will be responsible for evaluation of the actual settlement data. Installation of the permanent fascia shall not begin until the Geotechnical Branch has determined that an adequate percent of consolidation of the foundation soils has been achieved. The Contractor shall be responsible for replacing all damaged settlement platforms at no extra cost.

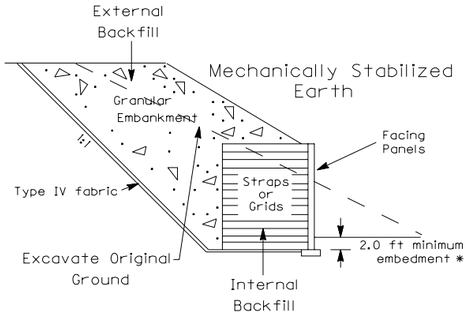
Use the following soil strength parameters for design:

	Cohesion (psf)	Friction Angle (degrees)	Unit Weight (pcf)
Internal Backfill (in reinforced volume)	0	34	115
Retained Fill			
Soil Embankment	170	27	120
Granular Embankment	0	38	120
Foundation Soils			
Existing	150	32	128
Granular Replacement	0	38	120

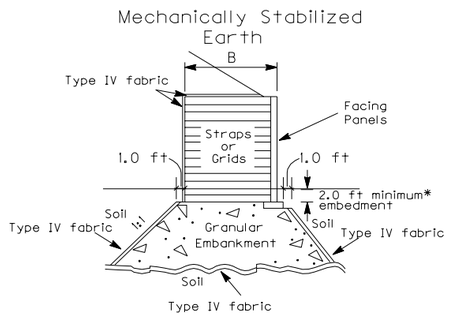


The minimum reinforcment length (L) shall be the greater of:
L > 0.7 H' (Where H' is the effective wall height)
L > 8 ft
H' = H/(1-0.3 tan β) for sloping backfill
H'=H for level backfill

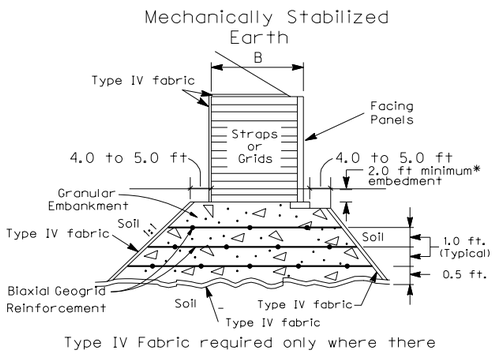
EXCAVATION AND GRANULAR BACKFILL REPLACEMENT



EXCAVATION AND GRANULAR FOUNDATION REPLACEMENT

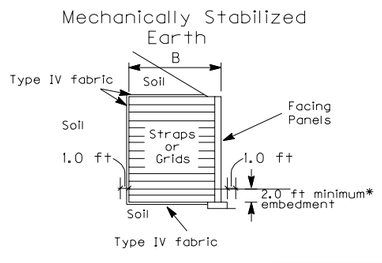


Type IV Fabric required only where there is a soil-granular material interface.



Type IV Fabric required only where there is a soil-granular material interface.

MSE WALL ON SOIL



* - Unless Otherwise Noted

PRELIMINARY - SUBJECT TO CHANGE

REVISION	DATE
DATE: DECEMBER 2006	CHECKED BY
DESIGNED BY:	
DETAILED BY: RWE	PVK, DLB

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: JEFFERSON

ROUTE: I-65 | CROSSING: S9270 (W65-9) MSE RETAINING WALL

GEOTECHNICAL NOTES

PREPARED BY: The Ohio River Bridges; Kentucky Transportation Associates

SHEET NO.

DRAWING NO.

ITEM NUMBER: 5-118.18/19

SHEET LOCATION:
FILE NAME: $$$$design$file$specification$$$$
USERNAME: $$$$USER$$$$
DATE: $$$$DATE$$$$
E-SHEET NAME:

LX2004130/PHASE1/S9270/MSE/S9270_GEONTS2.DGN

APPENDIX B

1990 PIT AND TRENCH SAMPLING INFORMATION

3.2 Task I - Pit and Trench Sampling

Task I of the Level II PSA included sampling sludge and other substances observed to be remaining in the various pits and trench drains in the existing buildings. On September 21, 1990, these pit and trench samples were collected. A total of four samples were obtained from the three buildings as illustrated in Figure 3.

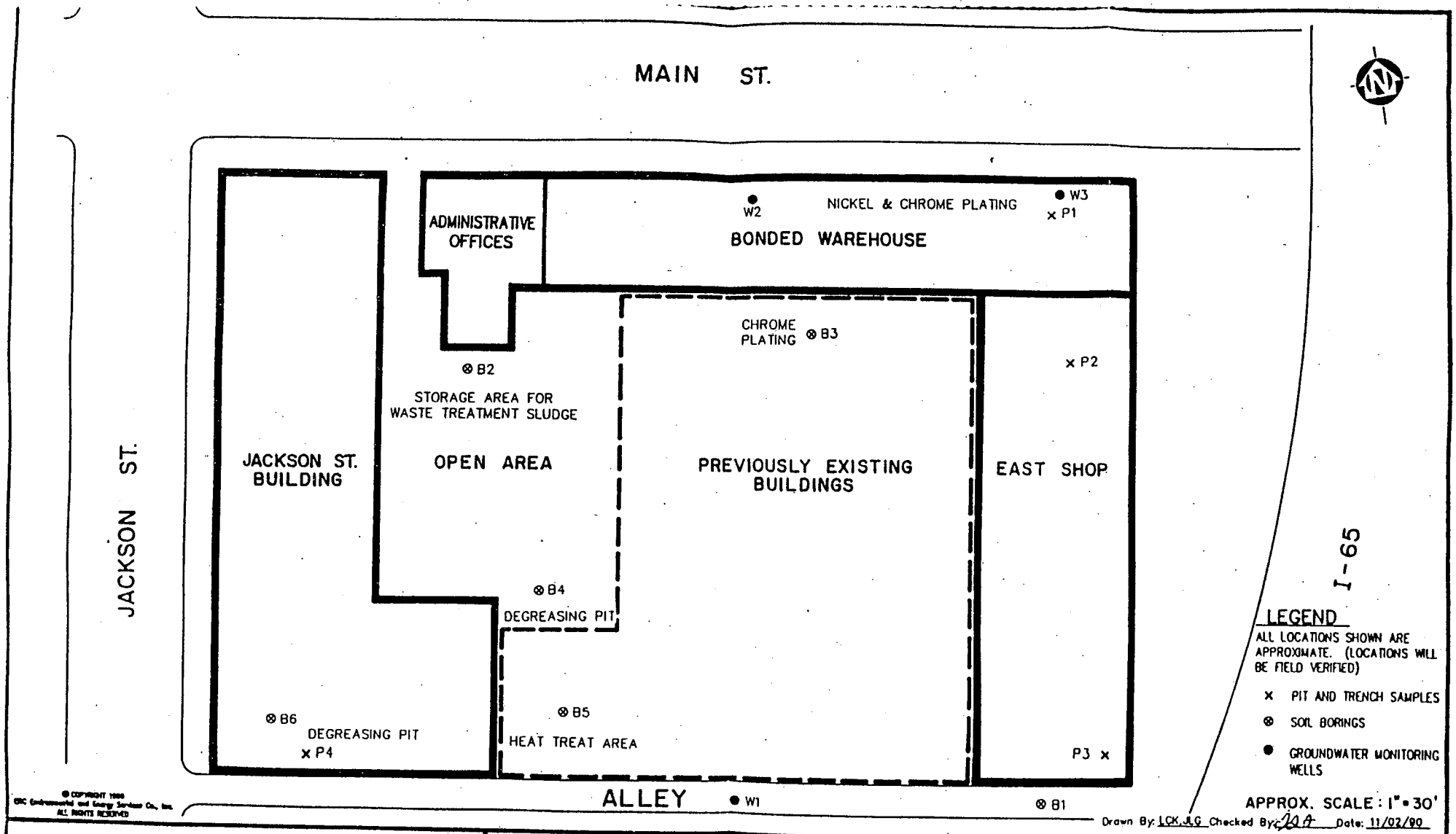
As seen in Figure 3, Pit P1 is located in the Bonded Warehouse on the north-east side of the building, and Pit P2 is located in the north central portion of the East Shop. Pit P3 represents the trench drain system within the East Shop. Pit P4 is located along the south wall of Jackson Street Building.

Samples were collected from the four pits using a small decontaminated shovel. These samples were placed into labeled 2-ounce and 9-ounce glass jars. The jars containing samples were placed in an ice-filled cooler and sent to Pioneer Laboratory for analysis of hexavalent chromium, priority pollutant metals, total cyanide, total toxic organics, and pH.

The material remaining in pit P1 was yellow and powdery, and had a crystalline appearance. Pit P2 contained a thick, black sludge below approximately six inches of water. The sample from P3 was a composite of sludge remaining in the trench drain system. This sludge was collected at various points throughout the system in the East Shop. The sludge was dry and varied in color from light brown to black.

The pit in the Jackson Street Building, Pit P4, was partially uncovered to obtain a sample (the pit was covered with a metal grate as pointed out in the Level I PSA). The pit bottom contained a thin layer of dried sludge mixed with metal debris. The sludge was scraped off the bottom of the pit using the shovel.

Tables 1 and 2 present the results of the pit and trench sample analyses. Table 1 exhibits results of Priority Pollutant Metals Analyses. Table 2 presents results of analyses performed for the pH of the sludge and the presence of hexavalent chromium, total cyanide, and total toxic organics.



ERCE

DOE ANDERSON ADVERTISING AGENCY
223 EAST BROADWAY
LOUISVILLE, KENTUCKY 40202

VERMONT AMERICAN
LEVEL II
SAMPLE LOCATIONS
FIGURE 3.

Table 1
Laboratory Results for Pit and Trench Samples
Priority Pollutant Metals Analyses

Parameter	Pit/Sample ID			
	P1 (VAP-1)	P2 (VAP-2)	P3 (VAP-3)	P4 (VAP-4)
Silver (ppm)	0.01	0.12	0.01	0.02
Arsenic (ppm)	16	6.0	12	9.4
Beryllium (ppm)	BDL	BDL	BDL	BDL
Cadmium (ppm)	1.5	22	7.0	10
Chromium (ppm)	24500	980	575	1800
Copper (ppm)	2000	640	475	3500
Mercury (ppm)	0.40	BDL	BDL	BDL
Nickel (ppm)	25000	1200	350	2500
Lead (ppm)	13750	470	460	320
Antimony (ppm)	6	BDL	BDL	BDL
Selenium (ppm)	2.80	0.30	BDL	0.20
Thallium (ppm)	BDL	BDL	BDL	BDL
Zinc (ppm)	1200	2900	10750	5000

BDL = Below Method Detection Limit
(See laboratory reports in Appendix for detection limits.)

ERCE
680 Commonwealth Business Center • 11001 Bluegrass Parkway • Louisville, Kentucky 40299

DOE–ANDERSON ADVERTISING
223 EAST BROADWAY
LOUISVILLE, KY 40202

Table 2
Laboratory Results for Pit and Trench Samples

Pit	Sample ID	pH (unit)	Hexavalent Chromium (ppm)	Total Cyanide (ppm)	Total Toxic Organics		
					Method 8240 Volatiles (ppb)	Method 8270 Acid & BN Extractables (ppb)	Method 8080 Organochlorine Pesticides & PCBs (ppb)
P1	VAP-1	8.21	BDL	0.92	Ethylbenzene = 418 Tetrachloroethene = 254 Toluene = 134 Trichloroethene = 2761 Trichlorofluoromethane = 30 Total Xylenes = 3104	Bis(2-Ethylhexyl) phthalate = 70000 Fluoranthene = 1000 Phenanthrene = 1000 Pyrene = 2000	Aldrin = 10 4,4'-DDD = 19 4,4'-DDE = 70 Dieldrin = 27 Endrin = 35
P2	VAP-2	7.32	BDL	BDL	Acetone = 439 Benzene = 35 1,2-Dichloroethane = 35 Methylene Chloride = 281 4-Methyl-2-pentanone = 35 Trichloroethene = 35	All Parametes BDL	4,4'-DDD = 113 4,4'-DDE = 363 Endrin = 19
P3	VAP-3	7.83	BDL	0.45	Ethylbenzene = 21 2-Methyl-2-pentanone = 260 Tetrachloroethene = 208 Toluene = 458 Trichloroethene = 500 Trichlorofluoromethane = 104 Total Xylenes = 136	All Parametes BDL	Aldrin = 50 Dieldrin = 26 Endosulfan Sulfate = 189 Endrin = 48 Endrin Aldehyde = 53
P4	VAP-4	10.64	40	0.35	All Parameters BDL	Bis(2-Ethylhexyl) phthalate = 79000	Aldrin = 221 Endosulfan Sulfate = 1023

BDL = Below Method Detection Limit
(See laboratory reports in Appendix for detection limits)

ERCE

DOE–ANDERSON ADVERTISING
223 EAST BROADWAY
LOUISVILLE, KY 40202