Remedial Investigation/ Alternatives Analysis Report (RI/AAR)

Phase II Business Park
Tecumseh Redevelopment Inc.
Lackawanna, New York

May 2011 0071-009-312
Revised March 2012

Prepared For:

Tecumseh Redevelopment Inc.

Prepared By:

TurnKey Environmental Restoration, LLC

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REMEDIAL INVESTIGATION/ ALTERNATIVES ANALYSIS REPORT

PHASE II BUSINESS PARK AREA
LACKAWANNA, NEW YORK
BCP SITE NO. C915198

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Table of Contents

Table of Contents

Table of Contents

LIST OF FIGURES

Table of Contents

LIST OF TABLES

Table of Contents

APPENDICES

REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT

Phase II Business Park Area

Certification

I, Thomas H. Forbes, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this RI/AA Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Signature of Environmental Professional

Seal

1.0 INTRODUCTION

1.1 Background and History

Tecumseh Redevelopment Inc. (Tecumseh) owns approximately 1,100-acres of land located on the west side of New York State Route 5 (Hamburg Turnpike) in the City of Lackawanna, NY (see Figures 1 and 2). The majority of Tecumseh's property is located in the City of Lackawanna (the City), with portions of the property extending into the Town of Hamburg. Tecumseh's property is bordered by NY State Route 5 on the east; Lake Erie to the west and northwest; and other industrial properties to the south and northeast.

The property was formerly used for the production of steel, coke, and related products by Bethlehem Steel Corporation (BSC). Steel production on the property was discontinued in 1983 and the coke ovens ceased activity in 2000. Tecumseh acquired its Lackawanna property from BSC's bankruptcy estate in 2003.

A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of all Solid Waste Management Units (SWMUs) located on the 1,100-acre property was initiated by BSC under an Administrative Order issued by the United States Environmental Protection Agency (USEPA) in 1990. Tecumseh completed the RFI in January 2005 (Ref. 1). USEPA subsequently determined that the Site investigation requirements of the 1990 Administrative Order were satisfied, and Tecumseh's obligations under the 1990 Administrative Order were terminated. Tecumseh has entered into an Order on Consent with the New York State Department of Environmental Conservation (NYSDEC) to undertake corrective measures at certain solid waste management units (SWMUs) primarily on the western slag fill and coke manufacturing portion of the property. As indicated on Figure 2, the CMS area encompasses approximately 500 acres.

Outside of the CMS Area, Tecumseh designated five parcels for redevelopment under the New York State Brownfield Cleanup Program (BCP). These include: The Phase I, IA, II and III Business Park Areas, which are at various points of investigation and cleanup under the BCP and are slated for commercial/industrial redevelopment; and the Steel Winds Site, which was remediated under the BCP and redeveloped as a commercial wind farm.

The 143.55-acre Phase II Business Park Area, which is the subject of this Remedial Investigation and Alternatives Analysis (RI/AA) Report, formerly housed several facilities used in BSC's steel manufacturing processes. As more fully described in Section 2.0, these included a pure oxygen generating station (known as South Linde Area); various mills; structural shipping yard; car repair shop; metal storage; and miscellaneous office production support buildings.

Five historical SWMUs (i.e., P-38 through P-42) are present within the Phase II Business Park Site (see Figure 3). BSC performed assessments for these SWMUs during the RCRA Facility Assessment (RFA; Ref. 2) and subsequent RFI. Based on the findings, USEPA Region II issued "No Further Action" determination for the identified SWMUs within the Business Park II area (Ref. 1).

Remedial Investigation activities on the Phase II Business Park Area were initiated in March 2010 and continued through to the end of April 2010.

1.2 Current Interim Remedial Measure

The South Linde Area of the site, shown on Figure 2, has undergone investigation and remediation as described in Section 2.1 of the RI/AAR Work Plan (Ref. 3). The existing groundwater collection and treatment system and primary recovery well skimmer has been operational since 2000; TurnKey installed additional product recovery wells and oil skimmers upgradient of the collection trench in 2004. The collection and product recovery systems have been effective in preventing migration of oils to Smokes Creek, and the treatment system has reliably reduced dissolved phase contaminant levels to below levels acceptable for discharge to the Creek. However, because of the persistence of floating product in piezometers upgradient of the collection system, the NYSDEC indicated that more aggressive, expedited remedial measures were necessary to address these source areas. In February 2010, TurnKey submitted and the NYSDEC approved an Interim Remedial Measures (IRM) Work Plan for implementing high vacuum extraction (HVE) at two monitoring wells and four piezometers for removal of oil product from the shallow overburden groundwater. To date, Green Environmental Specialists, Inc. (Green) has conducted HVE events on May 13, August 2, October 20, and December 21, 2010. The retrieved oil/water mixture was transported off-site to Green's Niagara Falls, NY facility where it was blended with soil prior to disposal at Modern Landfill in Lewiston, NY. As of January 2011 the product thickness in the wells/piezometers had decreased substantially as compared to pre-HVE conditions, with all but one of the piezometers exhibiting trace levels of remaining floating product (i.e., light non-aqueous phase liquid [LNAPL]).

1.3 Purpose and Scope

This RI/AA Report has been prepared on behalf of Tecumseh to present RI findings, describe environmental conditions at the Site, and evaluate and recommend a remedial approach. This Report contains the following sections.

- Section 2.0 presents a description of the Site and summarizes prior assessments.
- Section 3.0 presents a discussion of the RI sampling and methodology.
- Section 4.0 presents the nature and extent of impacted Site media.
- Section 5.0 discusses RI findings and describes potential chemical constituent migration pathways.
- Section 6.0 provides human health exposure and fish and wildlife resources impact assessments.
- Section 7.0 presents a summary of the RI with conclusions.
- Sections 8.0 through 10.0 present the development and evaluation of remedial alternatives
- Section 11.0 identifies post-remedial requirements that will be followed to assure the efficacy of the remedy.
- Section 12.0 lists cited references.

2.0 SITE DESCRIPTION

The Phase II Business Park is located along Route 5, east of the other Business Park Areas, north of lands owned by South Buffalo Railroad Company, and south of the Gateway Metroport Ship Canal and land currently owned by Gateway Trade Center (see Figures 1 and 2). The Site is transected by Smokes Creek; however, Smokes Creek and a 25-foot buffer zone from the top of the bank are not included within the Phase II Business Park Area as they are subject to further assessment in the RCRA CMS. West of Smokes Creek, the Site is segregated from the Phase III Business Park Area by the South Return Water Trench (SRWT), a man-made surface water discharge channel.

The Phase II Business Park Area formerly housed a portion of BSC's steel-making operations. Buildings and operations historically located on the Site are shown on Figure 3. As indicated, prior facilities within the Phase II Business Park Area boundaries included:

- 48" and 54" Finishing, Roughing, and Blooming Mills. These mills mechanically processed the steel, including hot rolling to reduce the cross-section of the ingot.
- 14"-18", 28", and 35" Structural Mills for various mechanical processes.
- Structural shipping yard (Cold Saws)
- Two electrical transformer stations
- Car repair shop
- Metal storage
- Miscellaneous office production support buildings, and Welfare buildings
- South Linde Area – a former pure oxygen generating station that serviced BSC's basic oxygen furnaces.

2.1 Site Topography and Drainage

The Phase II Business Park Area Site is generally characterized as a flat area sparsely vegetated with voluntary indigenous shrubs, grasses, weeds, and emergent trees. The Site is transected by Smokes Creek; however, Smokes Creek is not included in the Site. Due to the nature of the slag/soil fill there is very little ponded storm water or surface runoff as most of the precipitation seeps into the highly permeable slag/soil fill.

2.2 Remaining Site Structures

The Site contains few structural remnants and other features associated with historic integrated steel-making facilities. These include the 54" Bar Mill building; two separate electrical transformer stations; a former storage/welfare building to the south of Smokes Creek currently being leased by a lumber distribution company; the South Linde Area groundwater treatment system; and remnants of overhead lines, access roads, electrical power lines, and railroad tracks.

As indicated above, immediately west of the Site boundary is a man-made drainage channel designated as the SRWT that begins near WQCS No. 3 and flows south to Smokes Creek (see Figure 3). Historically and currently, the trench collects and discharges groundwater and storm water to Smokes Creek under active SPDES Permit No. NY-0269310. With the exception of treated groundwater discharges from the South Linde pump and treat system, there are no active outfalls from the Site into the SRWT.

2.3 Site Geology and Hydrogeology

The United States Department of Agriculture Soil Survey of Erie County, New York indicates that the Site is covered by surface soil classified as Urban Land; soil consisting of paved, foreign, or disturbed soils. Drilling logs from monitoring wells constructed on or near the Site indicate that the upper two feet (east side) to eight feet (west side) is typically composed of steel and iron-making slag and/or other fill material. The fill is underlain by lacustrine clays and silts that are, in turn, underlain by shale or limestone bedrock. Bedrock at the Tecumseh Site is approximately 60 feet below grade near the western perimeter of the Site (e.g., Lake Erie) and about 30 feet below the surface in the eastern portions of the Site (e.g., NY State Route 5).

Historically, due to the proximity of Lake Erie and municipal supplied water, groundwater in the area has not been developed for industrial, agricultural, or public supply purposes. There is a deed restriction that prohibits the use of groundwater on the property. Consequently, no groundwater supply wells are present on the 1,100-acre Tecumseh property.

Groundwater elevation maps completed during the RFI (Ref. 1) indicate that groundwater generally flows west across the Site toward Lake Erie, with local influence in the southern portion of the Site toward Smokes Creek, which eventually discharges into Lake Erie. Groundwater elevation measurements taken in April 2010 from monitoring wells on the Site indicate that the first water bearing zone (i.e., water table) ranges from approximately 6 to 13 feet below ground surface (fbgs) within the soil/slag-fill unit.

2.4 Utilities

The following utilities are present on or near the Site:

- Electric Utility: Overhead electric power lines on wooden utility poles, owned by Niagara Mohawk Power Corporation (NMPC), run north and south along the western portion of the Site.
- Railroad Tracks: Several active railroad tracks, owned and operated by South Buffalo Railway, are located on the eastern portion of the Site parallel to NY State Route 5 (Hamburg Turnpike). These tracks are used to service licensed tenants within the 1,100-acre Tecumseh property, Gateway Trade Center facilities, and for storage of railroad cars for customers.
- Water: Erie County currently supplies potable water to the Site. Lake Erie is not accessible from the Site without accessing properties owned by Tecumseh or Gateway Trade Center.
- Sanitary Sewers: Active and abandoned sewer lines are located at the approximate locations indicated on Figure 3.
- National Fuel Gas Pipeline: An underground medium-pressure 6-inch natural gas line crosses the northern portion of the property from east to west and is easily identified at the surface by natural gas markers (white PVC post with dark blue top).

2.5 Wetlands and Floodplains

The land surrounding Smokes Creek is listed on the National Wetlands Inventory and as a FEMA floodplain; however, no state/federal wetlands or floodplains exist within Site boundaries.

3.0 REMEDIAL INVESTIGATION APPROACH & RATIONALE

The RI was designed to provide defensible data to identify areas of the Site potentially requiring remediation, define chemical constituent migration pathways, and qualitatively assess human health and ecological risks to allow for performance of a remedial alternatives evaluation. This section of the RI report presents a discussion of the rationale for the data collection program of the RI, including the methods employed to collect samples and make field measurements and observations, and the methods used to chemically analyze the environmental samples.

3.1 General

The RI included the following field activities to delineate and characterize on-site soil/fill and assess groundwater quality at the Site:

- Visual, olfactory, and PID characterization of surface and subsurface soil/fill through test pit excavation.
- Collection of surface and subsurface soil/fill samples.
- Advancement of on-site borings completed as groundwater monitoring wells.
- Collection and analysis of groundwater samples from existing and newly installed monitoring wells at the Site, as well as testing for in situ hydraulic conductivity.

RI field activities were conducted by TurnKey Environmental Restoration, LLC (TurnKey) in accordance with the approved RI Work Plan (Ref. 3). Environmental sample collection was performed in accordance with TurnKey's Field Operating Procedures (FOPs). USEPA- and NYSDEC-approved sample collection and handling techniques were used. Samples for chemical analysis were analyzed in accordance with USEPA SW-846 methodology to meet the definitive-level data requirements. Analytical results were evaluated by a third-party data validation expert in accordance with provisions described in the RI Work Plan. The majority of field activities were conducted under NYSDEC oversight. Each sampling location was surveyed via GPS and plotted on the Site base map shown on Figure 3.

3.2 Constituents of Potential Concern

Table 1 presents the constituents of potential concern (COPCs) identified in the RI Work Plan that were based on Site operational history, groundwater sampling data, and

SWMU investigation reports. The primary COPCs included base-neutral Target Compound List (TCL) semi-volatile organic compounds (SVOCs) associated with petroleum bulk storage and fossil fuels; and select inorganic compounds (arsenic, cadmium, chromium, lead, mercury, and cyanide) typically associated with steel manufacturing. Other COPCs analyzed on a location-by-location basis included polychlorinated biphenyls (PCBs) analyzed at select locations near former transformers and electrical equipment; and petroleum-based VOCs analyzed in areas of former petroleum storage and/or maintenance activities.

In addition to the COPCs, an expanded list of parameters was developed as part of the RI Work Plan (see Table 2). The "expanded" list was employed during the RI at an approximate frequency of 1 per 10 samples per matrix to check for the presence of both COPCs and other constituents less likely to be encountered. Also, photoionization detector (PID) headspace screening for VOCs was employed at all test pit locations, with expanded list VOCs typically added to samples exhibiting elevated PID readings.

3.3 Soil/Fill Investigation

3.3.1 Test Pit Excavation

Surface and subsurface soil/fill samples were collected from the Phase II Business Park Area in March and April 2010 in accordance with the NYSDEC-approved July 2009 RI/AAR Work Plan for the Phase II Business Park Area.

The initial Phase II Business Park Area soil/fill investigation involved excavation of 105 test pits. A total of 56 surface soil/fill samples (typically collected from 0-2 fbgs) and 16 subsurface soil samples were collected from those test pit locations during the RI. One surface soil sample [SS-1(0-0.5)] was collected near the electrical transformer for analysis of PCBs. Water samples were collected from two test pits for the following reasons:

- BPA2-TP-36 for analysis of SVOCs and PCBs at the request of NYSDEC since the test pit was excavated near an electrical transformer and sheen was observed on the water at approximately 3 fbgs.
- BPA2-TP-81B for analysis of VOCs, SVOCs, and PCBs at the request of NYSDEC due to sheen observed on the water at approximately 5 fbgs. In addition, a slight odor was detected and the remains of a drum were found.

Table 3B identifies the test pit numbers, the sampling rationale, and laboratory analyses performed. Figure 3 shows the test pit locations discussed in this section. Appendix A includes the field notes and logs for all test pits excavated at the Site. Appendix A-1 provides representative photographs of test pit conditions. Following completion of each test pit, slag/fill material was returned to the excavation in the opposite order in which it was removed and compacted to match the existing grade.

3.3.2 Soil/Fill Sampling Methodology

Following test pit excavation, surface soil/fill samples were collected using a dedicated stainless steel spoon to scrape a representative sample from the test pit sidewall to a maximum depth of 2 fbgs. Subsurface samples were retrieved by scraping the excavator bucket across the depth from 2 fbgs to the bottom of the test pit and were collected from the center of the excavator bucket using a dedicated stainless steel spoon. Samples were transferred to laboratory-supplied, pre-cleaned sample containers for analysis of the parameters listed in Table 3A using USEPA SW-846 methodology.

In accordance with the RI Work Plan, a representative aliquot was also collected from the sample interval and transferred to a sealable plastic bag for discrete headspace determination. PID headspace readings are shown on the individual test pit excavation logs included as Appendix A. Per the Work Plan, three were analyzed for TCL VOC analysis using USEPA SW-846 methodology since PID scan values were greater than 20 ppm. Each VOC subsurface soil/fill sample collected was transferred directly into a laboratory supplied, pre-cleaned sample container for analysis of TCL VOCs.

3.3.3 Methods of Chemical Analysis

Surface and subsurface soil/fill samples were couriered under chain-of-custody command to TestAmerica, Inc., located at 10 Hazelwood Drive, Amherst, New York 14228 for chemical analysis as identified in Table 3A. TestAmerica is an independent, NY State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified facility approved to perform the analyses prescribed for this RI. TestAmerica also has NYSDOH Contract Laboratory Program (CLP) certification while maintaining ASP accreditation. TestAmerica employed analytical testing methods described in USEPA Test Methods for Evaluating Solid Wastes contained in SW-846 (revised 1991).

3.3.4 Railroad Realignment IRM

South Buffalo Railroad (SBRR), now owned by Genesee and Wyoming, Inc. (G&W), operates short haul railroad services supplying local manufacturing plants and connecting them with CSX and Norfolk Southern lines. SBRR operates switching yards and provides rail service for the entire Tecumseh Site, as well as the adjacent Port of Buffalo (Gateway Metroport Canal). In order to maximize the redevelopment potential in the Business Park Areas along NYS Route 5 and improve the currently limited access to and from the Tecumseh property, active rail lines along NYS Route 5 will be relocated to the western edge of the BCP Business Park Phases I and II as well as into a portion of BCP Business Park Phase III.

Because the rail relocation will precede final cleanup and redevelopment activities in the Business Park Areas, it was agreed with the NYSDEC that an IRM would be performed involving removal of hot spot soils from the new corridor area and placement of cover beneath the newly constructed tracks. As part of the Phase II Business Park Area RI work, a pre-IRM investigation was undertaken along the planned location for the railroad realignment in May 2009. The work involved excavation of 48 test pits along the proposed railroad realignment area (see Figure 3) to allow for visual/olfactory and PID assessment of subsurface conditions and to obtain representative samples for chemical characterization. Although 52 test pits were originally planned, four of these test pits were not completed as the locations fell at the center of the SRWT or the existing railroad track. The test pit locations were focused on the portion of the planned rail realignment that fell within Business Parks II and III, since the RI in Business Park I as well as required hotspot soil removal activities in that portion of the Site were already complete. The test pits, which were spaced at approximate 100-foot intervals, were excavated to native soils or the top of the water table with the majority of the samples collected from the shallow (0-2 feet below grade) slag/fill to characterize the interval of greatest potential exposure. Upon completion of each test pit, the associated slag/fill material was returned to the excavation in the opposite order in which it was removed and compacted to match existing grade.

Results of the rail corridor IRM investigation are presented in the NYSDEC-approved October 2010 IRM Work Plan for Railroad Realignment (Ref. 4). In accordance with that document, four hotspot soil areas involving soil/fill with elevated arsenic and/or PCB levels were identified and delineated. The locations of the hotspot areas, all of which fell within the limits of the Phase II Business Park Area, are shown on Figure 3. These hotspot areas were excavated and disposed at permitted offsite disposal facilities in December 2010. A total of 1,280.55 tons of arsenic-impacted soil material was excavated from Test Pits (TP-4, TP-12, and TP-42) and disposed at the Chautauqua County Landfill in Ellery, New York. A total of 258.27 tons of PCB-impacted soil material was excavated from Test Pit TP-30 and disposed at CWM Chemical Services, LLC in Model City, NY as regulated hazardous waste. The removal activities were observed by the NYSDEC and will be documented in a separate IRM Construction Completion Report (CCR) once the cover is placed and the new tracks are constructed. The CCR will be referenced in the Final Engineering Report for the Phase II Business Park Area.

3.4 Groundwater Investigation

A groundwater monitoring program was conducted at the Site to assess groundwater quality and potential groundwater contaminant migration pathways. The following sections describe the groundwater investigation and sampling methodology. Figure 3 shows the monitoring well locations discussed in this section. Appendix B includes the boring and monitoring well construction logs for all wells at the Site.

3.4.1 Monitoring Well Installation

Following completion of the soil/fill portion of the investigation, five new shallow overburden monitoring wells and two new bedrock monitoring wells were installed to better determine groundwater flow direction and upgradient/downgradient groundwater quality on the Phase II Business Park Area. Figure 3 identifies the groundwater monitoring points sampled during the RI, including: existing monitoring wells MW-01, MW-07A, and MW-07B; newly installed overburden wells MWS-32A, MWS-36A, MWS-37A, MWN-63A and MWN-64A; and newly installed bedrock wells MWN-63D and MWN-65D.

Monitoring wells were generally installed at the proposed (RI Work Plan) locations, with some minor adjustments made in the field as necessary to avoid underground utilities.

3.4.2 Monitoring Well Installation Methodology

Monitoring well installation methodology followed the RI Work Plan requirements. All new wells were constructed of 2-inch schedule 40 PVC with a lockable J-plug and protected by a vented, 4-inch diameter protective steel casing. Table 4 presents monitoring well construction details; the logs are included in Appendix B. Protective steel casings were installed to a depth of approximately 2 fbgs and anchored in a 2-foot by 2-foot concrete surface pad.

3.4.3 Monitoring Well Development

Both the newly installed and existing wells were developed prior to sampling using a dedicated disposable bottom-discharging polyethylene bailer for surging and a peristaltic pump for purging in accordance with NYSDEC and TurnKey protocols. During development on April 9, 2010, non-aqueous phase liquid (NAPL) and petroleum odor were identified in monitoring well MW-01. In addition, a sulfur odor was identified in the groundwater during development of monitoring wells MW-07B and MWS-32A.

3.4.4 Groundwater Elevation Measurements

Following installation, the locations and elevations of the newly installed monitoring wells were surveyed against a fixed benchmark and located on the Site plan. The top of the PVC casings were referenced to existing Site vertical datum to provide a reference point for groundwater elevation measurements. Table 4 summarizes the static depth to groundwater measurements from existing and newly installed wells/piezometers obtained on April 30, 2010. Figure 4 is an isopotential map prepared using these elevations. Examination of the isopotential map indicates that shallow groundwater generally flows toward the minor water bodies of the Tecumseh Site (e.g., Smokes Creek and the SRWT) in conjunction with a westerly component (northwest portion of the Phase II BPA Site) toward major water body Lake Erie. The SRWT is in hydraulic connection with the shallow groundwater at the Site and flows south into Smokes Creek, which then flows westerly and ultimately discharges into Lake Erie.

3.4.5 Monitoring Well Sampling

On April 29 and 30, 2010, all groundwater monitoring wells were sampled using low-flow sampling methodology in accordance with the RI Work Plan. On April 30, 2010 during monitoring well purging prior to sampling, sheen and petroleum-like odor were noted in monitoring wells MW-01 and MWN-64. Appendix A includes the well sampling logs.

3.4.6 Methods of Chemical Analysis

Groundwater samples were couriered under chain-of-custody command to TestAmerica for analysis of the parameters identified on Table 3A. TestAmerica employed analytical testing methods described in USEPA Test Methods for Evaluating Solid Wastes contained in the most recent version of USEPA SW-846.

3.5 Supplemental Test Pit Investigation

RI soil/fill samples collected from test pits BPA2-TP-10, -21, -40, -52, -58, and -103 exceeded the site-specific arsenic SCO of 118 ppm. On February 27 and 28, 2012, TurnKey sampling personnel revisited these locations to determine the lateral and vertical extent of arsenic impact. Tests pits were excavated at distances of 10 and 20 feet in each compass direction from the original test pit sample location. Surface soil/fill samples were collected using a dedicated stainless steel spoon to scrape a representative sample from the test pit sidewall to a maximum depth of 2 fbgs. The 10-foot samples were analyzed immediately upon receipt by TestAmerica Laboratory and the 20-foot samples were placed on hold pending the results of the 10-foot samples. The original test pit sample result was confirmed by collection and analysis of a sample adjacent to the original RI test pit sample (designated as "R").

As discussed in Section 4.2.3, due to the discrepancy between the lead concentration in the sample collected from BPA2-TP-58 (12,300 ppm) and its blind field duplicate (216 ppm), the supplemental test pit samples collected were also analyzed for lead.

3.6 Quality Assurance/Quality Control

Field investigation data were collected and processed using the procedures outlined in the RI Work Plan to ensure representative sample collection and to achieve the data quality objectives of the Remedial Investigation. The field activities were recorded in bound project field books supplemented with TurnKey field forms as necessary. No variance logs were completed during the RI as deviations from the Work Plan were not substantial and limited to minor test pit location changes and increase in analytical parameters for collected soil/fill samples. TurnKey collected blind duplicates and matrix spike/matrix spike duplicates (MS/MSD) at a frequency of 1 per 20 samples for each environmental media (i.e., soil/fill and groundwater). A trip blank accompanied each cooler of aqueous media to be analyzed for VOCs. Tables 6A, 6B, and 7 summarize the results of the QA/QC samples.

3.7 Data Usability Summary

In accordance with the RI Work Plan, the laboratory analytical data from this investigation was independently assessed and, as required, submitted for independent review. Ms. Judy Harry of Data Validation Services located in North Creek, New York performed the data usability summary assessment for the soil/fill and groundwater samples. The validation involved a review of the summary form information and sample raw data, and a limited review of associated QC raw data. Specifically, the following items were reviewed:

- Laboratory Narrative Discussion
- Custody Documentation
- Holding Times
- Surrogate and Internal Standard Recoveries
- Matrix Spike Recoveries/Duplicate Recoveries
- Field Duplicate Correlation
- Preparation/Calibration Blanks
- Control Spike/Laboratory Control Samples
- Instrumental IDLs
- Calibration/CRI/CRA Standards
- ICP Interference Check Standards
- ICP Serial Dilution Correlations
- Sample Results Verification

The data usability evaluations were conducted using guidance from the USEPA Region 2 Validation Standard Operating Procedures, the USEPA National Functional Guidelines for Data Review, as well as professional judgment. Appendix C includes the Data Usability Summary Reports (DUSRs), which were prepared in accordance with Appendix 2B of NYSDEC's DER-10 guidance. Those items listed above that demonstrated deficiencies are discussed in detail in the DUSRs. Analytical results that were edited or qualified per the DUSR have been modified appropriately on Tables 6 and 7. Appendix D includes the analytical data packages.

4.0 RI FINDINGS

This Section describes pertinent field observations and chemical analytical results in surface soil/fill, subsurface soil/fill, and groundwater.

4.1 Soil/Fill Field Observations

The surface of the Phase II BPA is generally characterized as a flat area sparsely vegetated with voluntary indigenous shrubs, grasses, weeds, and emergent trees (mostly poplars). Due to the nature of the slag/soil fill, there is very little ponded storm water or surface runoff as most of the precipitation seeps into the highly permeable slag/soil fill. Subsurface lithology generally consists of a soil/fill unit comprised of dark brown, non-plastic fines with fine to medium sand, slag, cinders, ash, gravel, cobbles, brick, metal debris, and concrete, all of which are ubiquitous at the Site. This unit is characterized as dense but loose when disturbed. Below the soil/fill unit is a silty clay layer, either native or suspected non-native. A peat layer was occasionally noted below either the soil/fill unit or silty clay unit. Groundwater within the soil/fill unit was generally encountered between 4 and 8 fbgs.

Field evidence of potential significant soil/fill impacts, characterized by moderate to strong odors, unusual discoloration, visible evidence of product layer, and/or PID readings in excess of 50 ppm was identified at certain test pit locations as presented below. These significant impacts have been noted on Figure 3 and on the test pit logs in Appendix A. In some instances supplemental test pits were excavated (noted below and shown on Figure 3) to determine the extent of impact for evaluation of remedial alternatives.

- **BPA2-TP-16:** Between 6 and 8 fbgs, saturated soil/fill exhibited PID readings greater than 50 ppm, with a maximum PID reading of 76.2 ppm. Moderate odor and grayish black staining were noted at this interval. Depth to water was recorded at 5.5 fbgs. A concrete wall running east-west was encountered at the southern limit of this test pit. An additional three test pits were excavated in this area; no field evidence of impact was observed in BPA2-TP-16A and -16C. Slight sheen and slight odor were detected on the water at approximately 5.5 fbgs in supplemental test pit BPA2-TP-16B, which was located northeast of the original test pit; however, the maximum PID reading was 7.0 ppm.
- **BPA2-TP-53:** Slight rainbow sheen, slight petroleum-like odor, and floating product were observed on the water surface at approximately 5 fbgs. PID readings were 0 ppm to the end of the test pit at 10 fbgs. An additional six test pits were excavated in this area to check for a possible contaminant source. Slight sheen and blobs of product were observed in BPA2-TP-53D and -53E on the water at 5 fbgs. Slight

sheen was noted in supplemental test pits BPA2-TP-53A and -53C; no evidence of impact was observed in test pits BPA2-TP-53B and -53F.

- **BPA2-TP-77:** At approximately 7 fbgs, a drum with grease-like material was discovered. The material was placed in a drum at NYSDEC's request. The PID readings were 0 ppm. A slight sheen was observed on the water at a depth of 6 fbgs; no odor was noted.
- **BPA2-TP-81B:** The original test pit location (BPA2-TP-81) excavated within the former 48"-54" Roughing Mill near the oil cellar (concrete tunnel) ended in refusal at 6 fbgs. Therefore, NYSDEC requested that the area to the east be excavated. During excavation of test pit BPA2-TP-81B, the remains of a drum were found. Sheen was observed on the water at approximately 9 fbgs and a slight odor was detected.
- **BPA2-TP-89:** Black staining and oily residue were identified in the soil/fill between 4 and 6 fbgs. Slight sheen and yellowish product were observed floating on the water table at approximately 4.5 fbgs. The maximum PID reading was 7.5 ppm at 5 fbgs, and moderate odor was noted. An additional 18 test pits were excavated in this area. Floating product was observed within 3 of the 18 test pits. With the exception of two supplemental test pits with no evidence of impact; sheen and odor were noted in the remaining test pits with a maximum PID reading of 18 ppm.
- **BPA2-TP-93:** Slight sheen and yellowish product were observed floating on the water table at approximately 6.5 fbgs. All PID readings were 0.0 ppm. The water table was observed below the soil/fill unit within a silty clay layer suspected to be non-native. Four additional test pits were excavated in this area to check for a possible contamination source; slight petroleum-like odor and floating product noted on the water at approximately 6 fbgs in 3 of the 4 test pits. No visual or olfactory evidence of impact was observed in test pit BPA2-TP-93D, located 45 feet west and 20 feet south of original test pit. Slight sheen and slight odor were noted in downgradient test pit BPA1-TP-73.
- **BPA2-TP-95:** Black stained soil and yellowish floating product were identified at the water table, estimated at approximately 8 fbgs. The maximum PID reading was 11.7 ppm at 7 fbgs. Moderate odor and trapped product were observed within the non-native silty clay cracks between 4 and 9 fbgs. An additional two test pits (BPA2-TP-95A and -95B) were excavated in this area to check for a possible contamination source. No visual or olfactory evidence of impact was observed in BPA2-TP-95A, which was excavated 30 feet north of the original test pit and to 8 fbgs. Test pit BPA2-TP-95B was excavated 30 feet south of the original test pit. A red/orange staining was observed on the north side wall from approximately 3 to 4 fbgs. No other visual or olfactory impacts were noted. Test pit BPA2-TP-62 excavated east of and adjacent to BPA2-TP-95 noted no visual or olfactory evidence of impact.

- **BPA2-TP-99B:** A PID reading of 105 ppm was measured at 7 fbgs and a slight odor was detected. This was 1 of 4 additional test pits excavated in the vicinity of original test pit BPA2-TP-99 because of the elevated PID reading (24.4 ppm). The PID readings in the other three supplemental test pits were 0.0 ppm.

In addition, minor field observations were noted during excavation of the following test pits:

- **BPA2-TP-7:** Slight sheen and slight fuel-oil like odor were noted.
- **BPA2-TP-19:** The remains of a 55-gallon drum containing tar were found on the ground at the location of this test pit. Following removal of the drum and material, the test pit was excavated to 9 fbgs. No water was encountered and no visual or olfactory evidence of impact were noted.
- **BPA2-TP-36:** Sheen was observed on the test pit water at a depth of 3 fbgs. All PID readings were 0.0 ppm, and no odor was detected. NYSDEC requested a test pit water sample be collected and analyzed due to the sheen and electrical debris found in the test pit.
- **BPA2-TP-56:** Sheen was observed on the test pit water at approximately 4.25 fbgs and a slight odor noted; all PID readings were 0.0 ppm. An additional six test pits were excavated in this area; similar impacts were observed within 4 of the 6 supplemental test pits. PID readings in all supplemental test pits were 0.0 ppm
- **BPA2-TP-73:** A slight sheen and slight odor were noted during excavation of this test pit. A maximum PID reading of 18.3 ppm was noted at the water table (7.5 fbgs).
- **BPA2-TP-80:** Slight sheen was noted on the water at 5 fbgs. Remains of old broken drums were discovered and removed. PID readings were 0.0 ppm throughout the 8-foot excavation and no odors were noted.
- **BPA2-TP-88A:** Test pit BPA2-TP-88 had no visual, olfactory, or PID evidence of impact. Supplemental test pit BPA2-TP-88 was excavated 2 feet to the east of the original test pit because oil was noted on the water in a depression. The supplemental test pit was excavated to 3.5 fbgs; no visual, olfactory, or PID evidence of impact were notice.
- **BPA2-TP-90:** Slight sheen at 5.5 fbgs and slight odor were noted. All PID readings were 0.0 ppm.

4.2 Soil/Fill

Chemical data for soil/fill samples collected during the RI are discussed in the following sections and are summarized in Table 6.

For the purpose of comparison, Tables 6a includes "Unrestricted Use" Soil Cleanup Objectives (SCOs) as published in 6NYCRR Part 375-6 "Remedial Program Soil Cleanup Objectives." Unrestricted Use SCOs are deemed protective of human health and groundwater irrespective of end use of the property. Accordingly, the unrestricted use SCOs represent conservative soil/fill cleanup objectives that are often difficult to achieve on former industrial sites in urban areas. Table 6b compares the data to restricted-commercial use SCOs per 6NYCRR Part 375-6. These values are deemed protective of human health, in the absence of other controls, for sites where end use will be limited to commercial or more restrictive (e.g., industrial) uses, which are considered the reasonably anticipated future uses for the Phase II Business Park Area per the land use analysis presented in Section 8.4.

RI sample locations where reported concentrations exceed respective SCOs are shaded on the data summary tables.

As indicated on Table 6a, several exceedances of the unrestricted use SCOs were noted, particularly for carcinogenic polyaromatic hydrocarbons; metal COPCs; and, to a lesser extent, PCBs. Based on the widespread nature of the unrestricted use SCO exceedances, the discussions below are limited to soil/fill quality as indicated by the more meaningful comparison to restricted-commercial use SCOs. To the extent commercial use SCOs are exceeded, unrestricted use SCOs would also be exceeded as well.

4.2.1 VOCs

No test pit locations/samples exhibited exceedance of the commercial SCOs for VOCs. This includes both STARS List VOCs and expanded list (STARS List plus TCL) VOCs, which were analyzed at all locations exhibiting elevated PID readings.

4.2.2 SVOCs

Several locations exhibited exceedances of the restricted-commercial SCOs for one or more PAH. Specifically, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, and indeno(1,2,3-cd)pyrene) were reported above commercial SCOs at several locations; however, the exceedances were generally within an order of magnitude of the SCO. The exceptions are the samples from test pits BPA2-TP-85 (0 to 2 fbgs) and BPA2-TP-93 (4 to 6 fbgs), with exceedances one to two orders of magnitude above the commercial SCOs for these parameters. A yellowish product was observed floating on the water within BPA2-TP-93 at 6.5 fbgs, and a slight odor and sheen were noted.

4.2.3 Inorganic Compounds

Arsenic was reported above the commercial SCO at the majority of the sample locations. Other inorganic compounds reported above commercial SCOs included barium (1 sample), cadmium (2 samples), copper (5 samples), lead (2 samples), manganese (2 samples), mercury (3 samples), and cyanide (2 samples). In all instances the reported exceedances were within an order of magnitude of the SCO with the exception of arsenic. The blind field duplicate of BPA2-TP-58 resulted in a greater than 50-fold variance in the lead concentration (216 mg/kg) from its parent sample (12,300 mg/kg). Therefore, the concentration of lead in BPA2-TP-58 should be used with caution and considered as borderline reliable, providing only the information that lead is present, but that the quantitative value is unknown.

4.2.4 Polychlorinated Biphenyls

The result for PCB Aroclor 1254 exceeded the commercial SCO for PCBs of 1 mg/kg at test pit sample locations: BPA2-TP-33 (0-0.5 fbgs) and BPA2-TP-48 (0-2 fbgs). No other PCBs were detected above restricted-commercial SCOs, including the surface soil sample collected near the former electrical transformer.

4.3 Groundwater

Groundwater quality data was collected during the RI from existing wells MW-01, MW-07A, and MW-07B; newly installed overburden wells MWS-32A, MWS-36A, MWS-37A, MWN-63A, and MWN-64A; and newly installed bedrock wells MWN-63D and MWN-65D. Table 4 summarizes groundwater monitoring well construction details. Table 8 summarizes the analytical data, including field QC samples, along with Class GA Groundwater Quality Standards and Guidance Values (GWQS/GVs) per NYSDEC June 1998 Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. The findings are discussed below, together with the water samples collected from test pits BPA2-TP-36 and BPA2-TP-81B.

4.3.1 VOCs

Groundwater samples exhibited non-detectable or trace (estimated) concentrations of VOCs well below the GWQS/GVs.

4.3.2 SVOCs

All samples obtained from groundwater monitoring wells exhibited SVOCs at non-detectable concentrations or at low concentration levels below GWQS/GVs. As indicated on Table 8, both test pit water samples exhibited concentrations of several SVOCs above GWQS/GVs. However, the total (cumulative) SVOC concentrations at each of these locations is less than 1 ppm, which is typically considered, along with other factors, to be the point at which groundwater impact is considered de-minimis or subject to no further remedial measures under NYSDEC's Petroleum Spills program.

4.3.3 Inorganic Compounds

Total metals were reported as non-detect or at concentrations well below GWQS/GVs for all metals with the exception of wells MW-01, MW-07A, MWS-32A, and MWS-37A, which exhibited slight exceedances of the standard for total arsenic. The samples from MWS-37A, MWN-63A, and MWN-64A yielded field turbidity measurements greater than TurnKey's threshold value of 50 nephelometric units (NTUs). Accordingly, filtered metals samples were collected and analyzed for soluble COPCs. The filtered sample data was reported as non-detect or below GWQS/GVs for all the analyzed inorganic compounds, including arsenic.

4.3.4 Polychlorinated Biphenyls

Groundwater monitoring wells were not sampled for analysis of PCBs. PCBs were not detected at concentrations above the industrial SCO of 25 ppm at any location on-site with the exception of downgradient test pit RR-TP-30, which was remediated via the rail relocation IRM. In addition, only one test pit sample (i.e., BPA2-TP-48) yielded a PCB concentration above 3.2 mg/kg, which is the concentration deemed protective of groundwater quality per 6NYCRR Park 375-6.8b. Accordingly, PCBs are not expected to be present at elevated concentration in groundwater.

Shallow groundwater encountered within two test pits (BPA-2-TP-36 and BPA-2-TP-81B) was analyzed for PCBs at the request of the NYSDEC. Analysis of test pit water is not considered a reliable indicator of groundwater quality due to potential positive bias attributable to the presence of suspended solids (fines); however, the test pit water samples were collected to determine if observed sheen was indicative of PCB-contaminated oil release (i.e., oil containing >50 ppm PCBs). As indicated on Table 8, no PCBs were detected in BPA-TP-36. PCB Aroclor 1242 was detected in the sample from test pit BPA2-TP-81B at a concentration of 0.56 ug/L, which exceeds the Class GA standard of 0.09 ug/L but does not suggest that field impacts are attributable to release of a regulated PCB source.

4.3.5 Groundwater Quality Measurements

According to TOGS 1.1.1, the maximum allowable concentration for pH ranges between 6.5 and 8.5. Field pH was measured immediately before and after groundwater sample collection. As indicated on Table 8, the pH measured at well MW-01 (9.20 and 9.28) and MWN-63D (6.28) were outside this range. As discussed in Section 4.3.3, the turbidity measured at MWS-37A, MWN-63A, and MWN-64 were greater than TurnKey's threshold value of 50 NTUs. Accordingly, filtered metals samples were collected and analyzed for soluble COPCs.

4.3.6 Groundwater Field Observations

For the South Linde IRM Area well, field evidence of groundwater impact (sheen, odor) was identified during sampling of existing well MW-01; NAPL and petroleum odor were also identified in monitoring well MW-01 during development. During drilling of the borehole for monitoring well MWN-65D (March 2010), a maximum PID reading of 27.2 ppm was measured at 16 fbgs, and a petroleum-like odor was noted from 15 to 17 fbgs; the water table was noted at 8.5 fbgs. No field evidence of impact was noted during development and sampling of MWN-65D.

In addition, field evidence of groundwater impact (sheen, odor) was identified during sampling of newly installed well MWN-64; however, no field evidence of impact was noted during drilling of the borehole and there were no exceedances of the GWQS (all non-detect except for pyrene and barium). A sulfur odor was present in the groundwater during development of monitoring wells MW-07B and MWS-32A. Barium was detected in both wells but at concentration below the GWQS. Arsenic slightly exceeded the GWQS at MWS-32A.

4.4 Supplemental Test Pit Investigation

Table 7 summarizes the arsenic and lead analytical results for the surface soil/fill samples collected from the supplemental test pits excavated February 27 and 28, 2012. Appendix D[1] includes the analytical data packages for this sampling. As indicated, at four test pit locations, the 10-foot samples analyzed for arsenic exceeded the site-specific SCO of 118 ppm and therefore the 20-foot sample was analyzed. With the exception of test pit TP-52, all 20-foot sample concentrations were below 118 ppm. A 20-foot sample east of TP52E10 (164 ppm) could not be collected due to the presence of the railroad tracks.

The lead concentrations in the soil/fill samples collected in the vicinity of BPA2-TP-58 were all well below the commercial SCO for lead (1,000 ppm).

[1] One of the analytical data packages in Appendix D includes two samples collected from the Phase III BPA. These latter results are not summarized on Table 7 as they are not relevant to the Phase II BPA.

TURNKEY ENVIRONMENTAL RESTORATION, LLC

5.0 FATE AND TRANSPORT OF COPCS

Soil/fill sample results exceed SCOs for certain COPCs. In addition, several groundwater samples indicated exceedance of Class GA GWQS/GVs for arsenic and two test pit water samples exceeded the GWQS/GVs for SVOCs. There was evidence of product in well MW-01 and on the water at four test pit locations. Accordingly, the soil/fill data and observed evidence of smear zone impact were incorporated with the physical characterization of the Site to evaluate the fate and transport of COPCs in Site media. The mechanisms by which the COPCs present above SCOs can migrate to other areas or media are briefly outlined below.

5.1 Airborne Pathways

Potential migration pathways involving airborne transport of soil/fill COPCs include erosion and transport of soil particles and sorbed chemical constituents in fugitive dust emissions, and volatilization from subsurface soil vapor.

5.1.1 Fugitive Dust

Chemicals present in soil/fill can be released to ambient air as a result of fugitive dust generation. Since the Site is largely unoccupied and substantially vegetated with shrubs, grasses, and trees, and because most of the fill consists of large grained slag, suspension due to wind erosion or physical disturbance of surface soil/fill particles does not occur across widespread areas of the property. (The area currently occupied by the lumber distribution operation has experienced particulate releases associated with equipment and trucking transport which are mitigated through watering and approved dust suppressant amendment). Under the planned future commercial/ industrial land use, the majority of the Site would be covered by asphalt and structures with only small areas covered by grass and/or ornamental landscaping. Nevertheless, fugitive dust may be generated during excavation activities either during or following redevelopment. Therefore, this migration pathway is potentially relevant under the current and reasonably anticipated future land use scenario.

5.1.2 Volatilization

Volatile chemicals, when present in soil/fill at elevated levels, may be released to ambient air or future building indoor air through volatilization from or through the soil/fill pore space. Volatile chemicals typically have a low organic-carbon partition coefficient (K_{oc}), low molecular weight, and a high Henry's Law constant. VOCs were not detected in Site soil/fill at concentrations above restricted-commercial SCOs. Similarly, groundwater samples yielded not-detectable or trace levels of VOCs below Class GA GWQS/GVs. Therefore, the soil and groundwater-to-air pathways are not relevant.

5.2 Waterborne Pathways

5.2.1 Surface Water Runoff

Under the current use scenario, the potential for soil particle transport with surface water runoff is low, as the Site is mostly flat lying and contains a significant amount of vegetative growth. In addition the well-drained slag/fill matrix precludes surface water ponding. Uncontrolled off-site transport is further limited because the Site is outside the 100-year floodplain. Under the reasonably anticipated future use scenario, the Site will be substantially covered by asphalt, buildings, and landscaping, mitigating transport of subsurface (i.e., covered) soil/fill via storm water runoff. Although stormwater runoff during excavation activities is possible during the future use scenario, erosion controls are typical construction practice and would be implemented as a component of the Site Management Plan required for BCP sites that do not achieve unrestricted use conditions.

5.2.2 Leaching

The relatively insoluble nature of the majority of the COPCs identified at elevated concentration in soil/fill and the general absence of significant overburden groundwater impacts in on-site groundwater monitoring wells indicates that the chemical migration via leaching pathway is not relevant. However, the presence of measurable NAPL in monitoring well MW-01 and floating product observed on the water table in test pits BPA2-TP-53 (5 fbgs), BPA2-TP-89 (4.5 fbgs), BPA2-TP-93 (6.5 fbgs), and BPA2-TP-95 (8 fbgs) indicate isolated smear zone impact by petroleum product and associated localized groundwater impact.

5.2.3 Groundwater to Surface Water Migration

In general, groundwater sample data for the Phase II Business Park Area monitoring wells indicates de-minimis impact by the constituents of potential concern. As indicated on Table 8, all parameters were reported at or below the Class GA GWQS/GVs with the exception of minor pH deviations recorded in wells MWN-01 and MW-63D; low levels of arsenic only slightly above the Class GA groundwater quality standard in samples collected from MW-07A, MWS-32A, and MWS-37A; and a moderate exceedance of the arsenic standard in well MW-01, which is upgradient of the South Linde IRM pump-and-treat system. While the groundwater samples were not analyzed for soluble arsenic (with the exception of MW-32A, for which soluble arsenic fell below the Class GA standard), it is expected that they would likely yield lesser dissolved arsenic results as indicated by the MW-32A results. Moreover, the applicable surface water quality standard for the South Return Water Trench (SRWT) and Smokes Creek is 0.15 mg/L; none of the samples exhibited exceedances of that threshold with the exception of MW-01 which is within the influence of the IRM pump-and-treat system.

Concerning test pit groundwater, analytical data from the sampled locations (BPA2-TP-36 and BPA2-TP-81B) is likely positively biased by the presence of suspended solids in the water column. Nevertheless, the total (cumulative) SVOC concentrations in the water collected from each of the two test pit locations is less than 1 ppm, which is typically considered, along with other factors, to be the point at which groundwater impact is considered de-minimis, and PCBs detected in BPA2-TP-81B were within an order of magnitude of the standard. Neither PCBs nor SVOCs were detected at elevated concentration in the monitoring well samples.

These data and observations indicate that migration of constituents of potential concern in groundwater at levels detrimental to surface water quality is not occurring. This is further evidenced by monthly surface water compliance sampling in the SRWT, which consistently conforms to NYSDEC SPDES discharge permit limits.

5.3 Exposure Pathways

Based on the analysis of chemical fate and transport provided above, the only complete pathways through which Site COPCs could potentially migrate to other areas or media are fugitive dust emissions via physical disturbance of soil particles and possible leaching of smear zone petroleum products to groundwater. Based on the limited extent of existing Site occupancy; the controls implemented by the current lumber yard tenant; the distance between the Site and occupied structures; the continued operation of the South Linde IRM groundwater collection and treatment system; and NYSDEC/NYSDOH requirements for dust controls during excavation at remedial program construction sites; it is unlikely that site-related COPCs would reach off-site receptors at significant exposure point concentrations.

6.0 Qualitative Human Health Exposure and Wildlife Impact Assessment

6.1 Human Health Exposure Assessment

A qualitative exposure assessment consists of characterizing the exposure setting (including the physical environment and potentially exposed human populations), identifying exposure pathways, and evaluating contaminant fate and transport.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements:

- A receptor population.
- A contaminant source
- A contaminant release and transport mechanism
- A point of exposure
- A route of exposure

The receptor population is the people who are or may be exposed to contaminants at a point of exposure. The source of contamination is defined as either the source of contaminant release to the environment (such as a waste disposal area or point of discharge), or the impacted environmental medium (soil, air, biota, water) at the point of exposure. Contaminant release and transport mechanisms carry contaminants from the source to points where people may be exposed. The point of exposure is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (i.e., ingestion, inhalation, dermal absorption).

An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented but could reasonably occur. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway does not exist in the present and will not exist in the future.

6.1.1 Potential Receptors

The identification of potential human receptors is based on the characteristics of the Site, the surrounding land uses, and the probable future land uses. The Phase II Business Park Site is presently unoccupied, with the exception of active rail lines and a current tenant (lumber distribution company). Under current Site use conditions, receptors would be limited to lumber yard workers (i.e., industrial users, most of whom work outdoors); trespassers who may traverse the Site (although presently mitigated by fencing and security measures); and construction workers that may access the Site to service utilities, perform rail maintenance, or similar duties. Trespassers might be comprised of adolescents and adults, whereas construction workers would be limited to adults.

In terms of future use, the current Site owner (Tecumseh Redevelopment) has developed a Master Plan for commercial/industrial redevelopment of the Site consistent with surrounding property use and Site zoning. Future Site use is further discussed under Section 8.4, which indicates that the reasonably anticipated future use of the Site is for commercial/industrial purposes. Exposed receptors under the future use scenario may be comprised of indoor workers, outdoor workers (e.g., groundskeepers or maintenance staff), and construction workers who may be employed at or perform work on the property. Site visitors/customers may also be considered receptors; their exposure would be similar to that of the indoor worker but at a lesser frequency and duration. Therefore, consideration of the indoor worker is conservatively protective of the Site visitor.

6.1.2 Contaminant Sources

Section 4.0 discusses the COPCs present in unremediated Site media at elevated concentrations. In general, these are limited to SVOCs and select inorganic COPCs in surface and subsurface soil/fill, and isolated smear zone impact by petroleum product. Specifically, elevated levels of PAH and arsenic were detected in the surface and/or subsurface samples collected from the majority of the sampled test pits. PCB Aroclor 1254 was detected at a concentration above the restricted-commercial SCO for PCBs of 1 mg/kg at test pit sample locations BPA2-TP-33 (0-0.5 fbgs) and BPA2-TP-48 (0-2 fbgs). An elevated concentration of lead was found in the surface soil at BPA2-TP-58 (12,300 mg/kg); however, the reliability of this results is suspect since the blind field duplicate was significantly lower (216 mg/kg). Supplemental test pit sampling and analysis for lead at this location confirmed that the blind field duplicate result is more representative of the actual lead concentration in this area. Other inorganic compounds (cadmium, cyanide, and mercury) were sporadically detected in soils at concentrations slightly above the SCOs.

Groundwater contained elevated concentrations of total arsenic at four locations; however, corresponding soluble arsenic concentrations (where analyzed) were below the GWQS/GV. The soil and water samples from test pits BPA2-TP-36 and BPA2-TP-81B contained elevated concentrations of several of the same PAHs. The presence of NAPL in monitoring well MW-01 and floating product observed on the water table in test pits BPA2-TP-53 (5 fbgs), BPA2-TP-89 (4.5 fbgs), BPA2-TP-93 (6.5 fbgs), and BPA2-TP-95 (8 fbgs) indicate isolated smear zone impact by petroleum product.

6.1.3 Contaminant Release and Transport Mechanisms

Contaminant release and transport mechanisms are specific to the type of contaminant and Site use. For the non-volatile COPCs present in site-wide soil/fill, contaminant release and transport mechanisms will generally be limited to fugitive dust migration and direct contact during intrusive work (e.g., during construction and grounds keeping activities), as the Site is currently covered by vegetation and will be substantially covered by roads, parking lots, buildings, and landscaping after redevelopment. VOCs are not present in the impacted soil/fill above SCOs and were only detected in groundwater at trace levels below the GWQS/GVs; therefore, the potential does not exist for exposure through pathways associated with soil gas migration (i.e., indoor or outdoor vapor migration). For the petroleum product observed on the water table at four test pit locations and within the South Linde Area, smear zone to groundwater is the contaminant release and transport mechanism.

6.1.4 Point of Exposure

Based on the widespread exceedance of restricted-commercial SCOs for certain ubiquitous parameters (i.e., arsenic and PAHs), the point of exposure is defined as the overall BCP Site. For both the current and future use scenarios, groundwater is not considered to pose a relevant mechanism due to the localized groundwater impacts, the availability of a local municipal potable water source, the depth to groundwater (greater than

4.5 feet; the standard depth of utilities and foundation footers), and the existence of a deed restriction that does not allow the use of Site groundwater.

6.1.5 Route of Exposure

Based on the types of receptors and points of exposure identified above, potential routes of exposure are listed below:

Current Use Scenario

- Construction Worker – skin contact, inhalation, and incidental ingestion
- Outdoor Worker – skin contact, inhalation, and incidental ingestion

Future Use Scenario

- Indoor Worker – inhalation
- Construction and Outdoor Worker – skin contact, inhalation and incidental ingestion

6.1.6 Exposure Assessment Summary

Based on the above assessment, the potential exposure pathways for the un-remediated Site condition are listed below.

Current Use Scenario

- Construction and Outdoor Worker – direct contact, incidental ingestion and inhalation of non-volatile COPCs present in site-wide soil/fill during intrusive activities and other dust-generating activities.

Future Use Scenario

- Construction and Outdoor Worker – direct contact, incidental ingestion, and inhalation of non-volatile COPCs present in site-wide soil/fill during intrusive activities

In most instances, these exposures can be readily mitigated during and following redevelopment through proper soil/fill management and placement of asphalt, building, and landscape cover.

6.2 Fish and Wildlife Impact Assessment (FWIA)

The Site has been vacant since the former BSC steel plant ceased production in 1983. The historical use of the Site has eliminated the majority of native species. The Site is mainly populated by low-lying vegetation and small stature early successional trees (e.g., eastern cottonwood and poplar). Vegetative cover has recolonized the vacant industrial site with scrub-like brush and trees. A mixture of cover types exists on the site, ranging from asphalt roadways, rail, and concrete foundation, to spots of dense scrub-brush/cottonwood vegetation. The majority of fauna found on the Site are avian and small mammal species with the exception of the white-tailed deer. No federally listed or proposed threatened or endangered species are known to exist in the project area (USFWS 1999).

The Phase II Business Park Area is slated for redevelopment as a commercial/light industrial area, consistent with surrounding property. Roadways, buildings, parking facilities, and maintained ornamental landscaping will substantially limit availability of suitable cover type for reestablishment of biota.

The impacts to the smear zone by petroleum product are isolated to four main areas (identified as Hotspots D through G) that are sufficiently upgradient of Smokes Creek and the South Return Water Trench such that they have a low potential to impact these surface water bodies. The South Linde Area IRM groundwater collection and skimmer recovery systems have been effective in preventing migration of oils to Smokes Creek, and the treatment system has reliably reduced dissolved phase contaminant concentrations below levels acceptable for discharge to the SRWT as monitored on a monthly basis. Water quality in the SRWT consistently meets discharge limits per SPDES-permitted Outfall 226.

As such, based on the Fish and Wildlife Resource Impact Analysis Decision Key included as Appendix E (NYSDEC DER-10 guidelines, Appendix 3C), no fish and wildlife resource impact analysis is warranted.

7.0 SUMMARY AND CONCLUSIONS

The RI findings indicate conditions consistent with the historic use of the Site for steel-making and finishing operations, and the widespread presence of fill materials containing slag and cindery ash. Key observations and findings from the soil/fill and groundwater investigations are listed below:

- Field observation of potential subsurface impact by petroleum was recorded at certain test pit locations as discussed in Section 4.1. However, samples from the associated depth intervals yielded VOC concentrations below commercial SCOs and, with the exception of test pits BPA2-TP-80 and BPA2-TP-93, SVOC concentrations at levels less than 500 ppm, suggesting that the observations are representative of residual, weathered organics that do not constitute a remaining source area. Floating product was observed on the water table in test pits BPA2-TP-53 (5 fbgs), BPA2-TP-89 (4.5 fbgs), BPA2-TP-93 (6.5 fbgs), and BPA2-TP-95 (8 fbgs). Elevated PID readings were noted in test pits BPA2-TP-16, and BPA2-TP-99, -99A, and -99B.
- The remains of a drum were found within test pit BPA2-TP-81B; the drum fragment was removed. Sheen was observed on the water at approximately 9 fbgs, a slight odor was detected, and the soil/fill was noted to be a little greasy. The soil/fill sample collected from 9-9.5 fbgs yielded SVOCs at a total concentration of 204 ppm
- Base-neutral SVOCs (i.e., PAHs) were detected above the SCOs at several test pit locations across the Site. NYSDEC's CP-51/Soil Cleanup Guidance Policy (October 21, 2010) provides for an alternative soil cleanup objective (i.e., in lieu of individual SCOs) for soils of 500 ppm total SVOCs where: end use of the Site will be for commercial or industrial purposes; a cover system (1 foot of clean soil, building and/or pavement) will be constructed; and institutional controls and a Site Management Plan will be implemented. Total PAH concentrations were reported at less than 500 parts per million (ppm), with the exception of BPA2-TP-80 (0-2 fbgs) where total SVOCs were reported at 663 ppm; BPA2-TP-85 (0-2 fbgs), where total SVOCs were reported at 1,577 ppm; and BPA2-TP-93 (4-6 fbgs) where total SVOCs were reported at 3,958 ppm. Test pit BPA2-TP-93 also showed associated evidence of visual or olfactory impact (i.e., slight sheen, slight odor, and product on the water).
- Arsenic was detected above the commercial SCO of 16 mg/kg at the majority of the test pit locations. Arsenic is a ubiquitous metal with urban background soils in New York State frequently containing concentrations in excess of the commercial SCO, particularly at active and former industrial properties characterized by historic slag fill deposition and coal burning, such as that which occurred on the

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subject property. Accordingly, comparison of the arsenic data to site-specific background or average concentrations is considered appropriate. To determine the Site background concentration, all surface (0-2 fbgs) soil/fill arsenic data for the Phase II Business Park Area was tabulated and the 95% upper confidence limit (95% UCL) on the mean was calculated (see Appendix F). Based on this analysis and further discussions with the NYSDEC, a site-specific SCO of 118 ppm has been established as the screening criteria for hotspot identification. The following six test pit areas exceeded this site-specific SCO: BPA2-TP-10 (est. 245 ppm), BPA2-TP-21 (est. 119 ppm), BPA2-TP-40 (est. 152 ppm), BPA2-TP-52 (141 ppm), BPA2-TP-58 (122 ppm), and BPA2-TP-104 (est. 198 ppm). The supplemental test pit investigation surrounding these six test pit locations undertaken in February 2012 provided a more definitive delineation of these areas.

- Elevated lead was detected in the shallow fill (0-2 fbgs) of BPA2-TP-58 (former Oil Pump House). Due to the disparity between the concentrations detected in the sample (12,300 mg/kg) and its blind duplicate (216 mg/kg), the data has been qualified as estimated and suspect. This means that lead is present but the quantitative value is unknown. No visual evidence of impact was noted. The supplemental surface soil/fill samples collected surrounding BPA2-TP-58 indicated results below the commercial SCO for lead, suggesting that the original result was anomalous.
- Mercury was identified at elevated levels above the restricted-commercial SCO in shallow fill at BPA2-TP-64 (near former repair shop/sump), BPA2-TP-67 (near former transformer vault), and BPA2-TP-69 (near former 54" Blooming Mill, pump house, and pit). These test pits were concentrated in one area; however, their locations were selected to determine the potential impact from three different former Site activities. These findings suggest potential localized shallow releases from one of these former operations. The mercury concentrations were all below the restricted-industrial SCO of 5.7 mg/kg.
- Other inorganic compounds (barium, cadmium, manganese, and cyanide) were sporadically detected at concentrations slightly above the commercial SCOs but below the industrial SCOs, with the exception of manganese. The industrial SCO for manganese is capped at a maximum value of 10,000 ppm, which is not based on health risk concerns but instead on factors such as appearance, olfactory impacts, and saturation levels.
- PCB Aroclor 1254 exceeded the commercial SCO for PCBs of 1 mg/kg in the surface fill at test pit sample locations BPA2-TP-33 (former transformer Substation 8F) and BPA2-TP-48 (former Car Repair Shop); however, in both instances the total PCB concentrations fall below the industrial SCO of 25 mg/kg. Railroad Realignment test pit RR-TP-30, located in the vicinity of BPA2-TP-33

(PCB concentration of 2.37 ppm), was excavated due to a PCB concentration of 52 ppm (twice the industrial SCO). To define the lateral extent of this hotspot area, TurnKey conducted a supplemental investigation of this test pit. On August 19, 2010, a TurnKey project scientist excavated shallow test pits (approximately 25 feet in each compass direction) from the original test pit. Sidewall samples (0-2 foot) were collected and analyzed for PCBs. In addition, a composite sample was collected from the floor of the supplemental test pit to verify that a 2-foot excavation depth was sufficient. PCB concentrations at the supplemental locations surrounding RR-TP-30 and at the 2-foot depth interval were all below the commercial SCO of 1 ppm.

- PCB Aroclor 1242 was detected above the GWQS of 0.09 ug/L in the unfiltered water sample collected from test pit BPA2-TP-81B; the remains of a drum were found and removed during excavation of this test pit located within the former 48"-54" Roughing Mill. The concentration of PCBs in the associated soil/fill sample was estimated at 0.602 mg/kg, which is well below the commercial SCO of 1 mg/kg.
- Field evidence of groundwater impact (LNAPL) was identified in monitoring well MW-01 (located in the South Linde Area of the Site), but the analytical data indicated no excursions of the GWQS/GVs. Although pH and arsenic levels exceeded the GWQS at certain well locations, pH was within one unit of the standard and, with the exception of MW-01, arsenic was at the same order of magnitude as the GWQS/GV and/or exhibited soluble arsenic below the GWQS/GV. Sheen observed in newly installed well MWN-64 may be a result of the elevated levels of SVOCs in the subsurface at test pit location BPA2-TP-93. With these limited exceptions, the groundwater investigation findings indicate that, as would be expected based on the relatively low solubility of the soil/fill constituents prevalent in the soil/fill matrix, widespread groundwater impact by COPCs is not evident. However, clearly discernible sheens in test pits combined with petroleum odor, free product, and/or elevated PID readings are indicative of potential localized impact to the saturated soil/fill (i.e., smear zone) due to past Site operations.

Based on the RI Findings, remedial measures for unsaturated and saturated (smear zone) soil/fill as well as localized groundwater within the South Linde IRM area are warranted. Sections 8 through 10 constitute an Alternatives Analysis Report (AAR) in accordance with NYSDEC DER-10 guidance.

7.1 Areas Requiring Supplemental Investigation

The following area will be further investigated through supplemental test pit excavation and sampling as indicated.

- **BPA2-TP-7:** A slight sheen and slight fuel-oil like odor were noted. The analytical results collected from the 5-7 fbgs depth interval of test pit BPA2-TP-7 indicated only slight impact (two PAHs slightly above commercial SCOs). However, it is acknowledged that at the time of the RI, lumber yard operations hampered further investigation. Accordingly, this area will be further delineated once the lumber yard vacates the area. Note that further investigation to the north may be infeasible due to the presence of the active 54" plant water line in this area.

- **BPA2-TP-48:** No visual or olfactory field evidence of impact was observed in this test pit, and PID readings were 0.0 ppm throughout the 12-foot excavation depth. The PCB concentration in the 0 to 2 fbgs interval at test pit BPA2-TP-48 (24 ppm) was above the commercial SCO of 1 ppm but below the industrial SCO of 25 ppm. Due to the variance between the concentration of the sample (24 ppm) and the blind duplicate (3.8 ppm), an additional sample will be collected in this area for analysis of PCBs.

8.0 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS

The development of an appropriate remedial approach begins with definition of site-specific Remedial Action Objectives (RAOs) to address substantial human health and ecological risk or other significant environmental issues identified in the Remedial Investigation (RI). General Response Actions are then developed as potential means to achieve the RAOs.

8.1 Remedial Action Objectives

RAOs for this Site have been developed based on the findings of the RI, which have identified localized "hotspot" soil/fill in discrete portions of the Site and product on test pit water in several areas of the Site as listed below. Hotspots are soil/fill areas where non-ubiquitous constituents significantly exceed industrial SCOs and/or had notable field observations indicating gross contamination (free product, significant staining, excessive odor, high PID readings). Those areas with soil/fill above the commercial SCOs will require cover under commercial reuse scenarios; however, unless these soils are also grossly impacted, no further investigation or remediation is warranted.

- PAH-impacted surface soil/fill near BPA2-TP-80 and BPA2-TP-85 in excess of 500 ppm.
- PAH-impacted saturated soil/fill (i.e., smear zone) near BPA2-TP-53, BPA2-TP-89, BPA2-TP-93, and BPA2-TP-95 with field evidence of impact, including product floating on the water table.
- Saturated soil/fill near test pit BPA2-TP-81B based on field evidence of impact (i.e., drum remains, sheen on water table at 9 fbgs, greasy soil, and odor).
- Field evidence of impact (elevated PID readings) in test pits BPA2-TP-16, and BPA2-TP-99, -99A, and -99B.
- Arsenic-impacted surface soil/fill at six locations with concentrations in excess of site-specific SCO of 118 ppm.
- Well MW-01 in the South Linde Area of the site (presence of floating product).

In developing the RAOs, consideration is given to the reasonably anticipated future use of the Site (i.e., commercial and/or industrial reuse – see Section 8.4), and the applicable

Standards, Criteria, and Guidance (SCGs), including soil cleanup guidance per 6 NYCRR Part 375 and GWQS/GVs per Technical and Operational Guidance Series (TOGS) 1.1.1. Accordingly, the RAOs for the Site are to:

- Remediate hotspot unsaturated surface and saturated subsurface soil/fill as described above.
- Mitigate exposure to soil/fill where contaminant levels exceed restricted-commercial SCOs.
- Improve South Linde Area groundwater cleanup measures provided by the existing pump-and-treat system.
- Implement and maintain engineering and institutional controls to assure that the Site is not used in a manner inconsistent with the reasonably anticipated future use scenario.

8.2 General Response Actions

General Response Actions are broad classes of actions that may satisfy the RAOs. General response actions form the foundation for the identification and screening of remedial technologies and alternatives. General Response Actions considered for the Site are:

- Excavation and on-site treatment and/or off-site disposal of impacted soil/fill
- In situ treatment of subsurface soil/fill
- Engineering controls or cover to mitigate contact and contaminant transport.
- Institutional controls (e.g., deed restrictions and other administrative measures) to restrict use of the Site and mitigate unacceptable exposure.
- Excavation of impacted smear zone soil/fill or enhanced removal of petroleum in the South Linde Area of the Site.

8.3 Standards, Criteria and Guidance (SCGs)

This section provides a summary of the standards, criteria, and guidance (SCGs) that are considered applicable or relevant and appropriate to remediation of the Site. SCGs include New York State laws, regulations, and guidance as well as more stringent Federal requirements.

Applicable SCGs pertain to cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under NY State or Federal environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. An applicable requirement must directly and fully address the situation at the site.

Relevant and appropriate SCGs pertain to cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under NY State or Federal environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site.

SCGs are classified as chemical-, action-, or location-specific. Chemical-specific SCGs are usually health- or risk-based concentrations in environmental media (e.g., air, soil, water), or methodologies that when applied to site-specific conditions, result in the establishment of concentrations of a chemical that may be found in, or discharged to, the ambient environment. Location-specific SCGs generally are restrictions imposed when remedial activities are performed in an environmentally sensitive area or special location. Some examples of special locations include floodplains, wetlands, historic places, and sensitive ecosystems or habitats. Action-specific SCGs are restrictions placed on particular treatment or disposal technologies. Examples of action-specific SCGs are effluent discharge limits and hazardous waste manifest requirements.

Additional discussions concerning the specific chemical, action and location-specific SCGs that may be applicable, relevant, or appropriate to remedy selection at the Site are presented below. In each case, the identified SCGs are generally limited to regulations or technical guidance in lieu of the environmental laws from which they are authorized, as the laws are typically less prescriptive in nature and are inherently considered in the regulatory and guidance evaluations.

8.3.1 Chemical-Specific SCGs

The determination of potential chemical-specific SCGs for a site is based on the nature and extent of contamination; potential migration pathways and release mechanisms for site contaminants; the presence of human receptor populations; and the likelihood that exposure to site contaminants will occur. The RI performed for the Phase II Business Park Area provides this information. RI sampling events included the collection and analysis of surface soil, subsurface soil, and groundwater samples. Table 10 presents a list of chemical-specific NY State and Federal SCGs that may be applicable or relevant and appropriate to the Site based on this information.

8.3.2 Location-Specific SCGs

The location of the Site is a fundamental determinant of its impact on human health and the environment. Location-specific SCGs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in a specific location. Some examples of these unique locations include: floodplains, wetlands, historic places, and sensitive ecosystems or habitats. Table 11 presents the location-specific SCGs that may be applicable or relevant and appropriate to the Site.

8.3.3 Action-Specific SCGs

Table 12 identifies action-specific SCGs that may significantly impact the selection of remedial alternatives for the Phase II Business Park Site. This list of potential action-specific SCGs is based on the candidate remedial alternatives identified in Section 10.

8.4 Future Use Evaluation

In developing and screening remedial alternatives, NYSDEC's Part 375 regulations require that the reasonableness of the anticipated future land use be factored into the evaluation. The regulations identify 16 criteria that must be considered. These criteria and the resultant outcome for the Phase II Business Park Site are presented in Appendix G. As indicated, the evaluation supports commercial and/or industrial redevelopment as the reasonably anticipated future use of the Site, consistent with surrounding Site use, zoning, and the Master Redevelopment Plan endorsed by Tecumseh, Erie County, and the City of Lackawanna. The remedial alternatives identified in Section 10 are evaluated against their consistency with the reasonably anticipated land use as well as other screening criteria.

In addition to the evaluation of alternatives to remediate to the likely end use of the Site, NYSDEC regulation and policy calls for evaluation of an unrestricted use scenario (considered under 6NYCRR Part 375-2.8 to be representative of cleanup to pre-disposal conditions). Per NYSDEC DER-10 Technical Guidance for Site Investigation and

Remediation (Ref. 5), evaluation of a "no-action" alternative is also required to provide a baseline for comparison against other alternatives.

9.0 VOLUME, NATURE, AND EXTENT OF CONTAMINATION

Estimation of the volume, nature, and extent of media that may require remediation to satisfy the RAOs or that needs to be quantified to facilitate evaluation of remedial alternatives is presented in this section. The estimates are a function of the cleanup goal: for the unrestricted use scenario, the cleanup goal would involve achieving unrestricted use SCOs; whereas for the reasonably anticipated future use scenario, the cleanup goal would involve achieving the restricted-commercial SCOs. The volume and extent of media requiring cleanup under these scenarios is presented in Sections 9.1 and 9.2. In addition, the volume and extent of "hotspot" material that may need to be addressed to achieve the RAOs for remediation of these areas is discussed in Section 9.3. In all instances, these volume estimates (and associated cost estimates presented in Section 10) are projected based on limited data and observations collected during the RI; additional pre-remedial investigation would be required to refine the estimates, particularly for hotspot areas.

9.1 Comparison to Unrestricted SCOs

Exceedance of the unrestricted use SCOs was noted in the majority of soil/fill samples collected, primarily for carcinogenic PAHs; petroleum SVOCs; metal COPCs (i.e., arsenic, cadmium, chromium, lead, and mercury); and, to a lesser extent, PCBs (Aroclors 1248, 1254, and 1260). Due to the highly ubiquitous nature of the constituents observed in Site soil/fill and the extent to which they exceed the unrestricted use SCO values, it is likely that the entire 143.55-acre property defines the impacted soil/fill area. The depth of impact is assumed to extend into native material, with an average depth of approximately 8 fbgs. Thus, the volume of impacted soil/fill requiring remediation is approximately 2.2 million cubic yards.

9.2 Comparison to Restricted-Commercial SCOs

The soil/fill data indicated widespread exceedance of the Part 375 restricted-commercial SCOs for several ubiquitous constituents. Specifically, nearly all samples collected exhibited exceedance of the commercial SCOs for one or more of the carcinogenic PAHs, with the majority also exhibiting exceedance of arsenic. Accordingly, in terms of strict conformance with commercial SCOs, the volume of soil/fill requiring remediation is similar to that for the unrestricted use scenario (i.e., 2.2 million cubic yards).

9.3 Hotspot Soil/Fill

As discussed in Section 8.1, certain test pit locations contained elevated levels of COPCs, with some locations corroborated by visual impacts. Figure 5 identifies the location of the impacted areas; in some cases, the dimensions of each area are approximated since the extent has not been fully defined. The estimated areal and vertical extent of impact in these source areas is described below and summarized on Table 9.

PETROLEUM-IMPACTED SOIL/FILL

- **Hotspot "A" – Test Pit BPA2-TP-85:** Total PAHs were detected in the shallow (0-2 fbgs) soil/fill at a concentration of 1,577 ppm. Because the extent of impact has not been delineated, an estimated 20-foot x 20-foot x 2-foot area has been assumed, for a corresponding in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment and/or disposal alternatives is estimated to be 45 cubic yards.

- **Hotspot "B" – Test Pit BPA2-TP-80:** Total PAHs were detected in the shallow (0-2 fbgs) soil/fill at a concentration of 663 ppm. Because the extent of impact has not been delineated, an estimated 20-foot x 20-foot x 2-foot area has been assumed, for a corresponding in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies, the volume for ex-situ treatment and/or disposal alternatives is estimated to be 45 cubic yards.

- **Hotspot "C" – Test Pit BPA2-TP-53:** Slight rainbow sheen, slight petroleum-like odor, and floating product were observed on the water surface at approximately 5 fbgs. PID readings were 0 ppm to the end of the test pit at 10 fbgs. Four SVOCs were detected in the 4 to 6 fbgs interval at concentrations above commercial SCOs, with a total SVOC concentration of 442 ppm. An additional six test pits were excavated in this area to check for a possible contaminant source. Slight sheen and blebs of product were observed in BPA2-TP-53D and -53E on the water at 5 fbgs. Slight sheen was noted in supplemental test pits BPA2-TP-53A and -53C; no evidence of impact was observed in test pits BPA2-TP-53B and -53F. The extent of impact is estimated to be 70 feet by 30 feet over a 3-foot depth from approximately 3.5 to 6.5 fbgs, for an in-place volume of approximately 240 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 360 cubic yards. Since the depth to water is approximately 5 fbgs, groundwater management may be required.

- **Hotspot "D" – Test Pit BPA2-TP-89:** Black staining and oily residue were identified in the soil/fill between 4 and 6 fbgs. Slight sheen and yellowish product were observed floating on the water table at approximately 4.5 fbgs. The maximum

PID reading was 7.5 ppm at 5 fbgs, and moderate odor was noted. The total SVOC concentration of 57.6 ppm was detected in the 4 to 6 fbgs interval. An additional 18 test pits were excavated in this area. Floating product was observed within 3 of the 18 test pits. With the exception of two supplemental test pits with no evidence of impact; sheen and odor were noted in the remaining test pits with a maximum PID reading of 18 ppm. The extent of impact is estimated to be 150 feet by 90 feet over a 3-foot depth from approximately 3 to 6 fbgs, for an in-place volume of approximately 1,500 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 2,250 cubic yards. Since the depth to water is approximately 4.5 fbgs, groundwater management may be required.

- **Hotspot "E" – Test Pit BPA2-TP-93:** Slight sheen and yellowish product were observed floating on the water table at approximately 6.5 fbgs in test pit BPA2-TP-93. The water table was observed below the soil/fill unit within a silty clay layer suspected to be non-native. The sample collected from the 4 to 6 fbgs interval detected SVOCs at concentrations above commercial SCOs with a total SVOC concentration of 3,958 ppm. Surrounding test pits BPA2-TP-93A and BPA2-TP-93B indicated similar findings. The observations noted in downgradient test pit BPA1-TP-73 (slight sheen, slight odor) will be further investigated during excavation of this upgradient hotspot. Therefore, the extent of impact is estimated to cover a 75-foot by 75-foot area within the smear zone at a depth of 5-8 fbgs, for a corresponding in-place volume of approximately 625 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 940 cubic yards. Since the depth to water is approximately 6.5 fbgs, groundwater management may be required.

- **Hotspot "F" – Test Pit BPA2-TP-95:** Black stained soil and yellowish floating product were identified at the water table, estimated at approximately 8 fbgs. The maximum PID reading was 11.7 ppm at 7 fbgs. Moderate odor and trapped product were observed within the non-native silty clay cracks between 4 and 9 fbgs. The sample collected from the 6 to 8 fbgs interval indicated three SVOC concentrations above the commercial SCOs, with a total SVOC concentration of 176 ppm. An additional two test pits (BPA2-TP-95A and -95B) were excavated in this area to check for a possible contamination source. No visual or olfactory evidence of impact was observed in BPA2-TP-95A, which was excavated 30 feet north of the original test pit and to 8 fbgs. Test pit BPA2-TP-95B was excavated 30 feet south of the original test pit. A red/orange staining was observed on the north side wall from approximately 3 to 4 fbgs. No other visual or olfactory impacts were noted. The sample collected from this interval was analyzed for inorganic compounds only; the arsenic concentration exceeded the commercial SCO. Test pit BPA2-TP-62 excavated east of and adjacent to BPA2-TP-95 noted no visual or olfactory evidence of impact.

The extent of impact is estimated to be 60 feet by 40 feet over a 5-foot depth from approximately 4 to 9 fbgs, for an in-place volume of approximately 450 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 675 cubic yards. Since the depth to water is approximately 8 fbgs, groundwater management may be required.

Based on the estimated and assumed extent of the petroleum impacts described above, the total estimated in-place volume of "hotspot" contamination is 2,875 cubic yards. The volume of soil/fill for ex-situ treatment and/or disposal alternatives is estimated to be 4,315 cubic yards.

WEATHERED ORGANIC SOIL/FILL

- **<u>Hotspot "G" – Test Pit BPA2-TP-81B</u>:** This test pit was excavated within the former 48"-54" Roughing Mill near the oil cellars, and the remains of a drum were found. Sheen was observed on the water at approximately 9 fbgs and a slight to moderate odor was detected. These olfactory and visual impacts were corroborated by analytical results from the sample collected at 9-9.5 fbgs; five PAHs detected at concentrations above Part 375 Restricted-Commercial SCOs. (However, the total PAH concentration was 204 ppm, which is below the 500 ppm threshold discussed in Section 7.0). NYSDEC requested that a sample of the test pit water be analyzed for VOCs, SVOCs, and PCBs; similar PAHs and PCB Aroclor 1242 were detected above GWQSs. The dimensions of the test pit were 15 feet long by 3 feet wide. The extent of impact surrounding test pit BPA2-TP-81G is estimated to be 20 feet by 20 feet over a 4-foot depth from approximately 5 to 9 fbgs.

- **<u>Hotspot "H" – Test Pit BPA2-TP-99 and -99B:</u>** A PID reading of 105 ppm was measured at 7 fbgs and a slight odor was detected. This was 1 of 4 additional test pits excavated in the vicinity of original test pit BPA2-TP-99 because of the elevated PID reading (24.4 ppm). The PID readings in the other three supplemental test pits were 0.0 ppm. The extent of impact surrounding original test pit BPA2-TP-99 is estimated to be 20 feet by 20 feet over a 2-foot depth from approximately 7 to 9 fbgs. The extent of impact surrounding supplemental test pits BPA2-TP-99A and -99B is estimated to be 120 feet by 50 feet over a 4-foot depth from approximately 5 to 9 fbgs.

- **<u>Hotspot "I" – Test Pit BPA2-TP-16:</u>** Between 6 and 8 fbgs, saturated soil/fill exhibited PID readings greater than 50 ppm, with a maximum PID reading of 76.2 ppm. Moderate odor and grayish black staining were noted at this interval. Depth to water was recorded at 5.5 fbgs. The sample collected from 6.0-8.5 fbgs interval indicated no concentrations above the commercial SCOs. A concrete wall running east-west was encountered at the southern limit of this test pit. An additional three test pits were excavated in this area; no field evidence of impact was observed in supplemental test pits BPA2-TP-16A and -16C. Although slight sheen and slight odor were detected on the water at approximately 5.5 fbgs in supplemental test pit BPA2-TP-16B, located northeast of the original test pit, the maximum PID reading was 7.0 ppm. The extent of impact surrounding test pit BPA2-TP-16 is estimated to be 30 feet by 30 feet over a 4-foot depth from approximately 5 to 9 fbgs.

ARSENIC-IMPACTED SOIL/FILL

Arsenic was detected in the surface soil/fill (0 to 2 fbgs) above the site-specific SCO of 118 ppm at six test pit locations. Supplemental test pits were excavated and the extent of impact for each location is presented below:

- **Hotspot "J" – BPA2-TP-10:** Arsenic was detected in the original test pit at an estimated concentration of 245 ppm. Arsenic was detected in the supplemental test pit 10 feet to the west at a concentration of 131 ppm; the 20-foot sample detected arsenic at a concentration of 102 ppm. Therefore, the extent of impact is estimated to be 30 feet by 20 feet, for an in-place volume of approximately 45 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 70 cubic yards.
- **Hotspot "K" – BPA2-TP-21:** Arsenic was detected in the original test pit at an estimated concentration of 119 ppm. Arsenic was detected in the supplemental test pit 10 feet to the east at a concentration of 167 ppm; the 20-foot sample detected arsenic at a concentration of 26.8 ppm. Therefore, the extent of impact is estimated to be 30 feet by 20 feet, for an in-place volume of approximately 45 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 70 cubic yards.
- **Hotspot "L" – BPA2-TP-40:** Arsenic was detected in the original test pit at an estimated concentration of 152 ppm. Arsenic was detected below the site-specific SCO of 118 ppm at all supplemental test pit locations. Therefore, the extent of impact is estimated to be 20 feet by 20 feet, for an in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 45 cubic yards.
- **Hotspot "M" – BPA2-TP-52:** Arsenic was detected in the original test pit at a concentration of 141 ppm. Arsenic was detected in the supplemental test pit 10 feet to the east at a concentration of 164 ppm. A 20-foot sample could not be collected due to the presence of railroad tracks. Therefore, the extent of impact is estimated to be 30 feet by 20 feet, for an in-place volume of approximately 45 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 70 cubic yards.

- **<u>Hotspot "N" – BPA2-TP-58:</u>** Arsenic was detected in the original test pit at a concentration of 122 ppm. Arsenic was detected in the supplemental test pit 10 feet to the south at a concentration of 127 ppm; the 20-foot sample detected arsenic at a concentration of 112 ppm. Therefore, the extent of impact is estimated to be 30 feet by 20 feet, for an in-place volume of approximately 45 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 70 cubic yards.
- **<u>Hotspot "O" – BPA2-TP-103</u>** Arsenic was detected in the original test pit at an estimated concentration of 198 ppm. Arsenic was detected below the site-specific SCO of 118 ppm at all supplemental test pit locations. Therefore, the extent of impact is estimated to be 20 feet by 20 feet, for an in-place volume of approximately 30 cubic yards. Accounting for contingency and excavation inefficiencies the volume for ex-situ treatment and/or disposal alternatives is estimated to be 45 cubic yards.

Based on the estimated and assumed extent of the impacts described above, the total estimated in-place volume of arsenic-impacted "hotspot" soil/fill is 250 cubic yards. The volume of soil/fill for ex-situ treatment and/or disposal alternatives is estimated to be 370 cubic yards.

9.4 South Linde Area Source Area Soil/Fill

As discussed in Section 1.2, an active groundwater pump-and-treat system, including a belt skimmer product recovery system, is present and being operated in the South Linde Area of the Site. Figure 5 shows the South Linde Area collection system, monitoring wells, and piezometers. Based on historical monitoring of the wells and piezometers in this area (as documented in monthly reports to the NYSDEC), free-phase floating product (i.e., light non-aqueous phase liquid, or LNAPL) is sporadically present at the groundwater interface. Groundwater levels recorded in the wells and piezometers since 2004 have ranged between 9 and 23 fbgs (smear zone). In addition RI Test pit BPA2-TP-102 was excavated north of MW-01 (see Figure 3) to a depth of 12 fbgs, with groundwater encountered at approximately 8 fbgs (at the interface between fill and silty clay). No olfactory or visual impacts were noted and all PID readings were 0.0 ppm, substantiating the isolated nature of the LNAPL.

For purposes of evaluating the smear zone excavation alternative, the aerial extent of impact has been assumed to be 175-foot (E-W) by 75-foot (N-S). Based on field observations, the depth of impact is assumed to be the entire 14-foot smear zone. Therefore, the in-place soil/fill volume would be approximately 6,800 cubic yards. The volume of water anticipated to be present within this area, assuming a porosity of 0.3 and dewatering from 9 to 23 fbgs, is over 400,000 gallons. This volume does not take into account the hydraulic connection to Smokes Creek and the SRWT. Therefore, the volume of impacted soil/fill is estimated to be 10,200 cubic yards (which accounts for contingency and excavation inefficiencies). This estimated areal and vertical extent of source area impact would need to be refined through supplemental investigation.

10.0 DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

10.1 Evaluation of Alternatives

NYSDEC's Brownfield Cleanup Program calls for remedy evaluation in accordance with DER-10 Technical Guidance for Site Investigation and Remediation (May 2010). In addition to achieving RAOs, the remedial alternatives are evaluated against the following criteria consistent with 6NYCRR Part 375-1.8(f):

- **Overall Protection of Public Health and the Environment**. This criterion is an evaluation of the remedy's ability to protect public health and the environment, assessing how risks posed through each existing or potential pathway of exposure are eliminated, reduced, or controlled through removal, treatment, engineering controls, or institutional controls.
- **Compliance with Standards, Criteria, and Guidance (SCGs)**. Compliance with SCGs addresses whether a remedy will meet applicable environmental laws, regulations, standards, and guidance.
- **Long-Term Effectiveness and Permanence**. This criterion evaluates the long-term effectiveness of the remedy after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: (i) the magnitude of the remaining risks (i.e., will there be any significant threats, exposure pathways, or risks to the community and environment from the remaining wastes or treated residuals), (ii) the adequacy of the engineering and institutional controls intended to limit the risk, (iii) the reliability of these controls, and (iv) the ability of the remedy to continue to meet RAOs in the future.
- **Reduction of Toxicity, Mobility, or Volume with Treatment**. This criterion evaluates the remedy's ability to reduce the toxicity, mobility, or volume of Site contamination. Preference is given to remedies that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the Site.
- **Short-Term Impacts and Effectiveness**. Short-term effectiveness is an evaluation of the potential short-term adverse impacts and risks of the remedy upon the community, the workers, and the environment during construction and/or implementation. This includes a discussion of how the identified adverse impacts and health risks to the community or workers at the Site will be controlled, and the effectiveness of the controls. This criterion also includes a discussion of engineering controls that will be used to mitigate short term impacts (i.e., dust control measures), and an estimate of the length of time needed to achieve the remedial objectives.

- **Implementability**. The implementability criterion evaluates the technical and administrative feasibility of implementing the remedy. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.
- **Cost-Effectiveness**. Capital, operation, maintenance, and monitoring costs are estimated for each remedial alternative and presented on a present worth basis. Detailed cost estimates for each alternative, excluding the no action alternative, are presented on Tables 11 through 13.
- **Community Acceptance**. This criterion evaluates the public's comments, concerns, and overall perception of the remedy. The Community Acceptance criterion incorporates public concerns into the evaluation of the remedial alternatives. Therefore, Community Acceptance of the remedy will be evaluated after the public comment period required by the BCP.
- **Land Use**. In addition to the above criteria, 6NYCRR Part 375-1 specifies that the criterion of Land Use (i.e., the current, intended, and reasonably anticipated future land uses of the Site and its surroundings) be considered in the selection of the remedy. The intended future land use was initially submitted to the NYSDEC via the BCP application. The reasonably anticipated future use of the Site in a commercial/ industrial capacity (i.e., as a business park) is further discussed in Appendix G.

10.2 Development and Evaluation of Soil/Fill Alternatives

The following soil/fill remedial alternatives have been developed in accordance with the General Response Actions and NYSDEC regulation and policy:

- Alternative 1: No Action
- Alternative 2: Excavation of Impacted Soil/Fill to Unrestricted SCOs
- Alternative 3: Hotspot Soil/Fill Remediation With Placement of Cover System Prior to Site Redevelopment
- Alternative 4: Hotspot Soil/Fill Remediation With Deferred Soil Cover System During Site Redevelopment

Institutional controls, though identified in the General Response Actions, were not identified as a stand-alone remedial alternative because a deed restriction prohibiting use of groundwater and limiting land reuse to industrial and similar non-residential settings already exists for the larger Tecumseh property. Accordingly, all of the above alternatives inherently include these institutional controls. In addition, Alternatives 3 and 4 will require development and enforcement of a Site Management Plan (see Section 11). Other institutional and engineering controls that would be considered applicable for this Site and would be incorporated into the remedial alternatives are described in greater detail in Section 11.

10.2.1 Alternative 1: No Action

The no-action alternative is defined as taking no additional actions to address the impacted soil/fill. The Site is presently subject to a deed restriction prohibiting groundwater use and limiting reuse to industrial and similar non-residential settings, and is fenced along NYS Route 5. While these controls would not be removed, the no action alternative assumes that there would be no maintenance, monitoring, or certifications to assure that these controls remain in place and effective. The no-action alternative also provides a baseline for comparison against the other remedial alternatives and justifies the need for any remedial action.

Overall Protection of Public Health and the Environment – This alternative would protect public health under the current use scenario via the existing engineering and institutional controls; however, localized areas of environmental impact associated with hotpot areas would remain. This alternative would not meet the RAOs for the Site.

Compliance with SCGs – This alternative would not address source area materials or mitigate exposure to contaminants in excess of commercial or industrial use SCOs, and would therefore not comply with SCGs per 6NYCRR Part 375.

Long-Term Effectiveness and Permanence – This alternative provides no long-term maintenance measures and, as such, provides no reliable long-term control against exposure to impacted soil/fill. All current and future risks would remain under this alternative.

Reduction of Toxicity, Mobility, or Volume with Treatment – This alternative provides no reduction in toxicity, mobility, or volume of COPCs in soil/fill.

Short-Term Impacts and Effectiveness – There would be no additional risks posed to the community, Site workers, or the environment associated with implementation of this alternative.

Implementability – No technical implementability issues or action-specific administrative implementability issues are associated with this alternative.

Cost-Effectiveness – There are no capital or operation, maintenance, and monitoring costs associated with this alternative.

Land Use – This alternative is consistent with the reasonably anticipated future use of the Site, but would not promote commercial and industrial redevelopment due to the absence of a release from liability and placement of the responsibility to assure protection of public health following redevelopment on the future buyer or developer.

10.2.2 Alternative 2: Excavation of Impacted Soil/Fill to Unrestricted SCOs

For unrestricted use scenarios, excavation and off-site treatment or disposal of impacted soil/fill would be performed, obviating the need for engineering and institutional controls. This alternative would necessitate excavation of all soil/fill where COPCs exceed unrestricted use SCOs per 6NYCRR Part 375, with transport of the excavated materials to and disposal at a permitted, off-site disposal facility. The estimated total volume of impacted soil/fill that would be removed from the Site for off-site disposal is approximately 1.9 million cubic yards. The same volume of clean soil would be necessary to backfill the excavation. For purposes of cost estimating all excavated materials are assumed to be non-hazardous and transported to a commercial solid waste disposal facility.

Overall Protection of Public Health and the Environment – Excavation and off-site disposal to unrestricted use SCOs would be protective of public health under any reuse scenario. However, this alternative would permanently use and displace 1.9 million cubic yards of valuable landfill airspace, causing ancillary environmental issues due to reduced landfill capacity, and would require removal of 1.9 million cubic yards of clean soil from an off-site borrow source, also contributing to significant detrimental off-site environmental issues.

Compliance with SCGs – Excavation and off-site disposal would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Soil excavation activities would necessitate preparation of and adherence to a community air monitoring plan for particulates in accordance with Appendix 1B of DER-10.

Long-Term Effectiveness and Permanence – This alternative would achieve removal of all impacted soil/fill; therefore, no soil/fill impacts would remain on the Site. The excavation alternative would provide long-term effectiveness and permanence. Post-remedial monitoring and certifications would not be required.

Reduction of Toxicity, Mobility, or Volume with Treatment – Through removal of all impacted soil/fill, this alternative would permanently and significantly reduce the toxicity, mobility, and volume of contamination within the Site. However, since this alternative transfers Site soil/fill from one environment to another, an overall reduction of toxicity, mobility, and volume would not occur.

Short-Term Impacts and Effectiveness – The short-term adverse impacts and risks to the community, workers, and environment during implementation of this alternative are significant. Site workers would be required to wear personal protective equipment (PPE) during excavation to prevent direct contact with soil/fill. Dust control methods would be required to limit the release of particulates during excavation of the impacted soil/fill and placement of the backfill soils. Physical hazards, primarily related to potential accidents from heavy truck traffic on NY State Route 5, would be expected. Substantial disruption of the neighboring community would occur due to material transport and deliveries and noise from heavy equipment used to construct the remedy. The Remedial Action Objectives would be achieved once the soil/fill is removed from the Site and backfill soils are in place (est. 2-3 years).

Implementability – Significant technical and administrative implementability issues would be encountered in construction of this unrestricted use alternative. These include, but are not limited to: the need for construction, maintenance, and operation of substantial dewatering facilities; the need to coordinate and secure disposal contracts with numerous permitted off-site landfills, as no single location would be able to accept the volume of soil/fill generated under this alternative; difficulty locating local borrow sources for such a large volume of backfill; traffic coordination for trucks entering and exiting NY State Route 5; and the need to relocate rail lines to allow excavation beneath the existing tracks.

Cost-Effectiveness – Capital costs for implementation of this alternative are estimated at $172 million. There are no operation and maintenance costs associated with this alternative. Table 13 presents a breakdown of these capital costs.

Land Use – This alternative, although inconsistent with the reasonably anticipated future use of the Site, would not preclude commercial and industrial redevelopment.

10.2.3 Alternative 3: Hotspot Soil/Fill Remediation with Placement of Soil Cover System Prior to Redevelopment

This alternative would initially involve removal of the 12 hotspot areas described in Section 9.3. The petroleum-impacted soil/fill (Hotspots A through F) would likely be treated via on-site bioremediation (e.g., on a biopad constructed over the Soaking Pit Building foundation) with relocation of the treated soils back into the excavation area. Previous experience during test pit excavations indicates the material is well-drained; however, provisions for managing groundwater will be in place. Hotspots G through I would receive in situ injection of a fast-acting chemical oxidant and a slow release product to stimulate aerobic bioremediation in a grid pattern across the areas over the smear zone. The arsenic-impacted soil/fill (Hotspots J through O) may require stabilization prior to off-site disposal; however, based on the similar approach undertaken as part of the rail relocation IRM, it is anticipated that these areas will be suitable for direct disposal in a Subtitle D sanitary landfill facility. Since only the upper two feet of soil/fill would be removed, grading of these hotspot areas will be performed in place of backfilling.

Following hotspot soil/fill removal, a 12-inch soil cover would be installed prior to Certificate of Completion (COC) issuance and redevelopment. The estimated total volume of clean soil required for the cover system is approximately 185,000 cubic yards. The cover would then be removed, as necessary, to accommodate build-out during the redevelopment period. Standard institutional and engineering controls would also be implemented under this alternative. Specifically, a Site Management Plan (SMP) incorporating an Excavation Plan; an Operation, Maintenance, and Monitoring (OM&M) Plan; and ongoing Engineering and Institutional Control certification requirements would be developed and enforced through an environmental easement. The environmental easement would restrict use of the Phase II Business Park Area to commercial and industrial applications and preclude groundwater use without treatment.

Overall Protection of Public Health and the Environment – This alternative meets NYSDEC requirements for a Track IV cleanup under the BCP regulations and is therefore protective of human health and the environment at the Site. Accordingly, Alternative 3 would achieve the RAOs. However, placement of a 12-inch soil cover over the Phase II Business Park area would require immediate clearing of the Site and borrow source(s), resulting in rapid loss of 143.55 acres of greenhouse gas consuming plant life and cover for habitat and foraging on-site and a likely similar acreage off-site, which is inconsistent with NYSDEC's January 2011 green remediation policy (DER-31). In addition, significant short-term impacts would result from implementation of this alternative as described below.

Compliance with SCGs – Excavation and off-site disposal, as well as on-site biotreatment of petroleum-impacted soil/fill and in situ injection, would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Imported cover material would need to meet backfill quality criteria per 6NYCRR Part 375. Borrow source mining would require a permit and storm water pollution prevention plan (SWPPP) for all disturbed areas greater than one acre in size. Vegetative cover stripping and cover placement would be performed under the BCP and would therefore require an equivalent SWPPP to address on-site impacts. Subgrade preparation activities would necessitate preparation of and adherence to a community air monitoring plan for particulates in accordance with NYSDEC

DER-10 Appendix 1B. As indicated above, this alternative is inconsistent with NYSDEC's DER-31 green remediation policy due to rapid loss of vegetative cover on- and off-site, as well as significant air emissions attributable to use of heavy diesel equipment for excavation and transport on-site and at the borrow source.

Long-Term Effectiveness and Permanence – Removal of the hotspot soil/fill areas as well as construction of a cover system prior to redevelopment would prevent direct contact with soil/fill exceeding restricted-commercial SCOs. The efficacy of the cover system would be maintained and monitored via the Site Management Plan. Periodic inspection and maintenance of the cover and possible repair of the soil and vegetative layers would be required to assure long-term cover integrity. The institutional controls outlined in Section 11 would be required for long-term effectiveness.

Reduction of Toxicity, Mobility, or Volume with Treatment – Removal of hotspot soil/fill would permanently and significantly reduce the toxicity, mobility, and volume of the soil/fill that could potentially be contacted or produce localized areas of environmental impact at the Site. However, since this alternative transfers Site soil/fill from one environment to another, an overall reduction of toxicity and volume would not occur, with the exception of the petroleum-impacted soil/fill bioremediated on-site and the arsenic-impacted soil/fill if stabilization is required. Placement of a soil cover over the remaining areas would somewhat reduce the mobility of contaminants from erosion, although the RI concluded that this pathway is not likely significant under the current (undeveloped) scenario. Accordingly the toxicity, mobility, and volume of remaining residual contaminants would not be appreciably reduced under this alternative.

Short-Term Effectiveness and Impacts – Similar to Alternative 2, the short-term adverse impacts and risks to the community, workers, and environment during implementation of this approach are significant. Because the Site clearing and soil cover placement would occur in a single construction season as opposed to a gradual progression during build out, excess physical hazards (primarily related to potential accidents from soil deliveries and associated increased truck traffic on NY State Route 5) would be expected. Disruption of the neighboring community would occur due to material transport, deliveries, noise, and air emissions from heavy equipment used to strip the Site and construct the cover. Community air monitoring, dust control, and soil erosion measures would be required during subgrade preparation and soil cover placement.

Moreover, under this alternative, the Phase II Business Park Area would require over 185,000 cubic yards of imported cover soil, which would be stripped from an off-site borrow source and then transported to the Site in approximately 13,215 truckloads and graded/raked using heavy, diesel-fueled grading equipment. This action alone would result in storm water impacts at the borrow source(s) and on-site; diesel fuel consumption on the order of 33,000 gallons (assuming 20 miles round trip, 8 miles per gallon); and related traffic, dust and air emissions. These impacts would be compounded when redevelopment is initiated, as much of the soil cover (est. 80%) would need to be removed and hauled off-site to allow for build out. Thus, an additional 27,000 gallons of diesel fuel may be consumed, resulting in total consumption of approximately 60,000 gallons of diesel fuel for transportation, with several thousands of gallons also consumed by excavation and grading equipment. The USEPA's estimated CO_2 generation rate for diesel engines is approximately 22.2 pounds per gallon of diesel consumed. Accordingly, the transportation of soil cover to the Site and subsequent removal and off-site transportation would produce approximately 1.3 million pounds of greenhouse gas while at the same time stripping hundreds of acres of CO_2 consuming trees and shrubs.

Finally, the existing soil/fill currently allows for good surface water percolation and drainage. If a soil cover were placed over the Phase II Business Park Area prior to redevelopment, it would be absent the permanent storm water drainage system and Site grading that will be designed and constructed when redevelopment occurs. As a result, ponding, washout, and undesirable drainage patterns can be expected, damaging the cover system if soil cover is placed before final grading and storm water collection and conveyance systems are in place. The RAOs would be achieved upon cover placement.

Implementability – Technical and administrative implementability issues anticipated under this alternative include difficulty locating local borrow sources for such a large volume of cover soil (estimated 185,000 cubic yards); traffic coordination for trucks entering and exiting NY State Route 5; the need to integrate the cover with rail lines traversing the property; and the need to design and provide for significant erosion and storm water controls to mitigate ponding, washout, and undesirable storm water drainage and runoff patterns. A pre-redevelopment cover system is also certain to be damaged and repaired multiple times by development work and buried infrastructure (sewer, water, gas, electric, telephone, etc.), necessitating multiple inspections by an environmental professional, and documentation/ explanation in annual Periodic Review Reports.

No significant administrative implementability issues are associated with this alternative.

Cost-Effectiveness – The estimated capital cost for this alternative is $9.1 million, which includes: hotspot removal with disposal/treatment and in situ treatment; construction of the 12-inch landscape cover over the entire 143.55 acres; development of a Site Management Plan; and environmental-based redevelopment costs associated with removal of the temporary soil cover system. Annual OM&M costs for groundwater monitoring, cover maintenance, and annual certifications are estimated to be $36,000, resulting in an estimated 30-year present worth cost of $9.8 million. Table 14 presents a breakdown of these costs.

Land Use – This alternative would be consistent with the reasonably anticipated future use of the Site. However, the placement of soil cover over the Site would significantly impair the ability and cost of redeveloping the Site. Redevelopment would require the removal and displacement of most if not all the soil cover during infrastructure and building construction; necessitate deeper excavation to access existing for utilities; and limit the ability to locate existing foundations and other near-surface structures that may require removal during redevelopment.

10.2.4 Alternative 4: Hotspot Soil/Fill Remediation with Deferred Soil Cover System during Site Redevelopment

This alternative is similar to Alternative 3 in that it provides for construction of a 12-inch soil cover over exposed areas of the Site following hotspot soil/fill removal; however, the cover would be placed on a sub-parcel basis <u>during</u> the redevelopment stage to coordinate with and exclude the cover that inherently will be provided by building, road, parking areas and landscaping. COC issuance would occur on a sub-parcel basis following cover placement. A Site Management Plan and environmental easement (see Section 11) would be prepared for the entire Phase II Business Park Area and all sub-parcel COC holders would be required to adhere to those requirements. The size of the subparcel would vary according to the build-out plan; however, a minimum acreage (e.g., 12-15 acres) incorporating the proposed redevelopment buildings and structures is envisioned.

Overall Protection of Public Health and the Environment – Based on the removal of hotspot soil/fill and the fact that the Site is isolated, covered by indigenous vegetation, secured with fencing, and patrolled by security during off hours to discourage trespassing, this alternative is protective of human health and the environment under the current (undeveloped) scenario. This alternative would be protective of human health and the environment under the future use scenario, as it provides for implementation of the 12-inch cover system in areas not otherwise covered by buildings, roads, etc. Therefore, Alternative 4 successfully achieves the RAOs for the Site.

Compliance with SCGs – Excavation and off-site disposal, as well as on-site biotreatment of petroleum-impacted soil/fill, would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Imported cover material would need to meet backfill quality criteria per 6NYCRR Part 375. Borrow source mining would require a permit and storm water pollution prevention plan (SWPPP) for all disturbed areas greater than one acre in size. Vegetative cover would be placed during the redevelopment period along with building, road, and other build-out and as such would be subject to storm water regulations. Soil excavation and cover activities would necessitate preparation of and adherence to a community air monitoring plan for particulates in accordance with NYSDEC DER-10 Appendix 1B.

Long-Term Effectiveness and Permanence – Removal of the hotspot soil/fill areas as well as construction of a cover system on a subparcel basis prior to occupancy would prevent direct contact with soil/fill exceeding restricted-commercial SCOs. The efficacy of the cover system will be maintained and monitored via the Site Management Plan. Periodic inspection and maintenance of the soil cover as well as the "hardscape" cover provided by asphalt roads, concrete, etc. would be required to assure long-term cover integrity. The institutional controls outlined in Section 11 would be required for long-term effectiveness.

Reduction of Toxicity, Mobility, or Volume with Treatment – Removal of hotspot soil/fill would permanently and significantly reduce the toxicity, mobility, and volume of the soil/fill that could potentially be contacted or produce localized areas of environmental impact at the Site. However, since this alternative transfers Site soil/fill from one environment to another, an overall reduction of toxicity and volume would not occur, with the exception of the petroleum-impacted soil/fill bioremediated on-site and the arsenic-impacted soil/fill if stabilization is required. Placement of a soil cover in conjunction with cover provided by build-out over the remaining areas may somewhat reduce the mobility of contaminants from erosion, although the RI concluded that this pathway is not likely significant under the current (undeveloped) scenario. Accordingly the toxicity, mobility, and volume of remaining residual contaminants would not be appreciably reduced under this alternative.

Short-Term Impacts and Effectiveness – Because cover will be placed on a gradual basis as development occurs and will exclude hardscape cover inherently provided by buildings, roads, parking areas, etc. (which are anticipated to represent 80-90% of the Site acreage), short-term impacts will be minimized. The net volume of soil cover required under this approach would be approximately 46,300 cubic yards, representing approximately 3,300 truck trips from borrow sources over a multi-year period in lieu of a single construction season, negating traffic concerns along Route 5. As the cover soil placement will coordinate with the build-out, no additional removal work will be required. Community air monitoring, dust control, and soil erosion measures would only be required during Site development. The RAOs would be achieved upon cover placement.

Implementability – No significant technical or administrative implementability issues are anticipated under this alternative.

Cost-Effectiveness – The estimated capital cost for this alternative is $2.2 million which includes: hotspot removal and disposal/treatment; cover system construction during remediation (i.e., areas not covered by building, parking, or roads, assumed to be approximately 20% of the Site); development of a Site Management Plan; and environmental-based redevelopment costs associated with air monitoring during intrusive work. Annual OM&M costs for groundwater monitoring, cover maintenance, and annual certifications are estimated to be $36,000, resulting in an estimated 30-year present worth cost of $2.9 million. Table 15 presents a breakdown of these costs.

Land Use – This alternative is consistent with the reasonably anticipated future use of the Site. Furthermore, this alternative facilitates redevelopment by deferring final soil cover placement until redevelopment, thus avoiding the costs, time delays, and unnecessary disruption of placing, removing, and replacing cover during building, road, and utility construction.

10.3 Evaluation of South Linde Area Groundwater Alternatives

The existing IRM groundwater collection and skimmer recovery systems have been effective in preventing migration of oils to Smokes Creek, and the treatment system has reliably reduced dissolved phase contaminant concentrations below levels acceptable for discharge to the Creek. Because of the persistence of floating product in piezometers and wells upgradient of the collection system and in groundwater recovered by the collection system, NYSDEC has indicated that more aggressive, expedited remedial measures are necessary to address these areas. The presence of free-phase product (non-aqueous phase liquid or NAPL) in the subsurface provides a continuing source of groundwater contaminants. Therefore, an RAO to improve South Linde Area groundwater cleanup measures provided by the existing activities has been developed.

In addressing the RAO, various in situ remediation technologies for the South Linde Area groundwater were initially considered including bioremediation, chemical oxidation, and saturated water injection. However, each of these technologies is associated with effectiveness or implementability issues as discussed below:

- Bioremediation involves creating geochemical conditions conducive to microbial growth. Depending on the oxidation state of the groundwater, either anaerobic or aerobic biodegradation can be implemented. Bioremediation can be an effective in situ remedial alternative but generally only occurs in the aqueous phase; microorganisms cannot degrade non-aqueous phase liquids directly.

- Chemical oxidation is a process that involves the injection of reactive chemical oxidants into groundwater and/or soil for the primary purpose of rapid contaminant destruction. Similar to bioremediation, chemical oxidation generally becomes less effective in the presence of NAPL. The quantity and volume of oxidant required to oxidize masses of recoverable NAPL will typically necessitate multiple chemical injections and may mobilize soluble phase contaminants through displacement due to the large volumes of chemical required. Moreover, the oxidant may migrate into Smokes Creek and/or the SRWT resulting in acute aquatic toxicity effects. In addition, there is a potential for violent exothermic reaction with NAPLs.
- Saturated water injection (SWI) is an emerging, innovative in situ technology for enhancement of NAPL recovery. SWI uses a gas infusion system to supersaturate water with carbon dioxide (CO_2) for injection below the water table. CO_2 gas bubbles that evolve from the carbonated water enhance the removal of trapped NAPL. The trapped NAPL is mobilized and migrates upward due to differential viscosity and buoyancy. This NAPL can then be recovered via conventional extraction and vapor phase recovery systems. Although promising for enhanced NAPL recovery, this technology is not yet proven and requires coupling with traditional removal technologies.

Therefore, the following groundwater remedial alternatives have been developed in accordance with the General Response Action of in-place treatment or enhanced removal of petroleum in the South Linde Area of the Site:

- Alternative 1: Operation of IRM pump and treat system with continued application of High Vacuum Extraction (HVE) to supplement product removal
- Alternative 2: Excavation of Source Area Soil/Fill with On-Site Treatment
- Alternative 3: Upgrade of IRM System and Supplemental Sampling

10.3.1 Alternative 1: Operation of IRM with Additional HVE

This alternative involves the: continued operation of the groundwater pump-and-treat system; and addition of MW-01 (due to the presence of NAPL) to the HVE program.

Overall Protectiveness of Public Health and the Environment **–** The existing IRM is effectively drawing Site groundwater to the collection system and protecting Smokes Creek and the SRWT; however, measurable product persists in the monitoring wells and piezometers. Therefore, the addition of MW-01 to the HVE events would enhance removal of product thereby achieving the RAO for the Site and maintaining protection of public health and the environment.

Compliance with SCGs – The IRM and supplemental HVE conform to applicable, relevant, and appropriate standards, guidance, and criteria. Discharge from the treatment system meets the limitations set by the SPDES permit; product removed by the HVE truck will be properly transported and disposed offsite at a permitted facility. Therefore, this alternative satisfies compliance with SCGs.

Long-Term Effectiveness and Permanence – The existing IRM mitigates off-site migration of contaminated groundwater to Smokes Creek and the SRWT, and is effectively reducing free-phase oil product collected in the subsurface. Therefore, continued operation with additional HVE will provide long-term effectiveness and permanence.

Reduction in Toxicity, Mobility, or Volume of Contamination through Treatment – The IRM has reduced the toxicity, mobility, and volume of Site groundwater contamination and free-phase oil product. Additional removal of product from MW-01 during the HVE events will further reduce the volume and mobility of contaminants, and likely decrease the toxicity of the collected groundwater. Therefore, this alternative satisfies this criterion.

Short-Term Impacts and Effectiveness – There are no short-term adverse impacts or risks to the community, Site workers, or the environment with implementation of this alternative. The potential for chemical exposures and physical injuries to field personnel during product removal and groundwater treatment system maintenance and monitoring are effectively reduced through safe work practices and the use of personal protective equipment (PPE).

Implementability – No technical or action-specific administrative implementability issues are associated with this alternative.

Cost-Effectiveness – There are no capital costs associated with this alternative. The annual (2011) cost for routine operation, maintenance & monitoring (OM&M) for the pump-and-treat IRM and oil recovery wells is approximately $45,000. The estimated cost to perform five HVE events during the 2011 calendar year, including all labor, equipment, and other expenses, is $23,000. This cost assumes that the oil will be deemed non-hazardous/suitable for recycling, and that the amount of material recovered during each event will total approximately 1,200 gallons. As shown on Table 16, the total 2011 OM&M cost for this alternative is approximately $68,000. The 10-year present worth cost of this alternative is approximately $580,000.

Land Use – This alternative would be consistent with industrial use as the reasonably anticipated future use of the Site.

10.3.2 Alternative 2: Excavation of Source Area Soil/Fill with On-Site Treatment

As described in Section 9.4, this alternative assumes dewatering of the South Linde Area soil/fill to below the depth of the smear zone (estimated between 9 and 23 fbgs) with excavation to this depth. Because of the proximity to and interconnectedness with Smokes Creek and the SRWT, water-tight sheet piling would need to be installed around the excavation in order for dewatering to be feasible. The top nine feet of fill is assumed to be non-impacted material and would be stockpiled for use as backfill for the excavation following verification sampling. The impacted soil/fill would be hauled to an onsite biopad (e.g., as constructed to address hotspot soil/fill) for on-site bioremediation. The excavation would be backfilled to grade with BUD-approved slag material. The existing groundwater treatment system would be moved off this area prior to excavation, and the three recovery wells would be operated to facilitate dewatering during excavation. The primary collection system (skimmer collection trench) would be removed during excavation and upon completion of the remedial measures the treatment system and recovery wells would be decommissioned.

Overall Protection of Public Health and the Environment – This alternative would achieve the RAO for the Site; however, the overall protection of public health and the environment would not be confirmed until downgradient groundwater monitoring indicated concentrations below GWQS/GVs.

Compliance with SCGs – Excavation and on-site biotreatment of impacted soil/fill would need to be performed in accordance with applicable, relevant, and appropriate SCGs. Excavation activities would necessitate preparation of and adherence to a community air monitoring plan for particulates in accordance with NYSDEC DER-10 Appendix 1B. Post-remedial downgradient groundwater monitoring would indicate whether this alternative complies with GWQS/GVs.

Long-Term Effectiveness and Permanence – Removal of the smear zone soil/fill would likely remove remaining NAPL from in the subsurface. However, because the collection and treatment system would be decommissioned any required post-remedial groundwater polishing to address residual soluble phase organics would require construction of a new system. Therefore, the long-term effectiveness and permanence of this alternative is uncertain.

Reduction of Toxicity, Mobility, or Volume with Treatment – Removal and treatment of source area soil/fill would permanently and significantly reduce the toxicity, mobility, and volume of impacted soil/fill and the groundwater that would be in contact with free-phase oil product in the subsurface.

Short-Term Effectiveness and Impacts – Community air monitoring, dust control, and soil erosion measures would be required during excavation and biotreatment of the soil/fill. The RAO would be achieved upon treatment of the soil/fill and placement of slag backfill into the excavation.

Implementability – Technical implementability issues anticipated under this alternative include the significant volume of water that will be generated in order to dewater during excavation below the smear zone since Smokes Creek and the SRWT are adjacent to and hydraulically contacted to the South Linde Area. Installation of water-tight sheet piling to isolate the excavation area would be difficult and costly, and may not be effective in reducing the volume of water generated. No significant administrative implementability issues are associated with this alternative.

Cost-Effectiveness – The capital cost for this alternative is approximately $800,000, which includes: excavation of impacted smear zone soil/fill and on-site bioremediation. Table 17 presents a breakdown of this cost.

Land Use – This alternative would be consistent with industrial use as the reasonably anticipated future use of the Site.

10.3.3 Alternative 3: Upgrade of IRM System and Supplemental Sampling

This alternative involves additional soil sampling as well as upgrades to the groundwater pump-and-treat system. As shown on Figure 5, four geoprobes will be advanced along the property boundary adjacent to Smokes Creek to check for downgradient impact, and two geoprobes will be advanced to the west and east of piezometers PZ-01 and PZ-02, where measureable product is routinely measured. Collected soil/fill samples will be analyzed for VOCs and SVOCs. The geoprobes will be converted to 1-inch temporary wells in order to monitor for the presence of product. The existing groundwater pump-and-treat system and product removal at the South Linde Area is effectively capturing and treating impacted groundwater. Under Alternative 3, the intermittent high vacuum extraction (HVE) events will be discontinued. Piezometer PZ-2 will be overdrilled to construct a 6-inch recovery well in its place. The belt skimmer currently operating at RW-3 was effective to the point that there is no residual product in that area of the Site; therefore it will be moved to the new monitoring well (former PZ-2 location) for continuous oil removal.

Overall Protectiveness of Public Health and the Environment **–** The existing IRM is effectively drawing Site groundwater to the collection system and protecting Smokes Creek and the SRWT; however, measurable product persists in the monitoring wells and piezometers. Therefore, the addition of continuous oil removal at PZ-02 would enhance removal of product thereby achieving the RAO for the Site and maintaining protection of public health and the environment. The results of the supplemental soil sampling will determine the need for additional remedial measures to decrease the time for cleanup of this area.

Compliance with SCGs – The IRM conforms to applicable, relevant, and appropriate standards, guidance, and criteria. Discharge from the treatment system meets the limitations set by the SPDES permit; product removed by the belt skimmers is properly transported and disposed at an off-site permitted facility. Therefore, this alternative satisfies compliance with SCGs.

Long-Term Effectiveness and Permanence – The existing IRM mitigates off-site migration of contaminated groundwater to Smokes Creek and the SRWT, and is effectively reducing free-phase oil product collected in the subsurface. Therefore, continued operation with additional continuous oil removal from the subsurface will provide long-term effectiveness and permanence.

Reduction in Toxicity, Mobility, or Volume of Contamination through Treatment – The IRM has reduced the toxicity, mobility, and volume of Site groundwater contamination and free-phase oil product. The additional of continuous product removal from the vicinity of PZ-02 will further reduce the volume and mobility of contaminants, and likely decrease the toxicity of the collected groundwater. Therefore, this alternative satisfies this criterion.

Short-Term Impacts and Effectiveness – There are no short-term adverse impacts or risks to the community, Site workers, or the environment with implementation of this alternative. The potential for chemical exposures and physical injuries to field personnel during geoprobe advancement, soil sampling, product removal, and groundwater treatment system maintenance and monitoring are effectively reduced through safe work practices and the use of personal protective equipment (PPE).

Implementability – No technical or action-specific administrative implementability issues are associated with this alternative.

Cost-Effectiveness – The estimated capital cost for this alternative is $11,000, which includes: the supplemental soil sampling event, installation of the recovery well, and relocation of the belt skimmer equipment and shed. The annual (2011) cost for routine operation, maintenance & monitoring (OM&M) for the pump-and-treat IRM is approximately $45,000. The OM&M cost assumes that the oil recovered by the belt skimmers continues to be deemed non-hazardous/suitable for recycling and the quantity recovered is approximately 400 gallons. As shown on Table 18, the 10-year present worth cost of this alternative is approximately $395,000.

10.4 Proposed Remedy

The previous sections describe the remedial alternatives for Site soil/fill and South Linda Area groundwater, and evaluate these alternatives against the screening criteria. This final section of the evaluation considers the information and evaluations contained in the previous sections to identify appropriate remedial measures to achieve the RAOs for the Phase II Business Park Area.

The proposed remedial approach for the impacted soil/fill is Alternative 4 – Hotspot Soil/Fill Remediation with Deferred Soil Cover System during Redevelopment – because it satisfies the RAOs for the Site, is significantly less disruptive to the community, is consistent with current and future land use, and represents a lower cost than Alternatives 2 or 3. This alternative would involve removal or in-place treatment of the 15 hotspot areas described in Section 9.3, summarized in Table 9, and shown on Figure 5. Hotspots A through F (petroleum-impacted soil/fill – estimated 4,315 cubic yards) would be removed and subjected to ex-situ bioremediation. Hotspots G through I would be treated in situ. Hotspots J through O (arsenic-impacted soil/fill – estimated 370 cubic yards) would be removed and disposed off-site. As a condition of COC issuance, Site developers would be required to cover all soil/fill areas that exceed the restricted-commercial SCOs through placement of asphalt, building, or landscape cover. The landscape cover would involve placement of at least 12 inches of clean soil followed by seeding to promote vegetative growth. The clean soil would be required to meet NYSDEC DER-10 standards for commercial sites (i.e., lower of Part 375 human health or groundwater protection values for restricted-commercial sites). The 30-year present worth cost is estimated to be $2.9 million with a projected $2.2 million for capital expenditures and $36,000 for annual groundwater monitoring, Site maintenance, and environmental easement certification.

The proposed remedy for the South Linde Area groundwater is Alternative 3 – Upgrade of IRM System and Supplemental Sampling. The existing IRM collection and product recovery systems have been effective in preventing migration of oils to Smokes Creek, and the treatment system has reliably reduced dissolved phase contaminant concentrations below levels acceptable for discharge to the Creek. Under this alternative, the intermittent HVE events will be discontinued. Piezometer PZ-2 will be overdrilled to construct a 6-inch recovery well in its place. The belt skimmer currently operating at RW-3 has negligible capture of product and will therefore be moved to the new location (former PZ-2) for continuous oil removal. The continuous oil removal in the vicinity of PZ-2proposed with this alternative will increase the removal of free-phase oil product from the area thereby satisfying the groundwater RAO for the South Linde Area of the Site. The estimated capital cost is $11,000, and the annual (2011) OM&M cost for this alternative is estimated at $45,000 for a 10-year present worth cost of approximately $395,000. There will likely be a marginal increase in these costs each year due to the cost of living increases for materials and labor.

11.0 POST-REMEDIAL REQUIREMENTS

11.1 Final Engineering Report

Following completion of the hotspot area remedial measures, a Construction Completion Report (CCR) documenting the cleanup activities and an associated Site Management Plan (SMP) and easement will be prepared for the Phase II Business Park Site. A Final Engineering Report (FER) and addenda to the SMP (if required) will be submitted to the NYSDEC on a sub-parcel basis as cover is placed. The FER will refer to the larger (site-wide) CCR and will include the following information and documentation, consistent with the NYSDEC regulations contained in 6 NYCRR Part 375-1.6(c):

- Background and Site description.
- Summary of the Site remedy that satisfied the remedial action objectives for the Site.
- Certification by a professional engineer to satisfy the requirements outlined in 6 NYCRR Part 375-1.6(c)(4).
- Description of engineering and institutional controls at the Site.
- Site map showing the areas remediated.
- Documentation of imported materials.
- Documentation of materials disposed off-site.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Air monitoring data and reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Work Plan.
- Analytical data packages and data usability summary reports (DUSRs).

11.2 Site Management Plan

A Site Management Plan (SMP) will be prepared and submitted concurrent with the FER. The purpose of the Site Management Plan is to assure that proper procedures are in

TURNKEY ENVIRONMENTAL RESTORATION, LLC

place to provide for long-term protection of human health and the environment after remedial construction is complete. The SMP is comprised of four main components:

- Engineering and Institutional Control Plan
- Site Monitoring Plan
- Operation and Maintenance Plan
- Inspections, Reporting, and Certifications

11.2.1 Engineering and Institutional Control Plan

An institutional control in the form of a new Environmental Easement will be necessary to limit future use of the Site to restricted (commercial or industrial) applications and prevent groundwater use for potable purposes. An existing deed restriction is on file for the Tecumseh Site limiting reuse to commercial/industrial applications. However, industrial uses are loosely defined and allow incidental commercial-type facilities such as offices and laboratories, provided that they do not provide for occupancy by multiple numbers of persons under the age of 18. The deed restriction also prohibits construction or use of groundwater extraction wells (excluding monitoring and remediation wells).

Tecumseh will prepare an Engineering and Institutional Control (EC/IC) Plan that will include a complete description of all institutional and/or engineering controls employed at the Site, including the mechanisms that will be used to continually implement, maintain, monitor, and enforce such controls. The EC/IC Plan will include:

- A description of all EC/ICs on the Site.
- The basic implementation and intended role of each EC/IC.
- A description of the key components of the ICs set forth in the Environmental Easement.
- A description of the features to be evaluated during each required inspection and periodic review, including the EC/IC certification, reporting, and Site monitoring.
- A description of plans and procedures to be followed for construction of the 12-inch soil cover as a condition of occupancy.
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

11.2.2 Site Monitoring Plan

The Site Monitoring Plan will describe the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, including:

- Sampling and analysis of all appropriate media (e.g., groundwater).
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil.
- Assessing achievement of the remedial performance criteria.
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Site Monitoring Plan will provide information on:

- Sampling locations, protocol, and frequency.
- Information on all designed monitoring systems (e.g., well logs).
- Analytical sampling program requirements.
- Reporting requirements.
- Quality Assurance/Quality Control (QA/QC) requirements.
- Inspection and maintenance requirements for monitoring wells.
- Monitoring well decommissioning procedures.
- Annual inspection and periodic certification.

Semi-annual groundwater monitoring to assess overall reduction in contamination on-site and off-site will be conducted for the first two years. The frequency thereafter will be discussed with the NYSDEC. Trends in contaminant levels in groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals.

11.2.3 Operation and Maintenance Plan

An Operation & Maintenance (O&M) plan governing maintenance of the cover system will include:

- Include the operation and maintenance activities necessary to allow individuals unfamiliar with the Site to maintain the soil cover system.
- Include an O&M contingency plan.
- Evaluate Site information periodically to confirm that the remedy continues to be effective for the protection of public health and the environment. If necessary, the O&M Plan will be updated to reflect changes in Site conditions or the manner in which the cover system is maintained.

11.2.4 Inspections, Reporting, and Certifications

11.2.4.1 Inspections

Site-wide inspection will be conducted annually or as otherwise approved by the NYSDEC. All applicable inspection forms and other records, including all media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format in a Periodic Review Report.

11.2.4.2 Reporting

The Periodic Review Report will be submitted to the NYSDEC annually, or as otherwise approved, beginning 18 months after the Certificate of Completion or equivalent document is issued. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period. The Periodic Review Report will include:

- Identification, assessment, and certification of all EC/ICs required by the remedy for the Site.
- Results of the required annual Site inspections and severe condition inspections, if applicable.
- All applicable inspection forms and other records generated for the Site during the reporting period in electronic format.
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted.

These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format.
- A Site evaluation that includes the following:
  - The compliance of the remedy with the requirements of the site-specific RAWP, ROD, or Decision Document.
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications.
  - Any new conclusions or observations regarding Site contamination based on inspections or data generated by the Site Monitoring Plan for the media being monitored.
  - Recommendations regarding any necessary changes to the remedy and/or Site Monitoring Plan.
  - The overall performance and effectiveness of the remedy.

Individual sub-parcels owners will be encouraged to retain a common professional engineering firm to prepare the Periodic Review Report with individual EC/IC certifications as discussed below.

11.2.4.3 Certification

For each sub-parcel a signed EC/IC Certification will be included in the Periodic Review Report described in Section 11.2.4.2: For each institutional or engineering control identified for the Site, a Professional Engineer licensed to practice in New York State will certify that all of the following statements are true:

- The inspection of the Site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction.
- The engineering and institutional controls employed at this Ste are unchanged from the date the control was put in place, or last approved by the NYSDEC.
- Nothing has occurred that would impair the ability of the control to protect the public health and environment.
- Nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control.

- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control.
- If a financial assurance mechanism is required under the oversight document for the Site, the mechanism remains valid and sufficient for the intended purpose under the document.
- Use of the Site is compliant with the Environmental Easement.
- The engineering control systems are performing as designed and are effective.
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the Site remedial program and generally accepted engineering practices.
- The information presented in this report is accurate and complete.

11.2.4.4 Corrective Measures Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Plan until it is approved by the NYSDEC.

12.0 REFERENCES

1. *RCRA Facility Investigation (RFI) Report for the Former Bethlehem Steel Corporation Facility, Lackawanna, New York, Parts I through VII*, prepared for Bethlehem Steel Corporation by URS Consultants, Inc., January 2005.
2. *RCRA Facility Assessment (RFA) Report for the Bethlehem Steel Corporation Facility, Lackawanna, New York*. EPA-330/2-88-054. NEIC, Denver, CO. 1988.
3. *Remedial Investigation/Alternatives Analysis Report Work Plan for Phase II Business Park*, prepared for ArcelorMittal Tecumseh Redevelopment Inc. by TurnKey Environmental Restoration, LLC, July 2009.
4. *Interim Remedial Measures (IRM) Work Plan, Railroad Realignment, Phase I-III Business Park Areas, Lackawanna, New York, BCP Site Nos. C915197-C915199*, prepared for Tecumseh Redevelopment Inc. by TurnKey Environmental Restoration, LLC, October 2010.
5. *DER-10/Technical Guidance for Site Investigation and Remediation*, prepared by New York State Department of Environmental Conservation, May 3, 2010.

TABLES

TABLE 1

CONSTITUENTS OF PRIMARY CONCERN (COPCs)

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

COMPOUND	CAS #
Volatile Organic Compounds	
(STARS Method 8021B)	
Benzene	*71-43-2*
n-Butylbenzene	*104-51-8*
sec-Butylbenzene	*135-98-8*
tert-Butylbenzene	*98-06-6*
p-Cymene	*99-87-6*
Ethylbenzene	*100-41-4*
Isopropylbenzene	*98-82-8*
Methyl tert butyl ether	*1634-04-4*
n-Propylbenzene	*103-65-1*
Toluene	*108-88-3*
1,2,4-Trimethylbenzene	*95-63-6*
1,3,5-Trimethylbenzene	*108-67-8*
m-Xylene	*95-47-6*
o-Xylene	*106-42-3*
p-Xylene	*108-38-3*
TCL Semi-Volatile Organic Compounds	
(Method 8270C - base/neutrals only)	
Acenaphthene	*83-32-9*
Acenaphthylene	*208-96-8*
Anthracene	*120-12-7*
Benzo(a)anthracene	*56-55-3*
Benzo(b)fluoranthene	*205-99-2*
Benzo(k)fluoranthene	*207-08-9*
Benzo(g,h,i)perylene	*191-24-2*
Benzo(a)pyrene	*50-32-8*
Benzyl alcohol	*100-51-6*
Bis(2-chloroethoxy) methane	*111-91-1*
Bis(2-chloroethyl) ether	*111-44-4*
2,2'-Oxybis (1-Chloropropane)	*108-60-1*
Bis(2-ethylhexyl) phthalate	*117-81-7*
4-Bromophenyl phenyl ether	*101-55-3*
Butyl benzyl phthalate	*85-68-7*
4-Chloroaniline	*106-47-8*
2-Chloronaphthalene	*91-58-7*
4-Chlorophenyl phenyl ether	*7005-72-3*
Chrysene	*218-01-9*
Dibenzo(a,h)anthracene	*53-70-3*
Dibenzofuran	*132-64-9*
Di-n-butyl phthalate	*84-74-2*
1,2-Dichlorobenzene	*95-50-1*
1,3-Dichlrobenzene	*541-73-1*
1,4-Dichlrobenzene	*106-46-7*
3,3'-Dichlorobenzidine	*91-94-1*
Diethyl phthalate	*84-66-2*

COMPOUND	CAS #
TCL Semi-Volatile Organic Compounds (cont'd)	
(Method 8270C - base/neutrals only)	
Dimethyl phthalate	*131-11-3*
2,4-Dinitrotoluene	*121-14-2*
2,6-Dinitrotoluene	*606-20-2*
Di-n-octyl phthalate	*117-84-0*
Fluoranthene	*206-44-0*
Fluorene	*86-73-7*
Hexachlorobenzene	*118-74-1*
Hexachlorobutadiene	*87-68-3*
Hexachlorocyclopentadiene	*77-47-4*
Hexachloroethane	*67-72-1*
Indeno(1,2,3-cd)pyrene	*193-39-5*
Isophorone	*78-59-1*
2-Methylnaphthalene	*91-57-6*
Naphthalene	*91-20-3*
2-Nitroaniline	*88-74-4*
3-Nitroaniline	*99-09-2*
4-Nitroaniline	*100-01-6*
Nitrobenzene	*95-95-3*
N-Nitrosodiphenylamine	*86-30-6*
N-Nitroso-Di-n-propylamine	*621-64-7*
Phenanthrene	*85-01-8*
Pyrene	*129-00-0*
1,2,4-Trichlorobenzene	*120-82-1*
Total Metals	
(Method 6010B)	
Arsenic	*7440-38-2*
Barium	*7440-39-3*
Cadmium	*7440-43-9*
Chromium	*7440-47-3*
Lead	*7439-92-1*
Mercury *(Method 7470A(water) and 7471A(s*	*7439-97-6*
Wet Chemistry	
Cyanide *(Method 9010B)*	*57-12-5*
PCBs	
Method 8082	
Aroclor 1016	*12674-11-2*
Aroclor 1221	*11104-28-2*
Aroclor 1232	*11141-16-5*
Aroclor 1242	*53469-21-9*
Aroclor 1248	*12672-29-6*
Aroclor 1254	*11097-69-1*
Aroclor 1260	*11096-82-5*

TABLE 2

EXPANDED PARAMETER LIST

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Collected 1 per 10 samples per matrix

COMPOUND	CAS #
TCL Volatile Organic Compounds	
(Full List TCL VOCs plus STARS, via Method 8260B)	
Acetone	67-64-1
Benzene	71-43-2
Bromoform	75-25-2
Bromochloromethane	74-97-5
Bromodichloromethane	75-27-4
Bromomethane (Methyl bromide)	74-83-9
2-Butanone (MEK)	78-93-3
n-Butylbenzene	104-51-8
sec-Butylbenzene	135-98-8
tert-Butylbenzene	98-06-6
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroethane	75-00-3
Chloroform	67-66-3
Chloromethane (Methyl chloride)	74-87-3
Cyclohexane	110-82-7
p-Cymene (p-isopropyltoluene)	99-87-6
1,2-Dibromo-3-chloropropane	96-12-8
1,2-Dibromoethane (EDB)	106-93-4
Dibromochloromethane	124-48-1
Dichlorodifluoromethane (Freon-12)	75-71-8
1,2-Dichlorobenzene	95-50-1
1,3-Dichlorobenzene	541-73-1
1,4-Dichlorobenzene	106-46-7
1,1-Dichloroethane	75-34-3
1,2-Dichloroethane (EDC)	107-06-2
1,1-Dichloroethylene (1,1-DCE)	75-35-4
trans-1,2-Dichloroethylene	156-60-5
cis-1,2-Dichloroethylene	156-59-2
cis-1,3-Dichloropropene	10061-01-5
trans-1,3-Dichloropropene	10061-02-6
1,2-Dichloropropane	78-87-5
Ethylbenzene	100-41-4
2-Hexanone	591-78-6
Isopropylbenzene (Cumene)	98-82-8
Methyl acetate	79-20-9
Methylene chloride	75-09-2
Methylcyclohexane	108-87-2
4-methyl-2-pentanone (MIBK)	108-10-1
Methyl tert butyl ether (MTBE)	1634-04-4
n-Propylbenzene	103-65-1
Styrene	100-42-5
1,1,2,2-Tetrachloroethane	630-20-6
Tetrachloroethylene (PCE)	127-18-4
Toluene	108-88-3
1,2,3-Trichlorobenzene	87-61-6
1,2,4-Trichlorobenzene	120-82-1
1,1,1-Trichloroethane	71-55-6
1,1,2-Trichloroethane	79-00-5
Trichloroethylene (TCE)	79-01-6
Trichlorofluoromethane (Freon-11)	75-69-4
1,1,2-Trichloro-1,2,2-trifluoroethane (Fre	76-13-1
1,2,4-Trimethylbenzene	95-63-6
1,3,5-Trimethylbenzene	108-67-8
Vinyl chloride	75-01-4
m-Xylene	95-47-6
o-Xylenes	106-42-3
p-Xylene	108-38-3
Total Xylenes	1330-20-7

COMPOUND	CAS #
TCL Semi-Volatile Organic Compounds	
(Method 8270C - base-neutrals and acid extractables)	
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Benzo(k)fluoranthene	207-08-9
Benzyl alcohol	100-51-6
bis(2-Chloroethoxy)methane	111-91-1
bis(2-Chloroethyl)ether	111-44-4
2,2'-oxybis(1-chloropropane); bis(2-chloroisopropyl)ether	108-60-1
bis(2-Ethylhexyl)phthalate	117-81-7
Butyl benzyl phthalate	85-68-7
4-Bromophenyl phenyl ether	101-55-3
4-Chloroaniline	106-47-8
4-Chloro-3-methylphenol	59-50-7
2-Chloronaphthalene	91-58-7
2-Chlorophenol	95-57-8
4-Chlorophenyl-phenylether	7005-72-3
Chrysene	218-01-9
Dibenzo(a,h)anthracene	53-70-3
Dibenzofuran	132-64-9
3,3'-Dichlorobenzidine	91-94-1
2,4-Dichlorophenol	120-83-2
1,2-Dichlorobenzene	95-50-1
1,3-Dichlorobenzene	541-73-1
1,4-Dichlorobenzene	106-46-7
Diethyl phthalate	84-66-2
2,4-Dimethylphenol	105-67-9
Dimethyl phthalate	131-11-3
Di-n-butyl phthalate	84-74-2
Di-n-octyl phthalate	117-84-0
4,6-Dinitro-2-methylphenol	534-52-1
2,4-Dinitrophenol	51-28-5
2,4-Dinitrotoluene	121-14-2
2,6-Dinitrotoluene	606-20-2
Fluoranthene	206-44-0
Fluorene	86-73-7
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3
Hexachlorocyclopentadiene	77-47-4
Hexachloroethane	67-72-1
Indeno(1,2,3-cd)pyrene	193-39-5
Isophorone	78-59-1
2-Methylnaphthalene	91-57-6
2-Methylphenol (o-Cresol)	95-48-7
4-Methylphenol (p-Cresol)	106-44-5
Naphthalene	91-20-3
2-Nitroaniline	88-74-4
3-Nitroaniline	99-09-2
4-Nitroaniline	100-01-6
Nitrobenzene	98-95-3
2-Nitrophenol	88-75-5
4-Nitrophenol	100-02-7

COMPOUND	CAS #
TCL Semi-Volatile Organic Compounds	
(Method 8270C - base-neutrals and acid extractables)	
N-Nitrosodiphenylamine	86-30-6
N-Nitroso-di-n-propylamine	621-64-7
Pentachlorophenol	87-86-5
Phenanthrene	85-01-8
Phenol	108-95-2
Pyrene	129-00-0
1,2,4-Trichlorobenzene	120-82-1
2,4,5-Trichlorophenol	95-95-4
2,4,6-Trichlorophenol	88-06-2
TAL Metals	
(Method 6010B)	
Antimony	7440-38-2
Arsenic	7440-38-2
Barium	7440-39-3
Beryllium	7440-39-3
Cadmium	7440-43-9
Calcium	7440-70-2
Chromium	7440-47-3
Cobalt	7440-48-4
Copper	7440-50-8
Iron	7439-89-6
Lead	7439-92-1
Mercury (Method 7470A(water) and 7471A(solid))	7439-97-6
Magnesium	7439-95-4
Manganese	7439-96-5
Nickel	7440-02-0
Potassium	7440-09-7
Selenium	7782-49-2
Silver	7440-22-4
Sodium	7440-23-5
Thallium	7440-28-0
Vanadium	7440-62-2
Zinc	7440-66-6
Wet Chemistry	
Cyanide (Method 9010B)	57-12-5
PCBs	
Method 8082	
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5

TABLE 3A

ANALYTICAL PROGRAM QUALITY ASSURANCE/ QUALITY CONTROL SUMMARY

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Matrix	Parameter [1]	Number of Samples Collected	Number of QC Samples Collected			
			Trip Blank [2]	MS [3]	MSD [3]	Blind Duplicate [3]
Soil/Fill - Subsurface	STARS VOCs [4]	14		1	1	1
	Full List + STARS VOCs [5]	18		1	1	1
	TCL SVOCs (BN only) [6]	51		3	3	3
	TCL SVOCs [7]	18		1	1	1
	COPC Metals [8]	55		3	3	3
	TAL Metals [9]	13		1	1	1
	Cyanide [10]	45		3	3	3
	TCL PCBs[11]	28		2	2	2
Groundwater [15]	STARS VOCs [4]	8				
	Full List + STARS VOCs [5]	2	1	1	1	1
	TCL SVOCs (BN only) [6]	8				
	TCL SVOCs [7]	2		1	1	1
	COPC Metals [8]	8				
	TAL Metals + Cyanide [9, 10, 12]	2		1	1	1
	Equipment Blank [13]	1				
	Field Parameters [14]	10				

Notes:

1. All analyses will be performed via SW-846 methodologies with Category B equivalent deliverables package.
2. Trip blanks will be submitted to the laboratory each day groundwater volatile organic samples are collected.
3. Blind duplicate and MS/MSD samples will be collected at a frequency of 1 per 20 samples collected.
4. NYSDEC Spill Technology and Remediation Series (STARS) List VOCs via Method 8021B.
5. Full TCL list of VOCs plus the STARS List VOCs, via Method 8260B.
6. TCL SVOCs, base-neutrals (BN) only, via Method 8270C.
7. Full TCL list of SVOCs, including base-neutrals and acid extractables, via Method 8270C.
8. COPC Metals include: arsenic (6010B), barium (6010B), cadmium (6010B), chromium (6010B), lead (6010B), mercury (7470A for water; 7471A for soil).
9. TAL Metals, via Method 6010B, per Table 2.
10. Cyanide via Method 9010B.
11. Full TCL list of PCBs via Method 8082.
12. A filtered (soluble) metals sample will be collected and analyzed if sample turbidity exceeds 50 NTU.
13. An Equioment Blank will be analyzed for full list parameters only if non-dedicated equipment is used.
14. Field parameters include: pH, specific conductance, Eh, turbidity, and temperature.
15. Groundwater will be analyzed from existing wells MW-01, MW-07A and MW-07B and new monitoring wells MWN-63A, MWN-63D, MWN-64A, MWS-32A, MWS-36A, and MWS-37A and MWN-65D (see Figure 2).

Acronyms:

BN = Base Neutral SVOC Compounds
TCL = Target Compound List
TAL = Target Analyte List
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
STARS = Spill Technology And Remediation Series; NYSDEC
COPCs = Constituents of Potential Concern
MS = Matrix Spike
MSD = Matrix Spike Duplicate
NA = Not Applicable

TABLE 3B

SUBSURFACE SOIL/FILL ANALYTICAL PROGRAM SUMMARY
TEST PIT INVESTIGATION

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Investigation Location (BPA 2-TP-#)	Rationale	Number of Samples [1,2]	Blind Duplicate Samples Collected[5]	STARS List VOCs	Full List VOCs [3,4]	SVOCs (BN only)	TCL SVOCs	COPC Metals	TAL Metals	Cyanide	PCBs
TP-1	General Coverage: No known or suspected impact	1				1		1			
TP-2	General Coverage: No known or suspected impact	1				1		1			
TP-3	General Coverage: No known or suspected impact										
TP-4	General Coverage: No known or suspected impact										
TP-5	General Coverage: No known or suspected impact										
TP-6	General Coverage: No known or suspected impact	1	1			1		1			
TP-7	Area of fuel and oil tanks	1			1		1		1	1	1
TP-8											
TP-9	Area of incinerator and paint storage shed										
TP-10		1		1		1		1		1	
TP-11	General Coverage: No known or suspected impact	1				1		1			
TP-12	Area of fuel and oil tanks	1		1		1		1		1	
TP-13		1			1		1		1	1	1
TP-14	Area of outdoor substation (transformers)										
TP-15		1				1		1		1	1
TP-103		1				1		1			1
TP-16	Area of former diesel tank and pump house	1		1		1					
TP-17		1			1		1		1	1	1
TP-18		1		1		1		1		1	
TP-19	Area of fuel oil tank	1				1		1		1	
TP-20	General Coverage: No known or suspected impact	1			1		1		1	1	1
TP-21	Area of former oil house and tar storage	1		1		1		1		1	
TP-22											
TP-23		1			1		1		1	1	1
TP-24	General Coverage: No known or suspected impact	1				1		1			
TP-25	Area of former incinerator	1				1		1		1	
TP-26											
TP-27	General Coverage: No known or suspected impact	1				1		1			
TP-28											
TP-29	Area of former Cold Saw No. 3										
TP-30		1			1		1		1	1	1
TP-31	Area of former Cold Saw No. 4										
TP-32		1				1		1		1	
TP-33	Area of former Cold Saw No. 5	1				1		1		1	1
TP-34		1						1			
TP-35	Former Cold Saw Oil House	1				1		1		1	
TP-36	Area of former transformer (Cold Saw Area)	1				1		1		1	1
TP-37	Area of Cold Saw No. 6										
TP-38		1		1		1		1		1	
TP-39	Area of former Cold Saw Shed No. 3	1				1		1		1	
TP-40	Area of Electric Service Building	1				1		1		1	1

TABLE 3B

SUBSURFACE SOIL/FILL ANALYTICAL PROGRAM SUMMARY
TEST PIT INVESTIGATION

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Investigation Location (BPA 2-TP-#)	Rationale	Number of Samples [1,2]	Blind Duplicate Samples Collected[5]	STARS List VOCs	Full List VOCs [3,4]	SVOCs (BN only)	TCL SVOCs	COPC Metals	TAL Metals	Cyanide	PCBs
TP-41	Area of former Cold Saw Shed No. 2	1				1		1		1	
TP-42											
TP-43	Area of former Cold Saw Shed No. 1	1	1			1		1		1	
TP-44											
TP-45	Area of former Structural Shipping Yard (transformer)	1				1		1		1	1
TP-46	General Coverage: No known or suspected impact	1				1		1			
TP-47	General Coverage: No known or suspected impact	1				1		1			
TP-48	Area of former Car Repair Shop	1	1		1		1		1	1	1
TP-49		1				1		1			
TP-50		1				1		1		1	
TP-51											
TP-52		1				1		1		1	
TP-53		1			1		1				1
TP-54											
TP-55		1		1		1		1		1	
TP-56	General Coverage: No known or suspected impact	1				1		1			1
TP-57	Area of former 14"-18" Mill (5 - transformers)	1				1		1		1	1
TP-97		1				1		1			
TP-58	Area of former 14"-18" Mill (Furnace Building), fuel oil tank, pump house	1	1	1		1		1		1	
TP-59											
TP-60		1			1		1		1	1	1
TP-61											
TP-62	Area of former Repair Shop/Sump	1				1		1		1	
TP-63											
TP-64		1		1		1		1		1	
TP-95		1			1		1	1			
TP-95B		1							1		
TP-65	General Coverage: No known or suspected impact	1				1		1			
TP-66	Area of former pipe tunnel/pump house	1		1		1		1		1	
TP-67	Area of former transformer vault	1				1		1		1	1
TP-68	Area of former 54" Blooming Mill, pump house, pit										
TP-69		1			1		1		1	1	1
TP-70											
TP-94		1		1		1		1			
TP-71	Area of former Splice Bar Shop tanks (quench & fuel oil), oil pump house	1				1		1		1	
TP-72											
TP-73											
TP-74		1			1		1		1	1	1
TP-93		1		1		1		1			
TP-75	General Coverage: No known or suspected impact	1				1		1			
TP-76	Area of former craneway hydraulic pump house	1		1		1		1		1	1
TP-77											
TP-78	General Coverage: No known or suspected impact	1				1		1			

TABLE 3B

SUBSURFACE SOIL/FILL ANALYTICAL PROGRAM SUMMARY
TEST PIT INVESTIGATION

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Investigation Location (BPA 2-TP-#)	Rationale	Number of Samples [1,2]	Blind Duplicate Samples Collected[5]	STARS List VOCs	Full List VOCs [3,4]	SVOCs (BN only)	TCL SVOCs	COPC Metals	TAL Metals	Cyanide	PCBs
TP-79	Area of former 48" Roughing Mill, oil cellars										
TP-80		1			1		1		1	1	
TP-81		1		1		1					1
TP-81B		1		1		1					1
TP-82											
TP-83		1		1		1		1		1	
TP-84		1		1		1		1		1	
TP-85	Area of former 28"-35" Mill, pump house, transformers	1				1		1		1	1
TP-86		1			1		1		1	1	1
TP-87											
TP-88											
TP-96		1			1		1	1			1
TP-89	General Coverage: No known or suspected impact	1			1		1		1	1	1
TP-90	Area of former substation	1				1		1		1	1
TP-91	Area of active substation 7S	1				1		1			1
TP-92	Area of active substation 11A	1			1		1	1			1
TP-98	Area of active substation 10-A	1	1								1
TP-99		2			1						1
TP-99B		1			1						
TP-100	General Coverage: No known or suspected impact	1			1		1	1			
TP-101	Area of former pedestrian tunnel										
TP-102	Area of former Plant No. 2										
TP-104	Area of former paint storage shed	1				1					
TP-105	General Coverage: No known or suspected impact	1			1		1	1			
	TOTAL:	**79**	**5**	**17**	**21**	**54**	**19**	**56**	**14**	**45**	**32**

Notes:

1. All samples to be collected from 0-2' BGS interval unless field observations indicate greater impact with depth. A minimum of one per 10 samples shall be collected from 2' to bottom depth.
2. All locations shall be sampled and archived by the laboratory for potential analysis/reanalysis.
3. Full List VOCs = TCL VOCs plus STARS List VOCs via Method 8260B.
4. Full List VOCs analysis will be taken from any additional Test Pit based on elevated PID readings (>20) and visual and/or olfactory observations.
5. Blind duplicate samples were analyzed for the same analytes as their comparative sample.

Acronyms:

VOCs = volatile organic compounds
SVOCs = semi-volatile organic compounds
TCL = Target Compound List
TAL = Target Analyte List
BN = Base Neutrals
PCBs = Polychlorinated Biphenyls
STARS = Spill Technology And Remediation Series; NYSDEC
COPCs = Constituents of Potential Concern
SWMU = Solid Waste Management Unit
TP = Test Pit

TABLE 4

GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Well ID	Drill/Install Date	Ground Elev. (fmsl)	TOR Elev. (fmsl)	TOC Elev. (fmsl)	Well Depth (fbgs)	Screen Length (ft)	Screened Interval (fbgs)		Riser/Screen Dia. (in)	Riser/Screen Material	Screen Slot Size (in)	Stratigraphic Unit Monitoring
							Top	Bottom				
Monitoring Wells North of Smokes Creek												
MW-07A	5/2/1980	583.09	584.09	584.59	15.00	10.00	5.00	15.00	4	PVC/PVC	--	Fill, Till
MW-07B	5/2/1980	584.19	584.91	584.49	27.60	10.00	17.60	27.60	4	PVC/PVC	--	Bedrock
MWN-63A	4/2/10	581.67	583.73	583.90	13.00	5.00	8.00	13.00	2	PVC/PVC	0.010	Sand
MWN-63D	4/1/10 & 4/2/10	581.47	583.71	583.89	49.80	12.00	37.00	49.00	2	PVC/PVC	0.010	Bedrock
MWN-64A	4/2/10	582.10	584.68	584.83	14.00	9.00	5.00	14.00	2	PVC/PVC	0.010	Slag/Fill
MWN-65D	3/30/10 & 4/5/10	583.88	585.80	586.10	59.00	12.00	47.00	59.00	2	PVC/PVC	0.010	Bedrock
Monitoring Wells South of Smokes Creek												
MWS-32A	3/30/10	581.42	584.24	584.42	7.00	2.00	5.00	7.00	2	PVC/PVC	0.010	Fill, Clay
MWS-36A	3/30/10	583.45	586.06	586.23	10.00	4.00	6.00	10.00	2	PVC/PVC	0.010	Fill, Clay
MWS-37A	4/5/10	583.28	585.68	585.86	16.00	5.00	11.00	16.00	2	PVC/PVC	0.010	Silty Sand
Piezometers												
P-40S	11/10/00	583.29	584.21	--	14.00	10.00	4.00	14.00	0.75	PVC/PVC	--	Fill, Sand, Clay
P-41S	11/10/2000	583.37	585.07	585.21	14.00	10.00	4.00	14.00	0.75	PVC/PVC	--	Fill, Sand, Clay
P-47S	01/19/01	581.09	582.89	--	13.00	10.00	3.00	13.00	0.75	PVC/PVC	--	Fill
P-49S	1/19/2001	581.05	581.55	582.44	13.00	10.00	5.00	15.00	0.75	PVC/PVC	--	Fill
Monitoring Wells in South Linde Area												
MW-01	5/20/1997	583.86	586.55	586.84	31.00	10.00	21.00	31.00	2	PVC/PVC	0.010	Fill, Sand, Clay
MW-03	5/20/1997	584.93	587.44	--	30.05	10.00	20.05	30.05	2	PVC/PVC	0.010	Sand
MW-05	4/6/1999	584.47	586.84	--	20.45	10.00	10.45	20.45	4	PVC/PVC	0.020	Fill, Sand
PZ-01	--	585.06	586.98	--	31.31	10.00	21.31	31.31	2	PVC/--	--	--
PZ-02	--	584.82	584.91	--	30.31	10.00	20.31	30.31	2	PVC/--	--	--
PZ-03	--	584.41	587.11	--	31.11	10.00	21.11	31.11	2	PVC/--	--	--
PZ-04	--	584.74	587.34	--	32.68	10.00	22.68	32.68	2	PVC/--	--	--
MZ-01	--	584.85	587.90	--	21.00	10.00	11.00	21.00	2	PVC/--	--	--
MZ-02	--	584.36	587.15	--	19.20	10.00	10.00	20.00	2	PVC/--	--	--
RW-1	10/5/1998	584.8	587.13	--	24.50	NA	NA	NA	18	HDPE	--	--
RW-2	12/8/2003	585.34	589.20	--	20.00	10.00	10.00	20.00	4	CSW/PVC	0.020	--
RW-3	12/8/2003	585.48	588.75	--	20.00	10.00	10.00	20.00	4	CSW/PVC	0.020	--

Notes:

1. Survey was completed on 4/23/10 - 4/26/10, Linde area wells surveyed on 1/29/09.

Acronyms:

TOC = Top of Casing
TOR = Top of Riser
fmsl = feet above mean sea level
fbgs = feet below ground surface
"--" = Unknown

TABLE 5

SUMMARY OF GROUNDWATER ELEVATIONS - APRIL 30, 2010

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Location	Date	Reference Point	Ref. Point Elevation [1] (fmsl)	Water Depth Below Ref. Pt. (feet)	Water Table Elevation [1] (fmsl)
Phase II Monitoring Wells(13)					
MW-01	05/01/10	TOR	586.55	11.79	574.76
MW-07A	04/30/10	TOR	584.18	6.26	577.92
MW-07B	04/30/10	TOR	583.91	13.00	570.91
MWN-56A	04/30/10	TOR	584.24	7.26	576.98
MWN-58A	04/30/10	TOR	586.93	10.37	576.56
MWN-63A	04/30/10	TOR	583.73	6.92	576.81
MWN-63D	04/30/10	TOR	583.71	9.59	574.12
MWN-64A	04/30/10	TOR	584.83	8.26	576.57
MWN-65D	04/30/10	TOR	585.80	11.76	574.04
MWS-30A	04/30/10	TOR	585.73	9.32	576.41
MWS-32A	04/30/10	TOR	584.24	7.81	576.43
MWS-36A	04/30/10	TOR	586.06	10.56	575.50
MWS-37A	04/30/10	TOR	585.68	10.99	574.69
Phase II Piezometers (4)					
P-40S	04/30/10	TOR	585.78	9.25	576.53
P-41S	04/30/10	TOR	585.07	9.14	575.93
P-47S	04/30/10	TOR	582.89	6.68	576.21
P-49S	04/30/10	TOR	581.55	4.84	576.71

Notes:

1. Elevation is measured in feet above mean sea level (fmsl).

TABLE 6A

COMPARISON OF SOIL ANALYTICAL DATA TO UNRESTRICTED USE SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																				Unrestricted SCO (mg/kg)
	TP-1	TP-2	TP-6	BLIND 1	TP-7	TP-10	TP-11	TP-12	TP-13	TP-15	TP-16	TP-17	TP-18	TP-19	TP-20	TP-21	TP-23	TP-24	TP-25	TP-27	
	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	(TP-6)	5.0 - 7.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	6.0 - 8.5	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	5.0 - 7.0	
Volatile Organic Compounds (VOCs) - mg/kg																					
Acetone	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	0.0033 J	--	ND	--	--	--	**0.05**
Benzene	--	--	--	--	ND	0.023 J	--	ND J	ND	--	ND J	ND	ND	--	ND	**0.23 DJ**	ND	--	--	--	**0.06**
2-Butanone	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**--**
Chlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**1.1**
Chlorohexane	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**--**
Cyclohexane	--	--	--	--	0.0025 J	--	--	--	ND	--	--	0.0023 J	--	--	ND	--	ND	--	--	--	**--**
1,2-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**1.1**
1,3-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**2.4**
1,4-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**1.8**
Ethylbenzene	--	--	--	--	ND	0.032 J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	**1**
n-Butylbenzene	--	--	--	--	ND	0.013 J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	**12**
sec-Butylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	2.3 J	ND	ND	--	ND	ND	ND	--	--	--	**11**
Isopropylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	**--**
p-Cymene	--	--	--	--	ND	ND J	--	ND J	ND	--	0.51 J	ND	ND	--	ND	ND	ND	--	--	--	**--**
n-Propylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	**3.9**
Toluene	--	--	--	--	ND	0.19 J	--	0.089 J	ND	--	0.092 J	0.0031 J	0.013 J	--	ND	0.19 DJ	ND	--	--	--	**0.7**
1,2,4-Trichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**--**
1,2,4-Trimethylbenzene	--	--	--	--	ND	0.044 J	--	0.044 J	ND	--	ND J	ND	0.015 J	--	ND	1.2 D	ND	--	--	--	**3.6**
1,3,5-Trimethylbenzene	--	--	--	--	ND	0.016 J	--	ND J	ND	--	ND J	ND	0.015 J	--	ND	ND	ND	--	--	--	**8.4**
o-Xylene	--	--	--	--	ND	0.066 J	--	0.044 J	ND	--	ND J	ND	0.013 J	--	ND	0.24 DJ	ND	--	--	--	**0.26**
m-Xylene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**0.26**
Xylenes, Total	--	--	--	--	ND	0.33 J	--	0.15 J	ND	--	ND J	ND	0.034 J	--	ND	0.46 DJ	ND	--	--	--	**--**
Naphthalene	--	--	--	--	ND	0.04 J	--	0.21 J	ND	--	ND J	ND	0.055 J	--	ND	4.2 D	ND	--	--	--	**--**
Methylcyclohexane	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**--**
Methyl tert butyl ether	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	**0.93**
Methylene Chloride	--	--	--	--	0.0053	--	--	--	0.0036 J	--	--	0.0053 J	--	--	0.0062 J	--	0.009	--	--	--	**0.05**
TOTAL VOCs (mg/kg)	--	--	--	--	*0.008*	*0.424*	--	*0.387*	*0.004*	--	*2.90*	*0.011*	*0.111*	--	*0.0095*	*6.06*	*0.009*	--	--	--	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																					
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	0.37 DJ	ND	ND	0.15 J	ND	0.95 DJ	ND	ND	ND	ND	ND	ND	ND	**20**
Acenaphthylene	ND	0.72 DJ	ND	ND	0.13 DJ	ND	0.22 DJ	ND	0.31 DJ	ND	ND	ND	ND	1.26 DJ	ND	0.44 DJ	0.31 DJ	0.24 DJ	0.048 J	0.053 DJ	**100**
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Anthracene	ND	0.59 DJ	ND	ND	0.35 DJ	ND	ND	0.92 DJ	0.14 DJ	ND	ND	ND	2.1 DJ	0.38 DJ	0.11 DJ	0.72 DJ	0.54 DJ	0.18 DJ	0.039 J	ND	**100**
Benzo(a)anthracene	0.66 DJ	**2.7 DJ**	0.69 DJ	0.62 DJ	**1.7 DJ**	0.69 DJ	0.76 DJ	**4.8 D**	**1.7 DJ**	0.28 DJ	0.018 J	0.19 DJ	**9.5 D**	**1.3 DJ**	0.84 DJ	**4 D**	**2 DJ**	**1.1 D**	0.22	0.59 DJB	**1**
Benzo(b)fluoranthene	0.8 DJ	**4.6 D**	ND	0.55 DJ	**1.7 DJ**	**1.1 DJ**	**1.1 DJ**	**4.5 D**	**2.2 D**	0.25 DJ	ND	0.27 D,ID4,J	**9.4 D**	**2.2 D**	**1.1 D**	**6 D**	**2.6 DJ**	**1.5 D**	0.38	0.83 DJ	**1**
Benzo(k)fluoranthene	0.29 DJ	**1.5 DJ**	ND	ND	**0.81 DJ**	0.42 DJ	0.31 DJ	**2 DJ**	**0.92 DJ**	0.11 DJ	ND	ND	**4.6 D**	0.68 DJ	0.34 DJ	**2.2 D**	**0.84 DJ**	**5.9 D**	0.13 J	0.59 DJ	**0.8**
Benzo(g,h,i)perylene	0.38 DJ	3.3 D	ND	0.29 DJ	0.97 DJ	0.95 DJ	0.62 DJ	2.7 DJ	1.2 DJ	0.15 DJ	ND	ND	4.7 D	1.3 DJ	0.47 DJ	3.6 D	1.5 DJ	0.88 D	0.24	0.5 DJB	**100**
Benzo(a)pyrene	0.49 DJ	**3.4 D**	ND	0.35 DJ	**1.3 DJ**	0.8 DJ	0.74 DJ	**3.7 DJ**	**1.6 DJ**	0.2 DJ	ND	ND	**7.2 D**	**1.5 DJ**	0.72 DJ	**4.8 D**	**2 DJ**	**1.2 D**	0.27	0.64 DJ	**1**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**
Carbazole	--	--	--	--	--	--	--	--	ND	--	--	ND	--	--	ND	--	ND	ND	--	--	**7**
Chrysene	0.86 DJB	**3 BD**	**1.1 DJB**	0.83 DJB	**1.7 DJB**	0.78 DJB	0.91 DJB	**4.9 BD**	**1.9 DJB**	0.39 DJB	JBU	0.31 DJB	**10 BD**	**1.4 DJ**	0.84 DJ	**4 BD**	**2.2 DJB**	**1.3 D**	0.26	0.53 DJ	**1**
Dibenzo(a,h)anthracene	ND	**0.68 DJ**	ND	ND	**1.9 D**	ND	0.19 DJ	**4.1 D**	**2.1 D**	ND	ND	ND	**4.4 D**	**0.38 DJ**	0.17 DJ	**0.96 DJ**	**0.43 DJ**	0.26 DJ	0.056 J	0.14 DJB	**0.33**
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 DJ	ND	ND	ND	ND	0.051 DJ	ND	ND	**--**
Fluoranthene	0.87 DJ	6 D	ND	0.81 DJ	3.3 D	0.73 DJ	1 DJ	10 D	1.9 DJ	0.35 DJ	0.027 J	ND	23 D	3 D	1.2 D	6.9 D	4.5 D	2.2 D	0.47	0.99 D	**100**
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42	ND	0.56 DJ	0.17 DJ	ND	ND	ND	0.037 DJ	ND	ND	**30**
Indeno(1,2,3-cd)pyrene	0.33 DJ	**2.8 D**	ND	ND	**0.83 DJ**	**0.74 DJ**	**0.52 DJ**	**2.3 DJ**	**1.1 DJ**	0.11 DJ	ND	ND	**4.1 D**	**1.2 DJ**	0.44 DJ	**3.3 D**	**1.4 DJ**	**0.81 D**	0.21 J	0.44 DJ	**0.5**
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78	ND	ND	ND	ND	ND	ND	0.054 DJ	0.026 J	ND	**--**
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.057 DJ	ND	ND	**12**
Phenanthrene	0.51 DJ	1.9 DJ	ND	0.98 DJ	1.7 DJ	0.25 DJ	0.56 DJ	6.8 D	0.51 DJ	0.28 DJ	0.7	ND	16 D	1.9 D	0.57 DJ	1.8 DJ	1.4 DJ	0.93 D	0.18 J	0.2 DJ	**100**
Pyrene	0.86 DJ	4.6 D	ND	0.76 DJ	2.8 D	0.78 DJ	0.91 DJ	8.7 D	1.9 DJ	0.33 DJ	0.1 J	0.14 DJ	18 D	2 D	1.1 D	5.5 D	3.2 DJ	1.8 D	0.32	1 D	**100**
TOTAL SVOCs (mg/kg)	*6.05*	*35.8*	*1.79*	*5.19*	*19.2*	*7.24*	*7.84*	*55.8*	*17.5*	*2.45*	*2.20*	*0.91*	*115*	*18.7*	*7.90*	*44.2*	*22.9*	*18.5*	*2.85*	*6.50*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																					
Aroclor 1242	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	**--**
Aroclor 1248	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	**--**
Aroclor 1254	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	**--**
Aroclor 1260	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	**--**
TOTAL PCBs (mg/kg)	--	--	--	--	*0*	--	--	--	*0*	*0*	--	*0*	--	--	*0*	--	--	--	--	*0*	***0.1***
Inorganic Compounds - mg/kg																					
Aluminum	--	--	--	--	2350	--	--	--	15400	--	--	5290	--	--	12100	--	19300	--	--	--	**--**
Antimony	--	--	--	--	ND J	--	--	--	ND J	--	--	ND J	--	--	ND J	--	ND J	--	--	--	**--**
Arsenic, Total	**51.4 J**	**45.9 J**	**15.8 J**	ND J	3.8	**245 J**	**64.9 J**	**21.6 J**	**21.9**	**105**	--	4.4	**14 J**	**24.6 J**	**30.1**	**119 J**	**32.8**	**86.9**	**27.4 J**	6.5	**13**
Barium, Total	110	192	102	97.8	30.2 J	108	111	278	232 J	122	--	56.4 J	86.5	195 J	296 J	240	199 J	96	195 J	21.7	**350**
Beryllium	--	--	--	--	ND	--	--	--	2.34	--	--	0.829	--	--	1.46	--	2.32	--	--	--	**7.2**
Cadmium, Total	**3.87**	1.96	1.87	0.774	0.632	**2.99**	1.35	**3.39**	**3.05**	0.521	--	1.79	2.44	1.06 J	1.97	1.07	0.396	1.14	0.861 J	1.11	**2.5**
Calcium	--	--	--	--	44200	--	--	--	89600 D	--	--	165000 D	--	--	204000 D	--	116000 D	--	--	--	**--**
Chromium, Total	**93.9 J**	**109 J**	**26 J**	**26.8 J**	**14.7**	**201 J**	**175 J**	**182 J**	**81.3**	**7.17**	--	**562**	**288 J**	**86.5 J**	**1100**	**50.2 J**	**29.2**	**46**	**29.5 J**	**4.71 J**	**1**
Cobalt	--	--	--	--	2.28	--	--	--	5.12	--	--	2.52	--	--	1.55	--	3.87	--	--	--	**--**
Copper	--	--	--	--	19.1	--	--	--	**84.7**	--	--	24.1	--	--	25.9	--	**51.7**	--	--	--	**50**
Iron	--	--	--	--	14200 B1, B	--	--	--	############	--	--	118000 B1,D,B	--	--	175000 BD	--	53500 B1, B	--	--	--	**--**
Lead, Total	**205 J**	**133 J**	**202 J**	57.9 J	51.8	**345 J**	**316 J**	**163 J**	**191**	22.6	--	23.6	**114 J**	**90.8 J**	**76.1**	**120 J**	58	**103**	**72.9 J**	49.5	**63**
Magnesium	--	--	--	--	5290	--	--	--	11100	--	--	21900	--	--	39600	--	7760	--	--	--	**--**
Manganese	--	--	--	--	645	--	--	--	**6080 D**	--	--	**18900 D**	--	--	**56000 D**	--	**6480 D**	--	--	--	**1600**
Mercury, Total	0.107 J	0.0585	**0.201 J**	0.144 J	0.0729 J	0.108 J	**0.587**	0.0395	**0.203**	**0.671**	--	ND	0.0918 D	0.0659 J	ND	**0.45**	**0.678**	0.135	0.0583 J	0.0568	**0.18**
Nickel	--	--	--	--	7.93 J	--	--	--	17.5 J	--	--	15.4 J	--	--	ND J	--	8.79 J	--	--	--	**30**
Potassium	--	--	--	--	329 J	--	--	--	1400 J	--	--	311 J	--	--	824 J	--	2120 J	--	--	--	**--**
Selenium	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	**11.9 J**	--	ND	--	--	--	**3.9**
Silver	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	**2**
Sodium	--	--	--	--	153 J	--	--	--	372 J	--	--	208 J	--	--	253 J	--	409 J	--	--	--	**--**
Vanadium	--	--	--	--	9.88	--	--	--	51.4	--	--	347	--	--	823	--	38.4	--	--	--	**--**
Zinc	--	--	--	--	**141**	--	--	--	**555**	--	--	68.1	--	--	91.3	--	93.6	--	--	--	**109**
Cyanide, Total	--	--	--	--	ND J	ND J	--	ND J	ND J	--	--	ND J	ND J	ND J	ND J	ND J	ND J	--	ND J	--	**27**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:

B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:

BOLD	= Value exceeds Part 375 Unrestricted Use Soil Cleanup Objectives.

TABLE 6A

COMPARISON OF SOIL ANALYTICAL DATA TO UNRESTRICTED USE SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																					Unrestricted SCO
	TP-30	TP-32	TP-33	TP-34	TP-35	TP-36	TP-38	TP-39	TP-40	TP-41	TP-43	Blind 3	TP-45	TP-46	TP-47	TP-48	Blind 2	TP-49	TP-50	TP-52	TP-53	TP-55	
	0.0 - 2.0	0.0 - 2.0	0.0 - 0.5	0.0 - 2.0	1.0 - 3.0	0.0 - 1.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	(TP-43)	0.0 - 2.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0	(TP-48)	0.0 - 7.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	(mg/kg)
Volatile Organic Compounds (VOCs) - mg/kg																						
Acetone	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	**0.11 J**	--	**0.05**
Benzene	ND	--	--	--	--	--	0.017	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**0.06**
2-Butanone	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	0.016 J	--	**--**
Chlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**1.1**
Chlorohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**--**
Cyclohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**--**
1,2-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**1.1**
1,3-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**2.4**
1,4-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**1.8**
Ethylbenzene	ND	--	--	--	--	--	0.027	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**1**
n-Butylbenzene	ND	--	--	--	--	--	0.036	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.0071 J	**12**
sec-Butylbenzene	ND	--	--	--	--	--	0.0096 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**11**
Isopropylbenzene	ND	--	--	--	--	--	0.0073 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**--**
p-Cymene	ND	--	--	--	--	--	0.014	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**--**
n-Propylbenzene	ND	--	--	--	--	--	0.0078 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**3.9**
Toluene	ND	--	--	--	--	--	0.071	--	--	--	--	--	--	--	--	ND	ND	--	2	--	ND	0.011	**0.7**
1,2,4-Trichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**--**
1,2,4-Trimethylbenzene	ND	--	--	--	--	--	0.059	--	--	--	--	--	--	--	--	ND	ND	--	--	--	0.016 J	0.012	**3.6**
1,3,5-Trimethylbenzene	ND	--	--	--	--	--	0.017	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**8.4**
o-Xylene	ND	--	--	--	--	--	0.057	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.011	**0.26**
m-Xylene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**0.26**
Xylenes, Total	ND	--	--	--	--	--	0.16	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.026	**--**
Naphthalene	ND	--	--	--	--	--	0.3 B	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.087 B	**--**
Methylcyclohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	**--**
Methyl tert butyl ether	ND	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	**0.93**
Methylene Chloride	0.0028 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.0045 J	--	--	--	0.018 J	--	**0.05**
TOTAL VOCs (mg/kg)	*0.003*	*0*	*0*	*0*	*0*	*0*	*0.623*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.005*	*0*	*2*	*0*	*0.16*	*0.128*	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																						
Acenaphthene	ND	8.7 DJ	ND	--	ND	ND	0.11 DJ	ND	1.1 DJ	ND	ND	ND	0.5 DJ	ND	ND	ND	ND	ND	ND	ND	17 TDJ	ND	**20**
Acenaphthylene	0.08 DJ	ND	0.45 DJ	--	0.26 DJ	ND	0.1 DJ	ND	0.59 DJ	ND	ND	ND	3.7 DJ	0.33 DJ	0.18 DJ	ND	ND	ND	2.3 DJ	0.72 DJ	4.2 TDJ	0.48 DJ	**100**
Acetophenone	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Anthracene	0.099 DJ	20 D	1.2 DJ	--	0.19 DJ	0.24 DJ	0.52 DJ	0.067 DJ	3.7 D	ND	0.058 DJ	ND	4.2 D	ND	ND	ND	ND	ND	0.79 DJ	0.55 DJ	23 TDJ	0.56 DJ	**100**
Benzo(a)anthracene	0.83 D	**32 D**	**7.6 D**	--	0.9 DJ	**2.3 D**	**3.1 D**	0.33 DJ	**12 D**	0.53 DJ	0.26 DJ	0.25 DJ	**11 D**	**1.5 DJB**	**1.1 DJB**	0.52 DJ	0.38 DJ	0.15 DJ	**5.4 DJ**	**2 DJ**	**30 TDJ**	**1.9 DJ**	**1**
Benzo(b)fluoranthene	**1.4 D**	**38 D**	**1.2 D**	--	**1 DJ**	**5.2 D**	**4 D**	0.35 DJ	**14 D**	0.67 DJ	0.38 DJ	0.34 DJ	**14 D**	**2.9 DJ**	**2 D,ID4,J**	0.89 DJ	0.64 DJ	0.17 DJ	**11 D**	**3.9 D**	**20 TDJ**	**3.3 DJ**	**1**
Benzo(k)fluoranthene	0.53 DJ	**13 D**	**4 DJ**	--	0.38 DJ	**1.6 DJ**	**1.9 D**	0.14 DJ	**4.8 D**	0.27 DJ	0.16 DJ	0.14 DJ	**6.6 D**	**1.9 DJ**	ND	0.29 DJ	0.19 DJ	ND	**3.2 DJ**	**1.8 DJ**	**12 TDJ**	**1.7 DJ**	**0.8**
Benzo(g,h,i)perylene	0.98 DJ	21 D	7.3 D	--	0.82 DJ	4.3 D	3.1 D	0.3 DJ	8.7 D	0.56 DJ	0.31 DJ	0.26 DJ	9.7 D	2 DJB	0.86 DJB	1.1 DJ	0.44 DJ	ND	7.6 DJ	2.7 DJ	11 TDJ	3.2 DJ	**100**
Benzo(a)pyrene	**1.1 D**	**32 D**	**8.5 D**	--	0.89 DJ	**3.9 D**	**3.8 D**	0.3 DJ	**12 D**	0.56 DJ	0.33 DJ	0.28 DJ	**12 D**	**2.1 DJ**	**1 DJ**	0.65 DJ	0.42 DJ	ND	**7.9 DJ**	**2.9 DJ**	**17 TDJ**	**2.9 DJ**	**1**
Bis(2-ethylhexyl) phthalate	ND	ND	**2.2 DJ**	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1**
Biphenyl	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	0.3 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**
Carbazole	0.039 DJ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	**8.1 TDJ**	--	**7**
Chrysene	0.96 D	**28 D**	**7.2 D**	--	0.88 DJ	**2.4 D**	**3.2 D**	0.34 DJ	**12 D**	0.52 DJ	0.3 DJ	0.25 DJ	**12 D**	**1.4 DJ**	0.65 DJ	0.53 DJ	0.38 DJ	0.17 DJ	**6.7 DJ**	**2.2 DJ**	**29 TDJ**	**2.3 DJ**	**1**
Dibenzo(a,h)anthracene	0.25 DJ	**5 DJ**	**1.7 DJ**	--	ND	**0.89 DJ**	**0.86 DJ**	0.083 DJ	ND	ND	0.091 DJ	0.073 DJ	ND	ND	ND	ND	ND	ND	**2.1 DJ**	**0.69 DJ**	ND	**0.67 DJ**	**0.33**
Dibenzofuran	ND	6.4 DJ	ND	--	ND	ND	0.17 DJ	ND	0.47 DJ	ND	ND	ND	2 DJ	ND	ND	ND	ND	ND	ND	ND	13 TDJ	ND	**--**
Fluoranthene	1.1 D	87 D	15 D	--	1.2 DJ	2.8 D	3.4 D	0.4 DJ	25 D	0.71 DJ	0.39 DJ	0.34 DJ	31 D	2.2 DJ	1.4 DJ	0.68 DJ	0.49 DJ	0.25 DJ	10 DJ	1.8 DJ	64 TDJ	3.3 DJ	**100**
Fluorene	ND	11 D	ND	--	ND	ND	0.11 DJ	ND	1.2 DJ	ND	ND	ND	3.5 DJ	ND	ND	ND	ND	ND	ND	ND	21 TDJ	ND	**30**
Indeno(1,2,3-cd)pyrene	0.81 D	**17 D**	**6 D**	--	**0.69 DJ**	**3.2 D**	**2.7 D**	0.24 DJ	**8 D**	0.45 DJ	0.27 DJ	0.22 DJ	**8.8 D**	**1.6 DJ**	**0.71 DJ**	**0.8 DJ**	0.37 DJ	ND	**6.5 DJ**	**2.2 DJ**	**10 TDJ**	**2.5 DJ**	**0.5**
2-Methylnaphthalene	0.043 DJ	2.6 DJ	ND	--	0.096 DJ	ND	0.26 DJ	0.048 DJ	0.18 DJ	ND	ND	0.051 DJ	0.93 DJ	ND	0.19 DJ	ND	ND	ND	ND	ND	7.3 TDJ	ND	**--**
Naphthalene	0.038 DJ	5.3 DJ	ND	--	ND	ND	0.27 DJ	ND	0.36 DJ	ND	ND	ND	**2.7 DJ**	ND	0.29 DJ	ND	ND	ND	ND	ND	**23 TDJ**	ND	**12**
Phenanthrene	0.38 DJ	75 D	6 D	--	0.6 DJ	0.96 DJ	1.8 DJ	0.25 DJ	12 D	0.28 DJ	0.17 DJ	0.15 DJ	25 D	0.17 DJ	ND	0.31 DJ	0.23 DJ	0.26 DJ	3.3 DJ	0.57 DJ	91 TDJ	1.4 DJ	**100**
Pyrene	0.99 D	56 D	11 D	--	1.3 DJ	2.1 D	3.2 D	0.42 DJ	23 D	0.71 DJ	0.34 DJ	0.3 DJ	25 D	2.4 DJ	1.6 DJ	0.58 DJ	0.42 DJ	0.24 DJ	7.7 DJ	2 DJ	49 TDJ	2.6 DJ	**100**
TOTAL SVOCs (mg/kg)	*9.63*	*458*	*79.4*	--	*9.21*	*29.9*	*32.6*	*3.27*	*139*	*5.26*	*3.06*	*2.65*	*172.9*	*18.5*	*9.98*	*6.35*	*3.96*	*1.24*	*74.5*	*24.0*	*450*	*26.8*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																						
Aroclor 1242	ND	--	ND	--	--	ND	--	--	ND	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	**--**
Aroclor 1248	ND	--	ND	--	--	0.029 J	--	--	ND	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	**--**
Aroclor 1254	ND	--	1.4 DJ	--	--	0.16 J	--	--	0.098 J,QSU	--	--	--	ND	--	--	24 QSU,D,J	3.8 QSU,J	--	--	--	ND	--	**--**
Aroclor 1260	ND	--	0.97 DCJ	--	--	0.061 CJ	--	--	0.064 J,QSU	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	**--**
TOTAL PCBs (mg/kg)	*0*	--	***2.37***	--	--	***0.25***	--	--	***0.162***	--	--	--	*0*	--	--	***24***	***3.8***	--	--	--	*0*	--	***0.1***
Inorganic Compounds - mg/kg																						
Aluminum	7570	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15300	16900	--	--	--	--	--	**--**
Antimony	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND J	ND J	--	--	--	--	--	**--**
Arsenic, Total	**15.9**	9.2 J	**17.7 J**	**13.2**	**31.9 J**	6.6 J	11.7 J	**19.2 J**	**152 J**	**30.4 J**	**17.2 J**	**13 J**	**73.6 J**	**20.5**	**13.5**	**74.8**	**76.9**	4.4	**14.3**	**141**	--	**68.7**	**13**
Barium, Total	68.1	139 J	**429 J**	**103**	146 J	27.2 J	139 J	143 J	158 J	219 J	190 J	170 J	**376 J**	60.4	94.4	192 J	196 J	134	173	93.3	--	84.3	**350**
Beryllium	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.94	2.12	--	--	--	--	--	**7.2**
Cadmium, Total	ND	**3.95 J**	**21.8 J**	**2.49**	**2.67 J**	1.03 J	**4.68 J**	**5.77 J**	**4.22 J**	**8.19 J**	**3.82 J**	**2.36 J**	**3.3 J**	0.805	0.337	0.861	1.28	0.619	**3.42**	**3.18**	--	**2.77**	**2.5**
Calcium	97700 D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64600	71300	--	--	--	--	--	**--**
Chromium, Total	**245**	**58.2 J**	**176 J**	**55.3**	**96.5 J**	**67.2 J**	**54.3 J**	**87.9 J**	**112 J**	**101 J**	**113 J**	**63.1 J**	**46.5 J**	**29.6 J**	**13.7 J**	**31.7 J**	**71.8 J**	**10.2**	**36.1**	**321 J**	--	**246**	**1**
Cobalt	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.55 J	5.1 J	--	--	--	--	--	**--**
Copper	70.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**220**	**162**	--	--	--	--	--	**50**
Iron	83600 D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	69700 D	57700	--	--	--	--	--	**--**
Lead, Total	68.7	**293 J**	**984 J**	**265**	**282 J**	**128 J**	**914**	**442 J**	**656 J**	**1090**	**731**	**762**	**562 J**	**425**	**181**	**383**	**387**	44.2	**515**	**456**	--	**275**	**63**
Magnesium	19800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5450 J	7240 J	--	--	--	--	--	**--**
Manganese	**15100 D**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**2030**	**7240 J**	--	--	--	--	--	**1600**
Mercury, Total	0.0749	0.17 J	**0.293 J**	**0.375**	**0.201 J**	0.0902 J	0.0998	0.09 J	0.0699 J	0.124	0.108	0.0877	**1.57 DJ**	0.0958	0.0777	0.0505	0.0709	0.0517	**0.185**	0.138	--	0.0968	**0.18**
Nickel	17.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.6 J	18.3 J	--	--	--	--	--	**30**
Potassium	1190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1270 J	1160 J	--	--	--	--	--	**--**
Selenium	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND J	ND J	--	--	--	--	--	**3.9**
Silver	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	--	**2**
Sodium	386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	289 J	318 J	--	--	--	--	--	**--**
Vanadium	269	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26.4	38.7	--	--	--	--	--	**--**
Zinc	159	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**399**	**473**	--	--	--	--	--	**109**
Cyanide, Total	ND	6.5 J	2 J	--	ND J	**27 J**	**27.8 J**	ND J	ND J	10.5 NJ	ND J	ND J	ND J	--	--	1.4	1.5 J	--	5.7	ND J	--	1.5	**27**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:

B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:

BOLD = Value exceeds Part 375 Unrestricted Use Soil Cleanup Objectives.

TABLE 6A

COMPARISON OF SOIL ANALYTICAL DATA TO UNRESTRICTED USE SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																				Unrestricted SCO [2] (mg/kg)
	TP-56	TP-57	TP-58	Blind 4	TP-60	TP-62	TP-64	TP-65	TP-66	TP-67	TP-69	TP-71	TP-74	TP-75	TP-76	TP-78	TP-80	TP-81B	TP-83	TP-84	
	4.0 - 6.0	0.0 - 2.0	0.0 - 2.0	(TP-58)	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	9.0 - 9.5	0.0 - 2.0	0.0 - 2.0	
Volatile Organic Compounds (VOCs) - mg/kg																					
Acetone	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	0.05
Benzene	--	--	ND	ND	ND	--	0.013	--	**0.077**	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	0.06
2-Butanone	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	--
Chlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	1.1
Chlorohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	--
Cyclohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	1.1
1,3-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	2.4
1,4-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	1.8
Ethylbenzene	--	--	ND	ND	ND	--	ND	--	0.1	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	1
n-Butylbenzene	--	--	0.024	0.017	ND	--	0.064	--	0.069	--	ND	--	ND	--	ND	--	ND	ND	0.01 J	ND	12
sec-Butylbenzene	--	--	0.01 J	0.0079 J	ND	--	0.027 J	--	0.027 J	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	11
Isopropylbenzene	--	--	ND	ND	ND	--	0.025	--	0.026	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	--
p-Cymene	--	--	ND	ND	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	--
n-Propylbenzene	--	--	ND	ND	ND	--	0.018	--	0.018	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	3.9
Toluene	--	--	0.027 B	0.026 B	ND	--	0.098 B	--	0.4 B	--	ND	--	ND	--	ND	--	ND	0.018 DJ	0.015	0.045 DJ	0.7
1,2,4-Trichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	--
1,2,4-Trimethylbenzene	--	--	0.041	0.037	ND	--	0.11	--	0.11	--	ND	--	ND	--	ND	--	ND	0.027 DJ	0.016	0.03 DJ	3.6
1,3,5-Trimethylbenzene	--	--	0.012	0.011 J	ND	--	0.034	--	0.037	--	ND	--	ND	--	ND	--	ND	ND	0.007 J	0.031 DJ	8.4
o-Xylene	--	--	0.051	0.036	ND	--	0.14	--	0.13	--	ND	--	ND	--	ND	--	ND	ND	0.013	0.027 DJ	0.26
m-Xylene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	0.26
Xylenes, Total	--	--	0.099	0.081	ND	--	0.28	--	0.28	--	ND	--	ND	--	ND	--	ND	ND	0.031	0.075 DJ	--
Naphthalene	--	--	0.097 B	0.11 B	ND	--	0.42 BJ	--	0.26 B	--	ND	--	ND	--	0.093 BD	--	ND	0.42 BD	0.07 B	0.13 BD	--
Methylcyclohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	--
Methyl tert butyl ether	--	--	ND	ND	ND	--	0.01 J	--	0.05	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	0.93
Methylene Chloride	--	--	--	--	0.014	--	--	--	--	--	0.0036 J	--	ND	--	--	--	ND	--	--	--	0.05
TOTAL VOCs (mg/kg)	--	--	*0.262*	*0.245*	*0.014*	--	*0.959*	--	*1.30*	--	*0.004*	--	*0*	--	*0.093*	--	*0*	*0.465*	*0.131*	*0.263*	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																					
Acenaphthene	ND	ND	ND	ND	0.17 DJ	0.55 DJ	ND	ND	ND	3.4 DJ	ND	ND	ND	ND	ND	0.86 DJ	7.3 DJ	2.2 TDJ	0.17 DJ	ND	20
Acenaphthylene	ND	0.68 DJ	0.17 DJ	ND	0.36 DJ	ND	0.44 DJ	ND	1.1 DJ	1.3 DJ	ND	2.4 DJ	1.2 DJ	ND	0.51 DJ	1.4 DJ	ND	ND	0.42 DJ	ND	100
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Anthracene	2.3 DJ	1.3 DJ	0.31 DJ	ND	0.81 DJ	1.4 DJ	0.55 DJ	ND	1.1 DJ	7.7 DJ	ND	3.5 DJ	0.81 DJ	ND	0.38 DJ	5.9 DJ	25 D	7.2 TDJ	0.9 DJ	2.3 TDJ	100
Benzo(a)anthracene	**7.8 DJ**	**4.5 D**	**1.6 DJ**	0.83 DJ	**3.4 DJ**	**3.5 DJ**	**2.7 DJ**	0.23 DJ	**3.3 DJ**	**24 BD**	0.91 DJB	**9.9 BD**	**5 BD**	**2.6 TDJB**	**2 DJ**	**17 D**	**53 D**	**15 TDJ**	**3 D**	**7.4 TDJ**	1
Benzo(b)fluoranthene	**9.3 DJ**	**6.3 D**	**2.6 DJ**	0.87 DJ	**3.8 D**	**3.5 DJ**	**4.5 D**	ND	**6.4 D**	**31 D**	**1.6 D,ID4,J**	**12 D**	**6 D**	**5.2 T,D,ID,J**	**3.3 DJ**	**20 D**	**56 D**	**17 TDJ**	**3.8 D**	**12 TDJ**	1
Benzo(k)fluoranthene	**4.6 DJ**	**2 DJ**	ND	0.53 DJ	**2.1 DJ**	**1.8 DJ**	**1.4 DJ**	ND	**1.8 DJ**	**14 D**	ND	**5.4 DJ**	**2.8 DJ**	ND	**1.2 DJ**	**6.3 DJ**	**26 D**	**7 TDJ**	**1.6 DJ**	**3.9 TDJ**	0.8
Benzo(g,h,i)perylene	6.3 DJ	5.1 D	1.3 DJ	0.74 DJ	3.1 DJ	2.2 DJ	2.7 DJ	ND	4 D	24 BD	0.8 DJB	7.6 DJB	3.4 DJ	2.6 TDJB	2.7 DJ	12 D	35 D	9.8 TDJ	2.6 D	7.7 TDJ	100
Benzo(a)pyrene	**7.9 DJ**	**5 D**	**1.6 DJ**	0.83 DJ	**3.4 DJ**	**3.1 DJ**	**3.1 DJ**	ND	**3.5 DJ**	**29 D**	0.93 DJ	**9.4 DJ**	**4.6 DJ**	**2.3 TDJB**	**2.7 DJ**	**16 D**	**51 D**	**15 TDJ**	**3.2 D**	**9.1 TDJ**	1
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33
Carbazole	--	--	--	--	0.26 DJ	--	--	--	--	--	ND	--	ND	--	--	--	5.9 DJ	--	--	--	7
Chrysene	**8.6 DJ**	4.5 D	**1.5 DJ**	0.82 DJ	**3.3 DJ**	**3.2 DJ**	**2.8 DJ**	ND	**3.7 DJ**	**26 D**	0.48 DJ	**11 D**	**4.6 BD**	ND	**2.1 DJ**	**16 D**	**48 D**	**15 TDJ**	**2.7 D**	**7.2 TDJ**	1
Dibenzo(a,h)anthracene	**1.8 DJ**	**1.2 DJ**	**0.4 DJ**	0.16 DJ	**0.67 DJ**	**0.53 DJ**	**0.68 DJ**	ND	**0.96 DJ**	ND	ND	**2 DJB**	**0.86 DJ**	ND	**0.62 DJ**	**3.2 DJ**	**8.6 DJ**	**3 TDJ**	**0.62 DJ**	**2.1 TDJ**	0.33
Dibenzofuran	ND	ND	ND	ND	ND	0.37 DJ	0.37 DJ	ND	0.33 DJ	2.3 DJ	ND	2 DJ	ND	ND	ND	ND	4.1 DJ	ND	ND	ND	--
Fluoranthene	18 D	9.7 D	2.9 DJ	1.4 DJ	6.4 D	8.3 D	4.4 D	ND	5.4 D	55 D	1.5 DJ	29 D	8.6 BD	ND	4.4 D	34 D	**130 D**	42 DT	6.6 D	16 TDJ	100
Fluorene	0.91 DJ	ND	ND	ND	ND	0.59 DJ	ND	ND	ND	3.7 DJ	ND	3.4 DJ	ND	ND	ND	1.2 DJ	8.5 DJ	3.8 TDJ	0.29 DJ	ND	30
Indeno(1,2,3-cd)pyrene	**5.5 DJ**	**4.1 D**	1.1 DJ	0.58 DJ	**2.2 DJ**	**2 DJ**	**2.5 DJ**	ND	3.5 DJ	**20 D**	**0.6 DJ**	**6.6 DJ**	**2.8 DJ**	**2.1 TDJ**	**2.2 DJ**	**11 D**	**30 D**	**8.8 TDJ**	**2.3 D**	**6.5 TDJ**	0.5
2-Methylnaphthalene	ND	ND	ND	ND	ND	0.16 DJ	0.81 DJ	ND	0.63 DJ	0.45 DJ	ND	0.54 DJ	ND	ND	ND	ND	1.2 DJ	ND	ND	ND	--
Naphthalene	ND	ND	ND	ND	ND	0.31 DJ	0.99 DJ	ND	0.54 DJ	1.3 DJ	ND	**2.1 DJ**	ND	ND	ND	ND	2.3 DJ	ND	ND	ND	12
Phenanthrene	8.5 DJ	3.4 DJ	1.6 DJ	0.67 DJ	2.6 DJ	6.4 D	2.2 DJ	ND	1.7 DJ	29 D	0.46 DJ	28 D	2.8 DJB	ND	1.7 DJ	13 D	78 D	30 TDJ	3.3 D	8.9 TDJ	100
Pyrene	13 DJ	7.2 D	2.4 DJ	1.2 DJ	5.3 DJ	6.4 D	4.2 D	ND	5.2 D	50 D	1.6 DJ	23 D	7.4 D	2.4 TDJ	3.4 DJ	24 D	93 D	28 TDJ	4.6 D	11 TDJ	100
TOTAL SVOCs (mg/kg)	*94.5*	*55.0*	*17.5*	*8.63*	*37.9*	*44.3*	*34.3*	*0.23*	*43.2*	*322*	*8.88*	*158*	*50.9*	*17.2*	*27.2*	*182*	*663*	*204*	*36.1*	*94.1*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																					
Aroclor 1242	ND	ND	--	--	ND	--	--	--	ND	ND	ND	--	ND	--	ND	--	--	0.062 QSU	--	--	--
Aroclor 1248	ND	ND	--	--	0.011 QSU, J	--	--	--	ND	ND	ND	--	ND	--	ND	--	--	ND	--	--	--
Aroclor 1254	ND	ND	--	--	ND	--	--	--	ND	0.35 QSU,D,J	ND	--	ND	--	ND	--	--	ND	--	--	--
Aroclor 1260	ND	ND	--	--	ND	--	--	--	ND	ND	ND	--	ND	--	0.13 QSU	--	--	ND	--	--	--
TOTAL PCBs (mg/kg)	*0*	*0*	--	--	*0.011*	--	--	--	*0*	***0.35***	*0*	*0*	*0*	--	***0.13***	--	--	*0.062*	--	--	*0.1*
Inorganic Compounds - mg/kg																					
Aluminum	--	--	--	--	13800	--	--	--	--	--	5530	--	7760	--	--	--	10700	--	--	--	--
Antimony	--	--	--	--	ND	--	--	--	--	--	ND J	--	ND	--	--	--	ND	--	--	--	--
Arsenic, Total	**14.1**	**46.4**	**122 J**	**57 J**	**17.8**	**23.7**	**24.1**	6.2	**39.9**	**17.3**	**25.3**	**72.7**	**47.4**	**14.3**	**13.8**	12.6	**36.5**	--	12.8	12.7	13
Barium, Total	102	116	118	177	178 J	86.8	94	159	163	125	63.6 J	120	88.8	66.9	73.3	113	166	--	112	91.1	350
Beryllium	--	--	--	--	2.04	--	--	--	--	--	0.725	--	0.97	--	--	--	0.818	--	--	--	7.2
Cadmium, Total	0.82	**3**	0.973	1.14	1.52	1.38	1.73	ND	**2.93**	2.21	**3.48**	**3.39**	1.87	**3.18**	**2.81**	**3.26**	**9.26**	--	**3.11**	**3.95**	2.5
Calcium	--	--	--	--	74900 D	--	--	--	--	--	36500 D	--	52900	--	--	--	61700 D	--	--	--	--
Chromium, Total	**16.7**	**55**	**24.3 J**	**41.6 J**	**46.5 J**	**292 J**	**61.8 J**	**23.4 J**	**174 J**	**54.8 J**	**73.4 J**	**44.1 J**	**91.4**	**67.8 J**	**277**	**18.8**	**175**	--	**134**	**57.1**	1
Cobalt	--	--	--	--	4.16	--	--	--	--	--	7.95	--	4.51	--	--	--	6.8	--	--	--	--
Copper	--	--	--	--	**128**	--	--	--	--	--	**779**	--	**120**	--	--	--	**518**	--	--	--	50
Iron	--	--	--	--	44600	--	--	--	--	--	71400 D	--	45100	--	--	--	50200	--	--	--	--
Lead, Total	**575**	**357**	**12300 DJ**	**216 J**	**176**	187	**384**	**68.4**	**647**	**518**	**303**	**460**	**290**	**942**	**325**	**106**	**450**	--	**305**	**329**	63
Magnesium	--	--	--	--	13700 J	--	--	--	--	--	4210 J	--	9020	--	--	--	24000	--	--	--	--
Manganese	--	--	--	--	**3190 D**	--	--	--	--	--	**3270 D**	--	**3770 D**	--	--	--	**1680**	--	--	--	1600
Mercury, Total	**0.414**	0.152	**0.269 J**	**0.541 J**	**0.276**	0.106	**4.05 D**	0.148	**0.35**	**5.51 D**	**5.68 D**	**0.738 D**	0.116	**0.284**	**0.518**	0.111	**0.819**	--	**0.299**	**2.1 D**	0.18
Nickel	--	--	--	--	29.3 J	--	--	--	--	--	**71.1 J**	--	20	--	--	--	**69.4**	--	--	--	30
Potassium	--	--	--	--	1180 J	--	--	--	--	--	408 J	--	900	--	--	--	1040	--	--	--	--
Selenium	--	--	--	--	ND J	--	--	--	--	--	ND J	--	ND	--	--	--	ND	--	--	--	3.9
Silver	--	--	--	--	ND	--	--	--	--	--	ND	--	0.508	--	--	--	ND	--	--	--	2
Sodium	--	--	--	--	367 J	--	--	--	--	--	166 J	--	234	--	--	--	331	--	--	--	--
Vanadium	--	--	--	--	27	--	--	--	--	--	44.2	--	39.7	--	--	--	46.5	--	--	--	--
Zinc	--	--	--	--	**213**	--	--	--	--	--	**409**	--	380	--	--	--	**675 D**	--	--	--	109
Cyanide, Total	--	1.6	ND	ND J	ND J	ND J	4 J	--	ND	12 J	2.3 J	1.6 J	ND	--	ND	--	1.1	--	1.1	15.5	27

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:

B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:

BOLD = Value exceeds Part 375 Unrestricted Use Soil Cleanup Objectives.

TABLE 6A

COMPARISON OF SOIL ANALYTICAL DATA TO UNRESTRICTED USE SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																						Unrestricted SCO [2] (mg/kg)
	TP-85	TP-86	TP-89	TP-90	TP-91	TP-92	TP-93	TP-94	TP-95	TP-95B	TP-96	TP-97	TP-98	Blind 5	TP-99	TP-99	TP-99B	TP-100	TP-103	TP-104	TP-105	SS-1	
	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	6.0 - 8.0	3.0 - 4.0	0.0 - 2.0	0.0 - 2.0	0.0 - 0.5	(TP-98)	0.0-0.5	5.0-8.0	6.0-8.0	0.0-2.0	0.0-2.0	0.0-2.0	0.0-2.0	0.0-0.5	
Volatile Organic Compounds (VOCs) - mg/kg																							
Acetone	--	ND	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.05**
Benzene	--	ND	ND	--	--	ND	ND	ND	**0.25 DWNJ**	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.06**
2-Butanone	--	ND	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Chlorobenzene	--	ND	ND	--	--	ND	--	--	0.2 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**1.1**
Chlorohexane	--	ND	ND	--	--	ND	--	--	0.42 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Cyclohexane	--	ND	ND	--	--	ND	--	--	0.42 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
1,2-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	**34 DW**	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**1.1**
1,3-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	0.46 DWNJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**2.4**
1,4-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	**3.9 DW**	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**1.8**
Ethylbenzene	--	ND	ND	--	--	ND	ND	ND	0.25 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**1**
n-Butylbenzene	--	ND	0.25 W	--	--	ND	ND	ND	0.53 DWNJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**12**
sec-Butylbenzene	--	ND	0.1 WJ	--	--	ND	ND	ND	0.24 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**11**
Isopropylbenzene	--	ND	ND	--	--	ND	ND	ND	0.12 DWJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
p-Cymene	--	ND	ND	--	--	ND	ND	ND	0.37 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
n-Propylbenzene	--	ND	ND	--	--	ND	ND	ND	0.36 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**3.9**
Toluene	--	ND	ND	--	--	ND	ND	ND	0.34 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.7**
1,2,4-Trichlorobenzene	--	ND	ND	--	--	ND	--	--	0.15 DWJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
1,2,4-Trimethylbenzene	--	ND	0.22 W	--	--	ND	ND	ND	**5.2 DW**	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**3.6**
1,3,5-Trimethylbenzene	--	ND	ND	--	--	ND	ND	ND	1.8 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**8.4**
o-Xylene	--	ND	ND	--	--	ND	ND	ND	**0.75 DW**	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.26**
m-Xylene	--	ND	ND	--	--	ND	--	--	1.5 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.26**
Xylenes, Total	--	ND	ND	--	--	ND	ND	ND	2.2 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Naphthalene	--	ND	ND	--	--	ND	0.063 BD	0.066 BD	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Methylcyclohexane	--	ND	0.11 WJ	--	--	ND	--	--	1.1 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Methyl tert butyl ether	--	ND	ND	--	--	ND	ND J	ND	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**0.93**
Methylene Chloride	--	0.0065	**0.09 WJ**	--	--	ND	--	--	ND	--	0.0036 J	--	--	--	--	0.0064	0.0076	ND	--	--	0.0082	--	**0.05**
TOTAL VOCs (mg/kg)	--	*0.007*	*0.770*	--	--	*0*	*0.063*	*0.066*	*52.4*	--	*0.004*	--	--	--	--	*0.006*	*0.008*	*0*	--	--	*0.008*	--	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																							
Acenaphthene	**27 D**	ND	1.4 TDJ	ND	ND	ND	4.4 DT	0.19 DJ	ND	--	ND	2.6 DJ	--	--	--	--	--	0.29 DJ	ND	ND	0.41 DJ	--	**20**
Acenaphthylene	3.7 DJ	ND	ND	0.4 DJ	0.32 DJ	0.15 DJ	89 TDJ	ND	1.9 TDJ	--	0.23 DJ	ND	--	--	--	--	--	2.4 D	ND	5.3 DJ	0.24 DJ	--	**100**
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	3.6 TDJ	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**--**
Anthracene	7.1 D	0.84 DJ	6 TDJ	1.5 DJ	0.3 DJ	ND	**120 DT**	0.46 DJ	4.7 TDJ	--	0.34 DJ	13 D	--	--	--	--	--	3 D	0.2 DJ	7.6 DJ	1.1 DJ	--	**100**
Benzo(a)anthracene	**120 D**	**2.7 DJ**	**4.4 TDJ**	**4.8 D**	**1.3 DJ**	0.7 DJ	**370 DTB**	**3.1 DJB**	**9.2 TDJ**	--	**1.7 DJ**	**35 D**	--	--	--	--	--	**11 D**	**1 DJ**	**30 D**	**2.4 D**	--	**1**
Benzo(b)fluoranthene	**120 D**	**3.7 DJ**	**1.8 TDJ**	**5.9 D**	**2.4 D**	0.92 DJ	**320 DT**	**5.5 D ID4**	**14 TDJ**	--	**2.7 D**	**37 D**	--	--	--	--	--	**12 D**	**1.2 DJ**	**26 D**	**3 D**	--	**1**
Benzo(k)fluoranthene	**57 D**	**1.2 DJ**	0.66 TDJ	**2.4 D**	**0.8 DJ**	**0.88 DJ**	**160 DT**	ND	**15 TDJ**	--	**0.89 DJ**	**17 D**	--	--	--	--	--	**5.8 DJ**	0.58 DJ	**12 D**	**0.98 DJ**	--	**0.8**
Benzo(g,h,i)perylene	78 D	2.8 DJ	2.4 TDJ	3.4 D	1.7 DJ	0.69 DJ	**180 DTB**	3.4 DJB	7.5 TDJ	--	2 D	25 D	--	--	--	--	--	7.5 D	0.97 DJ	12 D	1.7 DJ	--	**100**
Benzo(a)pyrene	**110 D**	**2.9 DJ**	**3.6 TDJ**	**4.9 D**	**1.7 DJ**	0.83 DJ	**280 DT**	**3.2 DJ**	ND	--	**2.2 D**	**35 D**	--	--	--	--	--	**11 D**	0.93 DJ	**23 D**	**2.4 D**	--	**1**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**1**
Biphenyl	**2.8 DJ**	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**0.33**
Carbazole	--	ND	ND	--	--	ND	--	--	ND	--	0.12 DJ	--	--	--	--	--	--	0.84 DJ	--	--	0.42 DJ	--	**7**
Chrysene	**99 D**	**2.5 DJ**	**5.1 TDJ**	4.5 D	**1.2 DJ**	**1 DJ**	**320 DT**	**2.2 DJ**	**8.1 TDJ**	--	**1.7 DJ**	**31 D**	--	--	--	--	--	**9.1 D**	**1.1 DJB**	**26 BD**	**2.4 DJ**	--	**1**
Dibenzo(a,h)anthracene	**20 D**	ND	**1 TDJ**	**0.89 DJ**	**0.38 DJ**	0.27 DJ	**58 TDJB**	**0.78 DJB**	ND	--	**0.52 DJ**	**6.6 DJ**	--	--	--	--	--	**1.9 DJ**	**2.1 D**	**11 D**	**0.44 DJ**	--	**0.33**
Dibenzofuran	23 D	ND	ND	ND	ND	ND	23 TDJ	ND	5.5 TDJ	--	ND	1.8 DJ	--	--	--	--	--	0.66 DJ	ND	ND	0.38 DJ	--	**--**
Fluoranthene	**300 D**	6.1 DJ	3.6 TDJ	11 D	2.8 D	0.91 DJ	**750 DT**	4.8 D	21 TDJ	--	3 D	77 D	--	--	--	--	--	25 D	1.1 DJ	60 D	5 D	--	**100**
Fluorene	**39 D**	ND	2.4 TDJ	0.19 DJ	ND	ND	**49 TDJ**	ND	23 TDJ	--	ND	3.3 DJ	--	--	--	--	--	1.5 DJ	ND	2.4 D	0.43 DJ	--	**30**
Indeno(1,2,3-cd)pyrene	**69 D**	**2.1 DJ**	**1.2 TDJ**	**3.2 D**	**1.5 DJ**	0.48 DJ	**170 DT**	**2.7 DJ**	**6.5 TDJ**	--	**1.7 DJ**	**23 D**	--	--	--	--	--	**6.7 D**	**0.79 DJ**	**12 D**	**1.6 DJ**	--	**0.5**
2-Methylnaphthalene	10 DJ	ND	ND	ND	ND	ND	5.2 TDJ	ND	8.4 TDJ	--	ND	ND	--	--	--	--	--	0.24 DJ	ND	ND	0.25 DJ	--	**--**
Naphthalene	**31 D**	ND	ND	ND	ND	ND	9.6 TDJ	ND	**13 TDJ**	--	ND	1.7 DJ	--	--	--	--	--	0.32 DJ	ND	ND	0.44 DJ	--	**12**
Phenanthrene	**250 D**	3.5 DJ	12 DT	4.5 D	1 DJ	0.35 DJ	**480 DT**	2.2 DJ	20 TDJ	--	1.4 DJ	42 D	--	--	--	--	--	13 D	0.58 DJ	26 D	4.1 D	--	**100**
Pyrene	**210 D**	4.6 DJ	12 DT	7.6 D	2 D	0.93 DJ	**570 DT**	5 D	15 TDJ	--	2.3 D	54 D	--	--	--	--	--	16 D	1 DJ	51 D	3.8 D	--	**100**
TOTAL SVOCs (mg/kg)	***1577***	*32.9*	*57.6*	*55.2*	*17.4*	*8.11*	***3958***	*33.5*	*176*	--	*20.8*	*405*	--	--	--	--	--	*128*	*11.6*	*304*	*31.5*	--	--
Polychlorinated Biphenyls (PCBs) - mg/kg																							
Aroclor 1242	0.068 QSU	0.015 QSU, J	ND	ND	ND	ND	--	--	ND	--	ND	--	ND	ND	ND	--	--	--	ND	--	--	ND	**--**
Aroclor 1248	ND	ND	ND	ND	ND	ND	--	--	0.24 QSU	--	ND	--	ND	ND	ND	--	--	--	ND	--	--	ND	**--**
Aroclor 1254	ND	ND	ND	ND	ND	ND	--	--	ND	--	ND	--	0.011 QSU, J	ND	0.04 QSU,D,J	--	--	--	ND	--	--	0.057	**--**
Aroclor 1260	0.13 QSU	0.063 QSU	ND	ND	**0.13 QSU**	ND	--	--	ND	--	ND	--	ND	ND	ND	--	--	--	0.063 QSU	--	--	ND	**--**
TOTAL PCBs (mg/kg)	***0.198***	*0.078*	*0*	*0*	***0.13***	*0*	--	--	***0.24***	--	*0*	--	*0.011*	*0*	*0.043*	--	--	--	*0.063*	--	--	*0.057*	***0.1***
Inorganic Compounds - mg/kg																							
Aluminum	--	19100	33800	--	--	--	--	--	--	8260	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Antimony	--	91.3	ND	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Arsenic, Total	**20.1**	**42.8**	3.1	**55.5**	**37.1**	**26.7**	**33.9**	**44.2**	11.8	**71.9**	**15.4**	4.7	--	--	--	--	--	**117 J**	**198 J**	--	**14 J**	--	**13**
Barium, Total	124	141	223	172	35.4	10.4	151	83.1	137	255 J	150	73.2	--	--	--	--	--	92.4 J	202	--	131	--	**350**
Beryllium	--	2.71	4.45	--	--	--	--	--	--	1.28	--	--	--	--	--	--	--	--	--	--	--	--	**7.2**
Cadmium, Total	**4.06**	1.86	ND	**2.65**	1.13	0.914	**2.92**	**2.53**	**2.55**	0.533	1.49	1.31	--	--	--	--	--	0.886 J	**54.5**	--	0.983	--	**2.5**
Calcium	--	109000 D	250000 D	--	--	--	--	--	--	43300 D	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Chromium, Total	**93.4**	**73.2**	**3.57**	**122**	**67.4**	**26.3**	**13.4 J**	**78.1 J**	**52.2 J**	**87.8 J**	**671**	**95.6**	--	--	--	--	--	**63.5 J**	**29.2 J**	--	**235 J**	--	**1**
Cobalt	--	13.1	1.38	--	--	--	--	--	--	3.21	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Copper	--	**655**	5.7	--	--	--	--	--	--	**65.4**	--	--	--	--	--	--	--	--	--	--	--	--	**50**
Iron	--	135000 D	7570 D	--	--	--	--	--	--	32900 D	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Lead, Total	603	0.62	6.9	**235**	**162**	**543**	**605**	**485**	**365**	**127**	**148**	**463**	--	--	--	--	--	**92.9 J**	**301 J**	--	**107 J**	--	**63**
Magnesium	--	16100	5080	--	--	--	--	--	--	5590 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Manganese	--	**3630 D**	**4390 D**	--	--	--	--	--	--	**3040 D**	--	--	--	--	--	--	--	--	--	--	--	--	**1600**
Mercury, Total	**0.314 D**	**0.508 D**	ND	0.104 D	0.0833 D	0.035	**0.724**	**2.71 D**	**0.452 D**	**0.209 D**	0.168	**0.671**	--	--	--	--	--	**0.265 J**	**0.229**	--	**0.538**	--	**0.18**
Nickel	--	**157**	ND	--	--	--	--	--	--	12.8 J	--	--	--	--	--	--	--	--	--	--	--	--	**30**
Potassium	--	1880	4080	--	--	--	--	--	--	1640 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Selenium	--	ND	ND	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**3.9**
Silver	--	ND	ND	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**2**
Sodium	--	512	998	--	--	--	--	--	--	206 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Vanadium	--	24	12.8	--	--	--	--	--	--	68.6	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Zinc	--	**376 D**	12.3 D	--	--	--	--	--	--	103	--	--	--	--	--	--	--	--	--	--	--	--	**109**
Cyanide, Total	1.2	1.1	ND	ND	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	--	**27**

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:
B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:
BOLD = Value exceeds Part 375 Unrestricted Use Soil Cleanup Objectives.

TABLE 6B

COMPARISON OF SOIL ANALYTICAL DATA TO RESTRICTED-COMMERCIAL SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																				Restricted-Commercial SCO^2 (mg/kg)
	TP-1	TP-2	TP-6	BLIND 1	TP-7	TP-10	TP-11	TP-12	TP-13	TP-15	TP-16	TP-17	TP-18	TP-19	TP-20	TP-21	TP-23	TP-24	TP-25	TP-27	
	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	(TP-6)	5.0 - 7.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	6.0 - 8.5	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	5.0 - 7.0	
Volatile Organic Compounds (VOCs) - mg/kg																					
Acetone	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	0.0033 J	--	ND	--	--	--	500
Benzene	--	--	--	--	ND	0.023 J	--	ND J	ND	--	ND J	ND	ND	--	ND	0.23 DJ	ND	--	--	--	44
2-Butanone	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--
Chlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	500
Chlorohexane	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--
Cyclohexane	--	--	--	--	0.0025 J	--	--	--	ND	--	--	0.0023 J	--	--	ND	--	ND	--	--	--	--
1,2-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	500
1,3-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	280
1,4-Dichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	130
Ethylbenzene	--	--	--	--	ND	0.032 J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	390
n-Butylbenzene	--	--	--	--	ND	0.013 J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	500
sec-Butylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	2.3 J	ND	ND	--	ND	ND	ND	--	--	--	500
Isopropylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	--
p-Cymene	--	--	--	--	ND	ND J	--	ND J	ND	--	0.51 J	ND	ND	--	ND	ND	ND	--	--	--	--
n-Propylbenzene	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	500
Toluene	--	--	--	--	ND	0.19 J	--	0.089 J	ND	--	0.092 J	0.0031 J	0.013 J	--	ND	0.19 DJ	ND	--	--	--	500
1,2,4-Trichlorobenzene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--
1,2,4-Trimethylbenzene	--	--	--	--	ND	0.044 J	--	0.044 J	ND	--	ND J	ND	0.015 J	--	ND	1.2 D	ND	--	--	--	190
1,3,5-Trimethylbenzene	--	--	--	--	ND	0.016 J	--	ND J	ND	--	ND J	ND	0.015 J	--	ND	ND	ND	--	--	--	190
o-Xylene	--	--	--	--	ND	0.066 J	--	0.044 J	ND	--	ND J	ND	0.013 J	--	ND	0.24 DJ	ND	--	--	--	500
m-Xylene	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	500
Xylenes, Total	--	--	--	--	ND	0.33 J	--	0.15 J	ND	--	ND J	ND	0.034 J	--	ND	0.46 DJ	ND	--	--	--	500
Naphthalene	--	--	--	--	ND	0.04 J	--	0.21 J	ND	--	ND J	ND	0.055 J	--	ND	4.2 D	ND	--	--	--	500
Methylcyclohexane	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--
Methyl tert butyl ether	--	--	--	--	ND	ND J	--	ND J	ND	--	ND J	ND	ND	--	ND	ND	ND	--	--	--	500
Methylene Chloride	--	--	--	--	0.0053	--	--	--	0.0036 J	--	--	0.0053 J	--	--	0.0062 J	--	0.009	--	--	--	500
TOTAL VOCs (mg/kg)	*--*	*--*	*--*	*--*	*0.008*	*0.424*	*--*	*0.387*	*0.004*	*--*	*2.90*	*0.011*	*0.111*	*--*	*0.010*	*6.06*	*0.009*	*--*	*--*	*--*	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																					
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	0.37 DJ	ND	ND	0.15 J	ND	0.95 DJ	ND	ND	ND	ND	ND	ND	ND	500
Acenaphthylene	ND	0.72 DJ	ND	ND	0.13 DJ	ND	0.22 DJ	ND	0.31 DJ	ND	ND	ND	ND	1.26 DJ	ND	0.44 DJ	0.31 DJ	0.24 DJ	0.048 J	0.053 DJ	500
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Anthracene	ND	0.59 DJ	ND	ND	0.35 DJ	ND	ND	0.92 DJ	0.14 DJ	ND	ND	ND	2.1 DJ	0.38 DJ	0.11 DJ	0.72 DJ	0.54 DJ	0.18 DJ	0.039 J	ND	500
Benzo(a)anthracene	0.66 DJ	2.7 DJ	0.69 DJ	0.62 DJ	1.7 DJ	0.69 DJ	0.76 DJ	4.8 D	1.7 DJ	0.28 DJ	0.018 J	0.19 DJ	**9.5 D**	1.3 DJ	0.84 DJ	4 D	2 DJ	**1.1 D**	0.22	0.59 DJB	5.6
Benzo(b)fluoranthene	0.8 DJ	4.6 D	ND	0.55 DJ	1.7 DJ	1.1 DJ	1.1 DJ	4.5 D	2.2 D	0.25 DJ	ND	0.27 D,ID4,J	**9.4 D**	2.2 D	1.1 D	**6 D**	2.6 DJ	**1.5 D**	0.38	0.83 DJ	5.6
Benzo(k)fluoranthene	0.29 DJ	1.5 DJ	ND	ND	0.81 DJ	0.42 DJ	0.31 DJ	2 DJ	0.92 DJ	0.11 DJ	ND	ND	4.6 D	0.68 DJ	0.34 DJ	2.2 D	0.84 DJ	**5.9 D**	0.13 J	0.59 DJ	56
Benzo(g,h,i)perylene	0.38 DJ	3.3 D	ND	0.29 DJ	0.97 DJ	0.95 DJ	0.62 DJ	2.7 DJ	1.2 DJ	0.15 DJ	ND	ND	4.7 D	1.3 DJ	0.47 DJ	3.6 D	1.5 DJ	0.88 D	0.24	0.5 DJB	500
Benzo(a)pyrene	0.49 DJ	**3.4 D**	ND	0.35 DJ	**1.3 DJ**	0.8 DJ	0.74 DJ	**3.7 DJ**	**1.6 DJ**	0.2 DJ	ND	ND	**7.2 D**	**1.5 DJ**	0.72 DJ	**4.8 D**	**2 DJ**	**1.2 D**	0.27	0.64 DJ	1
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Carbazole	--	--	--	--	--	--	--	--	ND	--	--	ND	--	--	ND	--	ND	ND	--	--	--
Chrysene	0.86 DJB	3 BD	1.1 DJB	0.83 DJB	1.7 DJB	0.78 DJB	0.91 DJB	4.9 BD	1.9 DJB	0.39 DJB	ND	0.31 DJB	10 BD	1.4 DJ	0.84 DJ	4 BD	2.2 DJB	**1.3 D**	0.26	0.53 DJ	56
Dibenzo(a,h)anthracene	ND	**0.68 DJ**	ND	ND	**1.9 D**	ND	0.19 DJ	**4.1 D**	**2.1 D**	ND	ND	ND	**4.4 D**	0.38 DJ	0.17 DJ	**0.96 DJ**	0.43 DJ	0.26 DJ	0.056 J	0.14 DJB	0.56
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42 DJ	ND	ND	ND	ND	0.051 DJ	ND	ND	350
Fluoranthene	0.87 DJ	6 D	ND	0.81 DJ	3.3 D	0.73 DJ	1 DJ	10 D	1.9 DJ	0.35 DJ	0.027 J	ND	23 D	3 D	1.2 D	6.9 D	4.5 D	2.2 D	0.47	0.99 D	500
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42	ND	0.56 DJ	0.17 DJ	ND	ND	ND	0.037 DJ	ND	ND	500
Indeno(1,2,3-cd)pyrene	0.33 DJ	2.8 D	ND	ND	0.83 DJ	0.74 DJ	0.52 DJ	2.3 DJ	1.1 DJ	0.11 DJ	ND	ND	4.1 D	1.2 DJ	0.44 DJ	3.3 D	1.4 DJ	**0.81 D**	0.21 J	0.44 DJ	5.6
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.78	ND	ND	ND	ND	ND	ND	0.054 DJ	0.026 J	ND	--
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.057 DJ	ND	ND	500
Phenanthrene	0.51 DJ	1.9 DJ	ND	0.98 DJ	1.7 DJ	0.25 DJ	0.56 DJ	6.8 D	0.51 DJ	0.28 DJ	0.7	ND	16 D	1.9 D	0.57 DJ	1.8 DJ	1.4 DJ	0.93 D	0.18 J	0.2 DJ	500
Pyrene	0.86 DJ	4.6 D	ND	0.76 DJ	2.8 D	0.78 DJ	0.91 DJ	8.7 D	1.9 DJ	0.33 DJ	0.1 J	0.14 DJ	18 D	2 D	1.1 D	5.5 D	3.2 DJ	1.8 D	0.32	1 D	500
TOTAL SVOCs (mg/kg)	*6.05*	*35.8*	*1.79*	*5.19*	*19.2*	*7.24*	*7.84*	*55.8*	*17.5*	*2.45*	*2.20*	*0.910*	*115*	*18.7*	*7.90*	*44.2*	*22.9*	*18.5*	*2.85*	*6.50*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																					
Aroclor 1242	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	--
Aroclor 1248	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	--
Aroclor 1254	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	--
Aroclor 1260	--	--	--	--	ND	--	--	--	ND	ND	--	ND	--	--	ND J	--	--	--	--	--	--
TOTAL PCBs (mg/kg)	*--*	*--*	*--*	*--*	*ND*	*--*	*--*	*--*	*ND*	*ND*	*--*	*ND*	*--*	*--*	*ND*	*--*	*--*	*--*	*--*	*--*	*1*
Inorganic Compounds - mg/kg																					
Aluminum	--	--	--	--	2350	--	--	--	15400	--	--	5290	--	--	12100	--	19300	--	--	--	--
Antimony	--	--	--	--	ND J	--	--	--	ND J	--	--	ND J	--	--	ND J	--	ND J	--	--	--	--
Arsenic, Total	**51.4 J**	**45.9 J**	15.8 J	ND J	3.8	**245 J**	**64.9 J**	**21.6 J**	**21.9**	**105**	--	4.4	14 J	**24.6 J**	**30.1**	**119 J**	**32.8**	**86.9**	**27.4 J**	6.5	16
Barium, Total	110	192	102	97.8	30.2 J	108	111	278	232 J	122	--	56.4 J	86.5	195 J	296 J	240	199 J	96	195 J	21.7	400
Beryllium	--	--	--	--	ND	--	--	--	2.34	--	--	0.829	--	--	1.46	--	2.32	--	--	--	590
Cadmium, Total	3.87	1.96	1.87	0.774	0.632	2.99	1.35	3.39	3.05	0.521	--	1.79	2.44	1.06 J	1.97	1.07	0.396	1.14	0.861 J	1.11	9.3
Calcium	--	--	--	--	44200	--	--	--	89600 D	--	--	165000 D	--	--	204000 D	--	116000 D	--	--	--	--
Chromium, Total	93.9 J	109 J	26 J	26.8 J	14.7	201 J	175 J	182 J	81.3	7.17	--	562	288 J	86.5 J	1100	50.2 J	29.2	**46**	29.5 J	4.71 J	1,500
Cobalt	--	--	--	--	2.28	--	--	--	5.12	--	--	2.52	--	--	1.55	--	3.87	--	--	--	--
Copper	--	--	--	--	19.1	--	--	--	84.7	--	--	24.1	--	--	25.9	--	51.7	--	--	--	270
Iron	--	--	--	--	14200 B1, B	--	--	--	89400 B1, D, B	--	--	118000 B1,D,B	--	--	175000 BD	--	53500 B1, B	--	--	--	--
Lead, Total	205 J	133 J	202 J	57.9 J	51.8	345 J	316 J	163 J	191	22.6	--	23.6	114 J	90.8 J	76.1	120 J	58	**103**	72.9 J	49.5	1,000
Magnesium	--	--	--	--	5290	--	--	--	11100	--	--	21900	--	--	39600	--	7760	--	--	--	--
Manganese	--	--	--	--	645	--	--	--	6080 D	--	--	**18900 D**	--	--	**56000 D**	--	6480 D	--	--	--	10,000
Mercury, Total	0.107 J	0.0585	0.201 J	0.144 J	0.0729 J	0.108 J	0.587	0.0395	0.203	0.671	--	ND	0.0918 D	0.0659 J	ND	0.45	0.678	0.135	0.0583 J	0.0568	2.8
Nickel	--	--	--	--	7.93 J	--	--	--	17.5 J	--	--	15.4 J	--	--	ND J	--	8.79 J	--	--	--	310
Potassium	--	--	--	--	329 J	--	--	--	1400 J	--	--	311 J	--	--	824 J	--	2120 J	--	--	--	--
Selenium	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	11.9 J	--	ND	--	--	--	1,500
Silver	--	--	--	--	ND	--	--	--	ND	--	--	ND	--	--	ND	--	ND	--	--	--	8.3
Sodium	--	--	--	--	153 J	--	--	--	372 J	--	--	208 J	--	--	253 J	--	409 J	--	--	--	--
Vanadium	--	--	--	--	9.88	--	--	--	51.4	--	--	347	--	--	823	--	38.4	--	--	--	--
Zinc	--	--	--	--	141	--	--	--	555	--	--	68.1	--	--	91.3	--	93.6	--	--	--	10,000
Cyanide, Total	--	--	--	--	ND J	ND J	--	ND J	ND J	--	--	ND J	ND J	ND J	ND J	ND J	ND J	--	ND J	--	27

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:
B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:

BOLD	= Value exceeds Restricted-Commercial SCO (and Unrestricted SCO)
BOLD	= Value exceeds Unrestricted SCO

TABLE 6B

COMPARISON OF SOIL ANALYTICAL DATA TO RESTRICTED-COMMERCIAL SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																						Restricted-Commercial SCO[2] (mg/kg)
	TP-30	TP-32	TP-33	TP-34	TP-35	TP-36	TP-38	TP-39	TP-40	TP-41	TP-43	Blind 3	TP-45	TP-46	TP-47	TP-48	Blind 2	TP-49	TP-50	TP-52	TP-53	TP-55	
	0.0 - 2.0	0.0 - 2.0	0.0 - 0.5	0.0 - 2.0	1.0 - 3.0	0.0 - 1.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	(TP-43)	0.0 - 2.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0	(TP-48)	0.0 - 7.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	
Volatile Organic Compounds (VOCs) - mg/kg																							
Acetone	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	0.11 J	--	500
Benzene	ND	--	--	--	--	--	0.017	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	44
2-Butanone	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	0.016 J	--	--
Chlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	500
Chlorohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	--
Cyclohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	--
1,2-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	500
1,3-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	280
1,4-Dichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	130
Ethylbenzene	ND	--	--	--	--	--	0.027	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	390
n-Butylbenzene	ND	--	--	--	--	--	0.036	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.0071 J	500
sec-Butylbenzene	ND	--	--	--	--	--	0.0096 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	500
Isopropylbenzene	ND	--	--	--	--	--	0.0073 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	--
p-Cymene	ND	--	--	--	--	--	0.014	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	--
n-Propylbenzene	ND	--	--	--	--	--	0.0078 J	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	500
Toluene	ND	--	--	--	--	--	0.071	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.011 J	500
1,2,4-Trichlorobenzene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	--
1,2,4-Trimethylbenzene	ND	--	--	--	--	--	0.059	--	--	--	--	--	--	--	--	ND	ND	--	--	--	0.016 J	0.012 J	190
1,3,5-Trimethylbenzene	ND	--	--	--	--	--	0.017	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	190
o-Xylene	ND	--	--	--	--	--	0.057	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.011 J	500
m-Xylene	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	500
Xylenes, Total	ND	--	--	--	--	--	0.16	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	0.026 J	500
Naphthalene	ND	--	--	--	--	--	0.3 B	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.087 BJ	500
Methylcyclohexane	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	--	--
Methyl tert butyl ether	ND	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	ND	--	--	--	ND	ND	500
Methylene Chloride	0.0028 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.0045	--	--	--	0.018 J	--	500
TOTAL VOCs (mg/kg)	*0.003*	--	--	--	--	--	*0.623*	--	--	--	--	--	--	--	--	*0*	*0.005*	--	--	--	*0.160*	*0.128*	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																							
Acenaphthene	ND	8.7 DJ	ND	--	ND	ND	0.11 DJ	ND	1.1 DJ	ND	ND	ND	0.5 DJ	ND	ND	ND	ND	ND	ND	ND	17 TDJ	ND	500
Acenaphthylene	0.08 DJ	ND	0.45 DJ	--	0.26 DJ	ND	0.1 DJ	ND	0.59 DJ	ND	ND	ND	3.7 DJ	0.33 DJ	0.18 DJ	ND	ND	ND	2.3 DJ	0.72 DJ	4.2 TDJ	0.48 DJ	500
Acetophenone	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Anthracene	0.099 DJ	20 D	1.2 DJ	--	0.19 DJ	0.24 DJ	0.52 DJ	0.067 DJ	3.7 D	ND	0.058 DJ	ND	4.2 D	ND	ND	ND	ND	ND	0.79 DJ	0.55 DJ	23 TDJ	0.56 DJ	500
Benzo(a)anthracene	0.83 D	**32 D**	**7.6 D**	--	0.9 DJ	2.3 D	3.1 D	0.33 DJ	**12 D**	0.53 DJ	0.26 DJ	0.25 DJ	**11 D**	1.5 DJB	1.1 DJB	0.52 DJ	0.38 DJ	0.15 DJ	5.4 DJ	2 DJ	**30 TDJ**	1.9 DJ	5.6
Benzo(b)fluoranthene	1.4 D	**38 D**	1.2 D	--	1 DJ	5.2 D	4 D	0.35 DJ	**14 D**	0.67 DJ	0.38 DJ	0.34 DJ	**14 D**	2.9 DJ	2 D,ID4,J	0.89 DJ	0.64 DJ	0.17 DJ	**11 D**	3.9 D	**20 TDJ**	3.3 DJ	5.6
Benzo(k)fluoranthene	0.53 DJ	13 D	4 DJ	--	0.38 DJ	1.6 DJ	1.9 D	0.14 DJ	4.8 D	0.27 DJ	0.16 DJ	0.14 DJ	6.6 D	1.9 DJ	ND	0.29 DJ	0.19 DJ	ND	3.2 DJ	1.8 DJ	12 TDJ	1.7 DJ	56
Benzo(g,h,i)perylene	0.98 DJ	21 D	7.3 D	--	0.82 DJ	4.3 D	3.1 D	0.3 DJ	8.7 D	0.56 DJ	0.31 DJ	0.26 DJ	9.7 D	2 DJB	0.86 DJB	1.1 DJ	0.44 DJ	ND	7.6 DJ	2.7 DJ	11 TDJ	3.2 DJ	500
Benzo(a)pyrene	**1.1 D**	**32 D**	**8.5 D**	--	0.89 DJ	**3.9 D**	**3.8 D**	0.3 DJ	**12 D**	0.56 DJ	0.33 DJ	0.28 DJ	**12 D**	**2.1 DJ**	**1 DJ**	0.65 DJ	0.42 DJ	ND	**7.9 DJ**	**2.9 DJ**	**17 TDJ**	**2.9 DJ**	1
Bis(2-ethylhexyl) phthalate	ND	ND	2.2 DJ	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Biphenyl	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	0.3 DJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
Carbazole	0.039 DJ	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	8.1 DJ	--
Chrysene	0.96 D	28 D	7.2 D	--	0.88 DJ	2.4 D	3.2 D	0.34 DJ	12 D	0.52 DJ	0.3 DJ	0.25 DJ	12 D	1.4 DJ	0.65 DJ	0.53 DJ	0.38 DJ	0.17 DJ	6.7 DJ	2.2 DJ	29 TDJ	2.3 DJ	56
Dibenzo(a,h)anthracene	0.25 DJ	**5 DJ**	**1.7 DJ**	--	ND	**0.89 DJ**	**0.86 DJ**	0.083 DJ	ND	ND	0.091 DJ	0.073 DJ	ND	ND	ND	ND	ND	ND	**2.1 DJ**	**0.69 DJ**	ND	**0.67 DJ**	0.56
Dibenzofuran	ND	6.4 DJ	ND	--	ND	ND	0.17 DJ	ND	0.47 DJ	ND	ND	ND	2 DJ	ND	ND	ND	ND	ND	ND	ND	13 TDJ	ND	350
Fluoranthene	1.1 D	87 D	15 D	--	1.2 DJ	2.8 D	3.4 D	0.4 DJ	25 D	0.71 DJ	0.39 DJ	0.34 DJ	31 D	2.2 DJ	1.4 DJ	0.68 DJ	0.49 DJ	0.25 DJ	10 DJ	1.8 DJ	64 TDJ	3.3 DJ	500
Fluorene	ND	11 D	ND	--	ND	ND	0.11 DJ	ND	1.2 DJ	ND	ND	ND	3.5 DJ	ND	ND	ND	ND	ND	ND	ND	21 TDJ	ND	500
Indeno(1,2,3-cd)pyrene	0.81 D	**17 D**	**6 D**	--	**0.69 DJ**	3.2 D	2.7 D	0.24 DJ	**8 D**	0.45 DJ	0.27 DJ	0.22 DJ	**8.8 D**	1.6 DJ	0.71 DJ	0.8 DJ	0.37 DJ	ND	**6.5 DJ**	2.2 DJ	**10 TDJ**	2.5 DJ	5.6
2-Methylnaphthalene	0.043 DJ	2.6 DJ	ND	--	0.096 DJ	ND	0.26 DJ	0.048 DJ	0.18 DJ	ND	ND	0.051 DJ	0.93 DJ	ND	0.19 DJ	ND	ND	ND	ND	ND	7.3 TDJ	ND	--
Naphthalene	0.038 DJ	5.3 DJ	ND	--	ND	ND	0.27 DJ	ND	0.36 DJ	ND	ND	ND	2.7 DJ	ND	0.29 DJ	ND	ND	ND	ND	ND	23 TDJ	ND	500
Phenanthrene	0.38 DJ	75 D	6 D	--	0.6 DJ	0.96 DJ	1.8 DJ	0.25 DJ	12 D	0.28 DJ	0.17 DJ	0.15 DJ	25 D	0.17 DJ	ND	0.31 DJ	0.23 DJ	0.26 DJ	3.3 DJ	0.57 DJ	91 TDJ	1.4 DJ	500
Pyrene	0.99 D	56 D	11 D	--	1.3 DJ	2.1 D	3.2 D	0.42 DJ	23 D	0.71 DJ	0.34 DJ	0.3 DJ	25 D	2.4 DJ	1.6 DJ	0.58 DJ	0.42 DJ	0.24 DJ	7.7 DJ	2 DJ	49 TDJ	2.6 DJ	500
TOTAL SVOCs (mg/kg)	*9.63*	*458*	*79.4*	--	*9.21*	*29.9*	*32.6*	*3.27*	*139*	*5.26*	*3.06*	*2.65*	*173*	*18.5*	*9.98*	*6.35*	*3.96*	*1.24*	*74.5*	*24.0*	*442*	*34.9*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																							
Aroclor 1242	ND	--	ND	--	--	ND	--	--	ND	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	--
Aroclor 1248	ND	--	ND	--	--	0.029 J	--	--	ND	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	--
Aroclor 1254	ND	--	**1.4 DJ**	--	--	0.16 J	--	--	0.098 J,QSU	--	--	--	ND	--	--	**24 QSU,D,J**	**3.8 QSU,D,J**	--	--	--	ND	--	--
Aroclor 1260	ND	--	0.97 DCJ	--	--	0.061 CJ	--	--	0.064 J,QSU	--	--	--	ND	--	--	ND	ND	--	--	--	ND	--	--
TOTAL PCBs (mg/kg)	*0*	--	***2.37***	--	--	*0.25*	--	--	*0.162*	--	--	--	*ND*	--	--	***24***	***3.8***	--	--	--	*ND*	--	*1*
Inorganic Compounds - mg/kg																							
Aluminum	7570	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15300	16900	--	--	--	--	--	--
Antimony	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND J	ND J	--	--	--	--	--	--
Arsenic, Total	15.9	9.2 J	**17.7 J**	13.2 J	**31.9 J**	6.6 J	11.7 J	**19.2 J**	**152 J**	**30.4 J**	**17.2 J**	13 J	**73.6 J**	**20.5**	13.5	**74.8**	**76.9**	4.4 J	14.3 J	**141**	--	**68.7 J**	16
Barium, Total	68.1	139 J	**429 J**	103 J	146 J	27.2 J	139 J	143 J	158 J	219 J	190 J	170 J	376 J	60.4	94.4	192 J	196 J	134 J	173 J	93.3	--	84.3 J	400
Beryllium	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.94	2.12	--	--	--	--	--	590
Cadmium, Total	ND	3.95 J	**21.8 J**	2.49 J	2.67 J	1.03 J	4.68 J	5.77 J	4.22 J	8.19 J	3.82 J	2.36 J	3.3 J	0.805	0.337	0.861	1.28	0.619 J	3.42 J	3.18	--	2.77 J	9.3
Calcium	97700 D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	64600	71300	--	--	--	--	--	--
Chromium, Total	245	58.2 J	176 J	55.3 J	96.5 J	67.2 J	54.3 J	87.9 J	112 J	101 J	113 J	63.1 J	46.5 J	29.6 J	13.7 J	31.7 J	71.8 J	10.2 J	36.1 J	321 J	--	246 J	1,500
Cobalt	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.55 J	5.1 J	--	--	--	--	--	--
Copper	70.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220	162	--	--	--	--	--	270
Iron	83600 D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	69700 D	57700	--	--	--	--	--	--
Lead, Total	68.7	293 J	984 J	265 J	282 J	128 J	914	442 J	656 J	**1090**	731	762	562 J	425	181	383	**387**	44.2	515	456	--	275	1,000
Magnesium	19800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5450 J	7240 J	--	--	--	--	--	--
Manganese	**15100 D**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2030	7240 J	--	--	--	--	--	10,000
Mercury, Total	0.0749	0.17 J	0.293 J	0.375 J	0.201 J	0.0902 J	0.0998	0.09 J	0.0699 J	0.124	0.108	0.0877	1.57 DJ	0.0958	0.0777	0.0505	0.0709	0.0517	0.185	0.138	--	0.0968	2.8
Nickel	17.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.6 J	18.3 J	--	--	--	--	--	310
Potassium	1190	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1270 J	1160 J	--	--	--	--	--	--
Selenium	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND J	--	--	--	--	--	1,500
Silver	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	--	8.3
Sodium	386	--	--	--	--	--	--	--	--	--	--	--	--	--	--	289 J	318 J	--	--	--	--	--	--
Vanadium	269	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26.4	38.7	--	--	--	--	--	--
Zinc	159	--	--	--	--	--	--	--	--	--	--	--	--	--	--	399	473	--	--	--	--	--	10,000
Cyanide, Total	ND	6.5 J	2 J	--	ND J	**27 J**	**27.8 J**	ND J	ND J	10.5 NJ	ND J	ND J	ND J	--	--	1.4	1.5 J	--	5.7	ND J	--	1.5	27

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:
B = Analyte was detected in associated Method Blank.
C = Calibration verification recovery was above the method control limit for this analyte.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:
BOLD (light blue) = Value exceeds Restricted-Commercial SCO (and Unrestricted SCO)
BOLD (purple) = Value exceeds Unrestricted SCO

TABLE 6B

COMPARISON OF SOIL ANALYTICAL DATA TO RESTRICTED-COMMERCIAL SCOs

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																				Restricted-Commercial SCO^2 (mg/kg)
	TP-56	TP-57	TP-58	Blind 4	TP-60	TP-62	TP-64	TP-65	TP-66	TP-67	TP-69	TP-71	TP-74	TP-75	TP-76	TP-78	TP-80	TP-81B	TP-83	TP-84	
	4.0 - 6.0	0.0 - 2.0	0.0 - 2.0	(TP-58)	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	2.0 - 4.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	9.0 - 9.5	0.0 - 2.0	0.0 - 2.0	
Volatile Organic Compounds (VOCs) - mg/kg																					
Acetone	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**500**
Benzene	--	--	ND	ND	ND	--	0.013	--	0.077	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**44**
2-Butanone	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**--**
Chlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**500**
Chlorohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**--**
Cyclohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**--**
1,2-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**500**
1,3-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**280**
1,4-Dichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**130**
Ethylbenzene	--	--	ND	ND	ND	--	ND	--	0.1	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**390**
n-Butylbenzene	--	--	0.024	0.017	ND	--	0.064	--	0.069	--	ND	--	ND	--	ND	--	ND	ND	0.01 J	ND	**500**
sec-Butylbenzene	--	--	0.01 J	0.0079 J	ND	--	0.027 J	--	0.027 J	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**500**
Isopropylbenzene	--	--	ND	ND	ND	--	0.025	--	0.026	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**--**
p-Cymene	--	--	ND	ND	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**--**
n-Propylbenzene	--	--	ND	ND	ND	--	0.018	--	0.018	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**500**
Toluene	--	--	0.027 B	0.026 B	ND	--	0.098 B	--	0.4 B	--	ND	--	ND	--	ND	--	ND	0.018 DJ	0.015 J	0.045 DJ	**500**
1,2,4-Trichlorobenzene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**--**
1,2,4-Trimethylbenzene	--	--	0.041	0.037	ND	--	0.11	--	0.11	--	ND	--	ND	--	ND	--	ND	0.027 DJ	0.016 J	0.03 DJ	**190**
1,3,5-Trimethylbenzene	--	--	0.012	0.011 J	ND	--	0.034	--	0.037	--	ND	--	ND	--	ND	--	ND	ND	0.007 J	0.031 DJ	**190**
o-Xylene	--	--	0.051	0.036	ND	--	0.14	--	0.13	--	ND	--	ND	--	ND	--	ND	ND	0.013 J	0.027 DJ	**500**
m-Xylene	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**500**
Xylenes, Total	--	--	0.099	0.081	ND	--	0.28	--	0.28	--	ND	--	ND	--	ND	--	ND	ND	0.031 J	0.075 DJ	**500**
Naphthalene	--	--	0.097 B	0.11 B	ND	--	0.42 BJ	--	0.26 B	--	ND	--	ND	--	0.093 DJB	--	ND	0.42 BD	0.07 BJ	0.13 DJB	**500**
Methylcyclohexane	--	--	--	--	ND	--	--	--	--	--	ND	--	ND	--	--	--	ND	--	--	--	**--**
Methyl tert butyl ether	--	--	ND	ND	ND	--	0.01 J	--	0.05	--	ND	--	ND	--	ND	--	ND	ND	ND	ND	**500**
Methylene Chloride	--	--	--	--	0.014	--	--	--	--	--	0.0036 J	--	ND	--	--	--	ND	--	--	--	**500**
TOTAL VOCs (mg/kg)	--	--	0.262	0.2449	0.014	--	0.959	--	1.304	--	0.0036	--	0	--	0.093	--	0	0.465	0.131	0.263	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																					
Acenaphthene	ND	ND	ND	ND	0.17 DJ	0.55 DJ	ND	ND	ND	3.4 DJ	ND	ND	ND	ND	ND	0.86 DJ	7.3 DJ	2.2 TDJ	0.17 DJ	ND	**500**
Acenaphthylene	ND	0.68 DJ	0.17 DJ	ND	0.36 DJ	ND	0.44 DJ	ND	1.1 DJ	1.3 DJ	ND	2.4 DJ	1.2 DJ	ND	0.51 DJ	1.4 DJ	ND	ND	0.42 DJ	ND	**500**
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Anthracene	2.3 DJ	1.3 DJ	0.31 DJ	ND	0.81 DJ	1.4 DJ	0.55 DJ	ND	1.1 DJ	7.7 DJ	ND	3.5 DJ	0.81 DJ	ND	0.38 DJ	5.9 DJ	25 D	7.2 TDJ	0.9 DJ	2.3 TDJ	**500**
Benzo(a)anthracene	**7.8 DJ**	4.5 D	1.6 DJ	0.83 DJ	3.4 DJ	3.5 DJ	2.7 DJ	0.23 DJ	3.3 DJ	**24 BD**	0.91 DJB	**9.9 BD**	5 BD	2.6 TDJB	2 DJ	**17 D**	**53 D**	**15 TDJ**	3 D	**7.4 TDJ**	**5.6**
Benzo(b)fluoranthene	**9.3 DJ**	**6.3 D**	2.6 DJ	0.87 DJ	3.8 D	3.5 DJ	4.5 D	ND	**6.4 D**	**31 D**	1.6 D,ID4,J	**12 D**	**6 D**	5.2 T,D,ID4,J	3.3 DJ	**20 D**	**56 D**	**17 TDJ**	3.8 D	**12 TDJ**	**5.6**
Benzo(k)fluoranthene	4.6 DJ	2 DJ	ND	0.53 DJ	2.1 DJ	1.8 DJ	1.4 DJ	ND	1.8 DJ	14 D	ND	5.4 DJ	2.8 DJ	ND	1.2 DJ	6.3 DJ	26 D	7 TDJ	1.6 DJ	3.9 TDJ	**56**
Benzo(g,h,i)perylene	6.3 DJ	5.1 D	1.3 DJ	0.74 DJ	3.1 DJ	2.2 DJ	2.7 DJ	ND	4 D	24 BD	0.8 DJB	7.6 DJB	3.4 DJ	2.6 TDJB	2.7 DJ	12 D	35 D	9.8 TDJ	2.6 D	7.7 TDJ	**500**
Benzo(a)pyrene	**7.9 DJ**	**5 D**	**1.6 DJ**	0.83 DJ	**3.4 DJ**	**3.1 DJ**	**3.1 DJ**	ND	**3.5 DJ**	**29 D**	0.93 DJ	**9.4 DJ**	**4.6 DJ**	**2.3 TDJB**	**2.7 DJ**	**16 D**	**51 D**	**15 TDJ**	**3.2 D**	**9.1 TDJ**	**1**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**--**
Carbazole	--	--	--	--	0.26 DJ	--	--	--	--	--	ND	--	ND	--	--	--	5.9 DJ	--	--	--	**--**
Chrysene	8.6 DJ	4.5 D	1.5 DJ	0.82 DJ	3.3 DJ	3.2 DJ	2.8 DJ	ND	3.7 DJ	26 D	0.48 DJ	11 D	4.6 BD	ND	2.1 DJ	16 D	48 D	15 TDJ	2.7 D	7.2 TDJ	**56**
Dibenzo(a,h)anthracene	**1.8 DJ**	**1.2 DJ**	0.4 DJ	0.16 DJ	**0.67 DJ**	0.53 DJ	**0.68 DJ**	ND	**0.96 DJ**	ND	ND	**2 DJB**	**0.86 DJ**	ND	**0.62 DJ**	**3.2 DJ**	**8.6 DJ**	**3 TDJ**	**0.62 DJ**	**2.1 TDJ**	**0.56**
Dibenzofuran	ND	ND	ND	ND	ND	0.37 DJ	0.37 DJ	ND	0.33 DJ	2.3 DJ	ND	2 DJ	ND	ND	ND	ND	4.1 DJ	ND	ND	ND	**350**
Fluoranthene	18 D	9.7 D	2.9 DJ	1.4 DJ	6.4 D	8.3 D	4.4 D	ND	5.4 D	55 D	1.5 DJ	29 D	8.6 BD	ND	4.4 D	34 D	130 D	42 DT	6.6 D	16 TDJ	**500**
Fluorene	0.91 DJ	ND	ND	ND	ND	0.59 DJ	ND	ND	ND	3.7 DJ	ND	3.4 DJ	ND	ND	ND	1.2 DJ	8.5 DJ	3.8 TDJ	0.29 DJ	ND	**500**
Indeno(1,2,3-cd)pyrene	5.5 DJ	4.1 D	1.1 DJ	0.58 DJ	2.2 DJ	**2 DJ**	2.5 DJ	ND	3.5 DJ	**20 D**	0.6 DJ	**6.6 DJ**	2.8 DJ	2.1 TDJ	2.2 DJ	**11 D**	**30 D**	**8.8 TDJ**	2.3 D	**6.5 TDJ**	**5.6**
2-Methylnaphthalene	ND	ND	ND	ND	ND	0.16 DJ	0.81 DJ	ND	0.63 DJ	0.45 DJ	ND	0.54 DJ	ND	ND	ND	ND	1.2 DJ	ND	ND	ND	**--**
Naphthalene	ND	ND	ND	ND	ND	0.31 DJ	0.99 DJ	ND	0.54 DJ	1.3 DJ	ND	2.1 DJ	ND	ND	ND	ND	2.3 DJ	ND	ND	ND	**500**
Phenanthrene	8.5 DJ	3.4 DJ	1.6 DJ	0.67 DJ	2.6 DJ	6.4 D	2.2 DJ	ND	1.7 DJ	29 D	0.46 DJ	28 D	2.8 DJB	ND	1.7 DJ	13 D	78 D	30 TDJ	3.3 D	8.9 TDJ	**500**
Pyrene	13 DJ	7.2 D	2.4 DJ	1.2 DJ	5.3 DJ	6.4 D	4.2 D	ND	5.2 D	50 D	1.6 DJ	23 D	7.4 D	2.4 TDJ	3.4 DJ	24 D	93 D	28 TDJ	4.6 D	11 TDJ	**500**
TOTAL SVOCs (mg/kg)	*94.5*	*55.0*	*17.5*	*8.63*	*37.9*	*44.3*	*34.3*	*0.230*	*43.2*	*322*	*8.88*	*158*	*50.9*	*17.2*	*27.2*	*182*	***663***	*204*	*36.1*	*94.1*	--
Polychlorinated Biphenyls (PCBs) - mg/kg																					
Aroclor 1242	ND	ND	--	--	ND	--	--	--	ND	ND	ND	--	ND	--	ND	--	--	0.062 QSU, J	--	--	**--**
Aroclor 1248	ND	ND	--	--	0.011 QSU, J	--	--	--	ND	ND	ND	--	ND	--	ND	--	--	ND	--	--	**--**
Aroclor 1254	ND	ND	--	--	ND	--	--	--	ND	0.35 QSU,D,J	ND	--	ND	--	ND	--	--	ND	--	--	**--**
Aroclor 1260	ND	ND	--	--	ND	--	--	--	ND	ND	ND	--	ND	--	0.13 QSU	--	--	ND	--	--	**--**
TOTAL PCBs (mg/kg)	*ND*	*ND*	--	--	*0.011*	--	--	--	*ND*	*0.35*	*ND*	--	*0*	--	*0.13*	--	--	*0.062*	--	--	***1***
Inorganic Compounds - mg/kg																					
Aluminum	--	--	--	--	13800	--	--	--	--	--	5530	--	7760	--	--	--	10700 J	--	--	--	**--**
Antimony	--	--	--	--	ND	--	--	--	--	--	ND J	--	ND	--	--	--	ND	--	--	--	**--**
Arsenic, Total	14.1 J	**46.4 J**	**122 J**	**57 J**	**17.8**	**23.7**	**24.1**	6.2	**39.9**	**17.3**	**25.3**	**72.7**	**47.4**	14.3	13.8 J	12.6 J	**36.5 J**	--	12.8 J	12.7 J	**16**
Barium, Total	102 J	116 J	118	177	178 J	86.8	94	159	163	125	63.6 J	120	88.8	66.9	73.3 J	113 J	166 J	--	112 J	91.1 J	**400**
Beryllium	--	--	--	--	2.04	--	--	--	--	--	0.725	--	0.97	--	--	--	0.818 J	--	--	--	**590**
Cadmium, Total	0.82 J	3 J	0.973	1.14	1.52	1.38	1.73	ND	2.93	2.21	3.48	3.39	1.87	3.18	2.81 J	3.26 J	9.26 J	--	3.11 J	3.95 J	**9.3**
Calcium	--	--	--	--	74900 D	--	--	--	--	--	36500 D	--	52900	--	--	--	61700 D	--	--	--	**--**
Chromium, Total	16.7 J	55 J	24.3 J	41.6 J	46.5 J	292 J	61.8 J	23.4 J	174 J	54.8 J	73.4 J	44.1 J	91.4	67.8 J	277 J	18.8 J	175 J	--	134 J	57.1 J	**1,500**
Cobalt	--	--	--	--	4.16	--	--	--	--	--	7.95	--	4.51	--	--	--	6.8 J	--	--	--	**--**
Copper	--	--	--	--	128	--	--	--	--	--	**779**	--	120	--	--	--	**518 J**	--	--	--	**270**
Iron	--	--	--	--	44600	--	--	--	--	--	71400 D	--	45100	--	--	--	50200 J	--	--	--	**--**
Lead, Total	575	357	**12300 DJ**	216 J	176	187	384	68.4	647	518	303	460	290	942	325	106	450	--	305	329	**1,000**
Magnesium	--	--	--	--	13700 J	--	--	--	--	--	4210 J	--	9020	--	--	--	24000 J	--	--	--	**--**
Manganese	--	--	--	--	3190 D	--	--	--	--	--	3270 D	--	3770 D	--	--	--	1680 J	--	--	--	**10,000**
Mercury, Total	0.414	0.152	0.269 J	0.541 J	0.276	0.106	**4.05 D**	0.148	0.35	**5.51 D**	**5.68 D**	0.738 D	0.116	0.284	0.518	0.111	0.819	--	0.299	2.1 D	**2.8**
Nickel	--	--	--	--	29.3 J	--	--	--	--	--	71.1 J	--	20	--	--	--	69.4 J	--	--	--	**310**
Potassium	--	--	--	--	1180 J	--	--	--	--	--	408 J	--	900	--	--	--	1040 J	--	--	--	**--**
Selenium	--	--	--	--	ND J	--	--	--	--	--	ND J	--	ND	--	--	--	ND	--	--	--	**1,500**
Silver	--	--	--	--	ND	--	--	--	--	--	ND	--	0.508	--	--	--	ND	--	--	--	**8.3**
Sodium	--	--	--	--	367 J	--	--	--	--	--	166 J	--	234	--	--	--	331 J	--	--	--	**--**
Vanadium	--	--	--	--	27	--	--	--	--	--	44.2	--	39.7	--	--	--	46.5 J	--	--	--	**--**
Zinc	--	--	--	--	213	--	--	--	--	--	409	--	380	--	--	--	675 DJ	--	--	--	**10,000**
Cyanide, Total	--	1.6	ND	ND J	ND J	ND J	4 J	--	ND	12 J	2.3 J	1.6 J	ND	--	ND	--	1.1	--	1.1	15.5	**27**

Notes:
1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:
B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:
BOLD (blue) = Value exceeds Restricted-Commercial SCO (and Unrestricted SCO)
BOLD (purple) = Value exceeds Unrestricted SCO

TABLE 6B

COMPARISON OF SOIL ANALYTICAL DATA TO RESTRICTED-COMMERCIAL SCOs

Remedial Investigation/Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Parameter [1]	Sample Location, Depth Interval (fbgs), and Type																						Restricted-Commercial SCO[2] (mg/kg)
	TP-85	TP-86	TP-89	TP-90	TP-91	TP-92	TP-93	TP-94	TP-95	TP-95B	TP-96	TP-97	TP-98	Blind 5	TP-99	TP-99	TP-99B	TP-100	TP-103	TP-104	TP-105	SS-1	
	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	4.0 - 6.0	0.0 - 2.0	6.0 - 8.0	3.0 - 4.0	0.0 - 2.0	0.0 - 2.0	0.0 - 0.5	(TP-98)	0.0-0.5	5.0-8.0	6.0-8.0	0.0-2.0	0.0-2.0	0.0-2.0	0.0-2.0	0.0-0.5	
Volatile Organic Compounds (VOCs) - mg/kg																							
Acetone	--	ND	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Benzene	--	ND	ND	--	--	ND	ND	ND	0.25 DWNJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**44**
2-Butanone	--	ND	ND	--	--	ND	--	--	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Chlorobenzene	--	ND	ND	--	--	ND	--	--	0.2 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Chlorohexane	--	ND	ND	--	--	ND	--	--	0.42 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Cyclohexane	--	ND	ND	--	--	ND	--	--	0.42 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
1,2-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	34 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
1,3-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	0.46 DWNJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**280**
1,4-Dichlorobenzene	--	ND	ND	--	--	ND	--	--	3.9 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**130**
Ethylbenzene	--	ND	ND	--	--	ND	ND	ND	0.25 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**390**
n-Butylbenzene	--	ND	ND	--	--	ND	ND	ND	0.53 DWNJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
sec-Butylbenzene	--	ND	ND	--	--	ND	ND	ND	0.24 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Isopropylbenzene	--	ND	ND	--	--	ND	ND	ND	0.12 DWJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
p-Cymene	--	ND	ND	--	--	ND	ND	ND	0.37 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
n-Propylbenzene	--	ND	ND	--	--	ND	ND	ND	0.36 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Toluene	--	ND	ND	--	--	ND	ND	ND	0.34 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
1,2,4-Trichlorobenzene	--	ND	ND	--	--	ND	--	--	0.15 DWJ	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
1,2,4-Trimethylbenzene	--	ND	0.22 W	--	--	ND	ND	ND	5.2 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**190**
1,3,5-Trimethylbenzene	--	ND	ND	--	--	ND	ND	ND	1.8 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**190**
o-Xylene	--	ND	ND	--	--	ND	ND	ND	0.75 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
m-Xylene	--	ND	ND	--	--	ND	--	--	1.5 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Xylenes, Total	--	ND	ND	--	--	ND	ND	ND	2.2 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Naphthalene	--	ND	ND	--	--	ND	0.063	0.066	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Methylcyclohexane	--	ND	0.11 WJ	--	--	ND	--	--	1.1 DW	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**--**
Methyl tert butyl ether	--	ND	ND	--	--	ND	ND J	ND	ND	--	ND	--	--	--	--	ND	ND	ND	--	--	ND	--	**500**
Methylene Chloride	--	0.0065	0.09 WJ	--	--	ND	--	--	ND	--	0.0036 J	--	--	--	--	0.0064	0.0076	ND	--	--	0.0082	--	**500**
TOTAL VOCs (mg/kg)	--	*0.007*	*0.420*	--	--	*0*	*0.063*	*0.066*	*52.4*	--	*0.004*	--	--	--	--	*0.006*	*0.008*	*0*	--	--	*0.008*	--	--
Semi-Volatile Organic Compounds (SVOCs) - mg/kg																							
Acenaphthene	27 D	ND	1.4 TDJ	ND	ND	ND	4.4 DT	0.19 DJ	ND	--	ND	2.6 DJ	--	--	--	--	--	0.29 DJ	ND	ND	0.41 DJ	--	**500**
Acenaphthylene	3.7 DJ	ND	ND	0.4 DJ	0.32 DJ	0.15 DJ	89 TDJ	ND	1.9 TDJ	--	0.23 DJ	ND	--	--	--	--	--	2.4 D	ND	5.3 DJ	0.24 DJ	--	**500**
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	3.6 TDJ	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**--**
Anthracene	7.1 D	0.84 DJ	6 TDJ	1.5 DJ	0.3 DJ	ND	120 DT	0.46 DJ	4.7 TDJ	--	0.34 DJ	13 D	--	--	--	--	--	3 D	0.2 DJ	7.6 DJ	1.1 DJ	--	**500**
Benzo(a)anthracene	**120 D**	2.7 DJ	4.4 TDJ	4.8 D	1.3 DJ	0.7 DJ	**370 DTB**	3.1 DJB	**9.2 TDJ**	--	1.7 DJ	**35 D**	--	--	--	--	--	**11 D**	1 DJ	**30 D**	2.4 D	--	**5.6**
Benzo(b)fluoranthene	**120 D**	3.7 DJ	1.8 TDJ	**5.9 D**	2.4 D	0.92 DJ	**320 DT**	5.5 D, ID4	**14 TDJ**	--	2.7 D	**37 D**	--	--	--	--	--	**12 D**	1.2 DJ	**26 D**	3 D	--	**5.6**
Benzo(k)fluoranthene	**57 D**	1.2 DJ	0.66 TDJ	2.4 D	0.8 DJ	0.88 DJ	**160 DT**	ND	15 TDJ	--	0.89 DJ	17 D	--	--	--	--	--	5.8 DJ	0.58 DJ	12 D	0.98 DJ	--	**56**
Benzo(g,h,i)perylene	78 D	2.8 DJ	2.4 TDJ	3.4 D	1.7 DJ	0.69 DJ	180 DTB	3.4 DJB	7.5 TDJ	--	2 D	25 D	--	--	--	--	--	7.5 D	0.97 DJ	12 D	1.7 DJ	--	**500**
Benzo(a)pyrene	**110 D**	**2.9 DJ**	**3.6 TDJ**	**4.9 D**	**1.7 DJ**	0.83 DJ	**280 DT**	**3.2 DJ**	ND	--	**2.2 D**	**35 D**	--	--	--	--	--	**11 D**	0.93 DJ	**23 D**	**2.4 D**	--	**1**
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**--**
Biphenyl	2.8 DJ	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	--	--	--	--	--	ND	ND	ND	ND	--	**--**
Carbazole	--	ND	ND	--	--	ND	--	--	ND	--	0.12 DJ	--	--	--	--	--	--	0.84 DJ	--	--	0.42 DJ	--	**--**
Chrysene	**99 D**	2.5 DJ	5.1 TDJ	4.5 D	1.2 DJ	1 DJ	**320 DT**	2.2 DJ	8.1 TDJ	--	1.7 DJ	31 D	--	--	--	--	--	9.1 D	1.1 DJB	26 BD	2.4 DJ	--	**56**
Dibenzo(a,h)anthracene	**20 D**	ND	**1 TDJ**	**0.89 DJ**	0.38 DJ	0.27 DJ	**58 TDJB**	**0.78 DJB**	ND	--	0.52 DJ	**6.6 DJ**	--	--	--	--	--	**1.9 DJ**	**2.1 D**	**11 D**	0.44 DJ	--	**0.56**
Dibenzofuran	23 D	ND	ND	ND	ND	ND	23 TDJ	ND	5.5 TDJ	--	ND	1.8 DJ	--	--	--	--	--	0.66 DJ	ND	ND	0.38 DJ	--	**350**
Fluoranthene	300 D	6.1 DJ	3.6 TDJ	11 D	2.8 D	0.91 DJ	**750 DT**	4.8 D	21 TDJ	--	3 D	77 D	--	--	--	--	--	25 D	1.1 DJ	60 D	5 D	--	**500**
Fluorene	39 D	ND	2.4 TDJ	0.19 DJ	ND	ND	49 TDJ	ND	23 TDJ	--	ND	3.3 DJ	--	--	--	--	--	1.5 DJ	ND	2.4 D	0.43 DJ	--	**500**
Indeno(1,2,3-cd)pyrene	**69 D**	2.1 DJ	1.2 TDJ	3.2 D	1.5 DJ	0.48 DJ	**170 DT**	2.7 DJ	**6.5 TDJ**	--	1.7 DJ	**23 D**	--	--	--	--	--	**6.7 D**	0.79 DJ	**12 D**	1.6 DJ	--	**5.6**
2-Methylnaphthalene	10 DJ	ND	ND	ND	ND	ND	5.2 TDJ	ND	8.4 TDJ	--	ND	ND	--	--	--	--	--	0.24 DJ	ND	ND	0.25 DJ	--	**--**
Naphthalene	31 D	ND	ND	ND	ND	ND	9.6 TDJ	ND	13 TDJ	--	ND	1.7 DJ	--	--	--	--	--	0.32 DJ	ND	ND	0.44 DJ	--	**500**
Phenanthrene	250 D	3.5 DJ	12 DT	4.5 D	1 DJ	0.35 DJ	480 DT	2.2 DJ	20 TDJ	--	1.4 DJ	42 D	--	--	--	--	--	13 D	0.58 DJ	26 D	4.1 D	--	**500**
Pyrene	210 D	4.6 DJ	12 DT	7.6 D	2 D	0.93 DJ	**570 DT**	5 D	15 TDJ	--	2.3 D	54 D	--	--	--	--	--	16 D	1 DJ	51 D	3.8 D	--	**500**
TOTAL SVOCs (mg/kg)	***1577***	*32.9*	*57.6*	*55.2*	*17.4*	*8.11*	***3958***	*33.5*	*176*	--	*20.8*	*405*	--	--	--	--	--	*128*	*11.6*	*304*	*31.5*	--	--
Polychlorinated Biphenyls (PCBs) - mg/kg																							
Aroclor 1242	0.068 QSU	0.015 QSU, J	ND	ND	ND	ND	--	--	ND	--	ND	--	ND	ND	ND	--	--	--	ND	--	--	ND	**--**
Aroclor 1248	ND	ND	ND	ND	ND	ND	--	--	0.24 QSU	--	ND	--	ND	ND	ND	--	--	--	ND	--	--	ND	**--**
Aroclor 1254	ND	ND	ND	ND	ND	ND	--	--	ND	--	ND	--	0.011 QSU, J	ND	0.04 QSU,D,J	--	--	--	ND	--	--	0.057	**--**
Aroclor 1260	0.13 QSU	0.063 QSU	ND	ND	0.13 J	ND	--	--	ND	--	ND	--	ND	ND	ND	--	--	--	0.063 QSU, J	--	--	ND	**--**
TOTAL PCBs (mg/kg)	*0.198*	*0.078*	*ND*	*ND*	*0.13*	*0*	--	--	*0.24*	--	*ND*	--	*0.011*	*0*	*0.043*	--	--	--	*0.063*	--	--	*0.057*	***1***
Inorganic Compounds - mg/kg																							
Aluminum	--	19100 J	33800 J	--	--	--	--	--	--	8260	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Antimony	--	91.3 J	ND J	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Arsenic, Total	**20.1 J**	**42.8 J**	3.1 J	**55.5 J**	**37.1 J**	**26.7**	**33.9**	**44.2**	11.8	**71.9**	15.4 J	4.7 J	--	--	--	--	--	**117 J**	**198 J**	--	14 J	--	**16**
Barium, Total	124 J	141 J	223 J	172 J	35.4 J	10.4	151	83.1	137	255 J	150 J	73.2 J	--	--	--	--	--	92.4 J	202	--	131	--	**400**
Beryllium	--	2.71 J	4.45 J	--	--	--	--	--	--	1.28	--	--	--	--	--	--	--	--	--	--	--	--	**590**
Cadmium, Total	4.06 J	1.86 J	ND J	2.65 J	1.13 J	0.914	2.92	2.53	2.55	0.533	1.49 J	1.31 J	--	--	--	--	--	0.886 J	**54.5**	--	0.983	--	**9.3**
Calcium	--	109000 D	250000 D	--	--	--	--	--	--	43300 D	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Chromium, Total	93.4	73.2 J	3.57 J	122 J	67.4 J	26.3	13.4 J	78.1 J	52.2 J	87.8 J	671 J	95.6 J	--	--	--	--	--	63.5 J	29.2 J	--	235 J	--	**1,500**
Cobalt	--	13.1 J	1.38 J	--	--	--	--	--	--	3.21	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Copper	--	**655 J**	5.7 J	--	--	--	--	--	--	65.4	--	--	--	--	--	--	--	--	--	--	--	--	**270**
Iron	--	135000 DJ	7570 J	--	--	--	--	--	--	32900 D	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Lead, Total	603	0.62	6.9	235	162	543	605	485	365	127	148	463	--	--	--	--	--	92.9 J	301 J	--	107 J	--	**1,000**
Magnesium	--	16100 J	5080 J	--	--	--	--	--	--	5590 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Manganese	--	3630 DJ	4390 DJ	--	--	--	--	--	--	3040 D	--	--	--	--	--	--	--	--	--	--	--	--	**10,000**
Mercury, Total	0.314 D	0.508	ND	0.104 D	0.0833 D	0.035	0.724	2.71 D	0.452 D	0.209 D	0.168	0.671	--	--	--	--	--	0.265 J	0.229	--	0.538	--	**2.8**
Nickel	--	157 J	ND J	--	--	--	--	--	--	12.8 J	--	--	--	--	--	--	--	--	--	--	--	--	**310**
Potassium	--	1880 J	4080 J	--	--	--	--	--	--	1640 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Selenium	--	ND J	ND J	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**1,500**
Silver	--	ND	ND	--	--	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	**8.3**
Sodium	--	512 J	998 J	--	--	--	--	--	--	206 J	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Vanadium	--	24 J	12.8 J	--	--	--	--	--	--	68.6	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Zinc	--	376 J	12.3 J	--	--	--	--	--	--	103	--	--	--	--	--	--	--	--	--	--	--	--	**10,000**
Cyanide, Total	1.2	1.1	ND	ND	--	--	--	--	ND J	--	--	--	--	--	--	--	--	--	--	--	--	--	**27**

Notes:

1. Only those parameters detected at a minimum of one sample location are presented in this table; all other compounds were reported as non-detect.
2. SCO = Soil Cleanup Objective (Protection of Public Health - Commercial), per NYSDEC 6NYCRR Part 375-6.8(b), Final December 2006.

Definitions:

B = Analyte was detected in associated Method Blank.
D = Dilution required due to high concentration of target analyte, sample matrix effects, sample color, or sample viscosity.
ID4 = Benzo(b)fluoranthene coelutes with Benzo(k)fluoranthene. The reported result is a summation of the isomers and the concentration is based on the response factor of Benzo(b)fluoranthene.
J = Estimated value; result is less than the sample quantitation limit but greater than zero.
ND = parameter not detected above laboratory detection limit.
NJ = The detection is tentative in identification and estimated in value.
QSU = Sulfur (EPA 3660) clean-up performed on extract.
T = Sample had an adjusted final volume during extraction due to extract matrix and / or viscosity.
U = The analyte was analyzed for, but was not detected above the level of the associated reported quantitation limit.
ND J = The analyte was not detected. The associated reported quantitation limit is an estimate and may be inaccurate or imprecise.
W = Sample was prepared and analyzed utilizing a medium level extraction.
" -- " = Not analyzed for this parameter or no individual SCO.

Color Code:

BOLD = Value exceeds Restricted-Commercial SCO (and Unrestricted SCO)

TurnKey Environmental Restoration, LLC

TABLE 7

SUMMARY OF SUPPLEMENTAL METALS ANALYTICAL DATA

Remedial Investigation/Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Original Sample ID	Supplemental Sample IDs [1]	Arsenic Result (ppm)	Lead Result (ppm)
BPA2-TP-10 (0-2)		**245 J**	345 J
	TP10R (0-2)	**360**	NA
	TP10N10 (0-2)	45.2	NA
	TP10S10 (0-2)	96.2	NA
	TP10E10 (0-2)	58	NA
	TP10W10 (0-2)	**131**	NA
	TP10W20 (0-2)	102	NA
BPA2-TP-21 (0-2)		**119 J**	120 J
	TP21R (0-2)	89.7	NA
	TP21N10 (0-1)	42.2	NA
	TP21S10 (0-2)	49.2	NA
	TP21E10 (0-2)	**167**	NA
	TP21E20 (0-2)	26.8	NA
	TP21W10 (0-2)	23.2	NA
BPA2-TP-40 (0-2)		**152 J**	656 J
	TP40R (0-2)	32.2	NA
	TP40N10 (0-1)	11.4	NA
	TP40S10 (0-2)	34.9	NA
	TP40E10 (0-1)	4.7	NA
	TP40W10 (0-2)	88.2	NA
BPA2-TP-52 (0-2)		**141**	456
	TP52R (0-2)	66	NA
	TP52N10 (0-2)	22.7	NA
	TP52S10 (0-2)	47.8	NA
	TP52E10 (0-2)	**164**	NA
	TP52W10 (0-2)	20.4	NA

TABLE 7

SUMMARY OF SUPPLEMENTAL METALS ANALYTICAL DATA

Remedial Investigation/Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Original Sample ID	Supplemental Sample IDs [1]	Arsenic Result (ppm)	Lead Result (ppm)
BPA2-TP-58 (0-2)		**122**	**12,300 DJ**
BLIND 4		*57 J*	*216 J*
	TP58R (0-2)	46.5	97.2
	TP58N10 (0-2)	23.2	207
	TP58S10 (0-2)	**127**	314
	TP58S20 (0-2)	112	NA
	TP58E10 (0-2)	31.5	175
	TP52W10 (0-2)	44.2	285
BPA2-TP-103 (0-2)		**198 J**	54.5
	TP103R (0-2)	29.2	NA
	TP103N10 (0-2)	NS	NA
	TP103S10 (0-2)	68.5	NA
	TP103E10 (0-2)	15.3	NA
	TP103W10 (0-2)	46.5	NA

Notes:

[1] "R" designation refers to a re-sample collected adjacent to original test pit location to confirm 0-2' depth interval.

Acronyms:

NA = Not analyzed for parameter
NS = Not sampled
J = Estimated value
D = Analyzed at dilution

BOLD (yellow) = Value exceeds arsenic site-specific SCO of 120 ppm.

BOLD (blue) = Value exceeds lead commerical SCO of 1,000 ppm.

TABLE 8

SUMMARY OF GROUNDWATER ANALYTICAL DATA

Remedial Investigation/Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

PARAMETER [1]	GWQS [2]	MW-01		MW-07A [4]		MW-07B		MWN-63A		MWN-63D [3,4]		MWN-64A		MWN-65D		MWS-32A		MWS-36A		MWS-37A		Trip Blank		Equipment Blank 1 [4,6]		Equipment Blank 2 [4,6]		Blind Dup[3]		BPA2-TP-36	BPA2-TP-81B
Field Measurements [5]:																															
Sample No.	--	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	NA	NA	NA	NA	NA	NA	1	2	NA	NA
pH (units)	**6.5 - 8.5**	**9.20**	**9.28**	7.19	7.19	6.75	6.81	6.65	6.67	**6.28**	6.52	7.84	7.82	6.54	6.63	8.39	8.15	7.90	7.88	7.06	7.26	NA	NA	NA	NA	NA	NA	**6.28**	6.52	NA	NA
Temperature (^oC)	**NA**	12.3	13.5	11.4	12.3	12.7	13.1	11.0	12.2	11.7	12.7	11.4	12.4	12.5	13.3	11.4	12.8	10.5	10.7	11.5	12.2	NA	NA	NA	NA	NA	NA	11.7	12.7	NA	NA
Sp. Conductance (uS)	**NA**	435.0	433.3	596.1	591.0	889.7	890.9	1150	1141	1410	1402	635.9	632.3	1712	1707	325.4	336.4	872.1	869	805.5	708.7	NA	NA	NA	NA	NA	NA	1410	1402	NA	NA
Turbidity (NTU)	**NA**	12.9	10.2	7.12	7.14	33.6	24.1	480.0	252.0	36.2	23.0	140	107	48.0	68.0	40.7	10.0	32.6	17.3	>1000	651	NA	NA	NA	NA	NA	NA	36.2	23.0	NA	NA
Eh (mV)	**NA**	-113	-119	29	46	-51	-55	-81	-93	41	28	-113	-119	25	29	-93	-127	-19	-14	41	-43	NA	NA	NA	NA	NA	NA	41	28	NA	NA
Total Inorganic Compounds (mg/L):																															
Aluminum - Total	**--**	ND		ND		ND		ND		0.878		ND		ND		ND		ND		ND		NA		ND		ND		0.82		NA	NA
Arsenic - Total	**0.025**	**0.491**		**0.0319**		ND		ND		ND		ND		ND		**0.0323**		ND		**0.0795**		NA		ND		ND		ND		NA	NA
Barium - Total	**1**	0.0222		0.014		0.0643		0.206		0.87		0.043		0.388		0.0173		0.0407		0.226		NA		ND		ND		0.893		NA	NA
Cadmium - Total	**0.005**	ND		ND		ND		ND		ND		ND		ND		ND		ND		0.001		NA		ND		ND		ND		NA	NA
Calcium - Total	**--**	ND		106		ND		ND		167		ND		ND		ND		ND		ND		NA		ND		ND		170		NA	NA
Chromium - Total	**0.05**	ND		ND		ND		0.006		ND		ND		ND		ND		ND		0.0477		NA		ND		ND		ND		NA	NA
Iron - Total	**0.3**	ND		0.1		ND		ND		1.43		ND		ND		ND		ND		ND		NA		ND		ND		1.44		NA	NA
Lead - Total	**0.025**	ND		ND		ND		0.005		ND		ND		ND		ND		ND		0.038		NA		ND		ND		ND		NA	NA
Magnesium - Total	**35***	ND		12.7		ND		ND		58.2		ND		ND		ND		ND		ND		NA		ND		ND		58.9		NA	NA
Manganese - Total	**0.3**	ND		0.00101		ND		ND		0.105		ND		ND		ND		ND		ND		NA		ND		ND		0.107		NA	NA
Potassium - Total	**--**	ND		2.54		ND		ND		15.2		ND		ND		ND		ND		ND		NA		ND		ND		15.6		NA	NA
Sodium - Total	**20**	ND		9.6		ND		ND		91.4		ND		ND		ND		ND		ND		NA		ND		ND		91.7		NA	NA
Soluble Inorganic Compounds (mg/L):																															
Arsenic -Soluble	**0.025**	NA		NA		NA		ND		NA		ND		NA		NA		NA		0.0177		NA		ND		ND		NA		NA	NA
Barium - Soluble	**1**	NA		NA		NA		0.133		NA		0.0293		NA		NA		NA		0.0625		NA		ND		ND		NA		NA	NA
Volatile Organic Compounds (ug/L):																															
1,2,4-Trimethylbenzene	**5**	ND		ND		ND		ND		1.8		ND		1.6		ND		ND		ND		ND		ND		ND		2.1		NA	ND
1,3,5 - Trimethylbenzene	**5**	ND		ND		ND		ND		ND		ND		0.48		ND		ND		ND		ND		ND		ND		0.79 J		NA	ND
Benzene	**1**	0.58 B		ND		ND		ND		ND		ND		0.31 B		ND		ND		ND		ND		ND		ND		ND		NA	ND
sec-Butylbenzene	**5**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA	ND
Bromomethane	**5**	ND		0.79 J		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		1.3		NA	ND
Cyclohexane	**--**	ND		ND		ND		ND		3.3		ND		ND		ND		ND		ND		ND		ND		ND		3.8		NA	ND
Ethylbenzene	**5**	ND		ND		ND		ND		ND		ND		0.25		ND		ND		ND		ND		ND		ND		ND		NA	ND
Methyl-t-Butyl Ether (MTBE)	**10**	ND		ND		ND		ND		ND		ND		0.72		ND		ND		ND		ND		ND		ND		ND		NA	ND
Methylcyclohexane	**--**	ND		ND		ND		ND		8.8		ND		ND		ND		ND		ND		ND		ND		ND		9.6		NA	ND
p-Cymene	**5**	ND		ND		ND		ND		ND		ND		ND		ND		0.14 J		ND		ND		ND		ND		ND		NA	ND
m-Xylene & p-Xylene	**10**	ND		ND		ND		ND		1 J		ND		1.6		ND		0.063 J		0.069 J		ND		ND		ND		1.1 J		NA	0.055 J
o-Xylene	**5**	ND		ND		ND		ND		ND		ND		0.67		ND		ND		ND		ND		ND		ND		ND		NA	ND
n-Butylbenzene	**5**	ND		ND		ND		ND		ND		ND		0.31 J		ND		ND		ND		ND		ND		ND		ND		NA	ND
Toluene	**5**	ND		ND		ND		ND		ND		ND		1.6 B		ND		ND		ND		ND		ND		ND		ND		NA	ND
Xylenes, total	**15**	ND		ND		ND		ND		1 J		ND		2.3		ND		0.063 J		0.069 J		ND		ND		ND		1.1 J		NA	0.055 J
Semi-Volatile Organic Compounds (ug/L):																															
Acenaphthene	**20***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		5 D10, J	ND
Anthracene	**50***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		6.2 D10, J	1.5 D10, J
Benzo(a)anthracene	**0.002***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**13 D10, J**	**5.5 D10, J**
Benzo(a)pyrene	**ND**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**13 D10, J**	**5.5 D10, J**
Benzo(b)fluoranthene	**0.002***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**23 D10, J**	**8.2 D10, J**
Benzo(ghi)perylene	--	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		11 D10, J	4.2 D10, J
Benzo(k)fluoranthene	**0.002***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**7.3 D10, J**	ND
Carbazole	**--**	0.43 J		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		7.5 D10, J	ND
Chrysene	**0.002**	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**14 D10, J**	**5 D10, J**
Fluoranthene	**50***	0.52 J		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		23 D10, J	12 D10, J
Indeno(1,2,3-cd)pyrene	**0.002***	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		NA		ND		ND		ND		**9.3 D10, J**	**3.6 D10, J**
Phenanthrene	**50***	1 J		ND		ND		ND		ND		ND		ND		ND		0.67 J		ND		NA		ND		ND		ND		21 D10, J	6.7 D10, J
Pyrene	**50***	0.49 J		ND		ND		ND		ND		0.35 J		ND		ND		ND		ND		NA		ND		ND		ND		19 D10, J	9.1 D10, J
Polychlorinated Biphenyls (ug/L):																															
Aroclor 1242	**0.09****	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		ND	**0.56**

Notes:
1. Only those compounds detected above the method detection limit at a minimum of one sample location are reported in this table.
2. NYSDEC Class "GA" Groundwater Quality Standards/Guidance Values (GWQS/GV) as per Technical & Operational Guidance Series 1.1.1 (June 1998, January 1999 Errata, April 2000 Addendum, and June 2004 Addendum).
3. Blind Duplicate and Matrix Spike/Matrix SpikeDuplicate (MS/MSD) analysis performed on groundwater sample collected from MWN-63D.
4. MW-7A, MWN-63D, EQB-1 and EQB-2 were sampled for expanded parmeters for 8260 TCL + STARS VOCs, TAL Metals, Total Cyanide, 8270 TCL SVOCs.
5. Field measurements were collected immediately before and after groundwater sample collection.
6. EQB-1 was collected on 4/29/10 and EQB-2 was collected on 4/30/10.

Definitions:

J = Estimated Value; result is less than the sample quantitation limit but greater than zero.
B = Analyte was detecded in the associated method blank.
"--" or NA = Not available
ND = Indicates parameter was not detected above laboratory reporting limit.
D10 = Dilution required due to sample color.

* = Guidance Value
** = Applies to the sum of PCB Aroclors.
BOLD = Result exceeds the GWQS/GV.

TABLE 9

SUMMARY OF HOTSPOT AREAS REQUIRING REMEDIATION

Remedial Investigation / Alternatives Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Hotspot ID	Impacted Test Pits		Field Evidence of Impact	Contaminant of Concern	Analytical (ppm)	Sample Interval (fbgs)	PID (ppm)	Est. DTW (fbgs)	Dimensions		Depth (fbgs)	Interval (fbgs)	Volume (CY)	Exc. Volume (x 1.5) CY
	Original	Supp..							Length (ft)	Width (ft)				
Bioremediation of Petroleum-Impacted Material														
A	TP-85	--	None	SVOCs	**Total = 1,577**	0-2	0.0	4	20	20	2	0-2	30	45
B	TP-80	--	Slight sheen; drum remains	SVOCs	**Total = 663**	0-2	0.0	5	20	20	2	0-2	30	45
											Subtotal (no dewatering needed) =			*90*
C	TP-53	TP-53D & E	Product on WT; slight & odor	SVOCs	Total = 442	4-6	0.0	5	70	30	3	3.5-6.5	240	360
D	TP-89	TP-89D, E, K & N	Yellowish product on WT; slight sheen, moderate odor; oily 4-6'; some tar 89D (1-5')	SVOCs	Total = 58	0-2	18 (supp. TP)	4.5	150	90	3	3.5-6.5	1500	2,250
E	TP-93	TP-93A & B	Yellowish product on WT; slight sheen & odor	SVOCs	**Total = 3,958**	4-6	0.0	6.5	75	75	3	5-8	625	940
F	TP-95	--	Yellowish oily product (4-9' & WT); black fill, moderate odor	SVOCs	Total = 176	6-8	11.7	8	60	40	5	4-9	450	675
											Subtotal (product and dewatering needed) =			*4,225*
											ESTIMATED VOLUME (CY) =			**4,315**
In Situ Treatment of Weathered Organic Material														
G	TP-81B	--	Slight sheen on WT & odor; little greasy; drum remains	SVOCs	Total = 204	9-9.5	0.0	5	20	20	4	5-9	60	--
						ESTIMATED AREA (SQ. FT.) =			**400**					
H	TP-99B	--	Slight odor	PID	VOCs = ND	6-8	105	8.5	120	50	4	5-9	890	--
	--	TP-99A	Not recorded (NR)	PID	NA	NA	26	NR						
	--	TP-99	Slight odor	PID	VOCs = ND	5-8	24.4	8.5	20	20	4	5-9	60	--
						ESTIMATED AREA (SQ. FT.) =			**6,400**					
I	TP-16	--	Moderate odor; grayish black staining	PID	VOCs = 2.9; SVOCs = 2.2	6-8	76.2	5.5	30	30	4	5-9	133	--
						ESTIMATED AREA (SQ. FT.) =			**900**					
Off-Site Disposal of Arsenic-Impacted Material														
J	TP-10	TP10W10; TP10W20	None	Arsenic	245J; 131; 102	0-2	0.0	--	30	20	2	0-2	45	70
K	TP-21	TP21E10; TP21E20	None	Arsenic	119J; 167; 26.8	0-2	0.0	--	30	20	2	0-2	45	70
L	TP-40	--	None	Arsenic	152J; <100	0-2	0.0	--	20	20	2	0-2	30	45
M	TP-52	TP52E10*	None	Arsenic	141; 164	0-2	0.0	--	30	20	2	0-2	45	70
N	TP-58	TP58S10; TP58S20	None	Arsenic	122; 127; 112	0-2	0.0	--	30	20	2	0-2	45	70
O	TP-103	--	None	Arsenic	198J; <100	0-2	0.0	--	20	20	2	0-2	30	45
											ESTIMATED VOLUME (CY) =			**370**

Notes:

* A test pit surface soil sample further east of TP52E10 could not be collected due to the railroad tracks.

TABLE 10
POTENTIAL CHEMICAL-SPECIFIC ARARs

PHASE II BUSINESS PARK AREA – BROWNFIELD CLEANUP PROGRAM
REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Groundwater/Surface Water:		
RCRA Groundwater Protection Standards and Maximum Concentration Limits	40 CFR 264, Subpart F	Establishes criteria for groundwater consumption. Groundwater is/will not be used for potable purposes. Potentially relevant for off-site groundwater quality.
NYSDEC Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations	6NYCRR Parts 701- 703	Establishes groundwater and surface water quality criteria. Applicable to on-site and off-site groundwater quality, and runoff/groundwater migration. Establishes criteria for groundwater consumption.
Ambient Water Quality Standards and Guidance Values	TOGS 1.1.1, June 1998	Establishes groundwater and surface water quality standards and guidance values. Applicable to on-site and off-site groundwater quality
Article 17 ECL – Title 8 SPDES	17-0801 to 17-0831	Effluent limitations for SPDES-permitted Outfall 226 for the South Linde IRM Area groundwater treatment system.
Air:		
New York State Air Quality Classifications and Standards	6NYCRR Parts 256 and 257	Establishes air quality standards protective of public health. Potentially applicable to disruptive activities.
National Primary and Secondary Ambient Air Quality Standards (NAAQS)	40 CFR Part 50	Establishes primary and secondary ambient air quality standards to protect public health and welfare. Potentially applicable to disruptive activities.
New York State DOH Soil Vapor Intrusion Guidance	New York State Department of Health, Oct. 2006	Establishes sub-slab and indoor air thresholds for sites impacted by VOCs. Potentially relevant.
Soil:		
NYSDEC Environmental Remedial Programs	6NYCRR Part 375	Establishes procedures for inactive haz. waste site remedy selection & identifies Soil Cleanup Objectives based on human health, ecological protection, and groundwater protection. Applicable to site soil/fill.
DER-10/Technical Guidance for Site Investigation and Remediation	DEC Program Policy; May 3, 2010	This guidance provides an overview of the site investigation and remediation process for the DEC remedial programs administered by the Division of Environmental Remediation (DER).
USEPA Preliminary Remediation Goals	EPA Region IX, Oct. 2002, updated per EPA Toxicity Guidance Memo (12/12/04)	Presents residential and non-residential soil cleanup goals based on human health criteria and groundwater protection. Potentially relevant.
USEPA Soil Screening Guidance	Technical Background Document and Users Guide, May 1996 revisions	Presents a framework for developing risk-based, soil screening levels for protection of human health. Provides a tiered approach to site evaluation and screening level development for Superfund sites. Potentially relevant.
Other:		
USEPA Integrated Risk Information System (IRIS)	www.epa.gov/iris	Database of human health effects that may result from exposure to various substances found in the environment.

TABLE 11
POTENTIAL LOCATION-SPECIFIC ARARs

PHASE II BUSINESS PARK AREA – BROWNFIELD CLEANUP PROGRAM
REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Other:		
National Historic Preservation Act	16 CFR Part 470	Requires avoiding impacts on cultural resources having historical significance. Potentially applicable to remedial alternatives involving soil/fill disruption.
NYSDEC Environmental Remedial Programs	6NYCRR Part 375	Requires consideration of future land use in remedy selection and soil cleanup criteria. Applicable to site soil/fill.

TABLE 12
POTENTIAL ACTION-SPECIFIC ARARs

PHASE II BUSINESS PARK AREA – BROWNFIELD CLEANUP PROGRAM
REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT

Standard, Requirement, Criteria or Limitation	Citation or Reference	Description/Comments
Groundwater:		
Clean Water Act, National Pretreatment Standards	40 CFR 403.5	General pretreatment regulations for discharge to POTWs – potentially applicable for soil excavation alternatives involving temporary discharges of storm water or perched groundwater to sanitary sewer.
Air:		
NYSDEC Guidance for Fugitive Dust Suppression and Particulate Monitoring	DEC Program Policy; May 3, 2010; Appendix 1B	Establishes guidance for community air monitoring and controls to monitor and mitigate fugitive dusts during intrusive activities at NY State inactive hazardous waste sites – applicable to disruptive activities.
OSHA General Industry Air Contaminants Standard	29 CFR 1910.1000	Establishes Permissible Exposure Limits for workers exposed to airborne contaminants. Applicable to disruptive activities.
Solid, Hazardous, and Non-Hazardous Waste:		
NYSDEC Inactive Hazardous Waste Disposal Sites	6NYCRR Part 375	Establishes procedures for inactive hazardous waste disposal site identification, classification, and investigation activities, as well as remedy selection and interim remedial actions. To be considered.
NY State Solid Waste Transfer Permits	6NYCRR Part 364	Establishes procedures to protect the environment from mishandling and mismanagement of all regulated waste transported from a site of generation to the site of ultimate treatment, storage, or disposal. Potentially applicable for alternatives involving off-site disposal.
DOT Rules for Hazardous Materials Transport	(49 CFR 107, 171.1 - 171.5).	Establishes requirements for shipping of hazardous materials. Potentially applicable for alternatives involving off-site disposal
Occupational Safety and Health Act (29 USC 651 *et seq.*)	29 CFR Part 1910 and 1926	Describes procedures for maintaining worker safety. Applicable to site construction activities.
NYSDEC Land Disposal Restrictions	6NYCRR Part 376	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may be land disposed. Applicable to soil/fill disposal alternatives

TABLE 13

ALTERNATIVE 2
EXCAVATION OF IMPACTED SOIL/FILL TO UNRESTRICTED SCOs

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Impacted Soil/Fill Removal				
Clearing & Grubbing	144	ACRE	$ 4,000	$ 574,200
Soil/Fill Excavation & Dewatering (to 8 fbgs)	1,852,752	CY	$ 8	$ 14,822,016
Transportation and Disposal at TSDF	3,149,678	TON	$ 35	$ 110,238,744
Rail Relocation	1	LS	$ 2,000,000	$ 2,000,000
Verification Sampling	1	LS	$ 60,000	$ 60,000
Subtotal:				**$ 127,694,960**
Site Restoration				
Part 375 [1] Compliant Backfill, Place & Compact	1,736,955	CY	$ 15	$ 26,054,325
6" Topsoil	115,797	CY	$ 20	$ 2,315,940
Seeding	144	ACRE	$ 2,500	$ 358,875
Subtotal:				**$ 28,729,140**
Subtotal Capital Cost				**$ 156,424,100**
Contractor Mobilization/Demobilization				$ 100,000
Health and Safety/Air Monitoring				$ 150,000
Engineering/Contingency (10%)				$ 15,642,410
Total Capital Cost				**$ 172,317,000**

Total Present Worth (PW): Capital Cost + OM&M PW	**$172,317,000**

Notes:

1. Per 6NYCRR 375-6.7(d)(ii)(b)

TABLE 14

ALTERNATIVE 3
HOTSPOT REMOVAL & PLACEMENT OF A SOIL COVER SYSTEM PRIOR TO REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Institutional Controls				
Develop Site Management Plan, Easement, Survey	1	LS	$ 25,000	$ 25,000
Subtotal:				**$ 25,000**
Soil Excavation/On-Site Biotreatment				
Hotspots A and B (PAHs)				
Soil/Fill Excavation	90	CY	$ 8	$ 720
On-site Hauling to/from Biopad	90	CY	$ 5	$ 450
Biotilling/Fertilizing	4	DAY	$ 1,500	$ 6,000
Verification Sampling	10	EA	$ 50	$ 500
Slag Backfill (furnish, place, compact)	153	TON	$ 10	$ 1,530
Subtotal:				**$ 9,200**
Hotspots C through F (SVOCs, Product)				
Soil/Fill Excavation	4,225	CY	$ 8	$ 33,800
On-site Hauling to/from Biopad	4,225	CY	$ 5	$ 21,125
Biotilling/Fertilizing	10	DAY	$ 1,500	$ 15,000
Verification Sampling	20	EA	$ 100	$ 2,000
Slag Backfill (furnish, place, compact)	7,183	TON	$ 10	$ 71,825
Subtotal:				**$ 143,750**
Floating Oil Removal During Excavation				
Rental of Oil Removal System (Tecumseh owned)	1	LS	$ -	$ -
Gas Generator	2	WK	$ 135	$ 270
Oil Absorbent Booms (20-ft length, 2/bag)	20	EA	$ 70	$ 1,400
Oil Absorbent Booms (10-ft length, 4/bag)	4	EA	$ 30	$ 120
Analytical to Characterize Oil for Disposal	1	EA	$ 500	$ 500
Disposal of 55-gallon drums of oil (one pickup)	1	LS	$ 1,500	$ 1,500
Subtotal:				**$ 3,790**
Biopad Preparation				
Clearing & Grubbing	2	ACRE	$ 4,000	$ 8,000
On-Site Biopad Prep/Mulch	2,500	CY	$ 12	$ 30,000
Subtotal:				**$ 38,000**

TurnKey Environmental Restoration, LLC

TABLE 14

ALTERNATIVE 3
HOTSPOT REMOVAL & PLACEMENT OF A SOIL COVER SYSTEM PRIOR TO REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
In Situ Injection				
Hotspots G, H & I (PID Impact, Field Evidence)				
Equipment (direct push injection)	4	DY	$ 2,000	$ 8,000
Equipment (mobilization/demobilization)	1	LS	$ 500	$ 500
Expendable Points	38	EA	$ 20	$ 760
RegenOx Product (ISCO)	2,500	LBS	$ 2.50	$ 6,250
ORC Advanced Product	800	LBS	$ 8.95	$ 7,160
Product Shipping ($0.50/lb) & Tax (8.75%)	3,300	LBS	$ 0.54	$ 1,794
1,000-Gallon Dilution Tank	1	EA	$ 2,500	$ 2,500
Field supplies and expenses	1	EST	$ 1,000	$ 1,000
Subtotal:				**$ 27,964**
Soil/Fill Excavation, Off-Site Disposal				
Hotspots J through O (Arsenic)				
Soil/Fill Excavation	370	CY	$ 8	$ 2,960
Waste Profile	1	LS	$ 3,000	$ 3,000
Transport & Off-site Stabilization/Disposal	629	TON	$ 225	$ 141,525
Slag Backfill (furnish, place, compact)	629	TON	$ 10	$ 6,290
Subtotal:				**$ 153,775**
Soil Cover System				
Clearing & Grubbing	144	ACRE	$ 4,000	$ 574,200
6" Part 375 [1] Compliant Cover, Place & Compact	115,797	CY	$ 15	$ 1,736,955
6" Topsoil	115,797	CY	$ 20	$ 2,315,940
Seeding	144	ACRE	$ 2,500	$ 358,875
Subtotal:				**$ 4,985,970**
Subtotal Remedial Cost				**$ 5,387,449**
Contractor Mobilization/Demobilization (5%)				$ 269,372
Health and Safety (2%)				$ 107,749
Engineering/Contingency (10%)				$ 538,745
Total Capital Remediation Cost				**$ 6,303,316**

TurnKey Environmental Restoration, LLC

TABLE 14

ALTERNATIVE 3
HOTSPOT REMOVAL & PLACEMENT OF A SOIL COVER SYSTEM PRIOR TO REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Environmental-Based Redevelopment Costs				
Clear/Remove & Transport Existing Cover Soil [2]	185,275	CY	$ 5	$ 926,376
Off-site Transportation and Staging Off-Site	185,275	CY	$ 10	$ 1,852,752
Air Monitoring during Intrusive Work	1	LS	$ 15,000	$ 15,000
Subtotal:				**$ 2,794,128**
TOTAL CAPITAL COSTS				**$ 9,097,000**
Annual Operation Maintenance & Monitoring:				
Site Maintenance and Mowing	2	Yr	$ 9,000	$ 18,000
Groundwater Sampling / Reporting	2	Yr	$ 7,500	$ 15,000
Annual Certification	1	Yr	$ 3,000	$ 3,000
Total Annual OM&M Cost				**$ 36,000**
Number of Years (n):				30
Interest Rate (i):				3%
p/A value:				19.6004
OM&M Present Worth (PW):				**$ 706,000**

Total Present Worth (PW): Capital Cost + OM&M PW	**$ 9,803,000**

Notes:
1. Per 6NYCRR 375-6.7(d)(ii)(b)
2. Assumes 20% of vegetated cover remains in place

TABLE 15

ALTERNATIVE 4
HOTSPOT REMOVAL & DEFERRED SOIL COVER SYSTEM DURING REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Institutional Controls				
Develop Site Management Plan, Easement, Survey	1	LS	$ 25,000	$ 25,000
Subtotal:				**$ 25,000**
Soil Excavation/On-Site Biotreatment				
Hotspots A and B (PAHs)				
Soil/Fill Excavation	90	CY	$ 8	$ 720
On-site Hauling to/from Biopad	90	CY	$ 5	$ 450
Biotilling/Fertilizing	4	DAY	$ 1,500	$ 6,000
Verification Sampling	10	EA	$ 50	$ 500
Slag Backfill (furnish, place, compact)	153	TON	$ 10	$ 1,530
Subtotal:				**$ 9,200**
Hotspots C through F (SVOCs, Product)				
Soil/Fill Excavation	4,225	CY	$ 8	$ 33,800
On-site Hauling to/from Biopad	4,225	CY	$ 5	$ 21,125
Biotilling/Fertilizing	10	DAY	$ 1,500	$ 15,000
Verification Sampling	20	EA	$ 100	$ 2,000
Slag Backfill (furnish, place, compact)	7,183	TON	$ 10	$ 71,825
Subtotal:				**$ 143,750**
Floating Oil Removal During Excavation				
Rental of Oil Removal System (Tecumseh owned)	1	LS	$ -	$ -
Gas Generator	2	WK	$ 135	$ 270
Oil Absorbent Booms (20-ft length, 2/bag)	20	EA	$ 70	$ 1,400
Oil Absorbent Booms (10-ft length, 4/bag)	4	EA	$ 30	$ 120
Analytical to Characterize Oil for Disposal	1	EA	$ 500	$ 500
Disposal of 55-gallon drums of oil (one pickup)	1	LS	$ 1,500	$ 1,500
Subtotal:				**$ 3,790**

TABLE 15

ALTERNATIVE 4
HOTSPOT REMOVAL & DEFERRED SOIL COVER SYSTEM DURING REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Biopad Preparation				
Clearing & Grubbing	2	ACRE	$ 4,000	$ 8,000
On-Site Biopad Prep/Mulch	2,500	CY	$ 12	$ 30,000
Subtotal:				**$ 38,000**
In Situ Injection				
Hotspots G, H & I (PID Impact, Field Evidence)				
Equipment (direct push injection)	4	DY	$ 2,000	$ 8,000
Equipment (mobilization/demobilization)	1	LS	$ 500	$ 500
Expendable Points	38	EA	$ 20	$ 760
RegenOx Product (ISCO)	2,500	LBS	$ 2.50	$ 6,250
ORC Advanced Product	800	LBS	$ 8.95	$ 7,160
Product Shipping ($0.50/lb) & Tax (8.75%)	3,300	LBS	$ 0.54	$ 1,794
1,000-Gallon Dilution Tank	1	EA	$ 2,500	$ 2,500
Field supplies and expenses	1	EST	$ 1,000	$ 1,000
Subtotal:				**$ 27,964**
Soil/Fill Excavation, Off-Site Disposal				
Hotspots J through O (Arsenic)				
Soil/Fill Excavation	370	CY	$ 8	$ 2,960
Waste Profile	1	LS	$ 3,000	$ 3,000
Transport & Off-site Stabilization/Disposal	629	TON	$ 225	$ 141,525
Slag Backfill (furnish, place, compact)	629	TON	$ 10	$ 6,290
Subtotal:				**$ 153,775**
Soil Cover System[1]				
Clearing & Grubbing	144	ACRE	$ 4,000	$ 574,200
6" Part 375 [2] Compliant Cover, Place & Compact	23159	CY	$ 15	$ 347,391
6" Topsoil	23159	CY	$ 20	$ 463,188
Seeding	29	ACRE	$ 2,500	$ 71,775
Subtotal:				**$ 1,456,554**

TABLE 15

ALTERNATIVE 4
HOTSPOT REMOVAL & DEFERRED SOIL COVER SYSTEM DURING REDEVELOPMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Subtotal Remedial Cost				**$ 1,858,033**
Contractor Mobilization/Demobilization (5%)				$ 92,902
Health and Safety (2%)				$ 37,161
Engineering/Contingency (10%)				$ 185,803
Total Capital Remediation Cost				**$ 2,173,899**
Environmental-Based Redevelopment Costs				
Air Monitoring during Intrusive Work	1	LS	$ 15,000	$ 15,000
Subtotal:				**$ 15,000**
TOTAL CAPITAL COSTS				**$ 2,189,000**
Annual Operation Maintenance & Monitoring:				
Site Maintenance and Mowing	2	YR	$ 9,000	$ 18,000
Groundwater Sampling / Reporting	2	YR	$ 7,500	$ 15,000
Annual Certification	1	YR	$ 3,000	$ 3,000
Total Annual OM&M Cost				**$ 36,000**
Number of Years (n):				30
Interest Rate (i):				3%
p/A value:				19.6004
OM&M Present Worth (PW):				**$ 705,614**
Total Present Worth (PW): Capital Cost + OM&M PW				**$ 2,895,000**

Notes:

1. Assumed to cover 20% of the Site (remainder covered by building, pavement, etc.)
2. Per 6NYCRR 375-6.7(d)(ii)(b)

TABLE 16

SOUTH LINDE AREA GROUNDWATER ALTERNATIVE 1
CONTINUED OPERATION OF IRM WITH ADDITIONAL HVE

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Annual OM&M of Groundwater Treatment System				
Oversight and Troubleshooting	1	LS	$ 15,000	$ 15,000
Electrial	1	LS	$ 2,000	$ 2,000
GAC - change-outs & disposal	4	EA	$ 800	$ 3,200
Replacement parts for system	1	LS	$ 1,000	$ 1,000
Oil Disposal (2 events)	2	EA	$ 1,535	$ 3,070
Monthly Sampling & Analysis	12	EA	$ 1,500	$ 18,000
Reporting	1	LS	$ 2,400	$ 2,400
Subtotal:				**$ 44,670**
Annual High Vacuum Extraction				
MW-01, MW-03, MW-05 and PZ-1 through PZ-4	5	Event	$ 2,500	$ 12,500
Oil-Water Disposal Cost	40	Ton	$ 112	$ 4,463
Analytical Costs	1	Year	$ 500	$ 500
ProjectCoordination and Oversight	1	LS	$ 4,000	$ 4,000
Reporting	1	LS	$ 1,000	$ 1,000
Equipment Rental	1	LS	$ 400	$ 400
Subtotal:				**$ 22,863**
Total Annual OM&M Cost				**$ 68,000**
Number of Years (n):				10
Interest Rate (i):				3%
p/A value:				8.53
10-Year OM&M Present Worth (PW):				**$ 580,040**
Total OM&M Present Worth (PW):				**$ 580,000**

Notes:
1. Addition of MW-01 increased estimated volume per HVE event from 1,000 to 1,200 gallons.

TABLE 17

SOUTH LINDE AREA GROUNDWATER ALTERNATIVE 2
EXCAVATION OF SOURCE AREA IMPACTED SOIL/FILL WITH ON-SITE TREATMENT

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Treatment System Decommissioning				
Temporary Equipment Relocation/Electrical Disconnect	1	LS	$ 7,500	$ 7,500
Recovery Well Decommissioning (3)	90	FT	$ 20	$ 1,800
Subtotal:				**$ 9,300**
Impacted Soil/Fill Removal/On-Site Bioremediation				
Clearing & Grubbing	0.30	Acres	$ 4,000	$ 1,205
Water-tight Sheet Pile (500 LF*25 ft deep)	12500	SF	$ 20	$ 250,000
Soil/Fill Excavation & Dewatering (to 23 fbgs)	16771	CY	$ 10	$ 167,708
On-Site Hauling Impacted (to/from biopad)	10208	CY	$ 5	$ 51,042
On-Site Hauling Unimpacted (to/from temporary stockpile)	6563	CY	$ 3	$ 19,688
Baker Tanks, Cleaning	5	EA	$ 3,500	$ 17,500
Twmp Water Treatment System	1	EA	$ 5,000	$ 5,000
GAC - # changeouts	5	EA	$ 1,000	$ 5,000
GAS Disposal (non-haz)	5	EA	$ 1,000	$ 5,000
Biotilling/Fertilizing	4	Day	$ 1,500	$ 6,000
Verification Sampling	30	EA	$ 180	$ 5,400
Subtotal:				**$ 533,543**
Site Restoration				
Backfilling (unimpacted overburden), Place/Compact	6563	CY	$ 6	$ 39,375
Slag Backfill	10208	CY	$ 10	$ 102,083
Subtotal:				**$ 141,458**
Subtotal Capital Cost				**$ 684,301**
Contractor Mobilization/Demobilization (5%)				$ 34,215
Health and Safety (2%)				$ 13,686
Engineering/Contingency (10%)				$ 68,430
Total Capital Cost				**$ 800,000**

Notes:

Estimated Volume of Water Generated during Dewatering

Void space (porosity of 0.3) = 55,125 cubic feet
* 7.4805 gallons per CF = 412,363 gallons

TurnKey Environmental Restoration, LLC

TABLE 18

SOUTH LINDE AREA GROUNDWATER ALTERNATIVE 3
UPGRADE OF IRM SYSTEM AND SUPPLEMENTAL SAMPLING

Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Supplemental Soil Sampling				
Advance Geoprobes/Convert to Piezometers (6)	1	DAY	$ 2,500	$ 2,500
Analytical Costs (STARS List VOCs, SVOCs-BN)	6	EA	$ 160	$ 960
Field Meters, Equipment, PPE	1	LS	$ 300	$ 300
Subtotal:				**$ 3,760**
Upgrade IRM System				
Driller Mob/Demob	1	LS	$ 800	$ 800
Decontamination	1	LS	$ 500	$ 500
Overdrill PZ-02 (6¼-inch hollow stem auger)	30	LF	$ 28	$ 840
Bentonite Backfill Borehole to 20 fbgs	10	LF	$ 22	$ 220
Installation 4-inch Recovery Well (Sch 40 PVC)	20	LF	$ 45	$ 900
Install 6-inch Locking Stell Protective Casing	1	EA	$ 265	$ 265
Relocate Belt Skimmer Equipment and Shed	1	LS	$ 2,500	$ 2,500
Subtotal:				**$ 6,025**
Subtotal Capital Cost				**$ 9,785**
Contractor Mobilization/Demobilization (5%)				$ 489
Health and Safety (2%)				$ 196
Engineering/Contingency (10%)				$ 979
Total Capital Cost				**$ 11,000**

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 18

SOUTH LINDE AREA GROUNDWATER ALTERNATIVE 3
UPGRADE OF IRM SYSTEM AND SUPPLEMENTAL SAMPLING

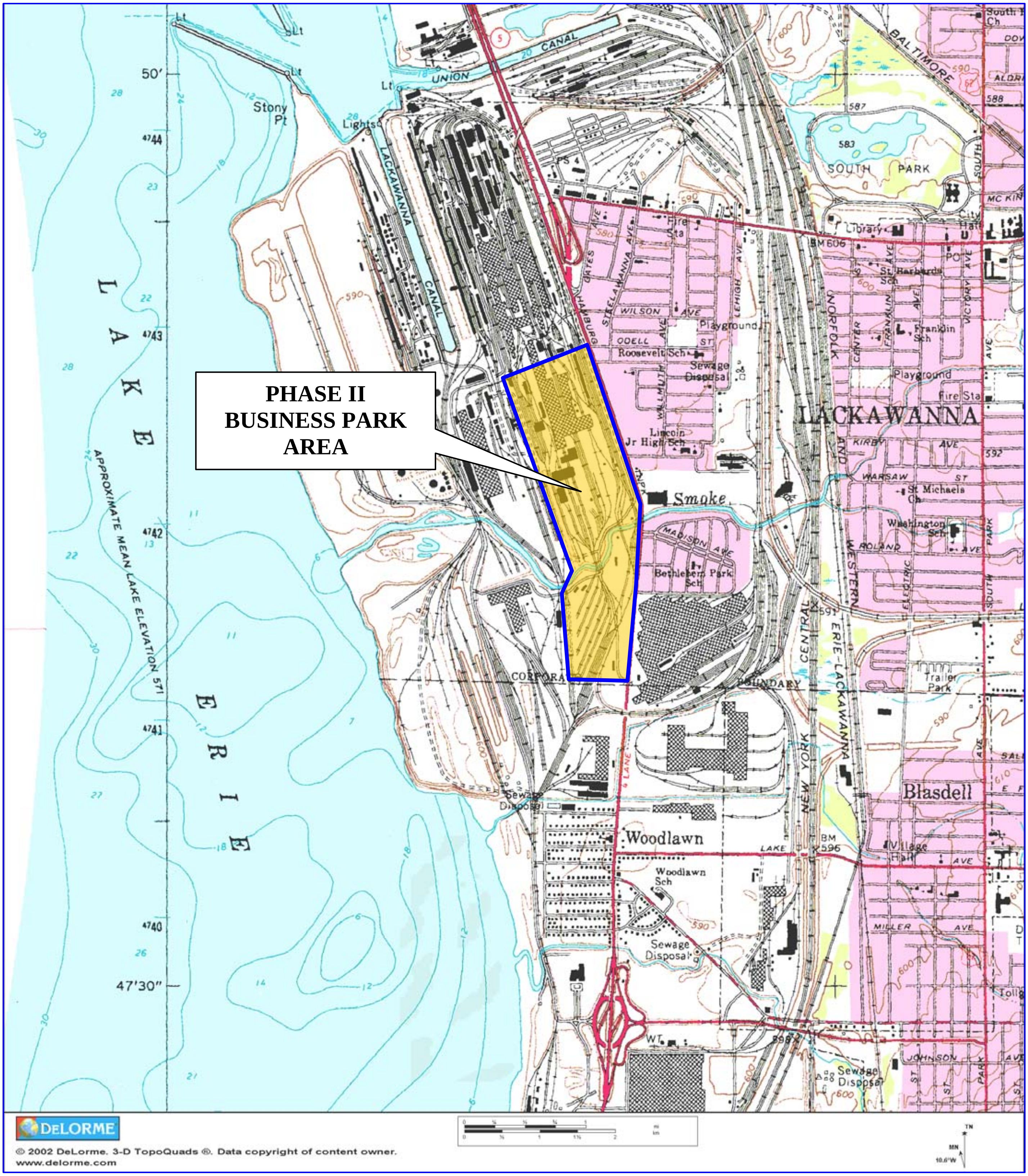
Remedial Investigation / Alternative Analysis Report
Phase II Business Park Area - Brownfield Cleanup Program
Tecumseh Redevelopment Inc.

Item	Quantity	Units	Unit Cost	Total Cost
Annual OM&M of Groundwater Treatment System				
Oversight and Troubleshooting	1	LS	$ 15,000	$ 15,000
Electrial	1	LS	$ 2,000	$ 2,000
GAC - change-outs & disposal	4	EA	$ 800	$ 3,200
Replacement parts for system	1	LS	$ 1,000	$ 1,000
Oil Disposal (2 events)	2	EA	$ 1,630	$ 3,260
Monthly Sampling & Analysis	12	EA	$ 1,500	$ 18,000
Reporting	1	LS	$ 2,400	$ 2,400
Subtotal:				**$ 44,860**
Total Annual OM&M Cost				**$ 45,000**
Number of Years (n):				10
Interest Rate (i):				3%
p/A value:				8.53
10-Year OM&M Present Worth (PW):				**$ 383,850**

Total Present Worth (PW): Capital Cost + OM&M PW	**$ 395,000**

FIGURES

FIGURE 1



TurnKey Environmental Restoration, LLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

PROJECT NO.: 0071-009-312

DATE: FEBRUARY 2011

DRAFTED BY: AJZ

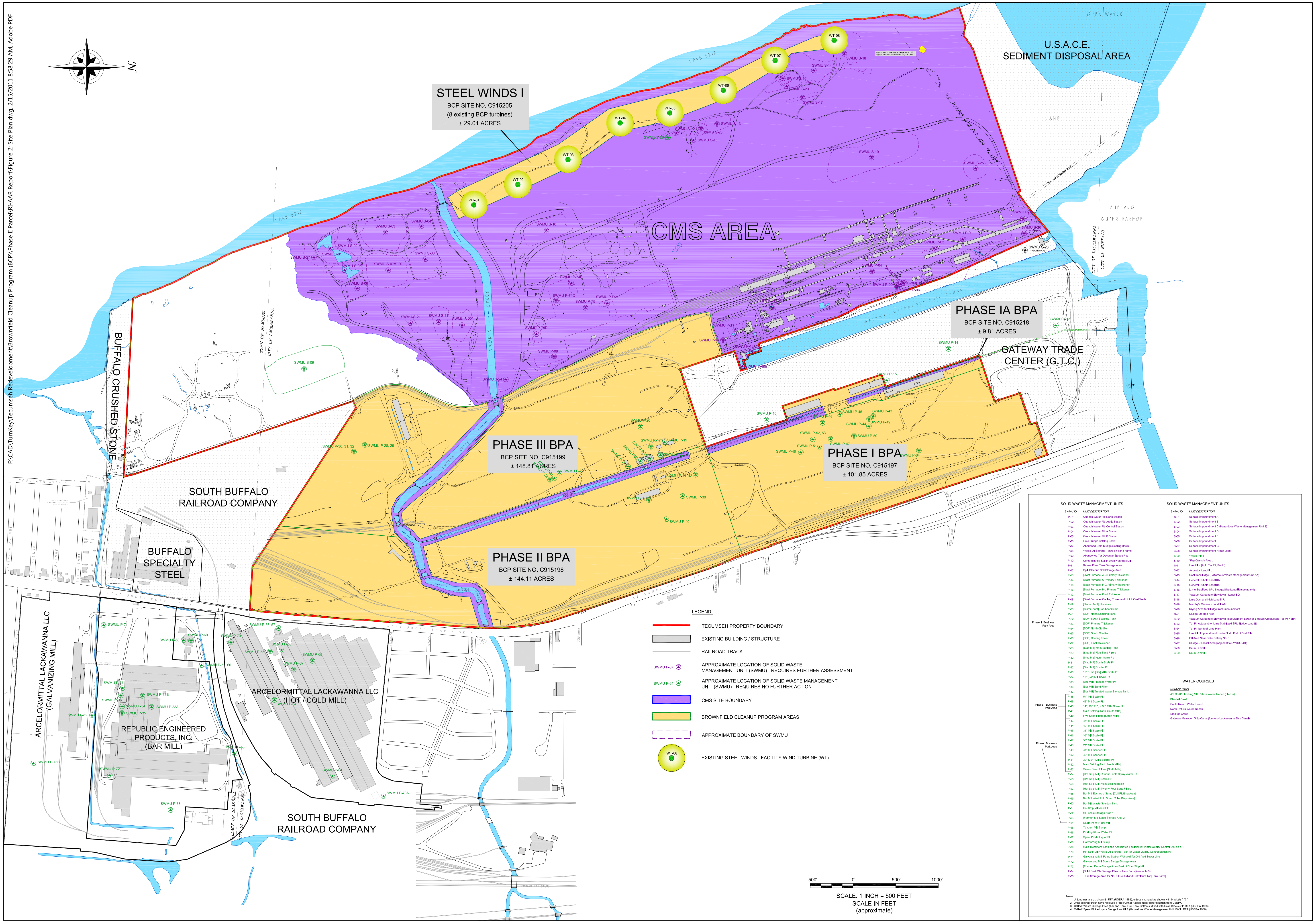
SITE LOCATION AND VICINITY MAP

PHASE II BUSINESS PARK AREA

LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.



2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

JOB NO.: 0071-009-312

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: BCH
DATE: FEBRUARY 2011
CHECKED BY:
APPROVED BY:

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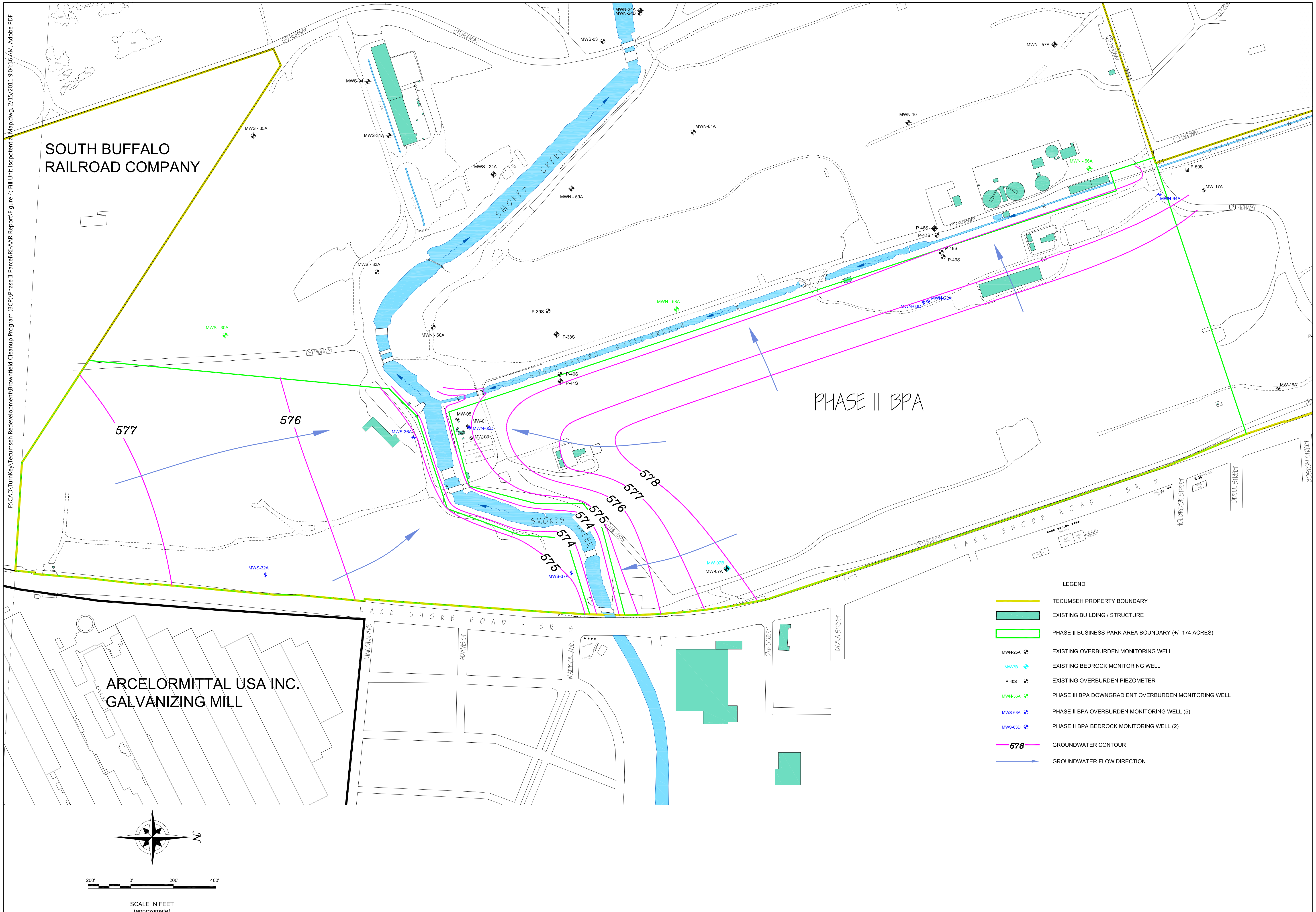
SITE PLAN

REMEDIAL INVESTIGATION / ALTERNATIVES ANALYSIS REPORT
PHASE II BUSINESS PARK AREA
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 2


INSET A
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-56
SCALE: 1 INCH = 40 FEET
SCALE IN FEET
(approximate)
INSET B
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-53
INSET C
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-16
SMOKES CREEK
INSET D
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-89
INSET E
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-93
INSET F
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-95
INSET G
SUPPLEMENTAL TEST PIT EXCAVATION FOR BPA 2-TP-99
SCALE: 1 INCH = 200 FEET
LAKE SHORE ROAD
LEGEND:
TECUMSEH PROPERTY BOUNDARY
EXISTING BUILDING / STRUCTURE
DEMOLISHED BUILDING AND HISTORICAL SITE FEATURE (see Notes 1 & 2)
PHASE II BUSINESS PARK AREA BOUNDARY (+/- 174 ACRES)
RAILROAD TRACK
PROPOSED SBRR TRACK REALIGNMENT & OFFSET
APPROXIMATE ALIGNMENT OF ACTIVE WATER LINES
APPROXIMATE ALIGNMENT OF ABANDONED WATER LINES
APPROXIMATE ALIGNMENT OF ACTIVE STORM & SANITARY SEWER LINES
APPROXIMATE ALIGNMENT OF ABANDONED SANITARY SEWER LINES
APPROXIMATE ALIGNMENT OF INACTIVE COKE OVEN GAS LINE
APPROXIMATE ALIGNMENT OF ACTIVE MEDIUM PRESSURE GAS LINE
(Locations taken from Nation Fuel Company records. Exact Location to be determined in the field, if necessary)
MWN-25A OVERBURDEN MONITORING WELL
MW-7B BEDROCK MONITORING WELL
P-40S OVERBURDEN PIEZOMETER
MWN-56A PHASE III BPA DOWNGRADIENT OVERBURDEN MONITORING WELL
MWS-63A EXISTING PHASE II BPA OVERBURDEN MONITORING WELL (5)
MWS-63D EXISTING PHASE II BPA BEDROCK MONITORING WELL (2)
BPA 2-TP-72 PHASE II BPA TEST PIT (105)
BPA 2-TP-72 SUPPLEMENTAL PHASE II BPA TEST PIT (LOGS NOT CREATED)
RR-TP-18 RAILROAD CORRIDOR TEST PIT (SEE 2010 IRM WORK PLAN)
RR-TP-15 RAILROAD CORRIDOR TEST PIT NOT ADVANCED DUE TO SURFACE FEATURE
(i.e., existing railroad tracks or South Return Water Trench)
COMPLETED RAILROAD REALIGNMENT HOTSPOT EXCAVATION (4)
(i.e., RR-TP-4, RR-TP-12, RR-TP-30, & RR-TP-42)
REMOVED ABOVE GROUND 6" GAS LINE
NOTES:
1. Building locations are based on historical surveys and maps, all locations should be considered approximate.
2. All buildings known to exist on site since 1944 are shown, some buildings were expanded or demolished following 1944, maximum building extents are shown.
TURNKEY ENVIRONMENTAL RESTORATION, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635
JOB NO.: 0071-009-310
REVISIONS
NO. BY DATE REMARKS
SEAL
DRAWN BY: BCH
DATE: NOVEMBER 2008 (REV MAR 2009)
CHECKED BY:
APPROVED BY:
DISCLAIMER: PROPERTY OF BENCHMARK EES, PLLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK EES, PLLC.
RI SAMPLE LOCATIONS
REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT
PHASE II BUSINESS PARK AREA
LACKAWANNA, NEW YORK
PREPARED FOR
TECUMSEH REDEVELOPMENT INC.
FIGURE 3



TURNKEY Environmental Restoration, LLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

JOB NO.: 0071-009-310

REVISIONS			
NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: BCH
DATE: OCTOBER 2010
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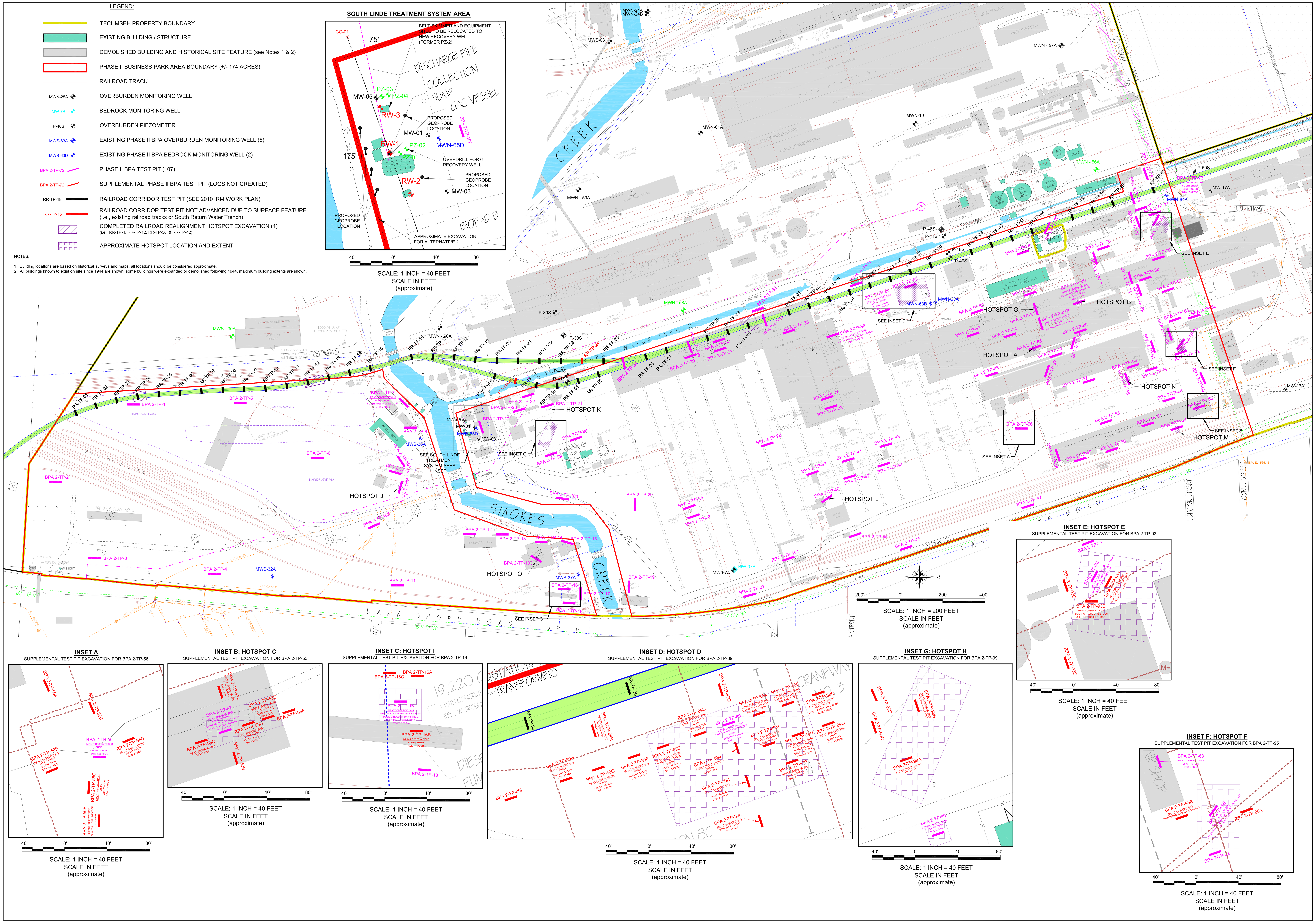
FILL UNIT ISOPOTENTIAL MAP

REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT
PHASE II BUSINESS PARK AREA
LACKAWANNA, NEW YORK

PREPARED FOR
TECUMSEH REDEVELOPMENT INC.

FIGURE 4



TurnKey Environmental Restoration, LLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

JOB NO.: 0071-009-310

REVISIONS

NO.	BY	DATE	REMARKS

SEAL

DRAWN BY: BCH (REV BY JCT)
DATE: NOVEMBER 2008 (REV MAR 2012)
CHECKED BY:
APPROVED BY:

SOIL/FILL HOTSPOT AREAS TO BE REMEDIATED

REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT

PHASE II BUSINESS PARK AREA

LACKAWANNA, NEW YORK

PREPARED FOR

TECUMSEH REDEVELOPMENT INC.

FIGURE 5

APPENDIX A

TEST PIT EXCAVATION LOGS, FIELD NOTES & MONITORING WELL SAMPLING LOGS