**WAYNE STATE UNIVERSITY**
**5454 CASS AVE**
**DETROIT, MI 48202-3646**

# DUE CARE PLAN FOR CONSTRUCTION

**GATEWAY PROJECT**
**W LAFAYETTE BLVD / W FORT ST**
**DETROIT, MI 48216**

**TEC Project 58870-04**

**Prepared by:**

**Testing Engineers & Consultants, Inc.**
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# 1.0 INTRODUCTION

On behalf of Wayne State University (WSU), Testing Engineers & Consultants, Inc. (TEC) has prepared a Due Care Plan (DCP) for the Gateway Project (the "Site"). See Figure 1 (Attachment A). The Site is comprised of a construction project at a former parking lot located along the north side West Forrest Avenue between Cass and Second avenues in Detroit, Wayne County, Michigan.

Authorization for this work was given to TEC by WSU under TEC's contract with WSU. This DCP has been prepared for WSU.

This DCP has been prepared for use solely during proposed construction activities. This DCP does not address post-construction or other due care obligations. This DCP will need to be revised or superseded to accommodate other activities, redevelopment, and subsequent use, and other entities that may purchase, lease, own, operate, occupy, or disturb the ground. As Site use changes, additional characterization of the Site may be necessary to further evaluate exposure pathways.

The Site is located in a mixed commercial, residential, and institutional usage area in the City of Detroit, Wayne County, Michigan. Environmental sampling has previously been conducted at the Site during environmental due diligence.

# 2.0 SITE OWNERSHIP AND OPERATORSHIP

WSU is the "Owner" and "Operator" of the Site. The Owner's address is 5454 Cass Ave, Detroit, MI 48202-3646.

# 3.0 DETAILED CHARACTERISTICS OF PROPERTY USE

## 3.1 CURRENT PROPERTY USE

The Site consists of an approximately rectangularly-shaped area encompassing one building and asphalt-paved parking and alley/drive areas in an area of mixed commercial, residential, and institutional use located within the City of Detroit, Wayne County, Michigan. Municipal water and sewer services are available to the Site, along with natural gas and electricity provided by the local public utilities.

## 3.2 PROPERTY INFORMATION

A Phase I Environmental Site Assessment (ESA) has been conducted for the Site. A May 2018 Phase I ESA identified the following recognized environmental conditions (RECs):

- Former presence of a gasoline service station with at least four underground storage tanks (USTs) and likely vehicle repair activities located at 4700 Second Avenue from at least 1926 through the 1960s.
- Former presence of four other vehicle repair facilities located along Second and W Forrest avenues from at least 1921 through the 1960s.

- Former presence of a dry cleaner business located at 4705 Cass Avenue from at least 1965 until sometime before 1972. A strong solvent odor was identified in soil at this location during recent geotechnical soil borings.
- Presence of at least one, possibly two, dry cleaner businesses located at the east adjoining property beyond Cass Avenue from least 1926 through the present.

Subsequent environmental sampling that occurred in June, July, and December 2018 indicated that the Site is contaminated above some Michigan Department of Environmental Quality (DEQ) Part 201/213 generic cleanup criteria and screening levels ("criteria"). Based on these results, the Site can be considered to meet the definition of a "facility" as defined under Part 201/Part 213 of the Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended (Part 201/Part 213).

### 3.3 PROPOSED PROPERTY USE

The applicability of this Due Care Plan is solely during construction. Construction activities will include moving Mackenzie House (the existing building) from the northeast corner of the Site to a new location near the west side of the Site.

## 4.0 HAZARDOUS SUBSTANCE INFORMATION

### 4.1 HAZARDOUS SUBSTANCES PRESENT

Sampling

Soil samples have previously been submitted for laboratory analysis of one of more of the following parameters: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatics (PNAs), polychlorinated biphenyls (PCBs), and metals (lead, cadmium, and chromium). The results have been compared to criteria.

Subsurface soil conditions encountered in the soil borings drilled at the Site generally consisted of silty sand overlying clay to a maximum depth explored of approximately 12 feet bgs (bgs). Groundwater was sampled from one soil boring located in the southwestern corner of the Subject Property via a temporary monitoring well screened at approximately 7-12 feet bgs.

The information collected indicates that compounds are present in soil at concentrations above criteria for drinking water protection (DWP), groundwater-surface water interface protection (GSIP), direct contact (DC), particulate soil inhalation (PSI), soil volatilization to indoor air inhalation (SVIAI), soil saturation concentration screening levels ($C_{SAT}$), ambient/outdoor air volatile soil inhalation (VSI), and recommended interim action screening levels [RIASLs for vapor intrusion (VI)]. Both residential and nonresidential criteria were exceeded.

The information collected indicates that compounds are present in groundwater at concentrations above criteria for drinking water (DW), groundwater-surface water interface (GSI), and RIASLs. Both residential and nonresidential criteria were exceeded.

The results indicated that the Site meets the definition of a "facility", as defined under Part 201/Part 213 of the Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended (Part 201/Part 213) based on concentrations in soil and groundwater exceeding criteria.

During construction, potentially relevant exposure pathways for the Site include ambient air inhalation, particulate soil inhalation, direct contact, and vapor intrusion into structures (and equivalents of confined spaces such as excavations). The potentially relevant pathways are determined without regard for the presence of specific chemical concentrations that might indicate an exceedance for a specific pathway.

If uncovered or disturbed, soil and groundwater must be handled as if they exceed criteria, unless sufficient additional testing is done to prove otherwise. Therefore, if excavated or disturbed, soil and groundwater will either be removed for proper off-site treatment or disposal at a licensed facility or properly managed in-place.

This DCP will be reviewed and revised as needed, as the plans for the construction and construction activities are developed, change, or if new environmental information or new regulations or changes to current regulations (including changes to applicable cleanup criteria) become available. Additional characterization of the Site may be necessary to further evaluate exposure pathways, as the Site progresses.

Hazardous Substances Known to be Present at Concentrations above Criteria

Some VOCs, PNAs, and metals were detected at concentrations greater than criteria. The exceedances are summarized below; refer to the attached report excerpts for the analytical data tables, including non-exceedances (Attachment B). Locations of the sampling points and relevant exceedances are presented on Figure 2 and in the excerpts from previous investigation reports (Attachment B). Note that the locations of sampling points on any figure are for general illustration only.

For the purpose of assessing due care concerns during construction, the results of the existing laboratory analysis of samples were referenced against the following potentially-applicable nonresidential criteria:

| | |
|---|---|
| Direct Contact (DC) | Soil Saturation Concentration Screening ($C_{SAT}$) |
| Volatile Soil Inhalation (VSI) for ambient air | Particulate Soil Inhalation (PSI) |
| Soil Volatilization to Indoor Air Inhalation (SVIAI) | Recommended Interim Action Screening Levels (RIASLs)* |

* RIASL: Nonresidential RIASLs are calculated based on a healthy adult worker and are intended to be protective for indoor air.

Laboratory analytical results for soil samples identified contaminant concentrations above some criteria. Concentrations (in micrograms per kilogram - µg/kg) of multiple contaminants were identified in one or more samples above nonresidential criteria, as summarized in the following table of maximum results (depths are in feet bgs):

| Contaminant | CAS # | Maximum concentration (µg/kg) | Sample ID & (depth) | Nonresidential criteria exceeded |
|---|---|---|---|---|
| Benzene | 71-43-2 | 2,060 | SS-2 (5) | SVIAI, RIASL |
| Ethylbenzene | 100-41-4 | 24,000 | SB-8 (8-9) | RIASL |
| Xylenes | 1330-20-7 | 31,000 | SB-8 (8-9) | RIASL |
| Tetrachloroethylene | 127-18-4 | 2,280,000 | SB-1 (7-8) | SVIAI, RIASL, VSI, DC, $C_{SAT}$ |

| Contaminant | CAS # | Maximum concentration (µg/kg) | Sample ID & (depth) | Nonresidential criteria exceeded |
|---|---|---|---|---|
| 1,2,3-trimethylbenzene | 526-73-8 | 43,000 | SB-8 (8-9) | RIASL |
| 1,2,4-trimethylbenzene | 95-63-6 | 9,000 | SB-8 (8-9) | RIASL |
| 1,3,5-trimethylbenzene | 108-67-8 | 37,000 | SB-8 (8-9) | RIASL |

Laboratory analytical results for groundwater samples identified contaminant concentrations above some criteria. Concentrations (in micrograms per liter - µg/L) of multiple contaminants were identified in one or more samples above nonresidential criteria, as summarized in the following table of maximum results (depths are in feet bgs):

| Contaminant | CAS # | Maximum concentration (µg/L) | Sample ID & (depth) | Nonresidential criteria exceeded |
|---|---|---|---|---|
| Benzene | 71-43-2 | 760 | SB-8 (7-12) | RIASL |
| Ethylbenzene | 100-41-4 | 480 | SB-8 (7-12) | RIASL |
| 2-methylnaphthalene | 91-57-6 | 200 | SB-8 (7-12) | RIASL |
| Naphthalene | 91-20-3 | 300 | SB-8 (7-12) | RIASL |
| n-propylbenzene | 103-65-1 | 290 | SB-8 (7-12) | RIASL |

Abandoned or Discarded ASTs, USTs, or Hazardous Substance Storage Containers

No abandoned or discarded aboveground storage tanks (ASTs), underground storage tanks (USTs), or hazardous substance storage containers have been identified at the Site.

### 4.2 HAZARDOUS SUBSTANCES CONCENTRATIONS

Some VOC and PNA compounds exceed the inhalation (PSI, RIASL, VSI, SVIAI) and/or DC criteria for a nonresidential (NR) exposure scenario. These exposure pathways are potentially relevant to the applicable activities (i.e., short-term construction scenario). Other exceedances (e.g., DW/DWP, GSI/GSIP) are not relevant to the applicable activities except for the purpose of preventing exacerbation.

### 4.3 COMPLETE HUMAN EXPOSURE PATHWAYS

There are human exposure pathways that are or may become complete during the short-term construction scenario.

**Direct Contact** - This pathway is complete; target compounds exhibited concentrations above potentially applicable criteria (DC). Based on the limited sampling conducted, direct contact concerns were only noted the southwest corner of the Site.

**Vapor Intrusion** - This pathway is complete; structures are present (and excavations will be present during construction) at the Site and target compounds exhibited concentrations above potentially applicable criteria (RIASL, SVIAI).

**Volatilization to Ambient Air** - This pathway is complete; target compounds exhibited concentrations above potentially applicable criteria (VSI).

**Particulate Inhalation** - This pathway is complete; target compounds exhibited concentrations above applicable criteria (PSI), and soil will be disturbed during

construction activities. Based on the limited sampling conducted, direct contact concerns were only noted the southwest corner of the Site.

### 4.4 INCOMPLETE HUMAN EXPOSURE PATHWAYS

Human exposure pathways that are not and will not become complete during the short-term construction scenario are listed below.

**Drinking Water** - This pathway is not complete because municipal water is available in the area and no potable water wells will be installed at the Site. In addition, the Operator will not install, or allow others to install, drinking water, irrigation or, similar-use water extraction wells.

If required as part of an environmental, geotechnical, or hydrogeological investigation, monitoring wells may be installed for the collection of groundwater samples for, determination of aquifer, parameters, or similar scientific purposes. Monitoring wells will be labeled as such, and well vaults, lockable well plugs, locks, fencing, supervision/monitoring by Site personnel, etc. will be used to prevent unauthorized access. If installed, temporary groundwater monitoring wells will be properly abandoned when they are no longer needed for their intended purposes.

If required for the purpose of dewatering during construction activities, dewatering wells may be installed. Dewatering wells will be labeled as such, and well vaults, lockable well plugs, locks, fencing, supervision/monitoring by Site personnel, etc. will be used to prevent unauthorized access. If installed, temporary dewatering monitoring wells will be properly abandoned when they are no longer needed for their intended purposes.

**Groundwater Surface Water Interface** - This pathway is not complete because there are no surface water bodies on the Site, and no uncontrolled/unmonitored dewatering to storm drains will be allowed.

### 4.5 INTENDED LAND USE

This DCP only addresses due care obligations during short-term construction activities. This DCP does not address post-construction or other due care obligations.

### 4.6 FIRE AND EXPLOSION HAZARDS

No fire or explosion hazards have been identified.

## 5.0 PLAN FOR RESPONSE ACTIVITIES (PRA)

A limited Plan for Response Activities (PRA) is necessary because there are response activities necessary to meet Due Care obligations. The following proposed activities are focused on preventing worker exposure and exacerbation, and taking precautions against reasonably foreseeable acts or omissions of third parties.

### 5.1 ENVIRONMENTAL HAZARD ANALYSIS

Subsurface investigation of the Site identified contaminants in soil and groundwater. Contaminants of concern included volatile organic compounds (VOCs) and polynuclear

aromatics (PNAs). The information collected during investigations indicates that compounds are present at concentrations exceeding nonresidential (NR) criteria for the following potentially-applicable exposure scenarios:

- Soil Direct Contact (DC).
- Soil Vapor Intrusion (RIASL, SVIAI)
- Groundwater Vapor Intrusion (RIASL)
- Ambient Air Soil Volatilization (VSI)

The Soil Saturation Concentration screening level ($C_{SAT}$) was exceeded in one sample from soil boring SB-8. According to the DEQ, *"[c]oncentrations greater than $C_{SAT}$ for a single contaminant indicate NAPL [non-aqueous phase liquid] is likely present*," and $C_{SAT}$ identifies "*an upper limit to the applicability of generic risk-based soil criteria since certain assumptions and models used in the generic algorithms are not applicable when NAPL contamination is present in soil. In addition, soil concentrations greater than $C_{SAT}$ raise concerns relative to physical hazards, such as corrosivity and flammability, contact-site toxicity, aesthetic impacts, and/or ecological impacts which are not incorporated into the development of generic soil criteria*."

The primary exposure pathway of concern for VOCs is through inhalation via breathing ambient air and vapor intrusion into structures (or the equivalents of confined spaces such as excavations). Workers should avoid the inhalation of vapors near freshly-exposed soil or groundwater or in excavations unless monitoring shows acceptable conditions. Due to the physical nature of VOC compounds, specifically the relatively high vapor pressures, there exists a potential vapor inhalation hazard. Therefore, regular monitoring for VOCs will be conducted in the general breathing zone of workers in excavation areas and at the excavation area perimeter. Repeated exposure to some VOCs has been associated with central nervous system depression, tissue and membrane irritation, and increased risk of certain cancers.

Workers should not eat, drink, or smoke at the Site, except at designated areas, because of the possibility of food, drink, or cigarettes becoming contaminated with Site soils. Prior to eating, drinking, or smoking after being on the Site, workers should wash their hands. Workers should also avoid placing their hands or other objects near or into their mouths after being on the Site before proper washing.

Subsurface investigations identified the presence (at concentrations below the nonresidential criteria) of various other compounds of concern in soil and groundwater that are generally classified as VOCs, PNAs, or metals.

### 5.2 EXPOSURE PATHWAY EVALUATION

Inhalation of vapors from soil or groundwater (VSI, RIASL, SVIAI), inhalation of soil (PSI, e.g., dust) and skin contact with soil (DC) including ingestion, are the exposure pathways of concern.

For workers conducting activities at the Site, the primary risk of exposure will be associated with activities that disturb Site soils or involve dewatering. Disturbed soil and groundwater may contain compounds of concern. Workers should avoid the

inhalation of vapors near freshly-exposed soil/groundwater or in excavations, and the ingestion of soil either directly or indirectly.

### 5.3 ANTICIPATED FIELD ACTIVITIES

Construction activities at the Site are anticipated to include the following:

- Pavement removal
- Excavation/trenching
- General cuts/fills
- Partial demolition/relocation of Mackenzie House
- Underground utility work
- New foundation construction
- Site grading and backfill
- Soil stockpiling
- Dewatering
- Soil and/or water handling for off-site transport and disposal

### 5.4 SOIL & GROUNDWATER MANAGEMENT

Site soil and groundwater shall be considered to be contaminated unless reliably demonstrated otherwise by sampling other appropriate means. Contaminated soil or groundwater that leaves the Site will go to an appropriate treatment, storage, or disposal location (TSD).

The following personal protective equipment (PPE) requirements should be employed along with additional PPE requirements stipulated by the site-specific HASP while performing work that may involve exposure to Site soil or groundwater:

- Hard hat, safety glasses, work boots, work clothes, and safety vests. Shirts with long sleeves, full-length pants (no shorts), and work gloves. As needed (especially for direct contact concerns in the southwest corner), disposal coveralls, gloves, and boot covers. Avoid direct contact with soil and groundwater, and with vapors.

### 5.5 ADDITIONAL SITE-WIDE SAFETY CONSIDERATIONS

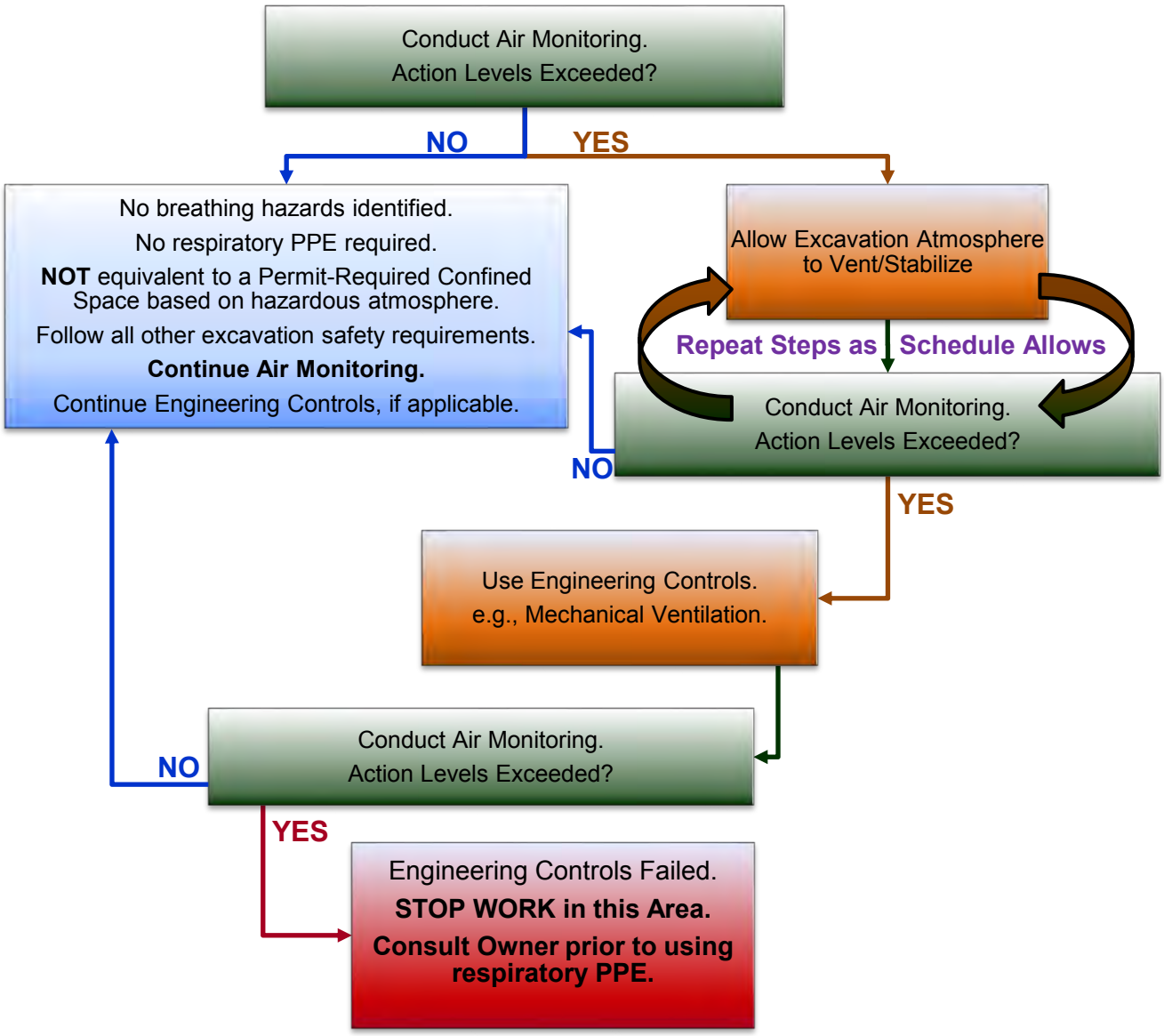
Because of past uses of the Site, there is a potential to encounter unknown or anticipated environmental issues during soil excavation, trenching or other intrusive activities. If any of the following are encountered: work shall cease, the affected area will be vacated, and supervisory/safety personnel will be immediately notified. Work may resume when the condition has abated; the area and condition have been properly assessed; and/or additional work practices, equipment, materials, etc. have been provided to properly address the situation.

- Strong petroleum, chemical, or unusual odors
- NAPL/free product (e.g., petroleum fuels or oils)
- Buried metal containers (e.g., tanks or drums)
- Visibly heavily-impacted soils

## 5.6 AIR MONITORING ACTION LEVELS

Environmental air monitoring will be conducted to:1) assess exposure levels to compounds of concern, 2) assess Site or ambient conditions,3) determine if work activities need to be altered or stopped, and 4) determine appropriate levels of PPE for work tasks. Attachment C presents the Air Monitoring Plan that includes Air Monitoring Action Levels and identifies appropriate levels of PPE based on-site conditions, presents action levels to start additional actions to control Site emissions, and presents minimum requirements for monitoring frequency. The following graphic presents a summary of the intent of the Air Monitoring Plan. Note that the Air Monitoring Plan must be read, understood, and followed in its entirety.

Summary Graphic for Air Monitoring



## 5.7 ADDITIONAL PPE

The levels of additional personal protection to be used for work tasks at the Site have been selected based on known or anticipated physical hazards; types and concentrations of contaminants that may be encountered on-site; and contaminant properties, toxicity, exposure pathways, and matrixes. The following sections describe protective equipment and clothing, reassessment of protection levels, and limitations of protective equipment.

Protective equipment and clothing

Based on the anticipated hazard level, personnel will perform field tasks in modified Level D protection. If conditions warrant a greater level of protection than those addressed herein, all field personnel will withdraw from the work area and will immediately contact their supervisor. Descriptions of equipment and clothing required for modified Level D protection are provided below.

Modified Level D

- Coveralls or work clothes with long sleeves & long pants
- As needed: disposable, coated, water- and/or chemical-resistant coveralls *
  * Additional clothing, especially coated protective outwear, can increase the concern for worker heat stress during physical exertion; monitoring for heat stress will be conducted if appropriate.
- Work gloves
- As needed: chemical-resistant disposable gloves (e.g., latex, nitrile, or similar)
- Work shoes/boots
- As needed: boot covers, water- and/or chemical-resistant outer boots
- Safety glasses or goggles
- Hard hat (as needed: optional face shield)
- Hearing protection
- Other task-specific work wear or safety gear as determined by the appropriate personnel.

Reassessment of protection levels

If a significant change in Site conditions occurs, hazards will be reassessed. Some indicators of the need for reassessment are as follows:

- Commencement of a new work phase, such as the start of a significantly different sampling activity or work that begins on a different portion of the Site
- Discovery of suspected contaminants other than those previously identified
- A change in ambient levels of airborne contaminants (see the action levels listed in the Air Monitoring Plan presented in Attachment C)
- A change in work scope that affects the degree of contact with contaminated media

***Limitations of protective clothing***

PPE clothing ensembles designated for use during Site activities have been selected to provide protection against contaminants at known or anticipated on-site concentrations and physical states. However, no protective garment, glove, or boot is entirely chemical-resistant, nor does any protective clothing provide protection against all types of

chemicals. Permeation of a given chemical through PPE depends on the contaminant concentration, environmental conditions, physical condition of the protective garment, and resistance of the garment to the specific contaminant. Chemical permeation may continue even after the source of contamination has been removed from the garment.

## 5.8 GENERAL PREVENTATIVE MEASURES

The following general preventative measures will be taken to mitigate the risk of exposure and prevent exacerbation of potential contamination at the Site. These measures are intended to be used by WSU, contractors, and/or subcontractors, during applicable activities.

1. Provide notices of known contamination to contractors, subcontractors, utility workers, and other personnel operating on-site.
2. Provide notices to regulatory agencies as required by federal, state, and local regulations, as appropriate/applicable, and within timeframes stipulated on notice forms and/or in regulations. These notices may include, but are not limited to the following DEQ forms; Notice of Migration of Contamination, Notice of Discarded or Abandoned Containers, Release Report, and Notice of On-Site Work Activity.
3. Prevent exacerbation of the existing contamination.
4. Prevent unacceptable human exposure and mitigate fire and explosion hazards to allow for the intended use of the property in a manner that protects the public health and safety.
5. Take reasonable precautions against the reasonably foreseeable acts or omissions of a third party.
6. Provide reasonable cooperation, assistance, and access to the persons that are authorized to conduct response activities or corrective actions at the property.
7. Comply with any land use or resource use restrictions established or relied on in connection with the response activities or corrective actions.
8. Do not impede the effectiveness or integrity of any land use or resource use restriction.
9. Contractors will be responsible for ensuring workers have the appropriate level of hazard training.
10. Require on-site companies to have a site-specific health and safety plan (HASP) requiring appropriate personal protective equipment (PPE), when necessary, including but not limited to boots, long-sleeved shirts, long pants, gloves, safety glasses or safety goggles, and a respirator.
11. WSU and its contractors shall restrict access to prevent exposures to third parties and prevent potential acts and omissions by third parties until due care procedures are implemented.
12. Following each phase of construction, contractors and subcontractors shall install and maintain a suitable ground cover in areas where in-ground soils are exposed as a result of construction disturbance to restrict human exposure to soil exceeding or potentially exceeding criteria.
13. WSU and its contractors shall handle soils contaminated above criteria in accordance with provisions outlined in Section 324.20120c (Relocation of Contaminated Soil) of the Natural Resources and Environmental Protection Act (NREPA), Public Act 451 of 1994 as amended, to manage soil on-site. If soil is to be moved off-site, it shall be properly characterized, managed, and disposed of at an appropriate licensed Type II treatment, storage, or disposal location (TSD, for soil characterized as nonhazardous), as necessary according to federal, state, and local requirements and regulations. Hazardous waste must go to a TSD licensed to accept and handle such waste.
14. If encountered, surface water and groundwater shall be properly characterized, handled, managed, and disposed of in accordance with a NPDES/Great Lakes Water Authority (GLWA) permit or other applicable federal, state, or local requirements and regulations. Water produced from excavated soil can be allowed to slowly re-infiltrate into the Site soil in unpaved areas. Produced water shall not be allowed to migrate off-site, or enter any catch basins, ditches, culverts, etc. where it might

migrate off-site. Soil shall not be transported off-site while it is saturated or has the potential to produce free liquids.

15. In the event that unforeseen contamination is discovered, potentially hazardous materials or debris is encountered (e.g., staining, odors, suspect asbestos, USTs, aerosol cans, oil cans, paint, mercury-containing equipment, or other household or universal wastes, etc.), contractors shall contact WSU immediately to assess the nature and extent of the potential impact(s).
16. In the event that a UST is encountered during construction activities, contractors and subcontractors shall contact WSU immediately to assess whether a release has occurred and facilitate registration, removal, and disposal.
17. In the event previously unknown or unevaluated demolition debris is encountered, contractors shall notify WSU, have a Competent Person on-site pursuant to 29 CFR 1926.32(f), and handle the debris and waste as contaminated with friable asbestos and/or containing friable asbestos, unless demonstrated otherwise. A Competent Person is defined as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."
18. Due care activities performed by contractors and subcontractors shall be documented by those contractors and subcontractors performing the due care activities. Documentation of due care shall be provided to WSU by the contractors and subcontractors performing the due care activities. Due care documentation may include, but is not limited to, notifications, daily field reports, waste manifests, landfill shipping/receiving tickets, sampling results, photographs, maps of sampling locations, laboratory analytical data, etc.

WSU may be contacted at:

Wayne State University
Attention: Mr. Ryan Miller - Project Manager
5454 Cass Ave, Detroit, MI 48202-3646
(313) 577-7663 (office)

WSU Police - (313) 577-2222

### 5.9 RESPONSE ACTIVITIES DURING CONSTRUCTION

At a minimum, the following actions will be taken when construction is undertaken.

**Responsible Person** - The individual(s) designated as the Responsible Person (e.g., site safety and health supervisor or other knowledgeable individual) will be a qualified, empowered designee of the Operator who will be present at the Site during construction activities and who regularly visit the Site during periods of inactivity as long as the Operator is in control of and responsible for due care at the Site. The Responsible Person will be fully trained on the content and requirements of the DCP and applicable Site-Specific Health and Safety Plans (HASPs). During construction activities, the Responsible Person may be a representative of the Owner or senior employee of a contractor.

**Ongoing Revision of the Plan** - As construction progresses, due care obligations should be re-evaluated and documentation must be updated to reflect current Site conditions.

**Notices** - Notice shall be provided to Site workers, contractors, subcontractors, public utility entities, etc., that Site soils/groundwater are contaminated. Notice will be provided to any entities that may conduct on-site work involving soil or groundwater disturbance. Soil (or groundwater) removed from the Site will be handled in accordance with Section 20120(c) of Part 201, Act 451 of 1994. Excavated soil and pumped groundwater will be properly transported off-site for treatment or disposal at an appropriate licensed location, or, with WSU approval, soil may be re-used in same general area from which it was excavated, and groundwater may be allowed to infiltrate back into the soil in same general area from which it was pumped. Groundwater may be able to be discharged to a sewer if properly characterized, treated if appropriate, and allowable under a valid permit if appropriate (see section 5.8, item 14).

Construction activities that will involve potentially contaminated soil or groundwater disturbance will be conducted using the following procedures:

**Site-Specific Health and Safety Plan (HASP)** - Entities that will conduct activities that may disturb impacted soil and /or groundwater will be required to develop a HASP, train their on-site workers, and have oversight of HASP implementation by a "Responsible Person." The HASP will mandate industry-standard good housekeeping and sanitation procedures as well as PPE requirements.

The Site-specific HASP should meet the requirements of the Occupational Safety and Health Administration's (OSHA's) Hazardous Waste Operations and Emergency Response (HAZWOPER) Standard, 29 CFR 1910.120 (general industry), and 29 CFR 1926.65 (construction industry), paragraph (b)(4). Employers must comply with their legal responsibilities (e.g., employee training) under the *applicable* standards. The employer must determine the appropriate type and amount of training. Untrained workers must be protected from contact with or exposure to hazardous substances.

For example, OSHA's 1910.120(e)(3) requires the following (among other requirements) for sites covered by the HAZWOPER standard:

- General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.
- Workers only occasionally on-site for a specific limited task (such as, but not limited to, ground water monitoring, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.

Even if a cleanup activity did not originate from an "emergency response" effort, the activity may fall under HAZWOPER as a hazardous waste site cleanup operation. A site is considered a hazardous waste site if it is:

- Identified or listed by a government agency as an uncontrolled hazardous waste site.
- Listed or proposed for listing on the National Priority List (NPL).
- Listed or proposed for listing on a state priority list.
- Regulated as a corrective action covered by the Resource Conservation and Recovery Act (RCRA).

OSHA requires employers who have employees on a Site that falls within the scope of the HAZWOPER standard, paragraphs (b)-(o), to be responsible for ensuring that their employees are protected by the provisions of an effective Site-specific HASP. The HASP will mandate industry standard for good housekeeping and sanitation procedures as well as PPE requirements, as are deemed necessary.

Personal Protective Equipment (PPE)

PPE requirements are anticipated to be modified Level D. Level D consists of a work uniform affording minimal protection and is generally used for nuisance contamination. See section 5.7 for a description of modified Level D PPE.

Employees will not enter confined spaces without applicable controls, supervision, permits (note that the requirements for confined space entry permits do not apply; see below), etc., including the appropriate additional PPE. A Confined Space means a space that: (1) is large enough and so configured that an employee can bodily enter it; (2) has limited or restricted means for entry and exit; and (3) is not designed for continuous employee occupancy. A Permit-Required Confined Space means a confined space that has one or more of the following four characteristics: (1) contains or has a potential to contain a hazardous atmosphere; (2) contains a material that has the potential for engulfing an entrant; (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) contains any other recognized serious safety or health hazard.

Although excavations in construction (those covered by 1926 Subpart P - Excavations) are not covered by the Confined Spaces in Construction (29 CFR Part 1926 Subpart AA) or Permit-Required Confined Spaces (29 CFR 1910.146) standards, excavations may need to be treated as if they were equivalent to Permit-Required Confined Spaces (if they have one or more of the four characteristics), with the exception that a permit is not required. Based on the plan for air monitoring and, if needed, engineering controls such as mechanical ventilation, it is not anticipated that respiratory PPE will be needed without significant additional evaluation and consultation with the Owner.

**Dust Control** - Dust control procedures will be implemented for the duration of construction activities. These procedures require that a Responsible Person (designated in advance by the operator) visually evaluate dust levels and direct the use of water (and if applicable on hard surfaces, sweepers using wet methods only), as appropriate, to

minimize dust levels and prevent unacceptable exposure (or exacerbation) to on-site and off-site persons. Trackout control (see below) will also be important to minimizing the production of dust.

Dust minimization measures could include: light misting of exposed soil and soil stockpiles; light watering of on-site drive areas/roads; enforce "dead slow" speed limit for all construction-related vehicles and equipment traversing exposed soil and in or near areas of stockpiled soil. Typical construction dust suppression measures to be used may include: water trucks, sprinklers/water cannons, compaction, enclosure ('snow' fences, windbreaks, etc.), speed limits, placing of straw, etc. Dry sweeping of known or potentially impacted soil/trackout will not be used. The Responsible Person will evaluate dust conditions and direct control procedures. Application of liquid to prevent dust shall not be allowed to create runoff water that leaves or might leave the Site.

**Trackout Control** - Procedures to control trackout will be implemented to minimize Site materials from being inadvertently tracked off-site. For vehicles or equipment that may have come in contact with known or potentially impacted soil or water, procedures may include requiring contractors to remove excess soil materials from the exterior of vehicles/equipment (with particular attention paid to tires) using wet (damp) methods and the use of devices such as crushed stone exit pads. Hand tools such as shovels, brushes, brooms, etc., may be used to remove soil from exiting vehicles if this does not lead to dust production. When deemed necessary by the Responsible Person, include the use of devices such as shakers and wheel washes. If water is used to remove contaminated soil, the water will be captured and directed back on-site to infiltrate slowly into the soil (but not cause run-off or soil erosion) in unpaved areas of the Site or will be contained for characterization and proper off-site treatment or disposal. Egress will only be allowed at controlled and monitored points that are raised and stabilized. Ingress will also be controlled and monitored to ensure that only necessary traffic enters the Site. Perimeter areas that are or may be used for egress from the zone of construction should have effective trackout controls. The Responsible Person will evaluate trackout conditions and direct control procedures.

**Soil Management** - A soil management program will be implemented. Oversight is performed by the Responsible Person. This program mandates appropriate procedures to ensure that excavated soils are managed appropriately. Excavated soil will be managed via proper off-site treatment or landfill disposal.

For excavation of potentially-impacted soil:

- Standard work wear for all Site employees will include long-sleeved shirts and long pant legs, work boots, and gloves. If necessary, workers will wear additional protective clothing (e.g., disposable gloves, boot coverings, and suits/coveralls as deemed necessary) during handling of potentially impacted soil. The identified concern for direct contact exposure was in the southwest corner of the Site, based on the limited sampling conducted. Workers may have limited exposure to soil during temporary activities, and these workers will all use additional protective clothing [(PPE) see section 5.8]. Equipment that comes in contact with potentially impacted soil will be properly decontaminated prior to removal from the Site.

- Prevent commingling with "clean" materials (e.g., imported fill soil). Separate stockpiles will be maintained and identified as unimpacted (new, imported fill) or impacted (existing Site soil staged for proper off-site treatment or disposal).
- Prevent the spreading of contamination. Minimize dust production. Avoid placing impacted soil on otherwise clean surfaces (such as areas already covered with clean, imported fill) and underlay and cover impacted soil with plastic sheeting to minimize erosion/runoff/comingling. Plastic sheeting shall be thick enough to resist degradation or tearing during the time it is used to isolate the soil.
- Off-site treatment or disposal at an acceptable location permitted to accept contaminated soil or water, or as a contingent: testing to demonstrate that excavated soil or produced water is not contaminated.
- Take reasonable steps to avoid contact between excavated soil and precipitation.

If present, splashing of groundwater or surface water (puddles, etc.) may provide a mechanism to transport suspended soil particles that potentially contain contaminants. Therefore, workers that are potentially in close contact with wet soil or puddles, including work during precipitation events, will wear additional PPE that provides an appropriate degree of water resistance. Water-resistant outerwear may include disposable or washable outer-boots, gloves, coveralls, and eye/face/head protection (e.g., safety glasses, face shields, hard hats, etc.) when splashing is a possibility.

Existing Site soil and groundwater/surface water will be handled as if they exceed relevant criteria unless they are characterized and shown to be unimpacted. Therefore, if disturbed, existing soil and water will be removed for proper off-site treatment or disposal, if the soil cannot be expeditiously re-used, or if water cannot be allowed to re-infiltrate, in the general location from which it was removed. Soil handling will comply with applicable sections of Part 201, Part 111, and Part 115.

Excavation must only be performed after notice to, and under the oversight of, Responsible Person. Appropriate notification procedures, dust control, soil management protocols, and trackout control procedures, etc., will be followed.

**Water in Fill Management** - If dewatering is required for construction needs, a water management program will be implemented to handle and dispose of the water in an environmentally sound manner. The produced water will be containerized, analytically characterized, and transported off-site for proper treatment or disposal, or will be directed to slowly re-infiltrate into areas of exposed soil if appropriate. Impacted water will not be placed into in any area in which clean imported fill has been placed because this may contaminate the clean fill. Oversight will be performed by the Responsible Person.

**Storm Water Management** - as applicable, soil erosion and sedimentation control will be conducted in accordance with applicable laws and good and customary practice. A standard professionally designed and maintained soil erosion and sedimentation control program following best management practices is expected to be sufficient. If staging of impacted soil occurs where it may come in contact with precipitation, nearby storm drains/catch basins will be protected from soil infiltration. Silt fencing will be properly installed, regularly inspected, and well-maintained. Filter fabric will be regularly checked

for effectiveness, rips, clogging, etc. and cleaned/replaced as necessary. Puddles will be drained as necessary. Disturbed impacted soil (particularly soil in stockpiles) will be protected from precipitation to limit runoff and erosion.

**Site Control** - During the construction phase, perimeter fencing may need to be installed and maintained to limit access by unauthorized entities or persons to the Site during construction or while impacted soil or groundwater is exposed, and to control ingress and egress of authorized construction traffic. The fencing will be maintained to prevent Site access at all times during construction or while impacted soil or groundwater is exposed. The fencing may be temporarily removed to allow authorized access while the Site is under full-time monitoring/supervision of a Responsible Person.

Routine Maintenance/Repairs
Maintenance will be performed routinely to keep the fencing as nearly as possible in its as-constructed condition. Early detection and repair of minor breaches will be performed to prevent more significant deterioration.

**Inspections** - Formal visual inspections of fencing will be performed on at least a weekly basis by the Responsible Person and observations will be recorded and kept on file. If breaches are identified, the frequency of inspections will be increased. The inspections will be performed to identify holes or other breaches, or unauthorized subsurface disturbances. If a breach is noted, the area will be supervised until repairs are made. If noted, any unauthorized on-site work will be stopped and Due Care obligations will be evaluated in light of the unauthorized activity.

**Responsibility** - Operation, maintenance, inspections, and breach repairs will be the responsibility of the operator and will be supervised and implemented by the Responsible Person. Selected employees in key positions will be made aware of the Site conditions. All employees will be trained in accordance with the DCP and applicable statutes and regulations per the employer's obligations under OSHA.

Unforeseen/Newly Discovered Conditions
During Site activities involving subsurface disturbance, the Responsible Person or designated and trained subordinates will observe for previously undiscovered conditions such as USTs/UST piping, buried drums, or heavily impacted soil or groundwater (as evidenced by heavy staining, strong odor, or sheens). If these or similar conditions are noted, work will stop until the situation can be properly evaluated for impact to due care, health & safety, or Site compliance with applicable laws (e.g., a discovered UST may need to be registered with the State of Michigan prior to requesting clearance to remove the UST from the ground).

## 6.0 EVALUATION AND DEMONSTRATION OF COMPLIANCE WITH SECTION 7A OBLIGATIONS

This section provides an evaluation of how the proposed use satisfies obligations during a construction scenario under Section 7a(1)(a).

## 6.1 EXACERBATION

**Exacerbation** - The proposed use of the Site for construction activities will not exacerbate existing contamination because the proposed work consists of relocating a structure on-site, removing and replacing pavement, etc., as well as the likely excavation and transport of impacted soil for proper off-site disposal at a licensed TSD (e.g., landfill). The proposed use will not increase the magnitude or extent of the existing contamination or cause other media (groundwater, surface water, air, etc.) to become impacted.

**Exacerbation through Increase in Response Activity Costs** - The proposed use of the Site will not result in exacerbation through an increase in response activity costs because the proposed use does not adversely alter the environmental conditions at the Site. No other response is necessary to allow the safe use of the Site for the proposed work. Therefore, no increase in response activity costs will occur.

## 6.2 DUE CARE

Mitigation of Unacceptable Exposures
Potential unacceptable exposures have been identified.

Exposure Hazard Communication
Exposure hazards will be communicated, as appropriate, to third parties as follows:

**Construction Workers** - will be provided notice of, and training on, the general nature and extent of contamination, practices to reduce exposure to contaminants, and the prohibition against exacerbation. Best practices will be reinforced in the health and safety plan and during daily pre-work health and safety (tailgate) briefings.

**Easement Holders of Record** - if identified, will be provided written notice, by a method that provides proof of delivery, of the general nature and extent of contamination and the prohibition against exacerbation.

**Utility Franchise Holders of Record** - if identified, will be provided written notice, by a method that provides proof of delivery, of the general nature and extent of contamination and the prohibition against exacerbation.

**Owners/Operators of Public Utilities** - if identified, will be provided written notice, by a method that provides proof of delivery, of the general nature and extent of contamination and the prohibition against exacerbation.

**Owners or Lessees of Severed Subsurface Mineral Rights or Subsurface Formations** - if identified, will be provided written notice, by a method that provides proof of delivery, of the general nature and extent of contamination.

Notice Requirements of Rule 1017
Based on the limited Site characterization information, there is no reason to believe that contamination is emanating from the Site, therefore the requirement to notify the DEQ and affected property owners is not applicable at this time. However, the possibility exists that impacted groundwater or vapors are migrating or have migrated off-site to

surrounding areas. Care should be exercised to monitor for unacceptable or changed conditions when working on-site and off-site (e.g., in adjacent right-of-way areas).

### 6.3 REASONABLE PRECAUTIONS

The reasonably foreseeable acts or omissions of third parties will be mitigated by the notices, perimeter fencing, and/or Site supervision.

The precautions which need to be taken against the reasonably foreseeable acts or omissions of a third party involve the potential disturbance of impacted soil or groundwater during construction. Due to the potential for off-site transport of impacted soil or groundwater, any future construction contract specifications will include provisions to ensure that any impacted media removed from the Site will be handled in accordance with Section 20120(c) of Part 201, Act 451 of 1994, and will be properly transported off-site for disposal at an appropriate location.

### 6.4 OTHER OBLIGATIONS

The Operator will:

- Provide reasonable cooperation, assistance, and access to persons conducting response activities at the Site; however, it is not currently anticipated that response activities not identified in this document will be required.
- Comply with land use or resource use restrictions applicable to the Site; however, it is not currently anticipated that land use or resource use restrictions not identified in this document will be required.
- Not impede the effectiveness or integrity of any land use or resource use restriction in effect at the Site; however, it is not currently anticipated that land use or resource use restrictions not identified in this document will be required.
- Document compliance with due care obligations.

## 7.0 REPORT PREPARATION

The person with the primary responsibility for the preparation of this DCP is Mr. Donald C. Kaylor, Professional Geologist (PG - Indiana, Tennessee) and Environmental Professional (EP). Mr. Kaylor is a Department Manager employed by Testing Engineers & Consultants, Inc. (TEC). TEC may be contacted at:

Testing Engineers & Consultants, Inc.

| | |
|---|---|
| Mailing Address:<br>PO Box 249<br>Troy, MI 48099-0249 | Street & Courier Address<br>1343 Rochester Rd<br>Troy, MI 48083-6015 |
| Tel: 248.588.6200<br>Fax: 248.588.6232 | dkaylor@tectest.com<br>www.testingengineers.com |


## 8.0 WARRANTY

The field observations, measurements, and research reported herein are considered sufficient in detail and scope to form a reasonable basis for a limited investigation of this property. The assessment, conclusions, and recommendations presented herein are based upon the subjective evaluation of limited data. They may not represent all

conditions at the Site as they reflect the information gathered from specific locations. TEC warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted environmental investigation methodology and only for the Site described in this report. The investigation is necessarily limited to the conditions observed and to the information available at the time of the work.

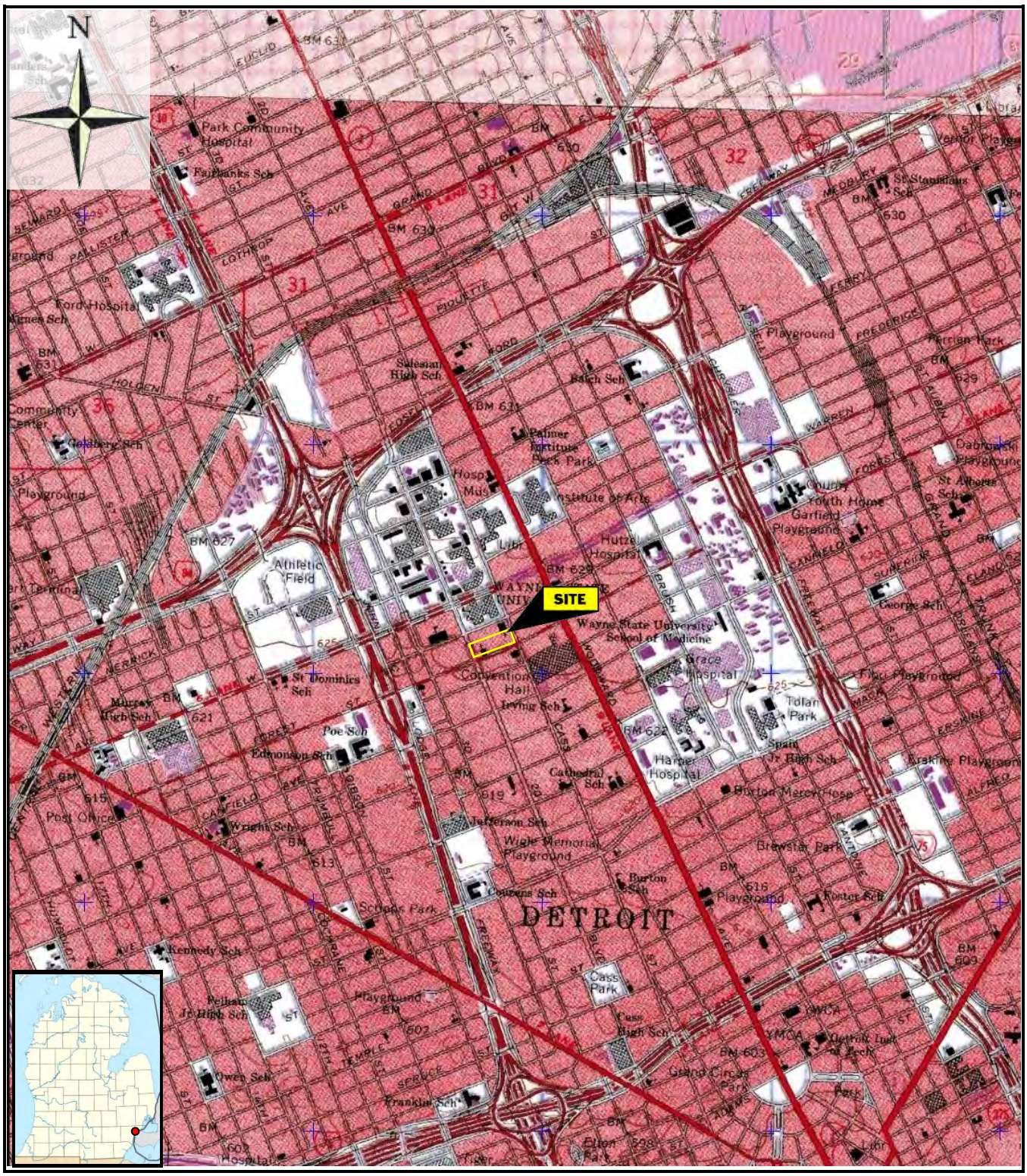
Due to the limited nature of the work, there is a possibility that there may exist conditions that could not be identified within the scope of the assessment or that were not apparent at the time of report preparation. It is also possible that the testing methods employed at the time of the report may later be superseded by other methods. The description, type, and composition of what are commonly referred to as "hazardous materials or conditions" can also change over time. TEC does not accept responsibility for changes in the state of the art, or for changes in the scope of various lists of hazardous materials or conditions. TEC believes that the findings and conclusions provided in this report are reasonable. However, no other warranties are implied or expressed.

## 9.0 USE BY THIRD PARTIES

This report was prepared pursuant to the contract TEC has with the Client. That contractual relationship included an exchange of information about the Site that was unique and between TEC and its client and serves as the basis upon which this report was prepared. Because of the importance of the communication between TEC and its Client, reliance on this report by anyone other than the client, for whom it was prepared, is prohibited and therefore not foreseeable to TEC.

Use by any such third party does not make said third party a third-party beneficiary to TEC's contract with the client. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

# ATTACHMENT A FIGURES




| | | | | |
|---|---|---|---|---|
| TEC | Testing Engineers & Consultants, Inc.<br>1343 Rochester Rd<br>Troy, MI 48083 | Due Care Plan<br>Gateway Project<br>2nd Ave & W Forrest Ave, Detroit, MI | TEC Project: 58870-04<br>Approx. scale: 1:24000<br>Date: 2019/02/08 | Figure 1<br>Site Location |


| SOIL (µg/kg) | | |
|---|---|---|
| *SB-2 (3-4')* | *Result* | *Exceedance* |
| Tetrachloroethylene | 200 | RIASL |

| SOIL (µg/kg) | | |
|---|---|---|
| *SB-1 (7-8')* | *Result* | *Exceedance* |
| Tetrachloroethylene | 2,280,000 | DC, PSI, $C_{SAT}$ VSI, SVIAI, RIASL |

| SOIL (µg/kg) | | |
|---|---|---|
| *SB-4 (8-9')* | *Result* | *Exceedance* |
| Tetrachloroethylene | 6,220 | RIASL |

| SOIL (µg/kg) | | |
|---|---|---|
| *SS-2 (5')* | *Result* | *Exceedance* |
| 1,2,3-trimethylbenzene | 1,210 | RIASL |
| 1,2,4-trimethylbenzene | 4,310 | RIASL |
| 1,3,5-trimethylbenzene | 1,660 | RIASL |
| Benzene | 2,060 | RIASL |
| Chlorobenzene | 80 | none |
| Ethylbenzene | 1,330 | RIASL |
| Xylenes | 7,090 | RIASL |

| SOIL (µg/kg) | | |
|---|---|---|
| *SB-8 (7-8')* | *Result* | *Exceedance* |
| 1,2,3-trimethylbenzene | 43,000 | RIASL |
| 1,2,4-trimethylbenzene | 9,000 | RIASL |
| 1,3,5-trimethylbenzene | 37,000 | RIASL |
| Ethylbenzene | 24,000 | RIASL |
| Xylenes | 30,000 | RIASL |
| GROUNDWATER (µg/L) | | |
| *SB-8 (7-12')* | *Result* | *Exceedance* |
| Benzene | 760 | RIASL |
| 1,2,4-trimethylbenzene | 360 | RIASL |
| 1,3,5-trimethylbenzene | 300 | RIASL |
| Ethylbenzene | 480 | RIASL |
| Xylenes | 960 | RIASL |

| SOIL (µg/kg) | | |
|---|---|---|
| *SS-1 (5')* | *Result* | *Exceedance* |
| Benzene | 630 | RIASL |
| Ethylbenzene | 470 | RIASL |

## LEGEND

- TEST PIT
- SOIL BORING

*EXCEEDANCES:*

DC = DIRECT CONTACT
PSI = PARTICULATE SOIL INHALATION (DUST)
$C_{SAT}$ = SOIL SATURATION
VSI = VOLATILE SOIL INHALATION (AMBIENT/OUTDOOR AIR)
SVIAI = SOIL VOLATILIZATION TO INDOOR AIR INHALATION
RIASL = RECOMMENDED INTERIM ACTION SCREENING LEVEL (INDOOR AIR)

| | | | | |
|---|---|---|---|---|
| TEC | Testing Engineers & Consultants, Inc.<br>1343 Rochester Rd, Troy, MI 48083<br>www.testingengineers.com | Due Care Plan<br>Gateway Project<br>2nd Ave & W Forrest Ave, Detroit, MI 48202 | TEC Project: 58870-04<br>Approx. scale: 1 inch = 50 feet<br>Date: 2019/01/15 | Figure 2<br>NONRESIDENTIAL EXCEEDANCES |

# ATTACHMENT B EXCERPTS FROM PREVIOUS REPORTS

Testing Engineers & Consultants, Inc.

**MR. TREESA JOHN**
**WAYNE STATE UNIVERSITY**
**5454 CASS AVE**
**DETROIT, MI 48202-3646**

# PHASE I
# ENVIRONMENTAL SITE ASSESSMENT
# COMMERCIAL PROPERTY
# 4743 CASS AVE, 460 & 490 W FOREST AVE, AND 4700, 4722, & 4730 SECOND AVE
# DETROIT, MI 48202

**TEC REPORT 58870-01**

**Submitted by:**

**TESTING ENGINEERS & CONSULTANTS, INC.**
**1343 ROCHESTER RD, TROY, MI 48083-6015**
**PO BOX 249, TROY, MI 48099-0149**
**(248) 588-6200**

**www.testingengineers.com**

**MAY 30, 2018**

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**LIST OF APPENDICES**

# 1.0 EXECUTIVE SUMMARY

On behalf of Wayne State University (Client), Testing Engineers & Consultants, Inc. (TEC) has completed the Phase I Environmental Site Assessment (ESA) of the contiguous properties located along the north side W Forrest Avenue between Cass and Second avenues in Detroit, Wayne County, Michigan (Subject Property). Pursuant to the contract (executed TEC Proposal 020-18-0037), the Phase I ESA was performed in general accordance with the ASTM E1527-13 guidelines for Phase I ESAs for Phase I ESAs, except as noted under the Limitations and Exceptions Section of this report.

## 1.1 Purpose

TEC understands that the Phase I ESA was conducted in support of redevelopment of the Subject Property. The Phase I ESA is intended to identify the actual or potential existence of ASTM recognized environmental conditions (RECs) at the Subject Property.

TEC endeavored to perform some elements of all appropriate inquiries (40 CFR Part 312 and industry standards) to assist a User with some of the requirements to qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability. Performance of this Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the Subject Property.

## 1.2 Definitions

The following terms used in this report are defined in the ASTM E1527-13 guidelines for Phase I ESAs, as quoted below:

Recognized Environmental Condition (REC): “the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.”

Controlled REC (CREC): “a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).” Because hazardous substances and/or petroleum products remain on the site and compliance with controls must be maintained indefinitely, CRECs are a type of REC.

Historical REC (HREC): "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)." To be considered HRECs, past releases must meet the regulatory criteria in effect at the time the Phase I ESA is conducted. In contrast to CRECs, HRECs are not RECs.

Business Environmental Risk (BER): "a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate." BERs do not meet the "presence or likely presence" or "material threat of a future release" tests that define an REC. Therefore, BERs include conditions that may indicate some potential for environmental impairment, but do not rise to the level of concern warranted by RECs. As requested by the Client, BERs may also include various considerations beyond the scope of the ASTM E1527 guidelines. Non-scope considerations, if any, are presented in Section 8.0.

*De Minimis* Condition: "a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies." Conditions determined to be *de minimis* are not RECs.

Data Gap: "a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information," and "may result from incompleteness in any of the activities required by this practice." Examples of scenarios that may give rise to significant data gaps include physical access restrictions and obstructions, lack of response to inquiries, and absence of standard record sources.

### 1.3 Scope Of Work

The Phase I ESA is a compilation of information (when available) obtained from, but not limited to, site reconnaissance, inquiry into the current and past uses of the Subject Property, a review of available municipal information, historical information, interviews with knowledgeable parties, and a review of environmental databases of regulated properties. The Phase I ESA was conducted from May 2, 2018 to May 30, 2018.

### 1.4 General Subject Property Information

The Subject Property consist of six contiguous parcels totaling approximately 2.8 acres located along the north side of W Forest Avenue between Cass and Second avenues in the City of Detroit, Wayne County, Michigan, in an area of commercial and residential development. The Subject Property is zoned "R6 High Density Residential District" and is currently developed with a parking lot and a residence used as an office. The residence located on the northeast portion of the Subject Property is a two-story Queen Anne-style

house constructed in 1895. A driveway, separated from the parking lot portion of the property by a security fence, is located along the northern portion of the property. Municipal water and sewer services are available to the Subject Property, along with natural gas and electricity provided by the local public utilities.

### 1.5 Conclusions

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527 of the contiguous properties located at 4743 Cass, 460 & 490 W Forest, and 4700, 4722, & 4730 Second avenues in Detroit, Wayne County, Michigan. Any exceptions to, or deletions from, this practice are described in the Limitations and Exceptions Section of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject Property except for the following:

RECs
- Former presence of a gasoline service station with at least four underground storage tanks (USTs) and likely vehicle repair activities located at 4700 Second Avenue from at least 1926 through the 1960s.
- Former presence of four other vehicle repair facilities located along Second and W Forrest avenues from at least 1921 through the 1960s.
- Former presence of a dry cleaner business located at 4705 Cass Avenue from at least 1965 until sometime before 1972. A strong solvent odor was identified in soil at this location during recent geotechnical soil borings.
- Presence of at least one, possibly two, dry cleaner businesses located at the east adjoining property beyond Cass Avenue from least 1926 through the present.

CRECs
- None identified.

In addition, this assessment has revealed the following:

HRECs
- None identified.

BERs
- None identified.

### 1.6 Recommendations

Based on the information provided and reviewed during the Phase I ESA, a Phase II ESA including soil gas investigation and laboratory analysis is recommended in order to assess the nature, extent, magnitude, and/or materiality of the identified RECs.

## 2.0 INTRODUCTION

Testing Engineers & Consultants, Inc. (TEC) was retained by Wayne State University (Client) to perform a Phase I Environmental Site Assessment (ESA) of the contiguous properties located along the north side W Forrest Avenue between Cass and Second avenues in Detroit, Wayne County, Michigan. The Subject Property location is presented in Figure 1. The Phase I ESA was performed in general accordance with the American Society for Testing Materials (ASTM) Designation E1527-13 guidelines for Phase I ESAs, except as noted under the Limitations and Exceptions Section of this report.

### 2.1 Purpose

The Phase I ESA is intended to provide a professional opinion of recognized environmental conditions (RECs) in connection with the past and current uses of the Subject Property. TEC endeavored to perform some elements of all appropriate inquiries (40 CFR Part 312 and industry standards) to assist a User with some of the requirements to qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability. Performance of this Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the Subject Property.

### 2.2 Phase I ESA Scope Of Work

TEC's Phase I ESA includes the collection and the review of site-specific background data and on-site visual assessment of the property. The background survey focuses on determining past and present use of the Subject Property. Appropriate regulatory agencies are contacted regarding past and present operations at the Subject Property. Readily available information such as maps, aerial photographs, and other publications regarding environmental conditions at the Subject Property are reviewed.

Existing operations on surrounding properties are observed from the Subject Property to evaluate the potential for migration of contaminants onto the property. The assessment considers regulatory agency records of known environmental problems at other properties in the vicinity of the Subject Property.

The Phase I ESA scope of work does not include a wetland study or delineation, nor a hydrogeological or hydrologic assessment. It does not include sampling and testing of air, asbestos-containing materials (except as otherwise indicated), soils, and groundwater or surface water. The scope of work does not fulfill the requirements for a regulatory compliance audit, nor does it guarantee a zero-risk level of environmental impairment liability.

This Phase I ESA does not purport to address safety concerns, if any, at the Subject Property. It also does not establish appropriate safety and health practices, or determine the applicability of health and safety regulatory limitations at the Subject Property.

### 2.3 Phase I ESA Significant Assumptions

TEC has used and incorporated information provided by private organizations and individuals, as well as government agencies. However, the Phase I ESA scope of work does not include the independent verification or confirmation of the reliability of this information.

### 2.4 Phase I ESA Staff

Mr. Kenneth M. Majetic, Senior Environmental Scientist at TEC, was the person with the primary responsibility for data assembly, interpretation, and technical conclusions with respect to the Phase I ESA. Mr. Donald C. Kaylor, Manager of Environmental Assessment at TEC, provided senior technical assistance.

Mr. Majetic and Mr. Kaylor described above meet the definition of an "Environmental Professional" as required in the "all appropriate inquiries" Final Rule (40 CFR Part 312). See Appendix A for the qualifications of the environmental professionals involved in the Phase I ESA.

### 2.5 Limitations And Exceptions

This report was prepared for, and may be relied upon by, those authorized parties who have been specifically identified herein. Other use or reliance, implied or otherwise, by any other party is strictly prohibited unless authorized and acknowledged by TEC in writing.

In accordance with the executed TEC proposal, TEC endeavored to perform all appropriate inquiries (40 CFR 312 and industry standards) in allowing a user to satisfy the requirements to qualify for one of the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability. Performance of this Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the Subject Property. TEC has used and incorporated information provided by private organizations and individuals, as well as municipal, state, and federal agencies. However, the Phase I ESA scope of work does not include the independent verification or confirmation of the reliability of this information.

This report is intended to serve only as an indicator of the potential for environmental impairment arising from readily discoverable, improper chemical, waste management and/or disposal activities conducted at the Subject Property or in the immediate vicinity of the Subject Property.

Regardless of the findings stated in this report, TEC is not responsible for consequences or conditions arising from facts that were concealed, withheld, not fully disclosed, or not readily accessible at the time the assessment was conducted. This report does not warrant against

future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The Phase I ESA scope of work did not include the following: sampling of potential asbestos-containing materials, lead-based paint screen, preliminary radon inspection, lead-in-water testing, wetlands investigations, wetlands evaluation, wetlands delineation, or multimedia compliance audit inspection.

Given the availability of data, probable future adjustments in industry standards, the limited scope of due diligence investigations, the future inclusion of new contaminated sites to agency databases, and the further development of information resources, the resulting environmental liability disposition of the Subject Property is subject to change with time and does not guarantee a zero-risk level of environmental impairment liability.

The Executive Summary to the Phase I ESA is intended to be used as an overview of the complete report findings. The Executive Summary is not intended to be used as a stand-alone document. Interpretation of the conclusions should be based on the report in its entirety.

The Phase I ESA report does not represent a legal opinion. Legal opinions regarding potential environmental liability issues as they relate to the Subject Property and the Phase I ESA should be obtained from a qualified attorney.

### 2.6 User Reliance

TEC realizes that this report was prepared for use by Wayne State University (Client) who may rely on its contents and conclusions.

## 3.0 PHYSICAL SETTING

### 3.1 Location

The Subject Property consists of the six contiguous parcels located along the north side W Forrest Avenue between Cass and Second avenues in Detroit, Wayne County, Michigan. The Subject Property is situated in the Section 6, Township 2 South, Range 12 East, as referenced on the United States Geological Survey (USGS) Detroit, Michigan quadrangle topographic map (2000). See Figure 1 for the Property Location Map and Figure 2 for the Property Features Diagram.

### 3.2 Topography

Based on the reconnaissance, the topography of the property is relatively flat. Based on the review of the USGS Topographic Map, the overall topography of the area is gently sloping to

the east towards The Detroit River. According to the topographic map, the Subject Property is at an elevation of 625 feet above mean sea level (AMSL).

### 3.3 Geology

Information provided in the Hydrogeologic Atlas of Michigan (1981) indicated that the area bedrock is Dundee Carbonates Formation at an approximate elevation of 425 feet AMSL. Therefore, bedrock is not likely to be pertinent to environmental conditions at the Subject Property.

According to the Michigan Geological Survey Division's publication, *Quaternary Geology of Southern Michigan*, soils in the area consisted of lacustrine clay and silt between 1 and 10 meters thick. The material is gray to dark reddish brown and varved in some localities. It chiefly underlies extensive, flat, low-lying areas formerly inundated by glacial Great Lakes, and includes small areas of lacustrine sand and clay-rich till.

Soils encountered during a recent geotechnical subsurface investigation were generally found to be consistent with lacustrine clay and silt in areas where fill soil was not encountered.

### 3.4 Drainage Patterns

Based on local topography, surface drainage at the Subject Property was towards catch basins located in the eastern and western portion of the parking lot.

### 3.5 Local Groundwater Flow

Generally, groundwater flow direction would be expected to be consistent with surface water flow and local topography and dependent upon seasonal variation in precipitation. Therefore, it is likely that the groundwater flow direction in the area of the Subject Property will locally be to the south towards the Detroit River.

According to the State of Michigan's online water well locator system (Wellogic), no current or historical water wells were identified to be located at the Subject Property.

### 3.6 Current Use Of The Subject Property

The Subject Property is zoned for high density residential use and is currently developed with a parking lot and a residence used as an office.

### 3.7 Descriptions Of Structures, Roads, And Improvements

The Subject Property is currently developed with a parking lot and a residence used as an office. The residence located on the northeast portion of the Subject Property, is a two-story Queen Anne-style house constructed in 1895. A driveway, separated from the parking lot portion of the property by a security fence, is located along the northern portion of the property.

## 4.0 SUBJECT PROPERTY AND AREA RECONNAISSANCE

The Subject Property reconnaissance was performed on May 10, 2018, by Mr. Kenneth M. Majetic of TEC. Weather conditions during the reconnaissance were mostly cloudy with an approximate air temperature of 70°F. Mr. Majetic was not accompanied during the reconnaissance. See Figure 2 for the Property Features Diagram. Photographs obtained during the reconnaissance are presented in Appendix B.

### 4.1 Methodology And Limiting Conditions

The Subject Property and adjoining properties were visually observed for ASTM RECs in an effort to determine if a release of petroleum or other hazardous materials has occurred to the Subject Property surface, soil, surface water or groundwater. Indications of RECs may include, but are not limited to, evidence of buried or discarded drums or containers, stained, discolored or disturbed soils, stressed vegetation, evidence of pipes or other objects protruding from the ground, and evidence of aboveground and underground storage tanks.

The reconnaissance was an observation of current Subject Property and adjoining property uses and conditions, and was conducted in a manner that allowed for visual observations and of identification of Subject Property features, including structures, open areas, boundaries, and adjoining properties. Access to the interior of the residential office structure was restricted and therefore, was not inspected. As part of the Phase I ESA, TEC requested to review the following documents per ASTM E1527-13:

- Phase I ESAs, Phase II ESAs, Environmental compliance audit reports
- Environmental permits
- Registrations for underground and above-ground storage tanks
- Registrations for underground injection systems
- Safety Data Sheets (SDSs)
- Community right-to-know plans
- Safety plans, preparedness and prevention plans, spill prevention, countermeasure, and control plans
- Reports on hydrogeologic conditions at the Subject Property or surrounding area
- Notices or other correspondence from government agencies relating to environmental laws or liens
- Hazardous waste generator notices or reports

- Geotechnical studies
- Risk assessments
- Recorded activity use limitations

Documents outlined above and provided to TEC are discussed as appropriate in the following sections and are attached to this report.

### 4.2 General Subject Property Observations

The Subject Property consisted of six contiguous parcels totaling approximately 2.8 acres located along the north side of W Forest Avenue between Cass and Second avenues in the City of Detroit, Wayne County, Michigan, in an area of commercial and residential development. The Subject Property is zoned "R6 High Density Residential District" and is currently developed with a parking lot and a residence used as an office. The residence located on the northeast portion of the Subject Property is a two-story Queen Anne-style house constructed in 1895. A driveway, separated from the parking lot portion of the property by a security fence, is located along the northern portion of the property. Municipal water and sewer services are available to the Subject Property, along with natural gas and electricity provided by the local public utilities.

### 4.3 Chemical Use And Storage

Although small quantities of general cleaning supplies and building maintenance products are present within the residential/office structure, no obvious visual indication of potential hazardous substance or petroleum product use or storage on the Subject Property was noted.

### 4.4 Waste Disposal

Three solid waste dumpsters containing a variety of general debris were observed on asphalt pavement in the driveway area on the northern portion of the Subject Property. No obvious concerns associated with the dumpster contents were observed. No other obvious evidence of on-site waste disposal activities was observed at the Subject Property.

### 4.5 Storage Tank Systems

The Subject Property was visually observed for signs of current or former USTs and aboveground storage tanks (ASTs). Typical indicators of USTs include pump islands, fill or vent piping, excavations, patches in pavement, etc.

No obvious evidence of UST or AST systems was apparent at or adjoining the Subject Property. However, as discussed in Section 6.8, four USTs associated with a former service station were identified on the far western portion of the Subject Property in 1950.

### 4.6 Vegetation

Vegetation at the Subject Property was limited to landscaping along the south and east sides of the residential/office structure and the south, east, and west property boundaries. No stained soils or stressed vegetation that appeared to be present due to releases of hazardous substances or petroleum products at the Subject Property.

### 4.7 Pits, Ponds, And Lagoons

No indications of pits, ponds, standing water, lagoons, retention basins, or detention basins were noted on the Subject Property.

### 4.8 Utilities, Wells, And Septics

Municipal water and sewer services are available to the Subject Property by the City of Detroit. Electricity and natural gas services are available to the Subject Property by the local public utility companies.

No obvious visual indications of water supply wells or septic systems were noted at the Subject Property during the visual reconnaissance.

### 4.9 Oil And Gas Wells Or Pipelines

No obvious indication of oil and gas well or pipeline activity was observed on or adjoining the Subject Property.

### 4.10 Suspected Polychlorinated Biphenyl-Containing Equipment

The Subject Property was observed for suspected polychlorinated biphenyl (PCB) containing equipment, such as electrical transformers and capacitors.

TEC observed two utility-owned platform-mounted transformers located on the western portion of the Subject Property. Labeling observed on one the transformers indicated that it was Non-PCB. Both transformers were observed to be in good condition and no evidence of spills or leaks was identified during the Subject Property reconnaissance. Based on this information and the overall good operational appearance, the transformers are not considered an environmental concern to the Subject Property.

Lighting observed at the Subject Property was limited to several high intensity discharge (HID) units in the lighting poles. The lighting units appeared to be in good condition and no obvious evidence of leakage from the lighting units was noted. Based on the overall good operational

appearance, the lighting units are not considered an environmental concern to the Subject Property.

No other electrical equipment suspected of containing PCBs was observed on the Subject Property.

### 4.11 Area Reconnaissance

A limited visual reconnaissance of the adjoining and nearby properties was performed. The reconnaissance was limited to observation of areas visible from the Subject Property or areas of public access. The adjoining and nearby properties (positions are relative to the Subject Property) are identified below:

To the North: Residential development and Hilberry Theatre.

To the South: W Forest Avenue, beyond which is a church and residential development.

To the East: Cass Avenue, beyond which is a parking lot, a restaurant, a dry cleaner.

To the West: Second Avenue, beyond which is residential development.

Other than the dry cleaner to the east, no obvious and specific indications of potential environmental concerns to the Subject Property were noted on the adjoining or nearby properties during reconnaissance. TEC did not identify any other evidence of USTs, ASTs, hazardous substance or petroleum product storage, material spillage, regulated waste generation, or waste disposal on the adjacent properties during the reconnaissance. Potential environmental concerns at adjoining and nearby properties are further discussed in Section 7.0.

## 5.0 USER/CLIENT PROVIDED INFORMATION

Consistent with the requirements of AAI and ASTM E1527-13, TEC provided the user of the Phase I ESA with a questionnaire regarding their specific knowledge of Subject Property environmental conditions, and requested that the User provide the Suggested Information per Appendix X3.1 of ASTM E1527-13. Mr. Harry Wyatt on behalf of Wayne State University, provided information regarding the Subject Property for use in the Phase I ESA report by responding to the User Questionnaire as follows.

### 5.1 Environmental Liens

The User answered “No” to the question “Are you aware of any environmental cleanup liens against the Subject Property that are filed or recorded under federal, tribal, state, or local law?”

### 5.2 Activity And Use Limitations

The User answered "No" to the question "Are you aware of any activity and land use limitations (AULs), such as engineering controls, land use restrictions, or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state, or local law?"

### 5.3 User Specialized Knowledge

The User answered "Yes" to the question "As the user of this ESA do you have any specialized knowledge or experience related to the Subject Property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the Subject Property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?" The User indicated that the Forest Apartments had been located on Parcel 02000931-5 and that a church had been located on Parcels 02000929 and 02000930.

### 5.4 Fair Market Value

The User "Yes" to the question "Does the purchase price being paid for this Subject Property reasonably reflect the fair market value of the Subject Property?"

### 5.5 Commonly Known Or Reasonably Ascertainable Information

The User answered "Yes "Are you aware of commonly known or reasonably ascertainable information about the Subject Property that would help the environmental professional to identify conditions indicative of releases or threatened releases?" The User indicated that the Forest Apartments and a church had been located at the Subject Property.

### 5.6 Obvious Indicators Of Contamination

The User answered "No" to the question "As the user of this ESA, based on your knowledge and experience related to the Subject Property are there any obvious indicators that point to the presence or likely presence of contamination at the Subject Property?"

### 5.7 Proceeding Involving The Subject Property

The User answered "No" to the question "Pursuant to ASTM E1527-13 §10.9, as the user of this ESA do you know of (1) any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the Subject Property; (2) any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum

products in, on, or from the Subject Property; and (3) any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?"

### 5.8 Reason For Performing The Phase I ESA

The Phase I ESA was conducted in support of a property redevelopment.

TEC endeavored to perform some elements of all appropriate inquiries (40 CFR Part 312 and industry standards) to assist a User with some of the requirements to qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability.

### 5.9 Title Records

According to ASTM E1527-13 Section 6.2, it is a User responsibility to review reasonably ascertainable title and judicial records for environmental liens or activity and use limitations (AULs), if any, that are currently recorded against the property. TEC was not provided with title records; however, the User indicated that no records of environmental liens or AULs associated with the Subject Property have been identified.

### 5.10 Other User Information

TEC was not provided with other information relevant to environmental conditions at the Subject Property by the User/Client. A copy of the User/Client Questionnaire is presented in Appendix C.

## 6.0 HISTORICAL SUBJECT PROPERTY USE REVIEW

Historical usage of the Subject Property and adjoining properties was referenced through reasonably ascertainable records (when available) which may include, but is not limited to, municipal information, aerial photographs, topographic maps, interviews with persons knowledgeable of Subject Property conditions, and previous assessments. See Section 12.0 for references that were reviewed.

### 6.1 Legal Description

Legal descriptions and record cards for the Subject Property as obtained from the City of Detroit Assessing are provided in Appendix D.

## 6.2 Municipal Records

Assessing records were provided to TEC by the City of Detroit. The Subject Property consists of six contiguous parcels owned by Wayne State University as follows:

- Parcel 02-00222004: 4743 Cass Avenue.
- Parcel 02-000931-5: 460 W Forest Avenue.
- Parcel 02-000930: 490 W Forest Avenue.
- Parcel 02-000929: 4700 Second Avenue.
- Parcel 02-002382: 4722 Second Avenue.
- Parcel 02-002383: 4730 Second Avenue.

The Cass Avenue parcel was improved with a Queen Anne-style residence used as an office. The building was indicated to have been constructed in 1895.

The Card Index File containing information on flammable liquid storage tanks and heating oil tanks was reviewed at the City of Detroit Building Safety Engineering Department. Tank systems identified at the Subject Property were as follows:

| Year(s) | Notes: Flammable Liquid Storage Tank Systems |
|---|---|
| 1961 | Three 5,000-gallon gasoline USTs for Mobil Oil Company located at 4700 Second Avenue |

| Year(s) | Notes: Oil Storage Tank Systems |
|---|---|
| 1947 | One 220-gallon tank (outside) located at 4705 Cass Avenue |
| 1942 | One 7-gallon tank (likely attached to furnace) located at 4707 Cass Avenue |
| 1947 | Two 220-gallon tanks (in basement) located at 466 W Forest Avenue |
| 1952 | One 250-gallon tank (at rear) located at 476 W Forest Avenue |

No other information regarding the presence of oil storage tanks located outside and in basements is not considered an environmental concern with respect to the Subject Property.

The presence of oil storage tanks located outside and in basements is not considered an environmental concern with respect to the Subject Property. However, the three 5,000-gallon gasoline USTs identified at the 4700 Second Avenue address are considered to represent an REC at the Subject Property.

No other records of flammable liquid storage tanks or heating oil tanks were identified for the Subject Property during the review of Card Index File.

According to the City of Detroit Zoning Map, the Subject Property is zoned “R6 High Density Residential District.” No other pertinent information regarding the zoning or re-zoning of the Subject Property was found.

The municipal records indicated that municipal water and sewer service along with natural gas and electricity services are provided to the Subject Property. Other than the three USTs at the

4700 Second Avenue address, TEC's review of municipal records did not identify potential RECs with respect to the Subject Property. Public records are presented in Appendix D.

### 6.3 County Records

Wayne County does not maintain records for properties within the City of Detroit, therefore, no records pertaining to the Subject Property were requested.

### 6.4 State Records

TEC made Freedom of Information Act (FOIA) requests for information pertaining to environmental conditions at the Subject Property to the Resource Management Group (RMG), the Remediation and Redevelopment Division (RRD), and the Water Resources Division (WRD) of the Michigan DEQ. TEC also made a FOIA request to the Michigan Department of Licensing and Regulatory Affairs (LARA), which regulates aboveground and underground storage tanks, concerning the Subject Property.

The DEQ FOIA request was denied indicating that the agency believed that public records do not exist under the name given by the requester, or by another name reasonably known to the agency. The LARA was also denied for similar reasons. TEC also obtained and reviewed the online DEQ RRD Perfected Lien List (dated July 25, 2017) and Significant or Resolved Enforcement Actions List (dated December 8, 2016). No perfected liens or significant or resolved enforcement actions were identified for the Subject Property or adjacent properties.

### 6.5 Interviews

Mr. Harry Wyatt on behalf of Wayne State University, was interviewed via a written questionnaire. Other than as may be previously discussed, Mr. Wyatt was not aware of any outstanding violations or environmental liens, proceedings, or other adverse environmental conditions associated with the Subject Property. A copy of the User/Client Questionnaire is presented in Appendix C.

TEC's written questionnaires (including the User Questionnaire) and freedom of information requests are also forms of an interview, and the results of these interviews are presented in appropriate sections of this report. TEC's interviews did not identify any environmental concerns associated with the Subject Property.

### 6.6 Recorded Land Title Records

No recorded land title records were reviewed for the Subject Property nor were they provided by the Client. However, as indicated in Section 5.9**.**, the User indicated that no records of environmental liens or AULs associated with the Subject Property have been identified.

Further, other historical references, specifically municipal records, aerial photographs, fire insurance maps, interviews, etc., were considered sufficient to establish prior uses.

### 6.7 Aerial Photographs

TEC reviewed aerial photographs of the Subject Property and surrounding area provided by Environmental Data Resources, Inc. (EDR). The aerial photographs indicated the following:

| Year(s) | Notes |
|---|---|
| 1937 | The Subject Property and surrounding properties were developed with multiple commercial and residential style structures. |
| 1949, 1952, 1956, 1961, 1967 | The southwest corner of the Subject Property was possibly developed with a gasoline service station. |
| 1972 | The majority of the structures at the Subject Property including the potential gasoline service station had been removed. |
| 1981, 1983, 1997, 1999, 2005 | The central portion of the Subject Property had been developed with a multiple story structure. The majority of remaining property to the east and west of the structure consisted of a parking lot. |
| 2010, 2014 | Other than a small structure at the northeast corner of the Subject Property, all structures had been removed at the Subject Property. The Subject Property and surrounding properties appear similar to existing conditions. |

The Subject Property and surrounding properties had consisted of developed land used for commercial and residential purposes since at least 1937.

Except as discussed, the scale and resolution of the aerial photographs limited observation of special features, such as relief, areas of staining, soil disturbances, or areas of outdoor storage. With the exception of a suspected gasoline service station at the southwest corner of the Subject Property (further discussed in Section 6.8), TEC's review of aerial photographs did not identify any RECs with respect to the Subject Property. Copies of the aerial photographs are presented in Appendix E.

### 6.8 Sanborn Fire Insurance Maps

A search for Sanborn Fire Insurance Maps of the Subject Property and surrounding area was conducted by Environmental Data Resources, Inc. (EDR). Sanborn Fire Insurance Maps identified by EDR indicated the following:

| Year(s) | Notes |
|---|---|
| 1897 | The Subject Property was developed with a church and several residential dwellings with associated out-buildings.<br>Adjoining properties consisted of vacant land and residential dwellings. |
| 1919 | Adjoining properties were developed with two churches and multiple residential dwellings. |
| 1921 | Some unspecified stores were present to the east of the Subject Property. |
| 1950 | A filling station with four USTs was located at the southwest corner of the Subject Property. |

| Year(s) | Notes |
|---|---|
| 1953 | A structure located at 420 W Forrest Avenue was indicated to be used for auto repair. |
| 1957, 1961 | A structure located to the rear of 4732 Cass Avenue was indicated to be used for auto repair. |
| 1977 | A large 10-story residential structure was centrally located at the Subject Property. Seven of the nine remaining structures, including the filling station, were marked with an "X" meaning that they had been removed. One of the structures located at the southeast corner of the Subject Property was indicated to be a dry cleaner. |
| 1988 | The 10-story structure at the Subject Property was indicated as "Wayne State University Forest Apartments. The church on the southeast portion of the Subject Property was marked with an "X" meaning that it had been removed. The only other remaining structure at the northeast corner of the Subject Property was indicated to be an office. |
| 1991, 1996, 2002 | The only structures at the Subject Property were the Wayne State University Forest Apartments and the office. The western portion of the property was indicated to be used for parking. |

With the exception of the gasoline service station at the southwest corner and a dry cleaner at the southeast corner of the Subject Property, TEC's review of the Sanborn Fire Insurance Maps did not identify any RECs with respect to the Subject Property. A copy of the historical Sanborn Fire Insurance Map is presented in Appendix F.

### 6.9 Previous Investigations

No previous environmental investigations or other environmental reports concerning the Subject Property were provided to TEC for review.

## 7.0 ENVIRONMENTAL REGULATORY RECORDS SEARCH

Federal and state environmental database records were referenced by TEC and Environmental Data Resources (EDR) regarding environmental concerns on the Subject Property. The following tables show properties found in the database records list that were found within specific radii surrounding the Subject Property. A complete copy of the EDR Radius Map report is presented in Appendix G.

**Standard Environmental Records**

| Database | AMSD (miles) | TP | <1/8 mile | 1/8-¼ mile | ¼-½ mile | ½-1 mile | Total |
|---|---|---|---|---|---|---|---|
| ***Federal NPL site list*** | | | | | | | |
| NPL | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| Proposed NPL | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| NPL Liens | TP | 0 | NR | NR | NR | NR | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | |
| Delisted NPL | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal CERCLIS list*** | | | | | | | |
| FEDERAL FACILITY | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |

| Database | AMSD (miles) | TP | <1/8 mile | 1/8-¼ mile | ¼-½ mile | ½-1 mile | Total |
|---|---|---|---|---|---|---|---|
| SEMS | 0.50 | 0 | 0 | 0 | **1** | NR | **1** |
| ***Federal CERCLIS NFRAP site list*** | | | | | | | |
| CERC-NFRAP | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | |
| CORRACTS | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | |
| RCRA-TSDF | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA generators list*** | | | | | | | |
| RCRA-LQG | 0.25 | 0 | 0 | **2** | NR | NR | **2** |
| RCRA-SQG | 0.25 | 0 | **1** | 0 | NR | NR | **1** |
| RCRA-CESQG | 0.25 | 0 | **3** | **8** | NR | NR | **11** |
| ***Federal institutional controls/engineering controls registries*** | | | | | | | |
| US Eng Controls | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| US Inst Control | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| LUCIS | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal ERNS list*** | | | | | | | |
| ERNS | TP | 0 | NR | NR | NR | NR | 0 |
| ***State- and tribal-equivalent CERCLIS*** | | | | | | | |
| SHWS | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | |
| SWF/LF | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | |
| LUST | 0.50 | 0 | **2** | **9** | **16** | NR | **27** |
| INDIAN LUST | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***State and tribal registered underground storage tank lists*** | | | | | | | |
| UST | 0.25 | 0 | **1** | **6** | NR | NR | **7** |
| AST | 0.25 | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN UST | 0.25 | 0 | 0 | 0 | NR | NR | 0 |
| FEMA UST | 0.25 | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal institutional control/engineering control registries*** | | | | | | | |
| AUL | 0.50 | 0 | 0 | **1** | **2** | NR | **3** |
| ***State and tribal voluntary cleanup sites*** | | | | | | | |
| INDIAN VCP | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***State and tribal Brownfields sites*** | | | | | | | |
| BROWNFIELDS | 0.50 | 0 | 0 | 0 | **1** | NR | **1** |

## Additional Environmental Records

| Database | Search Distance (miles) | TP | <1/8 mile | 1/8-¼ mile | ¼-½ mile | ½-1 mile | Total |
|---|---|---|---|---|---|---|---|
| ***Local Brownfield lists*** | | | | | | | |
| US BROWNFIELDS | 0.50 | 0 | **2** | **1** | **1** | NR | **4** |
| ***Local Lists of Landfill/Solid Waste Disposal Sites*** | | | | | | | |
| ODI | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| DEBRIS REGION 9 | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| HIST LF | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| SWRCY | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN ODI | 0.50 | 0 | 0 | 0 | 0 | NR | 0 |
| ***Local Lists of Hazardous waste/Contaminated Sites*** | | | | | | | |
| US CDL | TP | 0 | NR | NR | NR | NR | 0 |
| SHWS (PART 201) | 1.00 | 0 | 0 | 0 | 0 | **4** | **4** |
| DEL SHWS | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 |
| CDL | TP | 0 | NR | NR | NR | NR | 0 |
| US HIST CDL | TP | 0 | NR | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | |
| LIENS 2 | TP | 0 | NR | NR | NR | NR | 0 |
| LIENS | TP | 0 | NR | NR | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | |
| HMIRS | TP | 0 | NR | NR | NR | NR | 0 |
| SPILLS | TP | 0 | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | |
| RCRA NonGen/NLR | 0.25 | **1** | **1** | **14** | NR | NR | **16** |
| TRIS | TP | 0 | NR | NR | NR | NR | 0 |
| TSCA | TP | 0 | NR | NR | NR | NR | 0 |
| PADS | TP | 0 | NR | NR | NR | NR | 0 |
| FINDS | TP | **1** | NR | NR | NR | NR | **1** |
| DRYCLEANERS | 0.25 | 0 | **1** | 0 | NR | NR | **1** |
| MI FINANCIAL ASSURANCE | TP | 0 | 0 | NR | NR | NR | 0 |
| NPDES | TP | 0 | NR | NR | NR | NR | 0 |
| AIRS | TP | 0 | NR | NR | NR | NR | 0 |
| BEA | 0.5 | 0 | **2** | **11** | **12** | NR | **25** |
| EPA WATCH LIST | TP | 0 | NR | NR | NR | NR | 0 |
| WDS | TP | **1** | NR | NR | NR | NR | **1** |
| PCB TRANSFORMER | TP | 0 | NR | NR | NR | NR | 0 |
| PRP | TP | 0 | NR | NR | NR | NR | 0 |
| US AIRS | TP | 0 | NR | NR | NR | NR | 0 |
| ECHO | TP | **1** | NR | NR | NR | NR | **1** |

NOTES: AMSD = Approximate Minimum Search Distance, per ASTM E1527-13.
TP = Target Property (Subject Property).
NR = Not Requested at this Search Distance.

As tabulated above, EDR identified properties within the AMSD radii on the federal and state regulatory agency databases that were reviewed. Two additional database listings were identified in the orphan summary. The orphan summary lists properties within postal zip codes that are the same or adjoining to the zip code of the Subject Property that were unable to be adequately geographically located by EDR. TEC identified the two database listings to be located over 0.5 miles to the north and are not considered an environmental concern to the Subject Property.

## Subject Property Regulatory Agency Database Findings

During review of the federal and state database information in the EDR report, the Subject Property was identified on the ECHO, FINDS, RCRA, and WDS databases, as discussed below.

Environmental Compliance History Online (ECHO) List

Similar to the FINDs list below, the ECHO list contains facility information and links to a variety of other federal data sources that track environmental compliance and enforcement activities. The Subject Property appears on the ECHO database due to its listings in one or more of the other databases.

Facility Index System (FINDS) List

Similar to the ECHO list above, the FINDS list contains facility information and links to a variety of other federal data sources that track regulated and environmental enforcement activities. The Subject Property appears on the FINDS database due to its listings in one or more of the other databases.

Federal Resource Conservation and Recovery Act (RCRA) Facilities List

The United States (US) Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities list is an EPA compilation of reporting facilities that generate, store, transport, treat, or dispose of hazardous waste. According to the EDR report, the agency received notification in July and September 2007 from Wayne State University that it was generating small quantities of ignitable hazardous waste. The agency later received notification in December 2007 that it was no longer generating hazardous waste. Given that the apartment structure formerly located at the property was demolished shortly after these notifications were filed, it is TEC's opinion that the waste generation notifications were likely associated with the removal of unusable building maintenance products prior to demolition. TEC does not consider inclusion on the RCRA list to represent an REC with respect to the Subject Property.

Michigan Waste Data System (WDS)

The WDS database tracks activities at Michigan facilities regulated by the Solid Waste, Scrap Tire, Hazardous Waste, and Liquid Industrial Waste programs. TEC's review of DEQ's online WDS database revealed that various universal non-hazardous waste items were being generated at the apartment structure formerly located at the property. TEC does not consider inclusion on the WDS list to represent an REC with respect to the Subject Property.

In addition, the following properties were identified on the Historic Auto and Historic Cleaner databases in the EDR report as being formerly located at the Subject Property. These are EDR proprietary databases that have been complied via a review of national collections of business directories of various categories.

| Site Name | Address | Database | Activity | Year(s) |
|---|---|---|---|---|
| Wilson and Todd | 436 W Forrest Avenue | Historic Auto | Auto repair and garage | 1931, 1935 |
| George Edwin | 476 W Forrest Avenue | Historic Auto | Auto garage | 1921 |
| Dels Garage | 438/440 W Forrest Avenue | Historic Auto | Auto repair | 1926, 1931, 1940, 1956, 1965 |
| Brigg WM Rear | 4732 Second Avenue | Historic Auto | Auto repair | 1926 |
| Schram Ed Service | 4700 Second Avenue | Historic Auto | Gasoline station and oil service | 1926, 1940, 1956, 1965 |
| Know Hiow Cleaners | 4705 Cass Avenue | Historic Cleaner | Cleaner and Dyers | 1965 |

Although not identified on any other databases of potential environmental concern, TEC considers the former operation of these businesses to represent an REC with respect to the Subject Property.

## Adjoining and Surrounding Regulatory Agency Database Findings

In order to determine the potential of adjoining and surrounding sites to have impacted the Subject Property, TEC evaluated a variety of factors including (but not limited to) the following:

1. Type of database on which a property was identified
2. Information presented in the EDR report and government databases
3. Direction and distance of the property from the Subject Property
4. Suspected or known groundwater flow direction at or near the Subject Property
5. Likelihood that the released contaminants could migrate to the Subject Property
6. Surface and subsurface features (soil types, utility corridors, roadways, etc.)

The following table summarizes these factors for properties identified by EDR within 200 feet of the Target Property (TP). Nearby properties located beyond 200 feet are not considered likely to pose an environmental risk to the Subject Property also based on an evaluation of these factors.

| Site Name<br>Address | Database | Distance from TP (feet) | Direction from TP | REC? |
|---|---|---|---|---|
| Master Piano Restoration<br>495 W Forrest Ave | RCRA-CESQG | Adjoining (1) | South | No, based on the separation of distance, the nature of the regulatory record, and lack of violations. |
| Pioneer Cleaners and Dyers<br>4710 Cass Avenue | Historic Cleaner | Adjoining (2) | East | Yes, based on the nature of the regulatory record and close proximity to Subject Property. |
| University Cleaners<br>4704 Cass Avenue | Dry Cleaner, WDS | Adjoining (2) | East | Yes, based on the nature of the regulatory record and close proximity to Subject Property. |
| Cass Quick Service Laundry and Cleaners<br>4704 Cass Avenue | Historic Cleaner | Adjoining (2) | East | Yes, based on the nature of the regulatory record and close proximity to Subject Property. |
| Johnson Joseph<br>615 W Forrest Ave | Historic Cleaner | 190 feet | Southwest | No, based on the separation of distance. |
| Johnson Joseph<br>4625 Second Ave | Brownfields, FINDS | 200 feet | South | No, based on the separation of distance. |

(1) The site is located beyond W Forrest Avenue, approximately 60 feet from the Subject Property.
(2) The site is located beyond Cass Avenue, approximately 75 feet from the Subject Property.
(3) The Historic Cleaner database is an EDR proprietary database that has been complied via a review of national collections of business directories of various categories. In EDR's opinion cleaner categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc.

Based on evaluation of the above information and factors, three of the adjoining properties identified within the referenced search radii on the federal and state regulatory agency databases are considered to represent an REC with respect to the Subject Property.

Based on evaluation of the above information and factors, the remaining three properties identified within the referenced search radii on the federal and state regulatory agency databases are not considered likely to pose an environmental concern to the Subject Property. Furthermore, under Part 201, Environmental Remediation, of Michigan's Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended (Part 201), the owner of property impacted solely by contamination migrating from off-site is generally exempt from environmental liability for that contamination.

## 8.0 NON-SCOPE CONSIDERATIONS

Non-scope considerations as defined in ASTM E1527-13 include but are not limited to asbestos containing building materials (ACBMs), lead-based paint, wetlands, and radon. None of these non-scope considerations were assessed as part of the Phase I ESA.

# 9.0 ASTM DATA GAPS AND DEVIATIONS

## 9.1 Data Gaps

Under ASTM E1527-13, Section 3.2.20, a lack of or inability to obtain information required by ASTM practice despite good faith efforts by the environmental professional to gather such information is considered a data gap. The following data gap(s) were identified during this Phase I ESA:

- This Phase I ESA researched reasonably ascertainable and practically reviewable standard historical references back to 1897, at which time the Subject Property had been developed for residential use and a church. Therefore, all obvious uses of the Subject Property were not identified back to the first developed use, and this is a data failure. However, based on all commonly known and reasonably ascertainable information obtained during this Phase I ESA, it is likely that the area had consisted of farmland prior to the 1890s and TEC has not identified any reason to suspect that contamination exists from land uses prior to development of the property. Therefore, this data failure is not considered a Significant Data Gap and is unlikely to affect the opinions and conclusions rendered in this Phase I ESA report.

## 9.2 Deviations

No deviations to the stated scope of work, Section 1.3, were identified during the completion of the Phase I ESA.

# 10.0 CONCLUSIONS

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527 of the contiguous properties located at 4743 Cass, 460 & 490 W Forest, and 4700, 4722, & 4730 Second avenues in Detroit, Wayne County, Michigan. Any exceptions to, or deletions from, this practice are described in the Limitations and Exceptions Section of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Subject Property except for the following:

<u>RECs</u>

- Former presence of a gasoline service station with at least four underground storage tanks (USTs) and likely vehicle repair activities located at 4700 Second Avenue from at least 1926 through the 1960s.
- Former presence of four other vehicle repair facilities located along Second and W Forrest avenues from at least 1921 through the 1960s.
- Former presence of a dry cleaner business located at 4705 Cass Avenue from at least 1965 until sometime before 1972. A strong solvent odor was identified in soil at this location during recent geotechnical soil borings.

- Presence of at least one, possibly two, dry cleaner businesses located at the east adjoining property beyond Cass Avenue from least 1926 through the present.

CRECs
- None identified.

In addition, this assessment has revealed the following:

HRECs
- None identified.

BERs
- None identified.

## 11.0 RECOMMENDATIONS

Based on the information provided and reviewed during the Phase I ESA, a Phase II ESA including a soil gas investigation and laboratory analysis is recommended in order to assess the nature, extent, magnitude, and/or materiality of the identified RECs.

## 12.0 REFERENCES

ASTM "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," ASTM E1527-13, November 1, 2013.

City of Detroit Assessing and Building Department.

Environmental Data Resources, Inc. (EDR). "The EDR Radius Map Report," May 1, 2018.

---. "The EDR Certified Sanborn Map Report."

---. "The EDR Aerial Photo Decade Package."

Michigan Legislature. "Natural Resources and Environmental Protection Act (Act 451), Environmental Remediation (Part 201)," 1994, as amended.

State of Michigan. Department of Natural Resources, *Quaternary Geology of Southern Michigan*, 1982.

---. Department of Natural Resources, *Bedrock Geology of Southern Michigan*, 1987.

United States Geological Survey (USGS) Topographic Map. *Detroit, Michigan, Quadrangle Map* (1980).

Western Michigan University (WMU). Department of Geology, College of Arts and Sciences, *Bedrock Geology (Southern Peninsula)*, 1981.

---. Department of Geology, College of Arts and Sciences, *Topography of the Bedrock Surface (Southern Peninsula)*, 1981.

## 13.0 ENVIRONMENTAL PROFESSIONAL STATEMENT AND SIGNATURES

We declare that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

All of which is respectfully submitted,

Kenneth Majetic, EP
Senior Environmental Scientist

Donald C. Kaylor, PG (IN, TN), EP
Manager, Environmental Assessment

**WAYNE STATE UNIVERSITY**
**FACILITIES PLANNING AND MANAGEMENT**
**5454 CASS AVE, DETROIT, MI 48202-3646**

# PHASE II ESA
# GATEWAY PROJECT
# CASS AVE, W FOREST AVE, & SECOND AVE
# DETROIT, MI 48202

**TEC REPORT 58870-02**

**SUBMITTED BY**

**TESTING ENGINEERS & CONSULTANTS, INC.**
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**JANUARY 23, 2019**

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January 23, 2019 58870-02 Rev1

Ms. Ryan Miller email: rjmiller@wayne.edu
Wayne State University, Facilities Planning and Management tel: 313-577-7663
5454 Cass Ave, Detroit, MI 48202-3646

**RE: Phase II Environmental Site Assessment**
**Gateway Project, Cass, W Forest, & Second Avenues, Detroit, MI 48202**

Dear Mr. Miller:

Testing Engineers & Consultants, Inc. (TEC) has completed the Phase II Environmental Site Assessment (ESA) at the Gateway project site located at the western corner of the intersection of Cass Avenue and W Forrest Avenue, Detroit, Wayne County, Michigan 48202 (Subject Property). Our findings are enclosed in the following report.

TEC recently completed a Phase I ESA for the Subject Property in conformance with the scope and limitations of ASTM Practice E1527. The assessment revealed no evidence of recognized environmental conditions in connection with the Subject Property except for the following:

- Former presence of a gasoline service station with at least four underground storage tanks (USTs) and likely vehicle repair activities located at 4700 Second Avenue from at least 1926 through the 1960s.
- Former presence of four other vehicle repair facilities located along Second and W Forrest avenues from at least 1921 through the 1960s.
- Former presence of a dry cleaner business located at 4705 Cass Avenue from at least 1965 until sometime before 1972. A strong solvent odor was identified in soil at this location during recent geotechnical soil borings.
- Presence of at least one, possibly two, dry cleaner businesses located at the east adjoining property beyond Cass Avenue from least 1926 through the present.

Based on the information provided and reviewed during the Phase I ESA, further investigation was considered necessary in order to determine the nature, extent, magnitude, and/or materiality of the REC at the Subject Property as follows:

- Perform a Phase II ESA to that would include sampling and analysis of soil and groundwater (if encountered).

To evaluate the REC, TEC completed a Phase II ESA at the Subject Property. Mr. Joseph Hunter, Senior Environmental Scientist with TEC, was the person with the primary responsibility for sample collection, data assembly, interpretation, and technical conclusions with respect to the Phase II ESA. Mr. Donald Kaylor, Manager, Environmental Assessment at TEC, provided quality assurance and senior technical review in completing these tasks.

## SCOPE OF WORK

On June 27 and July 11, 2018, TEC performed the fieldwork portion of the Phase II ESA to evaluate subsurface conditions at the Subject Property. Soil borings were extended to a maximum depth of approximately 12 feet below ground surface (bgs). Weather conditions

during the sampling activities were generally sunny with an air temperature of approximately 80 degrees Fahrenheit. A Subject Property Location Map is presented as Figure 1. Refer to Figure 2 for the soil boring locations.

The subsurface portion of the Phase II ESA specifically consisted of the following:

- Advancing eight soil borings on the Subject Property and the collection of eight soil samples and one groundwater sample.
- Submitting three soil samples for laboratory analysis of Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs), and five soil samples for laboratory analysis of VOCs, Polynuclear Aromatic Compounds (PNAs), lead, cadmium, and chromium.
- Submitting one groundwater samples for laboratory analysis of VOCs, PNAs, lead, cadmium, and chromium.
- Comparing analytical results of soil and groundwater samples to Michigan Department of Environmental Quality (DEQ) Generic Cleanup Criteria ("criteria").

## SOIL SAMPLING

Soil borings were advanced with a truck-mounted direct-push sampler using a 4-foot long, 2-inch outside diameter, stainless steel sampler with disposable plastic liners. The sampler and associated drilling equipment were decontaminated prior to the initiation of drilling. The sampler, sample extraction implements, and any other equipment that came into contact with the samples were decontaminated using an Alconox detergent solution wash and rinsed prior to each sample collection event. Soil samples were collected continuously from the surface to the bottom of each boring.

Soil samples were observed for visual or olfactory indications of contamination. Selected soil samples were also screened in the field with a photoionization detector (PID). The PID is a trace gas (VOC) analyzer with a detection range of approximately 0.1 to 10,000 parts per million (ppm). The PID was calibrated prior to screening using 100-ppm isobutylene. Each soil sample was placed in a sealable, plastic sample collection bag. This allowed for headspace expansion as the sample was allowed to warm. Once expansion occurred, the bag was opened, the tip of the PID was inserted, and the result was recorded.

In general, soil boring information including depths, maximum PID readings, and evidence of odors or staining is as follows:

| Soil Boring Identification and Total Depth bgs (feet) | Maximum PID Reading (ppm) and Depth bgs (feet) | Evidence of Odors, Staining, Debris, and Depth bgs (feet) |
|---|---|---|
| SB-01 (12) | 5,000 ppm (7) | Chemical odor (5-12) |
| SB-02 (12) | 0.1 ppm (3) | None (various) |
| SB-03 (12) | 0 ppm (various) | None (various) |
| SB-04 (12) | 1.5 ppm (8-9) | None (various) |
| SB-05 (12) | 0 ppm (various) | None (various) |
| SB-06 (12) | 0 ppm (various) | None (various) |
| SB-07 (12) | 7.0 ppm (4-5) | Slight petroleum odor (4-5) |
| SB-08 (12) | 870 ppm (7-8) | Petroleum odor (2-12) |

The soil samples were stored in a cooler on ice prior to and during transportation under chain of custody to Merit Laboratories, Inc. in East Lansing, Michigan.

## GROUNDWATER SAMPLING

Groundwater was encountered in one soil boring that was advanced in the suspect UST area located in the southwestern corner of the Subject Property. A temporary monitoring well was installed to collect groundwater sample (SB-08 (7'-12')).

The temporary monitoring wells consisted of a 5-foot long, 1-inch outside diameter, pre-cleaned PVC well screen and associated riser. The groundwater samples were collected at a low flow rate using a peristaltic pump and clean, disposable plastic tubing connected to the pump.

In general, soil boring information including depths, maximum PID readings, and evidence of odors or staining is as follows:

| Groundwater Sample Identification and Depth bgs (feet) | Maximum PID Reading (ppm) and Depth bgs (feet) | Evidence of Odors, Staining, Debris, and Depth bgs (feet) |
|---|---|---|
| SB-08 (7-12) | 870 ppm (7-8) | Petroleum odor (2-12) |

The groundwater samples were stored in a cooler on ice prior to and during transportation under chain of custody to Merit Laboratories, Inc. in East Lansing, Michigan.

## LOCAL GEOLOGIC CONDITIONS

Information provided in the Hydrogeologic Atlas of Michigan (1981) indicated that the area bedrock is Dundee Carbonates Formation at an approximate elevation of 425 feet AMSL. Therefore, bedrock is not likely to be pertinent to environmental conditions at the Subject Property.

According to the Michigan Geological Survey Division's publication, *Quaternary Geology of Southern Michigan*, soils in the area consisted of lacustrine clay and silt between 1 and 10 meters thick. The material is gray to dark reddish brown and varved in some localities. It chiefly underlies extensive, flat, low-lying areas formerly inundated by glacial Great Lakes, and includes small areas of lacustrine sand and clay-rich till.

Soils encountered during a recent geotechnical subsurface investigation were generally found to be consistent with lacustrine clay and silt in areas where fill soil was not encountered.

Based on the reconnaissance, the topography of the property is relatively flat. Based on the review of the USGS Topographic Map, the overall topography of the area is gently sloping to the east towards The Detroit River. According to the topographic map, the Subject Property is at an elevation of 625 feet above mean sea level (AMSL).

Based on local topography, surface drainage at the Subject Property was towards catch basins located in the eastern and western portion of the parking lot.

Generally, groundwater flow direction would be expected to be consistent with surface water flow and local topography and dependent upon seasonal variation in precipitation. Therefore, it is likely that the groundwater flow direction in the area of the Subject Property will locally be to the south towards the Detroit River.

According to the State of Michigan's online water well locator system (Wellogic), no current or historical water wells were identified to be located at the Subject Property.

## ANALYTICAL SCOPE OF WORK

TEC submitted eight soil samples for chemical laboratory analysis during the Phase II ESA. Soil samples are typically submitted for analysis based on field indications of potential impact (PID readings, odor, or staining). In the absence of such indications, representative samples were submitted for analysis.

TEC used field observations and the limited scope of the Phase II ESA to select representative soil samples for analysis as follows:

| Soil Boring Identification | Soil Sample Identification (depth in feet) | Basis of Sample Selection |
|---|---|---|
| SB-01 | SB-01 (7-8) | Chemical odor (5-12) |
| SB-02 | SB-02 (3-4) | Representative sample |
| SB-03 | SB-03 (8-9) | Representative sample |
| SB-04 | SB-04 (8-9) | PID reading and slight petroleum odor |
| SB-05 | SB-05 (2-3) | Representative sample |
| SB-06 | SB-06 (4-5) | Representative sample |
| SB-07 | SB-07 (7-8) | Slight petroleum odor (4-5) |
| SB-08 | SB-08 (7-8) | Petroleum odor (2-12) |

Analytical parameters for soil and groundwater samples were variously selected based on TEC's knowledge of common contaminants typically associated with gasoline filling station and dry cleaning operations as follows:

- Volatile organic compounds (VOCs) via EPA method 8260
- Semi-volatile organic compounds (SVOCs) via EPA method 8270
- Polynuclear organic compounds (PNAs) via EPA method 8270
- Lead, cadmium, and chromium via EPA method 6020

The results of the laboratory analysis of the soil and groundwater samples were referenced against the following generic cleanup criteria and screening levels (criteria):

| Criteria for Soil | |
|---|---|
| Drinking Water Protection (DWP) | Particulate Soil Inhalation (PSI) |
| Groundwater Surface Water Interface Protection (GSIP) | Soil Saturation Concentration Screening Levels ($C_{sat}$) |
| Soil Volatilization to Indoor Air Inhalation (SVIAI) | Direct Contact (DC) |
| Time Sensitive Recommended Interim Action Screening Levels (TS RIASL) | Recommended Interim Action Screening Levels (RIASL) |
| Ambient Air - Volatile Soil Inhalation (VSI) | |

| Criteria for Groundwater | |
|---|---|
| Drinking Water (DW) | Groundwater Surface Water Interface (GSI) |
| Groundwater Volatilization to Indoor Air Inhalation (GVIAI) | Recommended Interim Action Screening Levels (RIASL) & Time-Sensitive (TS-RIASL) |
| Flammability & Explosivity Screening Level (FESL) | Water Solubility (WS) |

## SOIL RESULTS

- Several VOCs were detected at concentrations above the method detection limit (MDL) in five of the eight soil samples submitted for VOC analysis with concentrations above criteria in four of the of the soil samples. The soil sample collected from SB-01 (7'-8') exceeded multiple nonresidential criteria, including DWP, GSIP, SVIAI, RIASL, VSI, PSI, DC, and $C_{sat}$. Additionally, exceedance of the RIASL criteria was also identified in the soil samples collected from SB-02 (3'-4'), SB-04 (8'-9'), and SB-08 (8'-9').
- PNA and SVOC compounds were detected at concentrations above the MDL in two of the eight soil samples submitted for PNA and SVOC analysis with concentrations above criteria in one of the soil samples.
- One or more metals (lead, cadmium, and chromium) were detected at concentrations above the MDLs in each of the five soil samples submitted for metals analysis; however, the concentrations did not exceed criteria.

Table 1 (attached) presents a summary of the soil analytical results compared to criteria. A copy of the laboratory analytical report is presented as Appendix C.

## GROUNDWATER RESULTS

- Several VOCs, one PNA, cadmium, chromium, and lead were detected at concentrations above criteria in the one groundwater sample submitted for analysis.

Table 2 (attached) presents a summary of the groundwater analytical results compared to criteria. A copy of the laboratory analytical report is presented as Appendix C.

## SUMMARY OF SOIL AND GROUNDWATER ANALYTICAL RESULTS

Sample identifications (depths in feet), analytes, concentrations, and criteria exceeded are presented in the following tables:

| Sample Identification | Analyte | Soil Concentration (µg/kg) | Criteria Exceeded |
|---|---|---|---|
| SB-01 (7-8) | Tetrachloroethene | 2,280,000 | DWP, GSIP, SVIAI, RIASL, VSI, PSI, DC, $C_{sat}$ |
| SB-02 (3-4) | Tetrachloroethene | 200 | DWP, RIASL |
| SB-04 (8-9) | Tetrachloroethene | 6,220 | DWP, GSIP, RIASL |
| SB-08 (8-9) | 1,2,3-Trimethylbenzene | 43,000 | RIASL |
| | 1,2,4-Trimethylbenzene | 9,000 | DWP, GSIP, RIASL |
| | 1,3,5-Trimethylbenzene | 37,000 | DWP, GSIP, RIASL |
| | 2-Methylnaphthalene | 20,000 | GSIP |
| | Ethylbenzene | 24,000 | DWP, GSIP, RIASL |
| | n-Butylbenzene | 27,000 | DWP |
| | n-Propylbenzene | 25,000 | DWP |
| | Xylenes | 31,000 | DWP, GSIP, RIASL |
| | Naphthalene | 1,400 | GSIP |

| Sample Identification | Analyte | Groundwater Concentration (µg/L) | Criteria Exceeded |
|---|---|---|---|
| SB-08 (7-12) | Cadmium | 28 | DW |
| | Chromium | 453 | DW |
| | Lead | 1,230 | DW |
| | Benzene | 760 | DW, GSI, RIASL, TS RIASL |
| | Ethylbenzene | 480 | DW, GSI, RIASL, TS RIASL |
| | Naphthalene | 300 | GSI |
| | n-propylbenzene | 290 | DW |
| | 1,2,3-Trimethylbenzene | 400 | RIASL |
| | 1,2,4-Trimethylbenzene | 360 | DW, GSI, RIASL |
| | 1,3,5-Trimethylbenzene | 300 | DW, GSI, RIASL |
| | Xylenes | 960 | DW, GSI, RIASL |

## FINDINGS

- Subsurface soil conditions encountered in the soil borings drilled at the Subject Property generally consisted of silty sand overlying clay to a maximum depth explored of approximately 12 feet bgs.
- Water was encountered in the one of the eight soil borings advanced at the Subject Property.
- Obvious field indications (odors, staining, and elevated PID readings) of potential soil impacts were identified in four of the eight soil borings advanced at the Subject Property.
- Multiple VOCs and one PNA were detected at concentrations above multiple criteria in four of the eight soil samples submitted for analysis. $C_{sat}$ and nonresidential DC, PSI, VSI, SVIAI, and/or RIASL criteria were exceeded in samples from soil borings SB-01, SB-02, SB-04, and SB-08.
- Multiple VOCs, one PNA, and multiple metals were detected at concentrations above multiple criteria in the one groundwater sample submitted for analysis.

$C_{sat}$ represents the concentration in soil at which the solubility limits of the soil pore water, the vapor phase limits of the soil pore air, and the absorptive limits of the soil particles have been reached. Exceedances of $C_{sat}$ indicate that the generic criteria may no longer be applicable because separate phase product (also known as “free product”) may be present.

Tables 1 and 2, attached, present a summary of the soil and groundwater analytical results compared to criteria. The laboratory analytical report is presented as Appendix C.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the results and evaluation of the laboratory data collected during the Phase II ESA, TEC recommends the following:

- The Subject Property can be considered as a “facility” as defined in the Natural Resources and Environmental Protection Act (NREPA), 1994 P.A. 451, as amended. Informally, a facility is a site of contamination exceeding residential cleanup criteria.
- New non-liable owners or operators should consider preparing a BEA and disclosing it to the DEQ in order to obtain certain environmental liability exemptions for the existing contamination.
- Operators must understand and comply with their Due Care obligations per section 20107a (Part 201 of Michigan’s Natural Resources and Environmental Protection Act - 324.20107a

of Michigan Compiled Laws). The operator should have a written due care plan (DCP, also known as a Section 7a Compliance Plan).

- Additional investigation into the nature and extent of contamination should be conducted. Exceedances of the most important exposure pathway criteria (e.g., $C_{sat}$ and nonresidential PSI, VSI, SVIAI, and RIASL) should be conducted, especially along the southern Subject Property boundary.

Please note that BEAs are optional for the benefit of new, non-liable owners and operators of facilities and are not required by law. However, operators of facilities are required by law to meet certain due care obligations. It has been our pleasure to provide this service for you. Should you have any questions or desire further information, please do not hesitate to call us at (248) 588-6200.

Respectfully submitted,
TESTING ENGINEERS & CONSULTANTS, INC.

Joseph W. Hunter, EP
Senior Environmental Scientist

Donald C. Kaylor, PG (IN, TN), EP
Manager, Environmental Assessment

# TABLES

# Table 1:
# Soil Analytical Data Summary



| Parameter | Chemical Abstract Service Number | Michigan DEQ Residential Cleanup Criteria & Screening Levels (units = µg/kg) | | | | | | | | | | Sample ID, Depth, Date, PID Reading and Results (units = µg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Groundwater Protection | | Indoor Air | | | Ambient Air | | Contact | Csat | | | | | | | | |
| | | Statewide Default Background | Drinking Water Protection (DWP) | Groundwater-Surface Water Interface Protection (GSIP) | Soil Volatilization to Indoor Air Inhalation (SVIAI) | Recommended Interim Action Screening Level (RIASL) | Nonresidential RIASL | Infinite Source Volatile Soil Inhalation (VSI) | Particulate Soil Inhalation (PSI) | Direct Contact (DC) | Soil Saturation | SB-01 (7-8) 6/27/18 5,000 ppm | SB-02 (3-4) 7/11/18 0.1 ppm | SB-03 (3-4) 7/11/18 0.0 ppm | SB-04 (8-9) 7/11/18 1.5 ppm | SB-05 (2-3) 7/11/18 0.0 ppm | SB-06 (2-3) 7/11/18 0.0 ppm | SB-07 (4-5) 7/11/18 7.0 ppm | SB-08 (7-8) 7/11/18 870 ppm |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | | | | | | |
| 1,2,3-Trimethylbenzene | 526-73-8 | NA | NA | NA | NA | 270 | 1,200 | NA | NA | NA | NA | nd | nd | nd | nd | nd | nd | nd | **43,000** |
| 1,2,4-Trimethylbenzene | 95-63-6 | NA | 2,100 | 570 | 4.3E+6 (C) | 150 | 650 | 2.10E+07 | 8.20E+10 | 3.2E+7 (C) | 1.10E+05 | nd | nd | nd | nd | nd | nd | nd | **9,000** |
| 1,3,5-Trimethylbenzene | 108-67-8 | NA | 1,800 | 1,100 | 2.6E+6 (C) | 100 | 450 | 1.60E+07 | 8.20E+10 | 3.2E+7 (C) | 94,000 | nd | nd | nd | nd | nd | nd | nd | **37,000** |
| 2-Methylnaphthalene | 91-57-6 | NA | 57,000 | 4,200 | 2.70E+06 | NA | NA | 1.50E+06 | 6.70E+08 | 8.10E+06 | NA | nd | nd | nd | nd | nd | nd | nd | **20,000** |
| Ethylbenzene | 100-41-4 | NA | 1,500 | 360 | 87,000 | 12 (M) | 86 | 7.20E+05 | 1.00E+10 | 2.2E+7 (C) | 1.40E+05 | nd | nd | nd | nd | nd | nd | nd | **24,000** |
| n-Butylbenzene | 104-51-8 | NA | 1,600 | ID | ID | NA | NA | ID | 2.00E+09 | 2.50E+06 | 1.00E+07 | nd | nd | nd | nd | nd | nd | nd | **27,000** |
| n-Propylbenzene | 103-65-1 | NA | 1,600 | ID | ID | NA | NA | ID | 1.30E+09 | 2.50E+06 | 1.00E+07 | nd | nd | nd | nd | nd | nd | 270 | **25,000** |
| Tetrachloroethene | 127-18-4 | NA | 100 | 1,200 (X) | 11,000 | 6.2 (M) | 19 | 1.70E+05 | 2.70E+09 | 2.0E+5 (C) | 88,000 | **2,280,000** | **200** | nd | **6,220** | nd | nd | nd | nd |
| Xylenes | 1330-20-7 | NA | 5,600 | 820 | 6.30E+06 | 280 | 1200 | 4.60E+07 | 2.90E+11 | 4.10E+08 | 1.50E+05 | nd | nd | nd | nd | nd | nd | nd | **30,000** |
| Other VOCs | | Varies by Compound | | | | | | | | | | nd | nd | nd | nd | nd | nd | nd | nd |
| **Polynuclear Aromatics (PNAs)** | | | | | | | | | | | | | | | | | | | |
| 1-Methylnaphthalene | 90-12-0 | No Criteria | | | | | | | | | | nd | nd | nd | nd | nd | nd | nd | **1,000** |
| 2-Methylnaphthalene | 91-57-6 | NA | 57,000 | 4,200 | 2.70E+06 | NA | NA | 1.50E+06 | 6.70E+08 | 8.10E+06 | NA | nd | nd | nd | nd | nd | nd | nd | **2,100** |
| Benzo(a)anthracene | 56-55-3 | NA | NLL | NLL | NLV | NA | NA | NLV | ID | 2.00E+04 | NA | nd | nd | nd | nd | 1,000 | nd | nd | nd |
| Benzo(a)pyrene | 50-32-8 | NA | NLL | NLL | NLV | NA | NA | NLV | 1.50E+06 | 2,000 | NS | nd | nd | nd | nd | 900 | nd | nd | nd |
| Benzo(b)fluoranthene | 205-99-2 | NA | NLL | NLL | ID | NA | NA | ID | ID | 20,000 | NA | nd | nd | nd | nd | 1,400 | nd | nd | nd |
| Benzo(g,h,i)perylene | 191-24-2 | NA | NLL | NLL | NLV | NA | NA | NLV | 8.00E+08 | 2.50E+06 | NA | nd | nd | nd | nd | 500 | nd | nd | nd |
| Benzo(k)fluoranthene | 207-08-9 | NA | NLL | NLL | NLV | NA | NA | NLV | ID | 2.00E+05 | NA | nd | nd | nd | nd | 1,600 | nd | nd | nd |
| Chrysene | 218-01-9 | NA | NLL | NLL | ID | NA | NA | ID | ID | 2.00E+06 | NA | nd | nd | nd | nd | 900 | nd | nd | nd |
| Fluoranthene | 206-44-0 | NA | 7.30E+05 | 5,500 | 1.0E+9 (D) | NA | NA | 7.40E+08 | 9.30E+09 | 4.60E+07 | NA | nd | nd | nd | nd | 1,500 | nd | nd | nd |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NLL | NLL | NLV | NA | NA | NLV | ID | 2.00E+04 | NA | nd | nd | nd | nd | 500 | nd | nd | nd |
| Naphthalene | 91-20-3 | NA | 35,000 | 730 | 2.50E+05 | NA | NA | 3.00E+05 | 2.00E+08 | 1.60E+07 | NA | nd | nd | nd | nd | nd | nd | nd | **1,400** |
| Phenanthrene | 85-01-8 | NA | 56,000 | 2,100 | 2.80E+06 | NA | NA | 1.60E+05 | 6.70E+06 | 1.60E+06 | NA | nd | nd | nd | nd | 700 | nd | nd | nd |
| Pyrene | 129-00-0 | NA | 480,000 | ID | 1.0E+9 (D) | NA | NA | 6.50E+08 | 6.70E+09 | 2.90E+07 | NA | nd | nd | nd | nd | 1,300 | nd | nd | nd |
| Other PNAs | | Varies by Compound | | | | | | | | | | nd | nd | nd | nd | nd | nd | nd | nd |
| **Metals** | | | | | | | | | | | | | | | | | | | |
| Cadmium | 7440-43-9 | 1,200 | 6,000 | (G, X) | NLV | NA | | NLV | 1.70E+06 | 5.50E+05 | NA | --- | --- | nd | --- | 240 | 250 | nd | nd |
| Chromium | 7440-47-3 | 18,000 | 1.0E+9 (D) | (G,X) | NLV | NLV | | NLV | 3.30E+08 | 1.10E+07 | NA | --- | --- | 1,840 | --- | 3,320 | 3,820 | 5,730 | 2,200 |
| Lead | 7439-92-1 | 21,000 | 7.00E+05 | (G, X) | NLV | NA | | NLV | 1.00E+08 | 4.00E+05 | NA | --- | --- | 5,280 | --- | 6,090 | 7,780 | 14,100 | 24,100 |

**Footnotes**

B - Background, as defined in R 299.5701(b), may be substituted if higher than calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.
C - The criterion developed under R 299.20 to R 299.26 exceeds the chemical-specific soil saturation screening level (Csat).
D - Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).
G - Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water.
H - Valence-specific chromium data (Cr III and CR IV) shall be compared to valence specific cleanup criteria.
M - Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
X - The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.
Depths in feet below ground surface.
ID - Insufficient data to develop criterion.
NA - A criterion or value is not available or, in the case of background and CAS numbers, not applicable.
nd - Analyte was not detected at or above practical quantification limits.
NLL - Hazardous substance is not likely to leach under most soil conditions.
NLV - Hazardous substance is not likely to volatilize under most conditions.
PID - Photoionization detector.
ppm - Parts per million.
µg/kg - Micrograms per kilogram (ppb).
--- Sample not analyzed for compound.
- Blue-shaded boxes represent DEQ criteria exceeded.
- **Bolded** results in green-shaded boxes represent criteria exceeded.

Testing Engineers & Consultants, Inc.

# Table 2:
# Groundwater Analytical Data Summary

TEC Project 58870-02
Gateway Project
Detroit, MI

| Parameter | Chemical Abstract Service Number | Michigan DEQ Generic Cleanup Criteria & Screening Levels (units = µg/l) | | | | | | | | | | | | Sample ID, Depth, Date, & Results (units = mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Residential Drinking Water | Nonresidential Drinking Water | Groundwater Surface Water Interface | Residential Groundwater Volatilization to Indoor Air Inhalation | Nonresidential Groundwater Volatilization to Indoor Air Inhalation | Residential Recommended Interim Action Screening Level (RIASL) Shallow Groundwater | Nonresidential RIASL for Shallow Groundwater | Residential RIASL | Residential Time-Sensitive RIASL (TS RIASL) | Nonresidential RIASL | Water Solubility | Flammability and Explosivity | SB-08 (7-12) 7/11/18 |
| **Metals** | | | | | | | | | | | | | | |
| Cadmium (B) | 7440439 | 5.0 (A) | 5.0 (A) | (G,X) | NLV | NLV | NA | NA | NA | NA | NA | NA | NA | **28** |
| Chromium VI (B,H) | 18540299 | 100 (A) | 100 (A) | 11 | NLV | NLV | NA | NA | NA | NA | NA | NA | NA | **453** |
| Lead (B) - Unfiltered | 7439921 | 4.0 (L) | 4.0 (L) | (G,X) | NLV | NLV | NA | NA | NA | NA | N | NA | NA | **1,230** |
| **Polynuclear Aromatics (PNAs)** | | | | | | | | | | | | | | |
| Naphthalene | 91203 | 520 | 1,500 | 11 | 31,000 (S) | 31,000 (S) | NA | NA | NA | NA | NA | 31,000 | NA | **12** |
| 2-Methylnaphthalene | 91576 | 260 | 750 | 19 | 25,000 (S) | 25,000 (S) | NA | NA | NA | NA | NA | 24,600 | NA | 7 |
| Other PNAs | Varies by Compound | | | | | | | | | | | | | nd |
| **Volatile Organic Compounds (VOCs)** | | | | | | | | | | | | | | |
| Benzene (I) | 71432 | 5.0 (A) | 5.0 (A) | 200 (X) | 5,600 | 35,000 | 1.0 | 3.0 | 14 | 82 | 120 | 1.75E+6 | 68,000 | **760** |
| Ethylbenzene (I) | 100414 | 74 (E) | 74 (E) | 18 | 1.1E+5 | 1.7E+5 (S) | 2.8 | 8.5 | 45 | 450 | 360 | 1.69E+5 | 43,000 | **480** |
| 2-Methylnaphthalene | 91576 | 260 | 750 | NA | NA | NA | NA | NA | NA | NA | NA | 24,600 | NA | 200 |
| Naphthalene | 91203 | 520 | 1,500 | 11 | 31,000 (S) | 31,000 (S) | NA | NA | NA | NA | NA | 31,000 | NA | **300** |
| n-butylbenzene | 104518 | 80 | 230 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 60 |
| n-propylbenzene (I) | 103651 | 80 | 230 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | **290** |
| sec-butylbenzene | 135988 | 80 | 230 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 30 |
| 1,2,3-Trimethylbenzene (I) | 526738 | No Criteria Determined | | | | | 43 | 71 | 800 | 2,400 | 3,900 | | | **400** |
| 1,2,4-Trimethylbenzene (I) | 95636 | 63 (E) | 63 (E) | 17 | 56,000 (S) | 56,000 (S) | 25 | 44 | 440 | 1,300 | 2,200 | 55,890 | 56,000 (S) | **360** |
| 1,3,5-Trimethylbenzene (I) | 108678 | 72 (E) | 72 (E) | 45 | 61,000 (S) | 61,000 (S) | 18 | 34 | 310 | 940 | 1,500 | 61,150 | NA | **300** |
| Toluene (I) | 108883 | 790 (E) | 790 (E) | 140 | 5.3E+5 (S) | 5.3E+5 (S) | 300 | 850 | 23,000 | 33,000 | 1.1E+05 | 5.26E+5 (S) | 61,000 | 20 |
| Xylenes (I) | 1330207 | 280 (E) | 280 (E) | 41 | 1.9E+5 (S) | 1.9E+5 (S) | 75 | 140 | 1,200 | 3,600 | 6,000 | 1.86E+05 | 70,000 | **960** |
| Other VOCs | Varies by Compound | | | | | | | | | | | | | nd |

**Footnotes**

A - Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.
B - Background, as defined in R 299.5701(b), may be substituted if higher than the calculated cleanup criterion.
E - Criterion is the aesthetic drinking water value.
G - Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water.
H - Valence-specific chromium data (Cr III and CR IV) shall be compared to valence specific cleanup criteria.
I - Hazardous substance may exhibit the characteristic of ignitability.
S - Criterion defaults to the hazardous substance-specific water solubility limit.
ID - Insufficient data to develop criterion.
nd - Analyte was not detected at or above practical quantification limits.
µg/l - Micrograms per liter (approximately equivalent to parts per billion or ppb).
--- Sample not analyzed for compound.
- Numbers in blue-shaded boxes represent exceedance of criteria.
- **Bolded** results in green-shaded boxes represent criteria exceeded.

# APPENDIX B

# BORING LOGS

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 1 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | | Gravel & Silt-FILL | 1.5 | 1' | |
| | | | | | 2.1 | 2' | |
| 2.5 | | | 3 | | 3.7 | 3' | |
| | | | 4 | Gravel & Concrete-FILL | 6.0 | 4' | |
| | | | | | 7.5 | 5' | |
| 5.0 | | | | CLAY With Trace Of Gravel | 72 | 6' | |
| | SS (7'-8') | | | | 5,000 | 7' | SS (7'-8') |
| 7.5 | | | | | 2,500 | 8' | |
| | | | | | 162 | 9' | |
| | | | | | 775 | 10' | |
| 10.0 | | | | | 1,700 | 11' | |
| | | | 12 | | 337 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 1

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 2 **Job No.:** 58870

**Project:** WSU Hillberry Property, Cass Avenue

**Client:** Wayne State University

**Location:** Detroit, Michigan

**Type of Rig:** Geoprobe

**Drilled By:** J. Hunter

**Drilling Method:** Direct Push

**Started:** 6/27/2018

**Ground Surface Elevation:**

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | 1 | Gravel-FILL | 0.0 | 1' | |
| | | | 2 | | 0.0 | 2' | |
| 2.5 | SS (3'-4') | | | Sandy SILT With Trace Of Gravel | 0.1 | 3' | SS (3'-4') |
| | | | 4 | Stiff Tan CLAY | 0.0 | 4' | |
| 5.0 | | | | Stiff Brown CLAY | 0.0 | 5' | |
| | | | | | 0.0 | 6' | |
| | | | | | 0.0 | 7' | |
| 7.5 | | | 8 | | 0.0 | 8' | |
| | | | | CLAY | 0.0 | 9' | |
| 10.0 | | | | | 0.0 | 10' | |
| | | | | | 0.0 | 11' | |
| | | | 12 | | 0.0 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 2

# Testing Engineers & Consultants, Inc.

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(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 3 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | .5 | GRAVEL (6") | 0.0 | 1' | |
| | | | | | 0.0 | 2' | |
| 2.5 | SS (3'-4') | | 3 | Brown SAND | 0.0 | 3' | SS (3'-4') |
| | | | 4 | Brown & Gray CLAY | 0.0 | 4' | |
| 5.0 | | | | Stiff Brown CLAY | 0.0 | 5' | |
| | | | | | 0.0 | 6' | |
| | | | | | 0.0 | 7' | |
| 7.5 | | | | | 0.0 | 8' | |
| | | | | | 0.0 | 9' | |
| 10.0 | | | | | 0.0 | 10' | |
| | | | | | 0.0 | 11' | |
| | | | 12 | | 0.0 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
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ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 3

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 4 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | 1 | GRAVEL | 0.0 | 1' | |
| | | | | | 0.0 | 2' | |
| 2.5 | | | 3 | Brown SAND | 0.0 | 3' | |
| | | | 4 | Soft Brown CLAY | 0.0 | 4' | |
| | | | | | 1.0 | 5' | |
| 5.0 | | | 6 | Soft Brown & Gray CLAY | 0.5 | 6' | |
| | | | | | 0.4 | 7' | |
| 7.5 | SS (8'-9') | | | Hard Brown & Gray CLAY | 1.5 | 8' | SS (8'-9') |
| | | | | | 1.5 | 9' | |
| 10.0 | | | | | 0.7 | 10' | |
| | | | | | 0.5 | 11' | |
| | | | 12 | | 0.2 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 4

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 5 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | .5 | GRAVEL (6") | 0.0 | 1' | |
| | SS (2'-3') | | | | 0.0 | 2' | SS (2'-3') |
| 2.5 | | | 3 | Sand, Gravel & Brick-FILL | 0.0 | 3' | |
| | | | 4 | SAND & Gravel | 0.0 | 4' | |
| 5.0 | | | | Stiff Brown CLAY | 0.0 | 5' | |
| | | | | | 0.0 | 6' | |
| | | | | | 0.0 | 7' | |
| 7.5 | | | | | 0.0 | 8' | |
| | | | | | 0.0 | 9' | |
| 10.0 | | | | | 0.0 | 10' | |
| | | | | | 0.0 | 11' | |
| | | | 12 | | 0.0 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
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AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 5

# Testing Engineers & Consultants, Inc.

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(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 6 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | .33 | ASPHALT (4") | 0.0 | 1' | |
| 2.5 | SS (2'-3') | | | Sand & Gravel-FILL | 0.0 | 2' | SS (2'-3') |
| | | | | | 0.0 | 3' | |
| | | | 4 | | 0.0 | 4' | |
| 5.0 | | | | Stiff Brown CLAY | 0.0 | 5' | |
| | | | | | 0.0 | 6' | |
| | | | | | 0.0 | 7' | |
| 7.5 | | | | | 0.0 | 8' | |
| | | | | | 0.0 | 9' | |
| 10.0 | | | | | 0.0 | 10' | |
| | | | | | 0.0 | 11' | |
| | | | 12 | | 0.0 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 6

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 7 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | .5 | ASPHALT (6") | 0.2 | 1' | |
| | | | 2 | Sand & Gravel-FILL | 2.0 | 2' | |
| 2.5 | | | | | 1.5 | 3' | |
| | SS (4'-5') | | 4 | CLAY With Some Silt & Petroleum Odor | 7.0 | 4' | SS (4'-5') |
| 5.0 | | | | Tan & Gray CLAY With Petroleum Odor | 3.4 | 5' | |
| | | | | | 2.1 | 6' | |
| | | | 7 | | 0.1 | 7' | |
| 7.5 | | | | Tan CLAY | 0.0 | 8' | |
| | | | | | 0.0 | 9' | |
| 10.0 | | | | | 0.0 | 10' | |
| | | | | | 0.0 | 11' | |
| | | | 12 | | 0.0 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** None

**At Completion:** None

**Boring No.** 7

# Testing Engineers & Consultants, Inc.

1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232


**Boring No.:** 8 **Job No.:** 58870

**Client:** Wayne State University

**Type of Rig:** Geoprobe

**Drilling Method:** Direct Push

**Ground Surface Elevation:**

**Project:** WSU Hillberry Property, Cass Avenue

**Location:** Detroit, Michigan

**Drilled By:** J. Hunter

**Started:** 6/27/2018

**Completed:** 6/27/2018

| Depth (ft) | Sample Type | N | Strata Change | Soil Classification | PID | Depth | Submit for Testing |
|---|---|---|---|---|---|---|---|
| | | | .5 | ASPHALT (6") | 0.0 | 1' | |
| | | | 2 | GRAVEL | 10 | 2' | |
| 2.5 | | | | | 26 | 3' | |
| | | | 4 | Gray CLAY With Petroleum Odor | 42 | 4' | |
| 5.0 | | | | Gray CLAY With Petroleum Odor | 54 | 5' | |
| | | | | | 65 | 6' | |
| | SS (7'-8') | | 7 | | 870 | 7' | SS (7'-8') |
| 7.5 | GW (7'-12') | | 8 | Clay & Sand With Petroleum Odor | 718 | 8' | GW (7'-12') |
| | | | | Wet SAND With Petroleum Odor | 602 | 9' | |
| 10.0 | | | | | 211 | 10' | |
| | | | 11 | | 87 | 11' | |
| | | | 12 | Soft Wet CLAY With Petroleum Odor | 13 | 12' | |
| | | | | Bottom of Borehole at 12' | | | |

"N" - Standard Penetration Resistance
SS - Soil Sample
DP - Direct Push Sample
ST - Shelby Tube Sample
AS - Auger Sample

GW - Ground Water Sample
PID - Concentration as Determined with Photoionization Detector
Well - Location of Well

**Water Encountered:** @ 7'

**At Completion:** Yes

**Boring No.** 8

# ATTACHMENT C AIR MONITORING PLAN

# AIR QUALITY MONITORING PLAN
for the
EXCAVATION OF SOILS ASSOCIATED WITH THE GATEWAY
PROJECT

*Prepared for*

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## Introduction

This air monitoring plan has been developed to establish the procedures for monitoring air quality during soil disturbance activities at the site associated with the Gateway Performance Complex Project (Gateway Project). The excavation work is being performed as part of the construction of the Gateway Performance Complex and renovation of the Hilberry Theatre.

The project boundaries are roughly: an un-named public alley south of West Hancock Street and the property line of 4746 Second Avenue to the north, Cass Avenue to the east, West Forest Avenue to the south, and Second Avenue to the west. Excavation activities will initially consist of excavation for a basement for the re-located Mackenzie House followed installation of a new foundation and vapor mitigation system, and connection to underground utilities within the footprint for the Gateway Project. A later phase will involve the construction of a new theatre complex south of the existing Hilberry Theatre.

Excavation activities (excavations, trenches, pits, etc.; terms are used interchangeably in this plan) are to be performed by Walbridge and/or its subcontractors. Air quality monitoring in the vicinity of excavations will be performed by Walbridge and/or its subcontractors. Testing Engineers & Consultants, Inc. (TEC) has prepared this Air Quality Monitoring Plan and will conduct the monitoring or provide training to representatives of Walbridge and/or its subcontractors in the calibration and operation of the portable instruments that will be used. TEC will also assist on an as-needed basis regarding technical matters associated with air quality at or in excavations as they may arise.

This plan includes a description for an on-site air-monitoring program, conducting initial site-specific training, and providing continued support for assessing air contaminant levels, as required. TEC will be on-site at the beginning of construction activities, to attend meetings as needed, and to provide consultation in data interpretation when requested by the client or Walbridge.

This plan will be in effect any time that soil disturbance activities are performed, when employees are exposed or have the potential to be exposed to a hazardous material at concentrations which exceed an applicable Occupational Safety and Health Administration (OSHA). standard; in areas where the airborne level of volatile organic compounds (VOCs) exceeds 1 part per million (ppm) above the background for a period of ten minutes continuously. It is anticipated that most or all of the work for the project will be performed in Modified Level D Personal Protective Equipment (PPE).

## Air Monitoring Instrumentation

The following is a listing of on-site monitoring instruments that will be employed during the course of the site work for the determination of the level of protection to be worn by the site workers. Personnel who will be operating this instrumentation will be trained in its use and operation.

Monitoring for VOCs will be performed with a RAE Systems, Inc. MiniRAE 3000 equipped with a 10.6 eV photoionization detector (PID). This instrument will measure total VOCs during soil disturbance activities.

Monitoring of excavations equal to or deeper than 4 feet will be performed with an RKI GX-2012 multi-gas meter. The instrument will monitor for the following parameters: oxygen deficiency, explosive gases, methane, carbon monoxide, and hydrogen sulfide.

## Hazard Analysis

**VOCs.** When total airborne VOC concentrations exceed 1 ppm above background, Walbridge and/or its subcontractors will take steps to reduce airborne levels using approved work practices (including but not limited to allowing freshly-opened areas to vent/off-gas/stabilize for a brief duration) or engineering controls (including but not limited to using portable ventilation systems for dilution ventilation). The time allotted to allow freshly-excavated areas to vent can be based on the construction schedule, e.g., if an Action Level is exceeded after waiting 15 minutes since last soil disturbance, the excavation can be allowed to stabilize for a longer period of time, or mechanical ventilation can be installed.

Where the total VOC concentration in a worker's breathing zone remains between 1 ppm and 5 ppm above background with engineering and/or administrative controls in place, work in this area will be stopped pending consultation with the Owner.

*Only after consulting with the Owner and establishing that engineering and/or administrative controls are not effective*, workers will don a half-face respirator (full-face also acceptable) fitted with combination organic vapor/HEPA (P100) cartridges. If the total VOC concentration in the breathing zone exceeds 5 ppm (sustained for ten minutes), work in this area is to be discontinued and options for reducing concentrations to below 5 ppm will be re-evaluated.

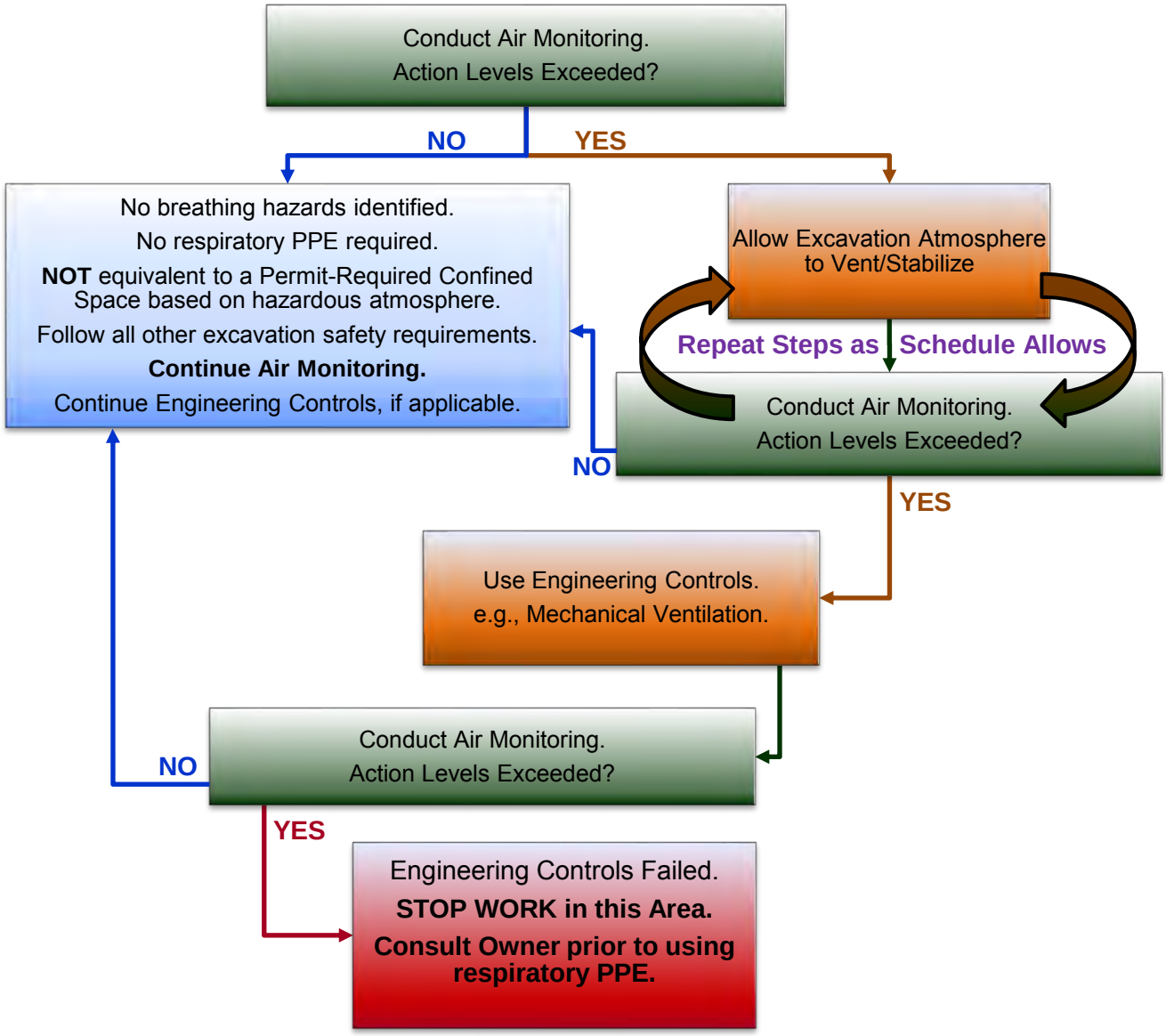
## Criteria for Assessing Organic Vapor Concentrations

The Action Levels for the upgrade or downgrade of worker personal protective equipment (PPE) are based upon information published by the American Conference of Governmental Industrial Hygienists (ACGIH) and OSHA. The Action Levels are based upon established Permissible Exposure Limits (OSHA), Threshold Limit Values (ACGIH), and Short-Term Exposure Limits (ACGIH).

The major contaminants and their associated Action Levels are listed in the following table:

| Contaminant | ACGIH TLV (TWA) | ACGIH TLV (STEL) | OSHA PEL (TWA) |
|---|---|---|---|
| 1,2,3-Trimethylbenzene | 25 ppm | --- | 25 ppm |
| 1,2,4-Trimethylbenzene | 25 ppm | --- | 25 ppm |
| 1,3,5-Trimethylbenzene | 25 ppm | --- | 25 ppm |
| Benzene | 0.5 ppm | 2.5 ppm | 1 ppm |
| Ethylbenzene | 100 ppm | 125 ppm | 100 ppm |
| Chlorobenzene | 10 ppm | --- | 75 ppm |
| Tetrachloroethylene | --- | --- | 100 ppm |
| Xylenes | 100 ppm | 150 ppm | 150 ppm (STEL) |

Summary Graphic for Air Monitoring




**Excavations (potentially equivalent to Confined Space Entry).** A Confined Space means a space that: (1) is large enough and so configured that an employee can bodily enter it; (2) has limited or restricted means for entry and exit; and (3) is not designed for continuous employee occupancy. A Permit-Required Confined Space (permit space) means a confined space that has one or more of the following four characteristics: (1) contains or has a potential to contain a hazardous atmosphere; (2) contains a material that has the potential for engulfing an entrant; (3) has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or (4) contains any other recognized serious safety or health hazard.

Although excavations in construction (those covered by 1926 Subpart P - Excavations) are not officially covered by the Confined Spaces in Construction (29 CFR Part 1926 Subpart AA) or Permit-Required Confined Spaces (29 CFR 1910.146) standards, excavations may need to be treated as if they were equivalent to Permit-Required Confined Spaces, with the exception that a permit is not required.

Entry into excavations by Walbridge's and/or its subcontractor's personnel is anticipated. The project is expected to include excavation of soils to various depths for construction. To ensure that excavations are NOT equivalent to permit-required confined spaces, Walbridge will ensure that none of the four characteristics (listed above) of permit-required confined spaces are present. This air monitoring plan provides guidance to assist with ensuring that excavations do NOT contain or have a potential to contain a hazardous atmosphere (characteristic (1) of permit-required confined spaces).

The excavations will primarily be created by backhoe or excavator. For the purpose of this plan, any excavation with a depth equal to or greater than four feet is equivalent to a confined space. Also, excavation less than four feet deep will also be treated as equivalent to a confined space if an employee will or might breath in that excavation (e.g., their head will or might break the plane of that excavation). OSHA standard 29 CFR 1910.146 was created to regulate confined space entries; 29 CFR 1910.146(c) subsection (d) states that there may be no hazardous atmosphere within a space whenever an employee is inside the space. Oxygen-deficient, toxic, or flammable atmospheres can occur in excavations, displacing the normal air. Some of the most common gases of concern are carbon monoxide, methane, and hydrogen sulfide.

Air monitoring for excavation characterization will be performed with the RKI GX-2012 multi-gas meter. This instrument will monitor for the following parameters: oxygen deficiency, explosive gases, methane, carbon monoxide, and hydrogen sulfide. The oxygen content must be between 19.5% and 23.5% to be considered safe to enter the excavation. Combustible gases must remain below 10% of the lower explosive limit (LEL). Levels of carbon monoxide must not exceed 25 ppm. Levels of hydrogen sulfide must not exceed 10 ppm. Instrument alarm levels will be preset to activate when these criteria are exceeded.

Daily Site Monitoring Procedure

Both the PID and excavation/confined space entry meters will be factory calibrated prior to use at the site. Calibration checks (bump tests) will entail using known concentrations of gases and recording an instrument's response to the gas. Bump testing will be performed on a daily basis to demonstrate that the instruments are within manufacturers' specifications for use. Bump test results will be recorded on daily log sheets.

**Procedure for General Area Monitoring.** Measure the background (ambient air) VOC concentration. Background VOC data is obtained by monitoring the ambient air for at least two minutes upwind of any site excavations. Breathing zone is face height at the surface for equipment operators and face height inside the excavation for other workers.

Monitor VOC concentrations at the downwind edge of an excavation as excavation proceeds. When VOC concentrations remain less than 1 ppm above background, no additional respiratory protection is required. When total VOC concentrations exceed 1 ppm above background, Walbridge and/or its subcontractors will take steps to reduce airborne levels using

approved engineering controls or work practices (examples include but are not limited to use portable ventilation systems for dilution ventilation, or allowing freshly opened areas to vent for a brief duration).

Where the total VOC concentration in a worker's breathing zone remains between 1 ppm and 5 ppm above background with engineering and/or administrative controls in place, and o*nly after consulting with the Owner and establishing that engineering and/or administrative controls are not effective*, workers will don a half-face (or full-face) respirator fitted with combination organic vapor/HEPA (P100) cartridges, while at the same time maintaining the engineering and/or administrative controls that were implemented. If the total VOC concentration in the breathing zone exceeds 5 ppm (sustained for ten minutes), work is to be discontinued and options for reducing concentrations to below 5 ppm will be re-evaluated. These criteria will also be used for any work being performed in an excavation less than four feet in depth.

**Procedure for Monitoring Excavation Atmospheres.** It will be the responsibility of Walbridge and/or its subcontractors to provide all appropriate PPE, rescue equipment and personnel for any work being conducted by their staff in excavations. It is anticipated that Walbridge and/or its subcontractors will have an attendant outside the excavation and will maintain visual communication with their entrant(s) at all times.

Presuming that VOC concentrations at the excavation edge have met the criteria described in the General Area Monitoring section, begin assessment of the excavation atmosphere as follows. At a minimum, monitoring will be performed every four feet of depth, to account for the differing weights of gases. Some gases (methane) are lighter than air, some are slightly lighter (carbon monoxide), and others are heavier than air (hydrogen sulfide). Allow the excavation/confined space entry instrument to stabilize at each height to account for the time necessary for the gases to be transported through the sample tubing to the instrument sensors. Audible alarms will be triggered if any of the established criteria are not met. Continue sampling at each four-foot interval with the final measurements being taken approximately one foot above the bottom of the excavation.

If all excavation/confined space entry criteria are met, continue assessment of the excavation atmosphere by monitoring for total VOC. When VOC concentrations remain less than 1 ppm above background, no additional respiratory protection is required. When total VOC concentrations exceed 1 ppm above background, Walbridge and/or its subcontractors will take steps to reduce airborne levels using approved engineering controls or work practices (see previous examples provided).

If the total VOC concentration at breathing zone in the excavation remains between 1 ppm and 5 ppm above background, work in this area will stop and the Owner will be consulted. It is not currently anticipated that work will occur in areas where the total VOC concentration at breathing zone remains equal to or greater than 1 ppm (but less than 5 ppm). After consultation, and if work must continue in that area, Walbridge and/or its subcontractors will continue using engineering controls and workers will don a half face respirator fitted with combination organic vapor/HEPA (P100) cartridges before entering the excavation. Monitoring will continue while workers are in the excavation. If at any time the total VOC concentration in the breathing zone exceeds 5 ppm (sustained for ten minutes) above background, work is to be discontinued and options for reducing concentrations to below 5 ppm will be re-evaluated. Walbridge and its subcontractor's workers should not be allowed to enter the excavation until

such time that all excavation/confined space entry and VOC monitoring criteria are met and appropriate PPE are worn.

Recording Air Monitoring Data

Daily narrative and air quality monitoring logs shall be maintained by Walbridge and/or its subcontractors. Instruments will be bump tested daily to verify proper operation. Bump test data will be stored in each instrument's memory for later download. Any recalibrations that are performed due to failing bump tests or when the calibration expiration date is reached will be recorded on the daily narrative form. Samples of log sheets and daily narratives are found in the appendices.

# APPENDIX A

# EXCAVATION ATMOSPHERIC MONITORING LOG

**Operator Name:_____**
**(Print Name)**

**Atmospheric Sampling Equipment Used:**

**Monitoring Location_____** **Date_____**
**_____**
**_____**

**Continuous Monitoring**

| Time (am or pm) | %Oxygen (19.5%-23.5%) | %LEL (max 10%) | $H_2S$ (max 10ppm) | CO (max 25ppm) | Other_____ |
|---|---|---|---|---|---|
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

Narrative

_____

_____

_____

**KEEP THIS LOG IN THE AIR QUALITY MONITORNG PLAN BINDER AT WORKSITE**

# APPENDIX B

# DAILY NARRATIVE

**Date:**_____

**Name:**_____

**Monitoring Location**_____

**Summary of Events**