Soil and Groundwater Management Plan

211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa

United States Environmental Protection Agency – Region 7
Brownfields Assessment Grant: BF97782001
Terracon Project No. 07207086

February 3, 2022

Prepared for:
East Central Intergovernmental Association (ECIA)
7600 Commerce Drive
Dubuque, Iowa 52002

&

City of Stanwood, Iowa
209 East Broadway
Stanwood, Iowa 52337

Prepared by:
Terracon Consultants, Inc.
Bettendorf, Iowa

February 3, 2022

East Central Iowa Intergovernmental Association
7600 Commerce Park
Dubuque, Iowa 52002-9673

Attn: Ms. Dawn Danielson
P: (563) 690-5772

Re: Soil and Groundwater Management Plan
ECIA Brownfields Assessment Services
211 & 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337
Terracon Project No. 07207086

Dear Ms. Danielson:

This Soil Management Plan (Plan) has been prepared for the site referenced above that may involve soil management. These activities are likely to include earthwork for site redevelopment by the City of Stanwood.

This plan is intended as a supporting document and does not function as a corrective action plan. It cannot be all inclusive or anticipate every future condition involving workers or construction involving on-site soils and groundwater. This document does not represent a general site safety plan for construction workers to address construction hazards.

We appreciate the opportunity to perform these services for you. Please do not hesitate to contact Benjamin LaPointe, 563-468-4311, or via email (benjamin.lapointe@terracon.com) if you have questions regarding this information or if we can provide any other services.

Sincerely,
Terracon Consultants, Inc.

Benjamin M. LaPointe, CHMM
Environmental Department Manager

Dennis R. Sensenbrenner, PG, CGP
Senior Associate

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APPENDICES

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) prepared this Soil and Groundwater Management Plan (Plan) for the property located at 211 and 213 East Broadway Street, Stanwood, Cedar County, Iowa (site). The Plan was prepared based on Terracon's prior Phase II Environmental Site Assessment dated January 14, 2022, as summarized in **Section 3.1** below. The purpose of the plan is to provide environmental information so that general contractors can review the information, make professional opinions regarding site development activities, and incorporate health and safety management into their bid package for the construction.

The approximately 0.12-acre site is currently developed with two 2-story vacant commercial buildings. According to the information provided by the client, we understand that the City of Stanwood plans on redeveloping the site as greenspace, office space, or as a building extension. A Topographic/Site Location Map is provided as **Exhibit 1** and an aerial view of the site is provided as **Exhibit 2** located in **Appendix A**.

Terracon completed a Phase II Environmental Site Assessment (ESA) at the site on January 14, 2022. The Phase II ESA was conducted to identify contaminants of concern associated with RECs identified in Terracon's Phase I ESA dated July 21, 2021. The Phase II ESA identified contaminants encountered in soil at concentrations that exceeded the Iowa Department of Natural Resources (IDNR) Statewide Standards (SWS) for soil.

2.0 PURPOSE

This Plan was prepared based on Terracon's Phase II ESA, as described above in **Section 1.0**. The purpose of the plan is to provide environmental information so that the general contractors can review the information, make professional opinions regarding site development activities, and incorporate health and safety into their bid package for the construction.

This Plan includes the following elements:

- A description of known or suspected contaminants at the property;
- A description of site information and IDNR requirements so contractors can review and make professional opinions on soil and groundwater management procedures to be in accordance with regulatory requirements;
- A description of the site safety responsibilities and contingency actions to be implemented, if necessary, at the property;
- A description of management practices for potential impacted groundwater or storm water (i.e. groundwater/stormwater contact with known contaminated soils during excavation) that requires treatment or disposal;

- Hazard recognition procedures when working with impacted media; and
- Hazard response procedures, if needed, when working with impacted media.

2.1 Contractor Notification

Contractors anticipated to be working at the property should review the site information provided in this Plan and associated reports and make their own professional opinions on proper procedures in compliance with regulations.

2.2 Worker Education and Safety

This plan provides contractors information for use in complying with employer obligations such as employee right-to-know, worker safety, and other regulatory programs. It provides general guidelines for reducing potential exposures of workers to environmental media having chemical impact.

This plan serves as an educational document for contractors and site workers involved with management of environmental media on the property. It is intended to draw awareness to the concept and value of media management and to provide contractors with knowledge of the potential contaminants of concern at the property, derived from information gathered during previous environmental investigations.

This plan is not intended for direct, unmodified use by employers to protect workers. Rather, it intends to provide general information and considerations for forming professional opinions and modification and incorporation by employers into their existing worker safety programs. Each employer is responsible for the health and safety of its own workers. This plan may be used by contractors to support employee right-to-know for workers performing excavation or other activities that disturb impacted media on the site.

2.3 Hazard Recognition

A key element of this plan is to inform and educate contractors and their site workers to be alert for new or undiscovered conditions that could potentially pose chemical risk. The plan provides a process for qualitatively and quantitatively identifying whether the changed condition presents a potential hazard condition different from conditions evaluated.

2.4 Media Management

This Plan provides procedures for contractors to control soil or groundwater suspected to contain residual contaminants. Soils with concentrations below Statewide Standards[1] and Tier 1 Values[2] may exhibit staining or odors but may not require special management. Statewide Standards and

[1] *Iowa Administrative Code (IAC) 567 Chapter 137.5*
[2] *IAC 567 Chapter 135.9(1)*

Tier 1 Values were developed by the Iowa Department of Natural Resources (IDNR) to represent concentrations of contaminants in respective environmental media at which normal exposure is considered unlikely to pose a threat to human health or the environment. Residual contaminant concentrations above these standards do not necessarily represent a hazard to workers or site occupants.

The IDNR regulates handling and disposal of environmental media with contaminant concentrations above the Statewide Standards or Tier 1 Values. Until suspect media can be tested for comparison to Statewide Standards and Tier 1 Values, contractors should prudently implement containment and control of removed media or materials.

3.0 PREVIOUS ENVIRONMENTAL ASSESSMENTS

Terracon's Phase II ESA dated January 14, 202 was conducted at the site to examine the potential for contaminated soils and/or groundwater commonly associated with the identified RECs from Terracon's Phase I ESA dated July 21, 2021. Contaminants of concern included volatile organic hydrocarbons (VOCs), RCRA 8[3] metals, and Total Extractable Hydrocarbons (TEH). The analytical results were compared to the IDNR SWS for soil and groundwater. Based on the Phase II ESA, soils were found to be impacted with lead at concentrations that exceed IDNR SWS for soil.

Concentrations of arsenic in soil exceeded the IDNR SWS; however, the concentrations are within the natural occurring range typically present in Iowa soils[4] and do not represent a suspect release to the site. Concentrations of RCRA 8 metals in filtered groundwater samples were below IDNR SWS for groundwater. Total Arsenic, barium, chromium, and lead were present in unfiltered groundwater at concentrations likely representative of natural occurring sediments in the groundwater.

4.0 SITE CONTAMINANTS

Near surface soils are known to be impacted with lead at concentrations exceeding the Iowa SWS.

Note: Arsenic was present in soils at concentrations exceeding IDNR SWS; however, the concentration is within the natural range typically encountered in Iowa soils and is not suspect evidence of a release and/or contamination.

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[3] *Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver)*

[4] *The Iowa Statewide Trace Element Soil sampling Project: Design and Implementation, R. Rowden, June 2010, Smith, D.B., Cannon, W.F., Woodruff, L.G., Solano, Federico, Kilburn, J.E., and Fey, D.L., 2013, Geochemical and mineralogical data for soils of the conterminous United States: U.S. Geological Survey Data Series 801, 19 p., http://pubs.usgs.gov/ds/801/.*

Dissolved concentrations of RCRA metals in groundwater did not exceed IDNR SWS. Total arsenic, barium, chromium, and lead were present in unfiltered groundwater, which is likely representative of natural sediments in the groundwater.

The known soil contaminants discussed above do not include complete delineation and characterization of site contaminants. Although not encountered while conducting the LSI, other potential contaminants such as other VOCs, other RCRA 8 metals, and/or petroleum compounds could have impacted soils onsite in other areas not yet defined. If elevated concentrations of these or other contaminants are encountered during property redevelopment, further testing may be warranted to determine potential exposure risk to construction workers or future site occupants. Copies of available toxicological data fact sheets for known site contaminants are provided in **Appendix B**.

5.0 HAZARD ASSESSMENT

The contaminant compounds listed in Table 1 above are the known contaminants of concern identified during a previous environmental investigation at the property. Disturbance of soil could potentially expose personnel to these compounds and/or additional constituents not yet identified.

Workers should understand that smell/odor is an ineffective indicator of "contamination." It is common for soils that have residual contamination, particularly diesel fuel, to exhibit odors without exceeding SWSs or Tier 1 Values for nonresidential, commercial uses. For example, the odor threshold of diesel fuel can be as low as 0.11 ppm in air (MFA Oil Material Safety Data Sheet, Diesel Fuel No. 2, 2005), hundreds of times lower than the equivalent 'safe' concentration in soils. Alternatively, certain types of contaminants at concentrations above acceptable risk thresholds do not emit significant odors.

At a minimum, prior to excavation activities at the site, the contractor should develop a safety plan to address possible worker exposure to contaminants of concern from soil and/or groundwater (if groundwater is suspect to be impacted such as by contact with contaminated soil) at the site. The safety plan should be implemented consistent with OSHA regulations (29 CFR 1910 and 1926), state, and local regulations.

5.1 Chemical Acute/Chronic (cumulative) Exposure Risk

Humans are exposed to thousands of natural and man-made chemical compounds every day. Chemical compounds are in the water we drink, the air we breathe, and in the materials and equipment we use daily. Excess chemical risk requires a chemical of sufficient toxicity, exposure to a sufficient amount over a sufficient time-period, and a complete exposure pathway for the exposure to produce excess, or unacceptable, chemical risk to the public. The following **Figure** 1 depicts this concept.

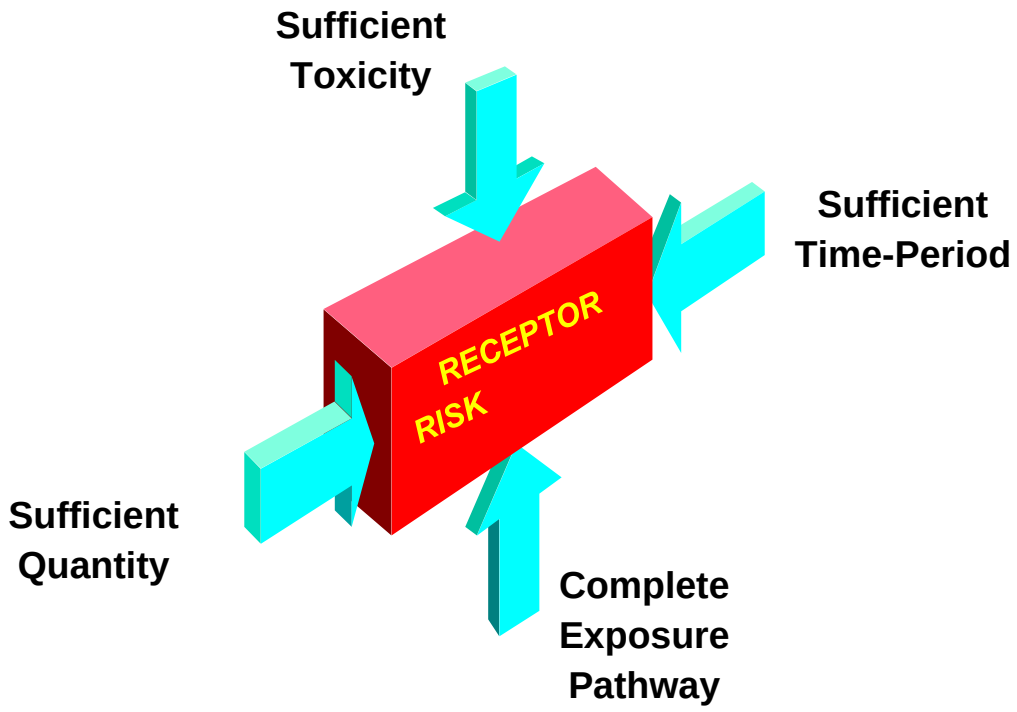


Figure 1 Concept of Risk

5.2 Chemical Toxicity

When the amount of material helps (as in the case of medicine) or does not harm the body, a condition of acceptable chemical risk exists. When a chemical exceeds the amount where it can begin to do harm immediately or over a long period, a condition of unacceptable risk is felt to exist. It is at this point of unacceptable risk where a chemical becomes harmful or toxic. A chemical becomes toxic when the amount of material which enters the body begins to produce harm. If the harm is realized in a relatively short period (minutes, days or weeks), the material is said to have an acute toxicity. If harm is realized over a relatively long period (years, decades or a person's lifetime), the material has a chronic toxicity. For example, consider a chemical used as a pain killer in medicine.

- In proper doses and short periods of exposure, the chemical has a beneficial medicinal effect.
- Used improperly in small doses over time (addiction), the chemical has a negative chronic effect.
- Used improperly in large doses (overdose), the chemical has a negative acute effect.

The IDNR does not make its own studies to determine a chemical's toxicity. The IDNR relies on the same chemistry and toxicity studies conducted by the Environmental Protection Agency (EPA) to set national levels of protection for our air and drinking water.

The Iowa regulatory programs must determine a level of target risk that is acceptable. In Iowa, the target risk for a chemical is to produce cancer effects at less than five additional cancer occurrences in one million, or 5-in-1,000,000. In comparison, workplace standards to protect workers from chemical exposure are often calculated using 1-in-10,000 risk levels. For chemicals which might produce other non-cancer health effects, the level is calculated to be protective of no ill effect over an average person's lifetime.

5.3 Exposure

Exposure is the manner in which a chemical encounters the body. Exposure consists of three basic parts:

- The physical material, or media, that carries the chemical to the body. For the property, this was determined to be soils with chemical impact above objectives;
- The period of time, or duration, that the body occupies the property impacted by the chemical. Under IDNR programs, this assumes 30 years residential occupancy at a site, 25 years for commercial occupancy, and 1 year for construction worker occupancy; and,
- The number of times, or frequency, that the contact and chemical delivery might occur during occupancy. Under IDNR programs, exposure frequency is assumed to occur 350 days per year for residential occupants, 250 days per year for commercial occupants, and 30 days per year for construction workers. A day is considered 24 hours.

In comparing to the objectives, it was assumed that the person is theoretically exposed to the mean amount of chemical measured at the property. Chemical measurements at the property were typically less than the maximum used for comparison.

5.4 Completing Exposure Pathways

An exposure pathway is the physical manner in which the chemical moves from its source to enter the body to do harm. An exposure pathway for this property would be complete if the environmental media with chemical impact is made available to a person or if there is a likelihood in the future that this condition could occur. Basic considerations in determining pathway completions for the property were:

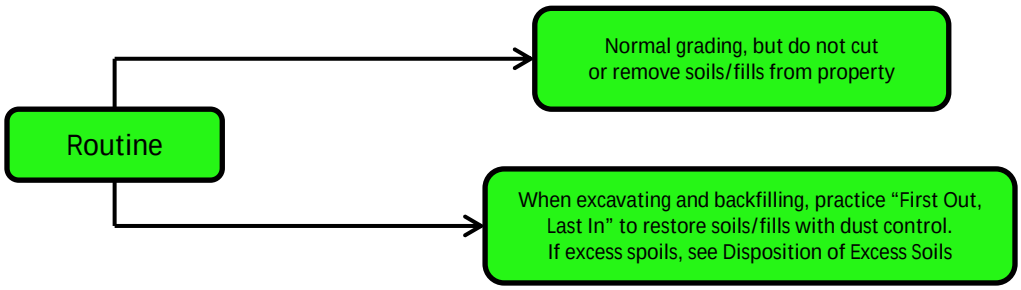
- Soils with chemical impact could be present for exposure to contractors and site workers disturbing materials, although individual exposures will likely be less than the 30 days per year, 24 hours per day assumed for the pathway;
- The analysis presented in this plan is based upon data obtained from the previously referenced environmental assessments and from other information discussed herein. This plan does not reflect any variations in subsurface stratigraphy that may occur between sample locations or across the property. Actual subsurface conditions and contaminant concentrations may vary. The extent of such variations may not become evident without additional exploration.

6.0 CONTAMINANT EXPOSURE PRECAUTIONS

This plan recognizes that site construction or maintenance activities may disturb impacted media at the property and that unplanned or as yet unknown activities might expose workers to the chemicals identified in soils and/or in groundwater (if groundwater is suspected to be impacted such as by contact with known lead-impacted shallow soils). The plan will advise contractors and site workers of the precautionary measures for minimizing potential exposures while operating on-site, and for recognizing and addressing potential new discoveries at the property.

6.1 Routine Control

Incidental disturbance of soils should be avoided. Earthwork and trenching should be planned to minimize disturbance of soils from original locations and original elevations. Where excavations are advanced to facilitate construction, the contractor should minimize the time excavations remain uncompleted to reduce potential exposure. The contractors and site workers must have a physical method of measuring and monitoring horizontal and vertical control when disturbing soils on the property to maintain the current conditions.



During routine operations involving soils at the property, contractor and site workers should use normal construction safety apparel of their respective contractor's safety program, augmented with gloves and rubberized safety footwear or safety footwear with disposable latex covers to reduce soil contact in areas of enhanced awareness.

For work beyond routine operations, a site health and safety plan should be developed. The contractor may contact the environmental engineer for assistance if their firm does not have the necessary resources or training to complete a site-specific health and safety plan under 29 CFR 1910.

6.2 Dust Control Measures

Dust control measures should be employed at the property to achieve no visible emissions. Personnel operating mobile equipment should be instructed to drive slowly to reduce dust generation. Low tipping of excavated loads and covering of soil stockpiles should be implemented to limit the generation of visible airborne dust. Use of a water spray unit to dampen surface

materials should be considered if visible dust is generated during excavation and soil movement. Workers should avoid over-spraying the area to prevent runoff and muddy work surfaces.

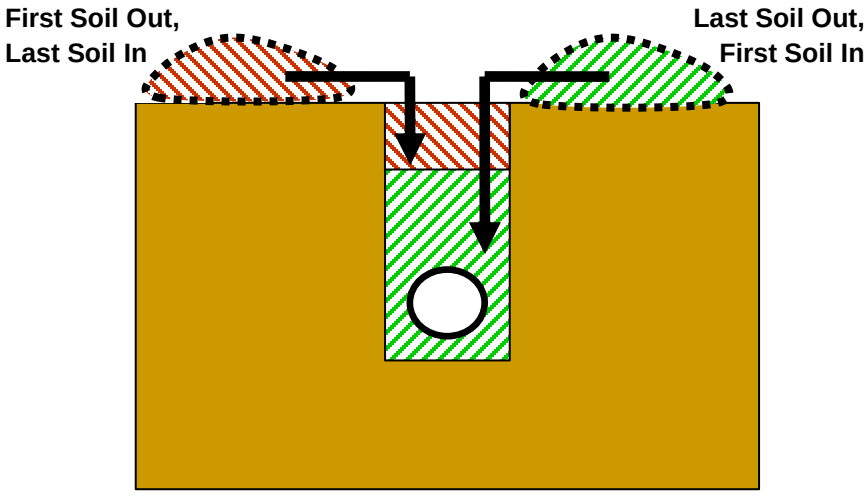
6.3 Surface Grading

When working at existing grades, workers should minimize the movement of surface soils from their original location to other areas of the property. In areas of enhanced awareness, contractors and site workers should plan their work to account for minimal soil movement and to adapt types and application of grading equipment to this end.

Surface disturbances such as rutting should be repaired immediately by localized leveling. Contractors involved in grading should minimize leveling of the surface through "back-dragging" by earthmoving equipment until imported fills have been placed. The Plan recognizes that absolute restoration of materials to original locations is difficult. However, workers should attempt to restore soils to original conditions as is practical.

6.4 Underground Excavation and Trenching

Vertical control of soils is very important. The Plan recognizes the construction of utilities or other structures will disturb the vertical positions of soil. The general rule will be to remove and stockpile soils so that a "last out, first in" process occurs. For example, during excavation, soils in the upper three feet should be stockpiled to one side. These soils should be the last returned to the excavation during backfill. Similarly, soils removed from below three feet should be replaced first.



Concerns and methods for environmental handling of soils do not preclude or modify any of the OSHA safety requirements for worker safety incumbent upon contractors for regular site safety and trenching/excavation activities. The OSHA safety requirements will dictate adjustment of the soil management method where necessary.

Installation of utilities or structures may displace soil volume in these zones, resulting in excess soils as excavation spoils. Excess spoils from excavations not needed on the property will require special handling and disposal. See discussion in **Section 9.0** - Disposition of Excess Soils.

6.5 Waste Minimization

To the extent practical, measures should be taken to minimize the volume of excess soils, to limit the need for dewatering activities, and to prevent contact between storm water and impacted soils. Excavations should be backfilled promptly to minimize exposure. The size or length of excavations should be controlled to allow for proper completion of immediately pending activities but should not be left open for extended periods with little or no activity.

Excavation areas should be protected from storm water run-on by constructing soil berms or other diversionary structures on the upslope side of the area to direct water away from exposed soils and into proper storm water conveyance structures. If necessary, storm water detention areas can be constructed to allow for collection and transfer of un-impacted storm water by pumping or other means around excavation areas.

7.0 PERSONAL PROTECTION

7.1 Skin Protection

Contractors are responsible for completing a site health and safety plan under 29 CFR 1910 identifying and providing appropriate personal protective equipment for their employees working at the property. At a minimum, it is recommended that personnel begin project activity in the following work attire.

- Standard work uniform
- Safety footwear or safety footwear with disposable latex covers
- Hard hat
- Cotton lined impermeable gloves of nitrile rubber or PVC

In order to minimize the potential for carrying contaminated soils off the property that could later be accidentally ingested by site workers or family members, especially children, it is suggested that clothing soiled on site be changed at the property or removed and laundered as soon as possible following each work day. Do not wear clothing soiled on the property for other projects until it has been laundered. Soiled clothing should be laundered separately from other articles of clothing.

7.2 Personal Hygiene

Site personnel are advised to use good personal hygiene practices during activities that disturb impacted media at the property. Work gloves as outlined above should be worn, and hands, face,

and forearms should be washed with soap and water prior to eating, drinking, smoking, or using restroom facilities. Contractors and site workers should avoid chewing gum and tobacco, and refrain from any other behavior that could increase the possibility of hand-to-mouth transfer of potentially contaminated media. No eating, drinking, or smoking should take place in areas where construction or maintenance activities could expose impacted material.

7.3 Decontamination

Contractors should use brushes, shovels, etc. to conduct gross soil removal from equipment used to excavate or move apparently impacted soils at the property. Decontamination with a high-pressure washer is recommended for equipment that has contacted obviously impacted soil. Personnel decontamination should consist of thorough washing of hands, forearms and face before eating, drinking, or smoking. Gross soils should be removed from footwear before leaving the property. A full-body shower should be taken as soon as possible upon completion of the work shift.

8.0 CHANGED CONDITIONS

If chemical odors, stained or saturated soils, a sheen on water in excavations, or other evidence of potential chemical contamination is encountered during subsurface activities that has not been described in this document, contractors and site workers should contact their health and safety manager. Recommended procedures for management of changed conditions are described below.

The notifications for reporting discovery of contaminated soil or groundwater are as follows.

- Site Owner Representative: _____ (write in name)

  Cell #: _____

- General Contractor Superintendent: _____ (write in name)

  Cell #: _____

8.1 Isolate Suspect Soils

Contractors should upgrade normal construction safety attire with nitrile or chemical resistant gloves and provide sufficient open-air ventilation consistent with the employer's safety plan.

Contractors should be aware of the regulatory implications of improper management or disposal of contaminated soils. As previously stated, soil that exhibits concentrations above the most stringent (*e.g.*, for residential use, construction worker or consumption of groundwater) Tier 1 SROs, or whose headspace has measurable vapors above background (measured with a

photoionization detector, or PID), cannot be considered Clean Soil Fill and must be disposed of at an approved facility.

Suspect materials should be isolated as soon as possible from contact and disturbance by rain and wind until laboratory results may be evaluated. Suspect materials should be placed on and covered with plastic sheeting. The plastic sheeting should be weighted down with planks or sandbags. Until the suspect materials are covered, construction flagging attached to laths can be used to prevent accidental movement of the materials during earthwork operations.

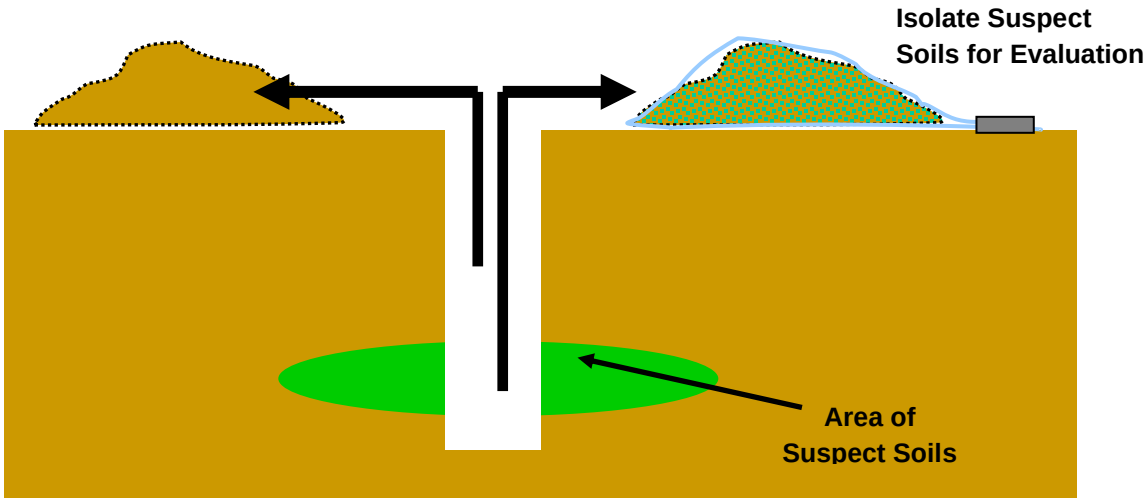


Figure 2 Isolation of Suspect Soils

8.2 Containerize Suspect Groundwater

Groundwater suspected of being contaminated (based on changed condition) and storm water that contacts contaminated soils should be collected and containerized in drums, totes, or frac tanks until laboratory analyses of the water can be completed. A subcontractor experienced in these activities is recommended. Discharge of contaminated groundwater and storm water to the ground or to surface waters will require IDNR approval and possibly other permits. Contractors should upgrade normal construction safety attire with rubber gloves and provide sufficient open-air ventilation consistent with their safety plan. See **Section 10.0** for additional details.

8.3 Measurement of Changed Condition

Upon discovery of a possible changed condition, it is necessary to make chemical measurements to determine if the materials pose a previously unidentified chemical risk. This requires laboratory chemical analyses, which takes time. The amount of time varies depending on the type of test. In general, the laboratory analysis can take on the order of 5-10 days unless special arrangements are made with the laboratory for more expensive “rush” results.

The number of samples to be submitted for chemical analyses is dependent on actual conditions and volumes encountered at the property. The analyses should be sufficient to evaluate potential

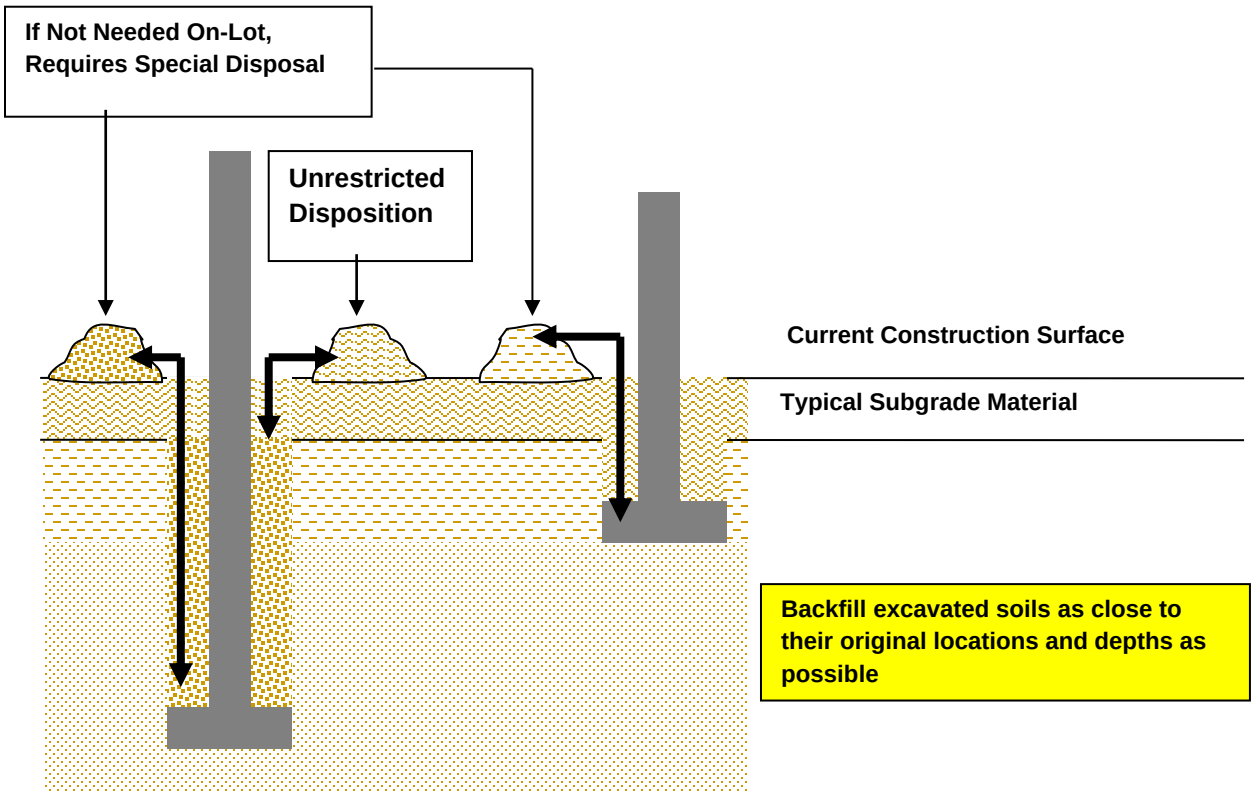
disposal options at permitted local and area landfills or water treatment facilities. Samples of excavated materials should be collected at a frequency adequate to achieve generally accepted regulatory practice.

Potentially impacted environmental media should be further isolated from worker and public exposure. Special handling and care must be taken in sampling and transporting soil and groundwater samples for the laboratory tests to be accurate. The workers in physical contact or breathing zone of apparently impacted environmental media should have Hazardous Waste Operations and Emergency Response training consistent with 29 OSHA 1910.120.

9.0 DISPOSITION OF EXCESS SOILS

Soils at the property may have varying degrees of chemical impact, ranging from no measurement to elevated concentrations of chemicals of concern. In these locations and at conditions of exposure evaluated by the previous environmental assessments these chemical impacts do not appear to pose excess health risk. If soils leave their original locations or the property, the onsite conditions that allow control of exposures and risk management may no longer apply. If excess materials are produced from an excavation as spoils that cannot be restored to original depths through the process of “first out, last in”, they must be handled with special care.

The contractor should plan from the onset of redevelopment activity to maintain physical segregation of materials by degrees of depth during the excavation activity. The contractor and site workers must exercise care in documenting and recording the location and original elevations of the source of materials relative to site benchmarks and the original property boundaries.



Excess materials produced by excavation and trenching that cannot be used on the property must be managed as discussed in the following sections.

9.1 Onsite Disposition

Excess materials generated as excavation spoils may require laboratory testing. If the laboratory testing indicates that chemicals are less than applicable IDNR SWS, the excess excavation spoils can be reincorporated into the project as fill material in landscaped areas or as engineered fill provided the material is determined to be suitable for reuse by the Geotechnical Engineer.

9.2 Confirmatory Chemical Analysis

Following selective excavation/removal of the soils, samples of any excess materials should be collected for laboratory chemical analyses. While the number of samples to be submitted for chemical analyses is dependent on actual conditions and volumes encountered at the property, analyses should be sufficient to evaluate potential disposal options at permitted local and area landfills. Samples of excavated materials should be collected at a frequency adequate to achieve generally accepted regulatory practice.

9.3 Off-Site Removal

Excess materials that are not eligible for onsite redistribution (environmentally or structurally) must be removed from the property in a manner consistent with general industry practices as discussed below. The contractor will transport the excess materials offsite to a permitted disposal facility if elevated concentrations of contaminants are observed or to a location selected by the contractor if no chemical impairment is observed. Uncontaminated excess materials proposed for offsite reuse must be handled and managed in accordance with Federal, State, and Local regulations.

Results of the previous environmental assessments indicate that some soils may exhibit detectable concentrations of contaminants that measure above IDNR standards. These materials may require removal from the property if the vertical control requirements, as discussed in **Section 6.4** and discussed above, cannot be met.

Upon receipt of chemical analyses and receipt of disposal authorization from an appropriately permitted landfill, arrangements for offsite transport and disposal of excavation spoils and excess soils will be coordinated with the appropriate contractor.

9.4 Capping Lead Impacted Areas

Should the developer or owner not choose to remediate (excavate & dispose) the area where lead was identified in shallow soil, capping would be recommended. Capping can include placement of a barrier (concrete or asphalt) over the area of concern. An alternative to concrete or asphalt would be a minimum of two feet of clean overburden in areas that could be green space.

10.0 GROUNDWATER MANAGEMENT

Based on the typical construction practices, utility trenches or foundation excavations could encounter groundwater. Dewatering of excavations due to groundwater infiltration or storm water flow into open excavations should comply with the guidance provided. In this section of the plan, as well as the approved Stormwater Pollution Prevention Plan (SWPPP) for the project (if necessary), modifications to a generic SWPPP may be necessary to account for the diversion of stormwater from impacted environmental media. Construction activities should be sequenced to reduce the amount of excavation open at any given time to reduce the volume of water requiring management and disposal. Groundwater suspected to be impacted based on changed condition or contact with contaminated soils and/or stormwater coming in contact with contaminated soil should be managed as potentially contaminated water as discussed below.

Known concentrations of lead in soils could adversely impact groundwater and/or stormwater encountered within excavations. Groundwater or stormwater entering an excavation that requires

removal to facilitate construction and water generated during excavation dewatering should be pumped to a portable holding tank or to a municipal sanitary sewer system under the permit and requirements of the wastewater treatment provider.

If dewatering is pumped to a holding tank, the contents should be sampled and tested to determine if contaminants are present. Discharge of untested or untreated groundwater to the ground surface, storm sewer, or sanitary system is prohibited. Depending on the results of laboratory analysis, the accumulated water shall be either transported off site for disposal at a licensed facility, discharged to a municipal sanitary sewer system under the permit and requirements of the wastewater treatment provider, or discharged in accordance with applicable National Pollutant Discharge Elimination System (NPDES) and/or other federal, state, or local permit requirements.

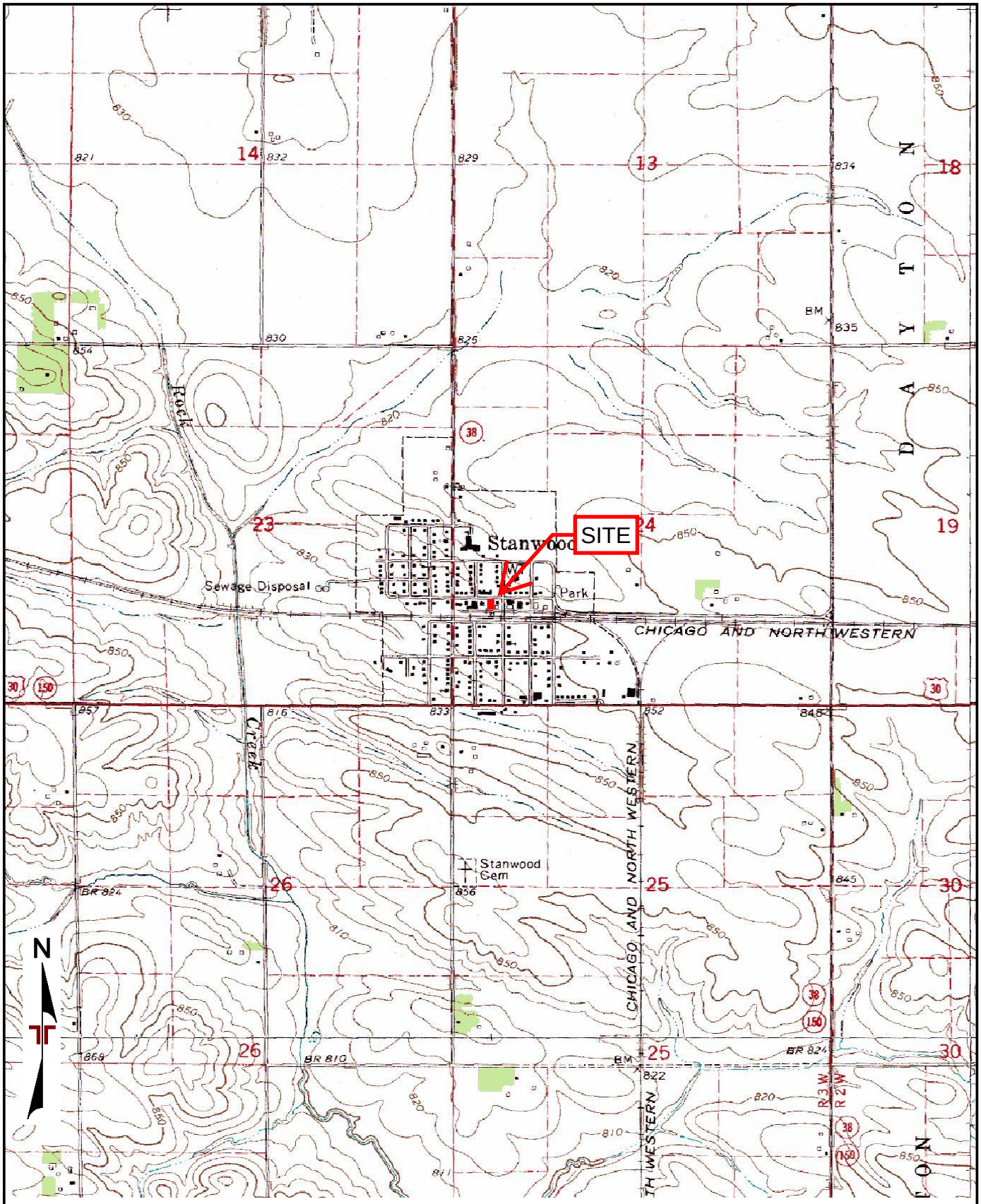
11.0 IMPORTED FILL

If imported fill from an off-site location(s) are to be used to backfill excavations or level the site, the material should be assessed for impacts. It is recommended that a historical records review be performed to identify potential chemicals of concern that may be associated with the off-site location(s). Terracon will recommend sampling of the material at its source based on the historical review. It is recommended that, at minimum, one sample be collected per 1,000 cubic yards of imported material regardless of source location. The samples, at minimum, should be analyzed for VOCs, PAHs, TEH, and RCRA Metals or other chemicals (based on the historical review) and compared to the SWS. If concentrations of the analyzed constituents are below the SWS, the soil would be considered suitable for clean fill.

12.0 SUMMARY

This document has been developed to inform contractors and site workers of the site environmental information. The concentrations of contaminants in environmental media pose a limited health hazard to construction personnel via inhalation of contaminated dust or vapors and the accidental ingestion and direct contact of soil or groundwater. The precautions included herein are intended to reduce the potential for adverse health effects to personnel excavating and managing environmental media at the property. This plan is intended to address the potential for health hazards due to exposure to contaminants previously identified in environmental media. **It is not intended as a comprehensive construction safety program**. Contractors should review the site information, make their own professional opinions to comply with required regulations, and are responsible for conducting site activities in accordance with federal, state and local environmental and safety regulations.

APPENDIX A
Exhibit 1 – Topographic Map
Exhibit 2 – Soil Contaminants of Concern



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: STANWOOD, IA (1/1/1965), CLARENCE, IA (1/1/1980), TIPTON WEST, IA (1/1/1965) and TIPTON EAST, IA (1/1/1953).

Project Manager: BML	Project No. 07207086	Terracon 870 40th Avenue Bettendorf, Iowa 52722-1607	TOPOGRAPHIC MAP Soil and Groundwater Management Plan ECIA Brownfields Assessment Services 211 and 213 East Broadway Street, Stanwood, Iowa	Exhibit 1
Drawn by: BJS	Scale: 1"=2,000'			
Checked by: BML				
Approved by: BML	Date: 2/2/2022			

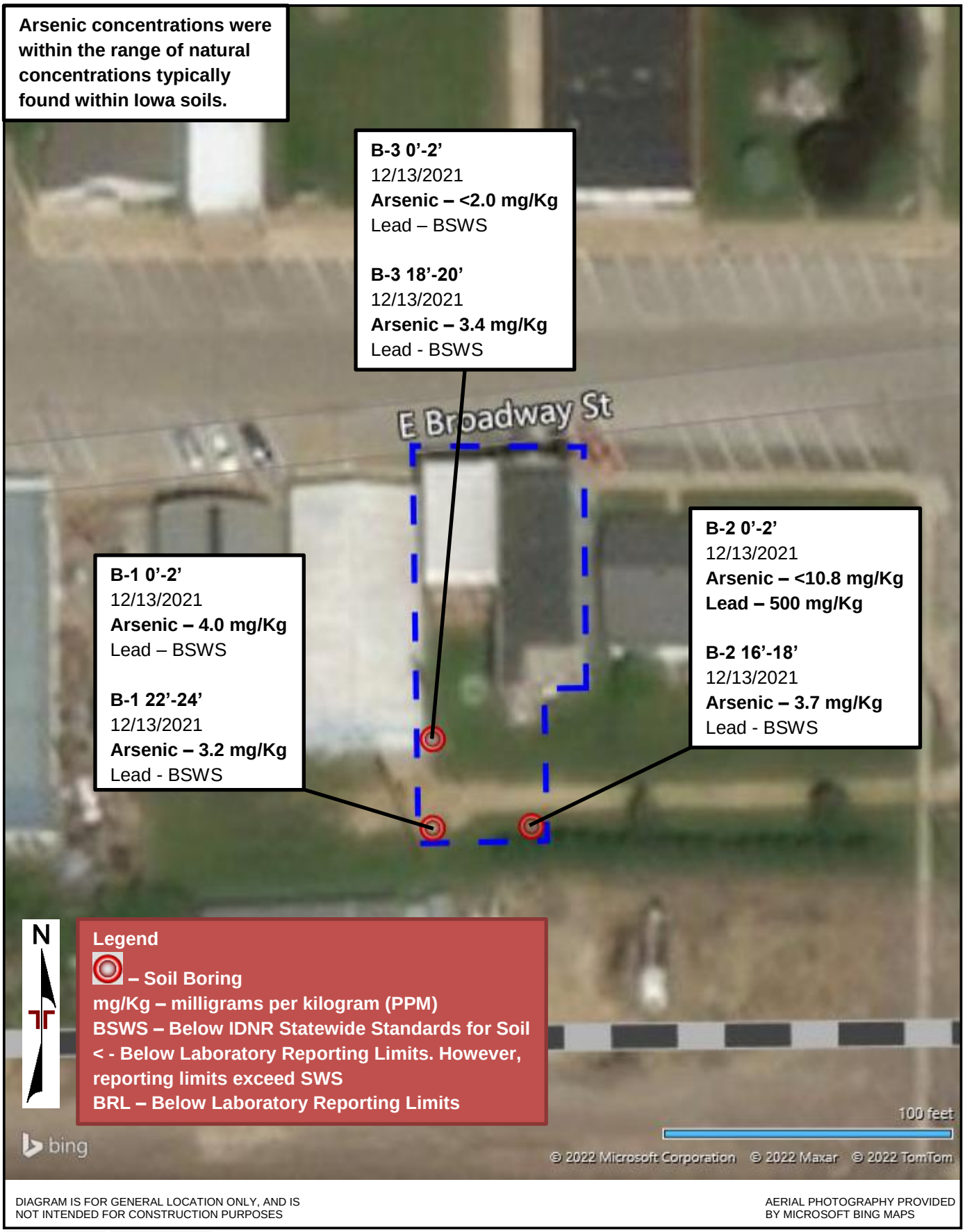


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: BML Drawn by: BJS Checked by: BML Approved by: BML	Project No. 07207086 Scale: AS SHOWN Date: 2/2/2022	Terracon 870 40th Ave Bettendorf, IA 52722-1607	Soil Contaminants of Concern Soil and Groundwater Management Plan ECIA Brownfields Assessment Services 211 and 213 East Broadway Street, Stanwood, Iowa	Exhibit 2

APPENDIX B
Toxicological Data Fact Sheets

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ARSENIC

CAS # 7440-38-2

Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

What happens to arsenic when it enters the environment?

❑ Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
❑ Arsenic cannot be destroyed in the environment. It can only change its form.
❑ Rain and snow remove arsenic dust particles from the air.
❑ Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
❑ Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

How might I be exposed to arsenic?

❑ Ingesting small amounts present in your food and water or breathing air containing arsenic.
❑ Breathing sawdust or burning smoke from wood treated with arsenic.
❑ Living in areas with unusually high natural levels of arsenic in rock.
❑ Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys

How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

How can families reduce the risks of exposure to arsenic?

❑ If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.

❑ If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

❑ If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10 $\mu g/m^3$) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

LEAD

CAS # 7439-92-1

Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about lead. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- ❏ Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- ❏ When lead is released to the air, it may travel long distances before settling to the ground.
- ❏ Once lead falls onto soil, it usually sticks to soil particles.
- ❏ Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- ❏ Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- ❏ Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- ❏ Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.
- ❏ Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services

(DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

❑ Avoid exposure to sources of lead.

❑ Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.

❑ If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.

❑ Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children

❑ If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (μg/dL). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a blood lead level of 10 μg/dL to be a level of concern for children.

EPA limits lead in drinking water to 15 μg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.