Analysis of Brownfield Cleanup Alternatives

211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337

May 17, 2022

Terracon Project No. 07207086; Task 20-3

Prepared for:
East Central Intergovernmental Association (E.C.I.A.) and
The City of Stanwood, Iowa

Prepared by:
Terracon Consultants, Inc.
Bettendorf, Iowa

May 17, 2022

East Central Iowa Intergovernmental Association (ECIA)
7600 Commerce Park
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Attn: Ms. Dawn Danielson
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E: ddanielson@ecia.org

Re: Analysis of Brownfield Cleanup Alternatives
211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337
Terracon Project No. 07207086; Task 20-3
Brownfields Assessment Grant: BF97782001

Dear Ms. Danielson:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached Analysis of Brownfield Cleanup Alternatives (ABCA) for the above referenced site to East Central Intergovernmental Association (ECIA). The attached ABCA was prepared under Brownfields Assessment Grant BF97782001 and in general accordance with the United States Environmental Protection Agency (USEPA or EPA) cooperative agreement awarded 9/18/2020 as grant Number: BF97782001; the ECIA Standard Consultant Contract f*or Qualified Environmental Professional (QEP)* dated December 3, 2020; Terracon's proposal dated January 21, 2022, and the ECIA Notice to Proceed dated January 19, 2022.

The purpose of this ABCA is to assess cleanup alternatives of known asbestos containing materials and asbestos contaminated debris identified during an asbestos survey conducted by Terracon in 2021. In addition, the ABCA covers soil exceeding the State of Iowa Statewide Standard for lead, as discovered in Terracon's Phase II Environmental Site Assessment.

Terracon appreciates the opportunity to provide this service to ECIA. If you have questions regarding this report, please contact Dennis at 319-366-8321.

Sincerely,
Terracon Consultants, Inc.

Eric W. Harris
Manager, Regional Services

Dennis R. Sensenbrenner, PG
Senior Associate/Project Reviewer

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Stanwood, Iowa
Cooperative Agreement No. # BF97782001
Terracon Project No. 07207086 T20-3

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1.0 INTRODUCTION

This Analysis of Brownfield Cleanup Alternatives (ABCA) is in support of evaluating cleanup alternatives and establishing the costs to support the cleanup necessary to support redevelopment of the properties at 211 and 213 Broadway Street, Stanwood, Cedar County, Iowa (the site). The City of Stanwood, Iowa (City) intended on removing the hazardous building materials from the site in support of their goal to renovate the current site structure and reuse as a commercial property; however, the buildings have become in significant disrepair and are no longer safe to enter. A topographic map with the general site location is provided as **Exhibit 1** located in **Appendix A**. A site diagram is provided as **Exhibit 2** located in **Appendix A**.

This ABCA is intended to briefly summarize information about the site and contamination issues, cleanup standards, applicable laws, cleanup alternatives considered, and the proposed cleanup, and includes information on the effectiveness, the ability of the grantee to implement each alternative, the cost of each proposed cleanup alternative, an evaluation of how commonly accepted climate change conditions might impact proposed cleanup alternatives, and an analysis of the reasonableness of the various cleanup alternatives considered, including the one chosen. The ABCA is intended as a brief preliminary document summarizing the larger and more detailed technical and financial evaluations performed in addressing each of these areas.

Cleanup alternatives were evaluated in accordance with EPA Region 7 protocols and general guidance required prior to implementation of a cleanup design using EPA Brownfields Grant funding. More specifically, this ABCA summarizes viable cleanup alternatives based on site-specific conditions, technical feasibility, resiliency to climate change conditions, and preliminary cost/benefit analyses. Specific cleanup alternatives and associated recommendations are presented in the applicable sections of this report.

1.1 Background

The site is an approximate 0.12-acre property that includes two commercial parcels located at 211 and 213 Broadway Street, Stanwood, Cedar County, Iowa (Cedar County Parcel No. 0460-02-24-308-007 and 0460-02-24-308-008). The property is improved with two conjoined 2-story commercial structures with a combined size of approximately 5,900 square feet. The site was first developed in the 1910s and was utilized as a City Hall/Fire Department and a Confectionary (candy store). The site was utilized for various commercial purposes between the 1930s until at least 2016. From June 2016 to April 2020, the site was utilized as an insurance office and apartments. The City of Stanwood acquired the property in 2020. The site is currently unoccupied.

1.2 Site Assessment History

1.2.1 Phase I Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) was conducted at the site in March 2021 in accordance with ASTM E1527-13 to identify recognized environmental conditions associated with the property. The following recognized environmental conditions were identified during the Phase I ESA.

- A former oil and coal storage and containment area abutted the site to the south along the adjoining railway during the 1910s. The time span that the area served as an oil and coal storage area is unknown.
- According to Terracon's records review, the property located at 209 Broadway Street, adjoining the west property boundary, was identified on the Underground Storage Tanks (UST) databases. The facility had former a 500-gallon UST installed in 1967 and was removed in 1987. In April of 1988, two soil samples were collected from the approximate former UST location. Analytical results of soil samples did not indicate the presence of contaminants of concern at concentration exceeding IDNR Statewide standards, However, confirmatory groundwater samples were not documented; therefore, a potential release to groundwater from the former UST could have adversely impacted the site.

1.2.2 Asbestos Survey

In conjunction with the Phase I ESA, Terracon completed an Asbestos Survey on the site. Laboratory analysis of bulk samples confirmed the presence of asbestos in samples collected from the structures. Based on the results of the asbestos sampling, the following asbestos containing materials (ACMs) were identified:

- Roof flashing – black, gray, and white coating (3% Chrysotile) Located on building 213 roof, south end flashing
- Build-up roof – black, gray with brown fibrous insulation (8-10%Chrysotile) Located on building 213 roof
- Build-up roof – black, gray, and white tar coating (3% Chrysotile) Located on Building 211 roof
- Window glazing – white (3% Chrysotile) Located on the exterior of the building on older windows
- Window caulk – white (3% Chrysotile) Located on the exterior of the building around older window openings
- Vinyl sheet flooring – brown and tan (25% Chrysotile) Located in building 211 north end apartment kitchen
- Vinyl sheet flooring – brown square pattern (25% Chrysotile) Located in building 211 South end apartment kitchen

- Vinyl sheet flooring – off-white/gray squared pattern (20% Chrysotile) Located in 213 north end apartment bathroom
- Terrazzo flooring (3% Chrysotile) Located in building 213 1st floor pathways
- Vinyl sheet flooring – off-white/gray with streaks (20% Chrysotile) Located in 211 1st floor office on east side of building in bathroom
- Vinyl sheet flooring – yellow, pebble pattern (20% Chrysotile) Located in 211 1st floor office on west side of building in bathroom and middle room

Confirmed ACM identified during the asbestos survey is presented in **Table 1** located in **Appendix B**. A copy of the Asbestos Sampling Survey Report; dated July 22, 2021; is provided in **Appendix C**.

The ACM is considered regulated asbestos containing materials (RACM) and, in accordance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 Code of Federal Regulations (CFR) Part 61, Subpart M, must be removed by a licensed asbestos abatement contractor prior to or in coordination with demolition of the buildings and disposed at an approved landfill. RACM includes friable ACM and non-friable ACM that will be or has been subjected to sanding, grinding, cutting abrading or has crumbled, pulverized or reduced to power in the course of demolition or renovation. The Survey Report, dated July 22, 2021, recommended that that identified ACMs be managed by an Iowa licensed asbestos abatement contractor prior to demolition of the structure. Preparation of an asbestos removal work plan was also recommended.

1.2.3 Phase II Environmental Site Assessment

The Phase II Environmental Site Assessment (the Phase II ESA) was completed in accordance the EPA approved Property Specific Sampling and Analysis Plan (PSAP) dated September 29, 2021 and the Generic Quality Assurance Project Plan (QAPP), dated April 7, 2021. The objective of the Phase II Environmental Site Assessment is to determine whether petroleum contaminated soil and/or groundwater are of concern for the site in regard to potential human or environment exposure and/or specific waste handling and disposal needs during redevelopment activities.

Contaminants of concern in soil samples collected that exceed the Iowa Department of Natural Resources (IDNR)statewide standards (SWS) were for the metals lead and arsenic. Therefore, soil and groundwater data collected represent the following exposure concerns:

1. Occupant dermal/ingestion exposure (surface contamination)
2. Contractor dermal/ingestion exposure (during excavation)
3. Groundwater ingestion exposure based on total metals analysis only

Copies of the Phase I ESA and Phase II ESA reports were provided to the IDNR for review and comment regarding the need for additional investigation. Per a letter from the IDNR; dated

January 27, 2022; the known concentrations of lead and arsenic at the property represent a low risk regarding potential adverse impact to the environment or public health. The IDNR deferred the need for additional environmental assessment. A copy of the Phase II ESA report dated January 14, 2022 is provided as **Appendix D**. A copy of the IDNR letter dated January 27, 2022 is provided as **Appendix E**.

1.2.4 Structural Assessment

The Terracon team had requested the services of Select Structural Engineering to inspect and report on the structural condition of the buildings. As presented in their letter dated January 14, 2022, Select Structural Engineering determined that "The condition of the building is rapidly deteriorating and is currently uninhabitable. The roof is no longer watertight which has caused the roof trusses to rot. With that, the roof structure is not safe to walk on and it is dangerous to be under for risk of collapse. Similarly, the water infiltration into the structure causing the floor trusses to rot and the floor system to become unstable. Nobody should walk on the upstairs floor as a failure of the floor sheathing and floor framing is possible if not imminent." and "Due to these considerations, it is not possible to deconstruct the structure with people inside without presenting safety hazards to those individuals. The deconstruction process will have to be performed from the exterior of the building and therefore the brick and other materials cannot be salvage." Therefore, the building is not safe to enter.

A copy of the letter from Select Structural Engineering dated January 14, 2022 is provided as **Appendix F**.

1.3 Summary of Hazardous Substances for Remedy

Regulated hazardous substances for remedy are asbestos containing building materials (ACBMs)/RACM and lead in soil.

Asbestos

Asbestos is the name given to a group of six different fibrous minerals that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building, friction products, heat-resistant fabrics, packaging, gaskets, and coatings. Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products. Asbestos fibers do not evaporate into air or dissolve in water. Small diameter fibers and particles may remain suspended in air for a long time and be carried long distances by wind or water before settling down. Larger diameter fibers and particles tend to settle more quickly. Asbestos fibers are not able to move through soil. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods. Exposure to asbestos usually occurs by breathing contaminated air in workplaces that make or use asbestos. Asbestos is also found in the air of buildings containing asbestos that are being torn down or renovated. Asbestos exposure can cause serious lung problems and cancer. Detailed asbestos information from the Agency for Toxic Substance and Disease Registry's ToxFAQ™ is included in **Appendix G**.

Lead

Lead is a toxic metal historically used in fossil fuels, used in metal alloys, and used as a component in various manufactured goods. Exposure to lead can through inhalation, ingestion, or direct dermal contact. Lead exposure can cause anemia, damage to the central nervous system, kidneys, other health concerns. Detailed lead information from the Agency for Toxic Substance and Disease Registry's ToxFAQ™ is included in **Appendix G**.

2.0 PROJECT GOAL AND RE-USE PLAN

The City owns the site and has the intention of redeveloping the site as an addition to their existing facilities as part of the revitalization of the downtown area of the City. The plan for the site is to demolish and renovate the existing property and reuse as a commercial property.

EPA brownfield cleanup funding will be used for ACM planning concerning the site structure prior to demolitions using other funding sources. This allows immediate and definitive resolution of the public health issue, while final develop plans can then proceed on a schedule that time and resources allow without worry or expense of maintaining and isolating damaged materials from public exposure. EPA funds will be used to complete a RACM demolition at this site to allow for potential future development.

3.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

3.1 Cleanup Responsibility

The city of Stanwood will be the cooperative agreement recipient responsible for hiring contractors. The City will use a qualified Environmental Professional to assist with contracting documents, cleanup contractor oversight and final documentation. The cleanup will be conducted by an asbestos abatement contractor licensed in the State of Iowa. A demolition permit will be obtained from the Iowa Workforce Development (IWD) and local agencies. Applicable documentation will be submitted as required to the IWD.

3.2 Cleanup Standards

Asbestos

The asbestos NESHAP (40 CFR Part 61, Subpart M) regulates asbestos fiber emissions and asbestos waste disposal practices. It also requires the identification and classification of existing building materials prior to demolition or renovation activity. Under NESHAP, asbestos-containing building materials are classified as either friable, Category I non-friable, or Category II non-friable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I non-friable ACM includes packing materials, gaskets, resilient floor coverings and asphalt roofing products containing more than 1 percent (%) asbestos. Category II nonfriable ACM are nonfriable materials other than Category I nonfriable materials that contain more than 1% asbestos.

Regulated ACM (RACM) must be removed before renovation or demolition activities that will disturb the materials. RACM includes:

- Friable ACM;
- Category I nonfriable ACM that has become friable or will be subjected to drilling, sanding, grinding, cutting, or abrading; and
- Category II nonfriable ACM that could be crumbled, pulverized, or reduced to powder during renovation or demolition activities.

In Iowa, asbestos activities are regulated by the IDNR and IWD, Division of Labor. IDNR regulates asbestos fiber emissions under Iowa Administrative Code 567 Chapter 23 (IAC 567-23) and asbestos-containing waste disposal under IAC 567-109. IWD regulates occupational exposure to asbestos under IAC 875-10 and asbestos removal and encapsulation activities under IAC 875-155.

IAC 875-155 Asbestos Removal and Encapsulation requires that any asbestos-related activity conducted in a public building be performed by personnel licensed or permitted by the IWD. The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities.

Removal of RACM must be conducted by an Iowa-permitted asbestos abatement contractor. An IDW-licensed Project Designer should prepare a written abatement design for each abatement project involving the removal of RACM. The IDW asbestos regulations can be found at https://www.iowadivisionoflabor.gov/asbestos-licenses.

The asbestos standard for construction (29 CFR 1926.1101) established by the Occupational Safety and Health Administration (OSHA) requires that employee exposure to airborne asbestos fibers be maintained below the permissible exposure limits (PEL). The occupational exposure limits are as follows:

- Asbestos Excursion Limit (excursion limit of 30 minutes): 1.0 f/cc (fibers per cubic centimeter as detected using phase contrast microscopy).
- Asbestos PEL (8-hour time-weighted average permissible exposure level): 0.1 f/cc.

The OSHA standard classifies construction and maintenance activities that could disturb ACM and specifies work practices and precautions that employers must follow when engaging in each class of regulated work. The OSHA asbestos standards may be found at http://www.osha.gov.

Lead

The Iowa Land Recycling Program (LRP) is a voluntary, risk-based cleanup program for properties with environmental impacts. The LRP is designed to meet the dual objectives of addressing contaminated sites and promoting the redevelopment of these sites. The primary means of meeting these objectives are by encouraging voluntary participation to address contamination by establishing a set of risk-based response action standards, and by providing a measure of liability protection to participants and future property owners. Iowa has finalized a MOA with the EPA. Under the MOA, the EPA agrees not to act at sites enrolled in the LRP.

For lead in soil, the IDNR has established a statewide standard of 400 mg/kg and a non-residential, site-specific standard of 1,100 mg/kg for soil less than two feet in depth. For non-residential site-specific standards for soil deeper than two feet and residential site-specific standards for soil deeper than ten feet, the IDNR standard is based on EPA's Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil.

IAC 875-10 adopts the OSHA lead standard for construction (29 CFR 1926.62) by reference. The OSHA standard does not define the amount of lead in materials, and it applies to all construction work where an employee may be occupationally exposed to lead. All work related to construction, alteration, or repair (including painting and decorating) is included. The standard applies to any detectable concentration of lead in paint, as even small concentrations of lead can result in unacceptable employee exposures depending upon on the method of removal and other workplace conditions. Under this standard, construction includes, but is not limited to, the following:

- Demolition or salvage of structures where lead or materials containing lead are present
- Removal or encapsulation of materials containing lead
- New construction, alteration, repair, or renovation of structures, substrates, or portions containing lead, or materials containing lead
- Installation of products containing lead
- Lead contamination/emergency clean-up
- Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed
- Maintenance operations associated with construction activities described above

Employers must assure that no employee will be exposed to lead at concentrations greater than the PEL of 50 μg/m^3 averaged over an eight-hour period without adequate protection. The OSHA standard also establishes an AL of 30 μg/m^3, which if exceeded, triggers certain requirements, including periodic exposure monitoring and medical monitoring.

3.3 Laws & Regulations Applicable to the Cleanup

Applicable asbestos related rules/regulations generally include, but are not limited to the following:

1. Federal Requirements: Federal requirements that govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

   A. U.S. Department of Labor, OSHA:

      - Asbestos – 29 CFR 1910.1001 (general industry) and 1926.1101 (construction).
      - Respiratory protection – 29 CFR 1910.134.
      - Specifications for accident prevention signs and tags – 29 CFR 1910.145.
      - Medical and first aid – 29 CFR 1910.151.
      - Access to employee exposure and medical records – 29 CFR 1910.1020.
      - Hazard Communication – 29 CFR 1910.1200.
      - Construction industry standards – 29 CFR 1926.

   B. USEPA:

      - Asbestos – 40 CFR 763, Subpart E–Asbestos-Containing Materials in Schools.
      - National Emission Standards for Hazardous Air Pollutants (NESHAP) – 40 CFR 61, Subpart A–General Provisions.

- NESHAP – 40 CFR 61, Subpart M–National Emission Standard for Asbestos.
- The Clean Water Act - National Pollutant Discharge Elimination System (NPDES)

C. U.S. Department of Transportation 49 CFR 171-180

- Part 171 – Hazardous Substances
- Part 172 – Hazardous Materials Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans
- Part 173 – Shippers – General Requirements for Shipments and Packaging's

2. Applicable Iowa state regulations, Iowa Administrative Code (IAC): All state requirements that govern asbestos abatement work or hauling and disposal of asbestos waste materials shall apply.

   A. IAC 567-23 – Asbestos Fiber Emissions

   B. IAC 567-109 – Asbestos-Containing Waste Disposal

   C. IAC 875-10 – Occupational Exposure to Asbestos

   D. IAC 875-155 – Asbestos Removal and Encapsulation Activities

3. Other considerations for asbestos abatement projects:

- Preparation of abatement specifications by an IWD licensed Project Designer, when required.
- The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities. Removal of RACM must be conducted by an Iowa-permitted asbestos abatement contractor.
- Submittals and associated reviews.
- Conduct asbestos abatement oversight and complete asbestos monitoring, as required.
- Preparation of an asbestos abatement and air monitoring report at the conclusion of the project.

The user of this document must understand the limited applicability of the standards adopted under the authority of the LRP. The standards were developed within the narrow focus and constraints of the LRP. While the standards are based on a consideration of risk, they are different from other "risk-based" approaches.

The LRP does not contain standards that are established based on the migration of contaminants from one medium to another, which then becomes the basis for subsequent exposure. This does not mean the IDNR has no concern for these cross-media transfers. IDNR chooses to address

them through direct measurement of the medium in which the exposure takes place or through the calculation of such cross-media transfer standards only when it is determined that such an approach is appropriate in a site-specific context. The intent is to avoid the application of needlessly restrictive standards to situations where they are not a relevant concern. Implicit in the final application of the standards is IDNR concurrence that the standards applied in any given situation address all exposure pathways that are deemed to be of concern. This can only take place when the IDNR is adequately informed of the particulars of a situation. Without IDNR concurrence there should be no presumption that a standard is sufficiently protective or that it will meet the requirements of the LRP.

Most of the standards entail very specific exposure assumptions. Site-specific standards assume that institutional controls will be put in place in order to preserve those exposure assumptions (e.g., a prohibition of residential use or well installation). Implicit in the use of such standards is the assumption that the IDNR has evaluated the exposure assumptions, along with necessary institutional controls, and determined that they are appropriate to the situation.

As a result of the integral role of IDNR in determining and approving the appropriate use of the standards, they should not routinely be used for purposes outside of the LRP, including screening to determine whether a situation is a significant problem or whether it is reportable. Exceptions to this are the statewide standards for a Protected Groundwater Source. These standards may be used in lieu of action levels set by 567 IAC Chapter 133: Rules for Determining Cleanup Actions and Responsible Parties. This does not prevent IDNR from making use of the standards outside of the LRP when applicable and appropriate to projects under their supervision.

4.0 EVALUATION OF CLEANUP ALTERNATIVES

Lead in soil and asbestos are considered hazardous substances relative to cleanup grant funding. EPA proposal guidance requires the ABCA, at a minimum, to consider two different cleanup remedies and a “no action” alternative. Asbestos and lead mitigation in the environmental industry is an established practice. Due to their chemical and physical nature, both lead and asbestos can, generally speaking, only be managed. Unlike organic chemical contamination, it cannot be readily altered or broken down. The industry has historically evolved two basic approaches: removal with off-site management and in-place isolation and on-site management.

In addition to effectiveness, Implementability, and cost considerations, consideration was given to the sustainability of cleanup alternatives in regard to current and future climate change concerns. According to the National Oceanic and Atmospheric Administration’s (NOAA) National Climate Assessment, the primary climate change conditions identified for the southeast region include increased weather activity. Increased weather activity has been identified as site-specific climate change considerations and the resiliency of each cleanup alternative will be evaluated against these considerations.

4.1 RACM Cleanup Alternatives Considered

To address RACM at the Site, three different alternatives were considered. These alternatives are outlined below. The following subsections present each alternative in greater detail, including estimated costs and potential contingency items:

- Cleanup Alternative A: Pre-Demolition RACM Removal
- Cleanup Alternative B: RACM Disposal Post-Demolition (demolish in place)
- Cleanup Alternative C: No Action

4.1.1 RACM Cleanup Alternative A: Pre-Demolition RACM Removal

Cleanup Alternative A includes conventional removal/abatement of ACMs using standard industry practices. Asbestos abatement must be performed by an Iowa-licensed abatement contractor. The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities.

Regulated areas would be established prior to the removal of ACBMs, utilizing a variety of controls such as polyethylene sheeting to establish primary and secondary barriers, negative pressure systems/containments, and/or other applicable measures to prevent asbestos fiber migration beyond the regulated area(s). Abatement procedures require that ACBMs be adequately wetted to control potential spreading of damaged or friable asbestos and airborne particulates. The work would also require decontamination facilities for both abatement workers and for equipment/materials. To aid in the remedial efforts, debris, particulates, and other residual materials would be vacuumed with a high efficiency particulate air (HEPA) units.

Waste would be containerized in air and leak tight containers to contain ACM in manageable quantities and would be kept adequately wet until final disposal. Waste would be labeled with appropriate OSHA warning labels, Class 9 labels and generator information and disposed in a landfill permitted to accept RACM waste. Landfill disposal authorizations would be secured prior to initiating the work.

An air monitoring program will be recommended for removal of RACM. Final clearance would be granted following a visual inspection of the work area followed by receipt of acceptable phase contrast microscopy (PCM) air sampling in accordance with National institute for Occupational Safety and Health (NIOSH) 7400 methodology.

Effectiveness – Including Climate Change Considerations

The ACM is permanently removed. This approach is technically effective as a definitive and direct physical elimination of the contaminants that produce unacceptable public risk. The remedy usually does not significantly alter structural conditions due to typical ACM uses. Demolition restrictions would not remain following demonstration of clearance criteria. Excluding clearance sampling, follow-up inspections and maintenance will not be required. With removal and off-site disposal of contaminants, the approach requires no special post-remedy institutional or land use controls for the property.

Potential disadvantages: Disadvantages are minimum; however, errors during the abatement could potentially release asbestos fibers to the environment. This option creates a waste generation stream and associated liabilities for the generator/owner. The structural stability of the buildings can limit safe building access to abate all necessary materials.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damaged from storms). Removal of all ACM reduces the potential for environmental contamination.

Implementability

This alternative is technically achievable in safe structures. However, this structure has been deemed unsafe by a structural engineer. Special approaches would be required shoring, bracing, etc. to complete what would normally be considered a mature remedy, common in the remediation industry. The approach requires specialized equipment readily available in the local demolition and engineering markets. A specialized labor force exists in Iowa to accomplish the remedy. The implementation period is shorter-term and can be conducted during any time of the year.

Cost

Due to the assessment of the structural engineer, pre-demolition RACM removal is not a feasible alternative; therefore, costs are not provided.

4.1.2 RACM Cleanup Alternative B: RACM Demolition

Cleanup Alternative B involves demolition of structures with RACM left in place. Structure debris would be disposed of in a regulated landfill generally similar to Alternative A. In accordance with the asbestos NESHAP, demolition, handling, loading and transportation will require materials to be adequately wet and contained. For this alternative, all structure debris will be treated as RACM and must be handled and disposed according to all federal, state, and local regulations.

This approach hinges on structures being unsafe to the extent that the abatement contractor could not safely implement Cleanup Alternative A. This approach will require special approval by the governing regulatory agencies. RACM demolition must be performed by an Iowa licensed

abatement contractor. This approach, if approved by the regulatory agencies, has the positive aspect of accelerating the period of abatement, demolition, and disposal.

Adversely, this approach requires special approval by regulatory agencies having control that will be made on a project-specific basis, lengthening the process of abating community risk. The potential for public airborne exposure increases as demolition occurs as the ability to control airborne asbestos becomes limited to the adequacy of wetting procedures. This approach greatly increases the volume of material that must be handled as ACM, thereby taking greater volume from existing capacity of regional landfills. This option also creates a waste generation stream and associated liabilities for the generator.

Effectiveness – Including Climate Change Considerations

The ACM is permanently removed. This approach is technically effective as a definitive and direct physical elimination of the contaminants available to public exposures. Follow-up inspections and maintenance will not be required. With removal and off-site disposal of contaminants, the approach requires no special post-remedy institutional or land use controls for the property.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damage from storms) and result in the building collapse. Removal of all ACM reduces the potential for environmental contamination.

Implementability

This alternative is technically achievable although it does require a work practice variance from various regulatory agencies. It is a mature approach common in the remediation industry. The approach requires specialized equipment readily available in the local demolition and engineering markets. A specialized labor force exists in Iowa to accomplish the remedy. The implementation period is medium-term because it requires all demolition waste to be managed as asbestos-containing or asbestos-contaminated. This option can be conducted during all periods of weather.

Cost

The onsite structures are approximately 5,900 square feet; an estimated 1,000 cubic yards of total debris[1] would be generated as part of the demolition. This material would have to be considered RACM for disposal. Using $125/cubic yard disposal cost of RACM material, the disposal cost would be approximately $125,000 (based on Terracon's experience). Including the additional costs for labor, equipment, professional environmental consulting services increases the total cost ranging from approximately $150,000 to $200,000. Additionally, in order to perform this task, the contractor would be required to obtain and maintain approval of a work practice variance from the regulatory agencies having control for this option. Comparatively, this alternative can be cost-

[1] Debris Estimating Field Guide - FEMA 329, September 2010. Federal Emergency Management Agency, Department of Homeland Security.

prohibitive and may not be approved by IWD/IDNR. However, a licensed engineered in the State of Iowa has concluded the building is unsafe to enter for regular abatement practices.

4.1.3 RACM Cleanup Alternative C: No Action

The "no action" scenario is required by the EPA ABCA process. This alternative is to not address contaminants and trust that exposures as airborne particulate/fibers or dust through further weathering and degradation of the structure does not make contaminants available for human exposure by inhalation.

Effectiveness

This alternative is deemed ineffective and unacceptable for continued Brownfield redevelopment for this Site because:

- It is likely to be considered unacceptable to the community because citizens, nearby workers and construction workers could unknowingly be placed at risk in the future. No-action provides neither remedy nor preventive value to site conditions or in support of improved public health.

- This approach is unacceptable technically in that the microscopic asbestos fibers are known human carcinogens and provide no readily discernable exposure warning mechanism such as odor or other sensory identification. Without an expensive and long-term outdoor air/dust sampling program, there is no ability to identify if and when residual contaminants may be available for exposure.

- The continued presence of ACM in the building would continue to pose a long-term health risk to the public and also to workers entering the building. The No Action Alternative would make no progress toward achieving the goals of reduction of health risks to the surrounding public and facilitating the demolition of the building for redevelopment.

Implementability

By its definition, taking no action precludes a discussion of implementation. The structure would be left in the unused state in which it currently exists. The identified ACM would still pose a hazard to those entering the building and asbestos fibers and lead dust would continue to be released to ambient air. The value of the building would continue to decrease due to deterioration.

Cost

By its definition, taking no action precludes a discussion of cost to implement. This cleanup alternative would not include any specific efforts to remove or maintain ACM in place. There would be no direct cleanup costs associated with this alterative. Further, this alternative may later result in demolition complications, delays, and increased demolition costs due to ACM remaining

within the structures. Direct costs associated with the No Action Alternative and associated non-use of the building would consist of providing site security.

Expanded costs could occur if fugitive asbestos is released during future storms or weathering of damaged structures that might result in secondary deposition and contamination of soils. This would impair re-use and value of surrounding property adjacent to the structure.

4.1.4 Cost Comparison of Alternatives for RACM

The table below presents a summary of the estimated costs for all alternatives under consideration. There would be no capital cost if the site were to remain as an unused, vacant building.

ALTERNATIVE	CAPITAL COST	ANNUAL COST
A – Pre-Demolition ACM Removal	N/A*	N/A
B – RACM Demolition	$150,000 to $200,000†	N/A
C – No Action	$0	$4,000‡

* - Costs would be considered prohibitive compared to RACM demolition removal.
† - Estimate includes costs for demolition due to the nature of the alternative (total removal).
‡ - Includes costs for annual re-inspection of ACMs to document current condition.

4.2 Lead in Soil Cleanup Alternatives Considered

To address hazardous substances at the Site specific to lead in soil, three different alternatives were considered. These alternatives are outlined below. The following subsections present each alternative in greater detail, including estimated costs and potential contingency items:

- Cleanup Alternative A: Excavation and Removal
- Cleanup Alternative B: Environmental Covenant and Engineered Cap
- Cleanup Alternative C: No Action

Should the site be entered into the Land Recycling Program and remain commercial, the concentrations of lead measure in soil meet the commercial standard for the state of Iowa.

4.2.1 Lead Cleanup Alternative A: Excavation and Removal

Alternative A includes conventional excavation removal using standard industry practices. The Remedial area would be contained prior to the removal using barriers and dust suppression to control dust beyond the work zone. Remedial activities would be to dig out the affected area and utilized practices to control airborne particulates. During and following the excavation, dust particulates and other residual materials would be controlled by low dumping/placing materials in truck and utilization of dust control practices (wetting and covering of dump trucks).

Effectiveness – Including Climate Change Considerations

The lead in soil is permanently removed. This approach is technically effective as a definitive and direct physical elimination of the contaminants that produce unacceptable public risk. The remedy usually does not significantly alter structural conditions due to the shallow depths needed to meet remedial goals. Excluding clearance sampling, follow-up inspections and maintenance will not be required. With removal and off-site disposal of contaminants, the approach requires no special post-remedy institutional or land use controls for the property.

Potential disadvantages: Disadvantages are minimum; however, errors during the removal could potentially release lead dust to the environment. This option creates a waste generation stream and associated liabilities for the generator.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damaged from storms). Removal of the lead in soil reduces the potential for environmental contamination that could be encountered during rebuilding and possible utility improvements/work.

Implementability

This alternative is technically achievable. No special approaches would be required to complete what would normally be considered a mature remedy, common in the remediation industry. The approach requires specialized equipment readily available in the local demolition and engineering markets. A specialized labor force exists in Iowa to accomplish the remedy. The implementation period is shorter-term and can be conducted during any time of the year.

Cost

Based upon Terracon's experience with similar projects, the estimated cost to remove the lead in soil area from the Site is approximately $71,000 including planning, special waste permits, excavation and disposal, post excavation testing, and professional management.

4.2.2 Lead Cleanup Alternative B: Environmental Covenant and Engineered Cap

Alternative B includes placing an environmental covenant (EC) on the site using standard industry practices. The EC area would be identified and surveyed. An engineered cap (concrete/asphalt, or two feet of clean cap material) would be placed over the affected area. In addition, a Soil and Groundwater Management Plan would be included with the EC to educate workers and the public on protective soil management practices of the impaired material.

Effectiveness – Including Climate Change Considerations

The lead in soil would be protected against public exposure and identified on the Title to the property. This approach is technically effective as a definitive and direct physical elimination of the contaminants that produce unacceptable public risk. The remedy usually does not alter

structural conditions and is attached to the property deed to meet remedial goals. Follow-up inspections and maintenance will be required to maintain the cap. This remedy requires institutional or land use controls for the property.

Potential disadvantages: Disadvantages are minimal; This option creates a need for long term maintenance of the cap.

The site-specific climate change conditions identified include increased weather activity which could affect building integrity (damaged from storms). Removal of the lead in soil reduces the potential for environmental contamination.

Implementability

This alternative is technically achievable. No special approaches would be required to complete what would normally be considered a mature remedy, common in the remediation industry. The approach does not require specialized equipment. A specialized labor force exists in Iowa to accomplish the remedy. The implementation period is shorter-term and can be conducted during any time of the year.

Cost

Based upon Terracon's experience with similar projects, the estimated cost to cap the lead in soil area on the Site, execute the Soil Management Plan (Appendix H), and implement an environmental covenant is approximately $7,500 for the EC (would include drafting the covenant and filing with the respective county). Based on the area where the lead impacted soil resides, capping can be incorporated into the general redevelopment of the site and would not have a direct remedial cost. Estimated concrete cap would be on the order of $59,500. Should the site not be redeveloped and covered with two feet of clean fill (no concrete) the estimated costs would be on the order of $17,150. Capping estimated fees do not include the cost to draft and file the environmental covenant, itemized separately above.

4.2.3 Lead Cleanup Alternative C: No Action

The "no action" scenario is required by the EPA ABCA process. This alternative is to not address contaminants and trust that exposures as airborne particulate/fibers or dust through further weathering and degradation of the structure does not make contaminants available for human exposure by inhalation.

Effectiveness

This alternative is deemed ineffective and unacceptable for continued Brownfield redevelopment for this Site because:

- It is likely to be considered unacceptable to the community because citizens, nearby workers and construction workers could unknowingly be placed at risk in the future. No-action provides neither remedy nor preventive value to site conditions or in support of improved public health.
- The continued presence of lead in soil would continue to pose a potential long-term health risk to the public and also to workers that may perform excavation work in the area. The No Action Alternative would make no progress toward achieving the goals of reduction of health risks to the surrounding public and facilitating the demolition of the building for redevelopment.

Implementability

By its definition, taking no action precludes a discussion of implementation. The structure would be left in the unused state in which it currently exists. The identified ACM would still pose a hazard to those entering the building and asbestos fibers and lead dust would continue to be released to ambient air. The value of the building would continue to decrease due to deterioration.

Cost

By its definition, taking no action precludes a discussion of cost to implement. This cleanup alternative would not include any specific efforts to remove or maintain ACM in place. There would be no direct cleanup costs associated with this alterative. Further, this alternative may later result in demolition complications, delays and increased demolition costs due to ACM remaining within the structures. Direct costs associated with the No Action Alternative and associated non-use of the building would consist of providing site security.

Expanded costs could occur if fugitive asbestos is released during future storms or weathering of damaged structures that might result in secondary deposition and contamination of soils. This would impair re-use and value of surrounding property adjacent to the structure.

4.2.4 Cost Comparison of Alternatives for Lead

The table below presents a summary of the estimated costs for all alternatives under consideration. There would be no capital cost if the site were to remain as unused.

ALTERNATIVE	CAPITAL COST	ANNUAL COST
A – Excavation and Removal	$71,000*	N/A
B – Environmental Covenant and Engineered Cap	EC - $7,500	Normal Grounds Maintenance; Soil Management Plan
	Concrete Cap - $59,500†	
	Soil Cap - $17,150††	
C – No Action	$0	$0

* - Estimate includes excavating and landfill disposal of 415 tons of impacted soil; disposal; backfilling; and Excavation report.

† - Estimate includes placement of 3,750 square feet of 6 inch thick concrete over the lead impacted area. The concrete cover will likely be installed as part of the redevelopment project regardless of environmental conditions at the site.

† † - Estimate includes placement of two feet of clean cap material only.

5.0 RECOMMENDED CLEANUP ALTERNATIVE

The recommended asbestos cleanup approach is Alternative B: RACM Demolition. Alternative B: Environmental Covenant and Engineered Cap is also recommended for the lead in soil. These alternatives would address exposure risks using a proven approach consistent with recognized industry standards while at the same time easily garnering regulatory approvals. These options would remain comparably cost-effective based on current building structural integrity when compared to almost all abatement scenarios and building conditions.

RACM removal would not require the need for subsequent inspections, maintenance and/or regulatory oversight. This alternative addresses ACM liabilities, potential contaminant sources or potential limitations to future land use and brownfields redevelopment potential consistent with the City's goals and re-use planning. Additionally, it would eliminate the hazard for impending building collapse, due to ongoing decay, and potential for damage to adjoining building structures.

The EC and capping would require regular grounds maintenance programs typical for commercial properties.

A copy of the Soil and Groundwater Management Plan is provided as **Appendix H**.

6.0 GREEN REMEDIATION TECHNIQUES

Strategies for green remediation rely on sustainable development whereby environmental protection does not preclude economic development, and economic development is ecologically viable today and in the long run. Potential green remediation techniques take into account sustainability along the categories of the built environment; water, ecosystems and agriculture; energy and environment; and materials and toxics.

Terracon's approach to green remediation has considered best management plans (BMPs) which helps to accelerate the pace of environmental protection in accordance with EPA's strategic plan for improving environmental performance of business sectors. Green remediation builds on environmentally conscious practices already used across business and public sectors, as fostered by the EPA's Sectors Program, and promotes incorporation of state-of-the-art methods. The following represent BMPs and how they will be applied for the project:

- Conserving water by applying minimal amounts of water, as practical, for dust/particulate control,
- Improving water quality by removal or capping of lead in soil to reduce the threat of lead in soil leaching to groundwater,
- Stormwater pollution prevention plan (SWPPP) will be used to control sediment/pollutant runoff during remedial activities,

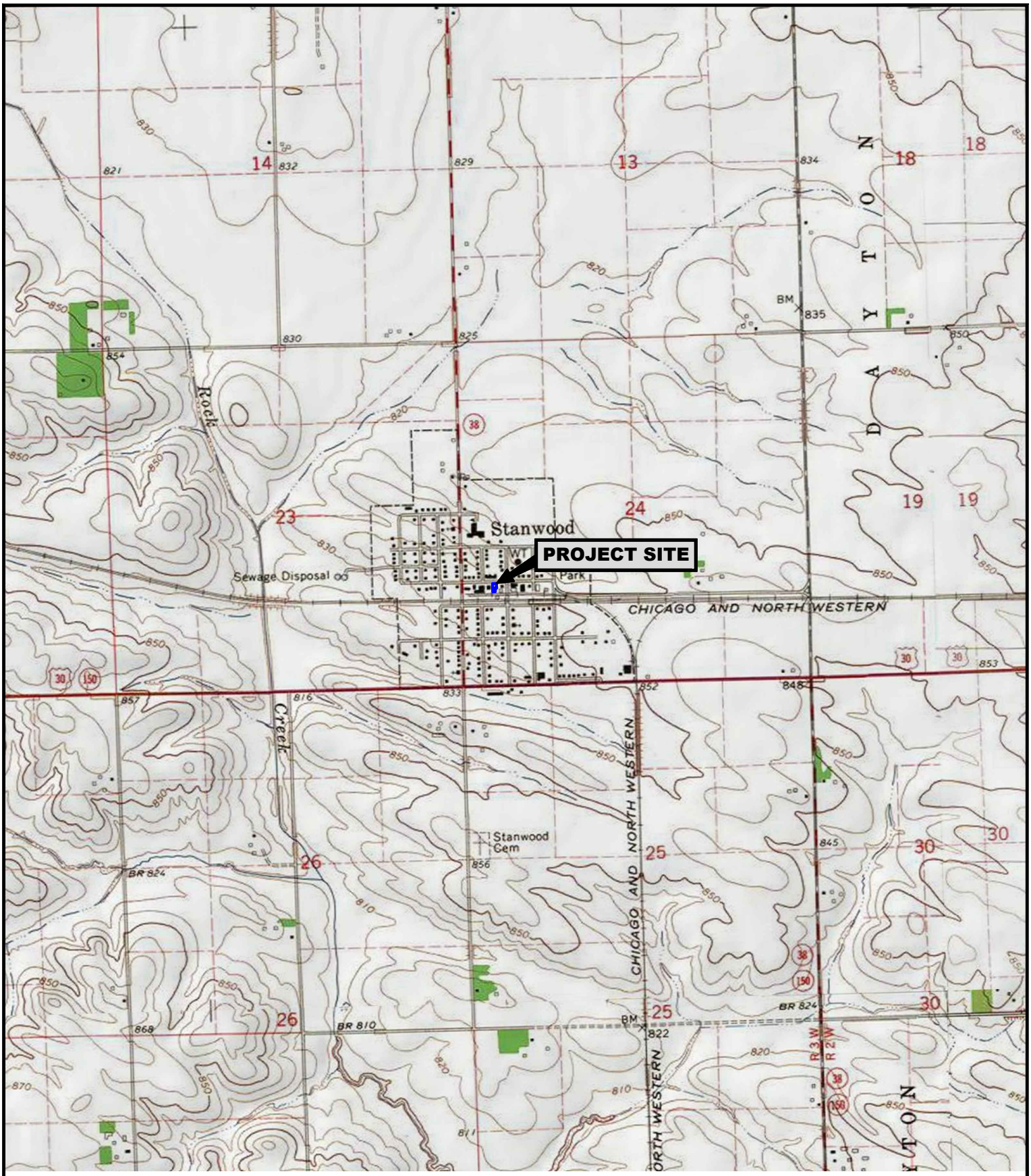
- Managing and minimizing toxics as presented in the ACM RACM Cleanup Plan and SGMP,
- Managing and minimizing waste as presented in the ACM RACM Cleanup Plan and SGMP, and
- Reducing emission of criteria air pollutants and greenhouse gases (GHGs) (U.S. EPA National Center for Environmental Innovation, 2006) as presented in the ACM RACM Cleanup Plan and SGMP.

The ACM RACM Cleanup Plan and SGMP present the best BMPs for managing water use during remedial efforts; control of fugitive particulates, toxins, dust; runoff, and controlling soil leaching to groundwater for protecting surface and groundwater quality.

The remedial approaches for this project are well established and Terracon has incorporated BMPs within the proposed Plans. The approaches are protective of the environment and public.

APPENDIX A

EXHIBITS



TOPO IMAGE FROM ARCGIS MAP SERVER
http://services.arcgisonline.com/ArcGIS/services

LEGEND

- BOUNDARY OF ASSESSED AREA

NORTH

0 2000'

APPROXIMATE DRAWING SCALE

Project No.	07207086
Date:	3/24/2021
Project Mngr:	JFC
Drawn By:	JAL
File Name:	07207086-01.dwg
Layout Name:	E1

Terracon
Consulting Engineers and Scientists
870 40TH AVENUE BETTENDORF, IOWA 52722
PH. (563) 355-0702 FAX. (563) 355-4789

TOPOGRAPHIC SITE MAP

211 & 213 EAST BROADWAY STREET
STANWOOD, CEDAR COUNTY, IOWA

EXHIBIT

1

AERIAL PHOTO FROM GOOGLE EARTH

LEGEND

- BOUNDARY OF ASSESSED AREA

NORTH

0 200'

APPROXIMATE DRAWING SCALE

Project No.	07207086
Date:	3/24/2021
Project Mngr:	JFC
Drawn By:	JAL
File Name:	07207086-01.dwg
Layout Name:	E2

Terracon
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SITE DIAGRAM

211 & 213 EAST BROADWAY STREET
STANWOOD, CEDAR COUNTY, IOWA

EXHIBIT

2

APPENDIX B

TABLE

Table 1. Confirmed Asbestos-Containing Materials by Homogeneous Area (HA)

HA #	HA Material Description	HA Material Location	Percent/Type Asbestos	Friability	Condition	Estimated Quantity (LF)
1	Roof flashing – black, gray, and white coating	Building 213 roof, south end flashing	3% chrysotile	Non-friable	Significant damage	120 LF
2	Build-up roof – black, gray with brown fibrous insulation	Building 213 roof, south end, near roof edge	8-10% chrysotile	Non-friable	Significant damage	900 SF
2	Build-up roof – black, gray, and white tar coating	Building 211 roof, south end, near roof edge	3% chrysotile	Non-friable	Significant damage	750 SF
3	Window glazing - white	Around the building	3% chrysotile	Friable	Damaged	7 Units
4	Window caulk - white	Around original window openings	3% chrysotile	Friable	Damaged	200 LF
8	Vinyl sheet flooring – brown and tan	Building 211 kitchen, north end apartment	25% chrysotile	Non-friable	Good	70 SF
9	Vinyl sheet flooring – brown square pattern	Building 211 kitchen, north end apartment	25% chrysotile	Non-friable	Good	70 SF
13	Vinyl sheet flooring – off-white/gray squared pattern	Bathroom of apartment 213, 2nd floor	20% chrysotile	Non-friable	Good	70 SF
15	Terrazzo flooring	Building 213, 1st floor paths	3% chrysotile	Non-friable	Good	525 SF
18	Vinyl sheet flooring – off-white/gray with streaks	Building 211, 1st floor bathroom, east side	20% chrysotile	Non-friable	Good	32 SF
21	Vinyl sheet flooring – yellow, pebble pattern	Building 211, west side, middle of 1st floor	20% chrysotile	Non-friable	Good	140 SF

APPENDIX C

ASBESTOS SAMPLING SURVEY REPORT

Asbestos Sampling Survey Report

211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337

July 22, 2021

Terracon Project No. 07207086; Task 5

Prepared for:
East Central Intergovernmental Association (E.C.I.A.)
Dubuque, Iowa

Prepared by:
Terracon Consultants, Inc.
Bettendorf, Iowa

July 22, 2021

Ms. Dawn Danielson
East Central Iowa Intergovernmental Association
7600 Commerce Park
Dubuque, Iowa 52002-9673

Re: Asbestos Sampling Survey Report
211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337
Terracon Project No. 07207086; Task 5
Brownfields Assessment Grant: BF97782001

Dear Ms. Danielson:

Terracon Consultants, Inc. (Terracon) is pleased to submit the attached report for the above referenced site to East Central Iowa Intergovernmental Association (ECIA). The purpose of this report is to present the results of the asbestos sampling survey conducted on May 14 and 24, 2021. The assessment was conducted in accordance with the Standard Consultant Contract *For Qualified Environmental Professional (QEP) Consultant Contract, ECIA Brownfield Coalition* dated December 3, 2020, and the Notice to Proceed Asbestos Inspection on 211-213 Broadway, Stanwood, dated May 4, 2021. The survey was requested to identify asbestos-containing materials (ACMs) in the buildings located at 211 and 213 East Broadway Street Stanwood, Iowa.

Asbestos-containing materials (ACMs) were identified in the samples collected on May 14 and 24, 2021 from suspect ACMs associated with the above-referenced location. Please refer to the attached report for additional details.

Terracon appreciates the opportunity to provide this service to ECIA. If you have questions regarding this report, please contact the undersigned at 563-355-0702.

Sincerely,
Terracon Consultants, Inc.

Alexander J. Davis
Environmental Scientist

James R. Baxter
Environmental Group Manager

TABLE OF CONTENTS

ASBESTOS SAMPLING SURVEY REPORT
211 and 213 East Broadway Street
Cedar County, Stanwood, Iowa
Terracon Project No. 07217086; Task 5

July 22, 2021

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted an asbestos survey of the buildings located at 211 and 213 East Broadway Street, Stanwood, Cedar County, Iowa for East Central Iowa Intergovernmental Association (ECIA). The survey was conducted on May 14 and 24, in accordance with the Standard Consultant Contract *For Qualified Environmental Professional (QEP) Consultant Contract, ECIA Brownfield Coalition* (The Agreement) dated December 3, 2020, the Notice to Proceed Asbestos Inspection on 211-213 Broadway, Stanwood, dated May 4, 2021, the Generic Quality Assurance Project Plan (QAPP), dated April 7, 2021. We understand the survey was requested to identify asbestos-containing materials (ACMs) in advance of planned demolition of the buildings.

The purpose of this survey report is to present the findings for bulk samples of building materials collected at the site. The scope of Terracon's services for the survey included the following:

- Sampling of suspect asbestos-containing materials associated with the buildings; and
- Completion of this survey report.

Suspect ACM samples were collected in accordance with the sampling protocols outlined in US Environmental Protection Agency (USEPA) regulation 40 Code of Federal Regulations Part 763-Asbestos, Subpart E-Asbestos-Containing Materials in Schools (40 CFR 763; known as the Asbestos Hazard Emergency Response Act, [AHERA]) and Terracon's Sampling and Analysis Plan and delivered to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory for analysis by polarized light microscopy (PLM).

1.1 Project Objective

We understand this asbestos survey was requested to satisfy requirements of USEPA 40 CFR 61 Subpart M, the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), which applies to buildings or structures that are demolished or renovated.

1.2 Reliance

This report is for the exclusive use of ECIA for the project being discussed. Reliance by other parties on this report is prohibited without written authorization of Terracon and ECIA. Reliance on this report by ECIA and all authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, this report, and the Standard Consultant Contract. The limitations of liability defined in The Agreement is the aggregate limit of Terracon's liability to ECIA.

2.0 SITE DESCRIPTION

Terracon understands that the site consists of two structures, located at 211 and 213 East Broadway street in Stanwood, cedar county, Iowa. Based on information obtained from the cedar county assessor's office, the structures appear to have been constructed circa 1900 and are slated for demolition. Visual inspection shows structural damage to the south end of the building. The structures are 2-story buildings on a concrete slab the exterior of the buildings is brick and interior finishes of drywall, drop ceilings, terrazzo, carpet, floor tile, and vinyl sheet flooring.

3.0 FIELD ACTIVITIES

In accordance with the asbestos Sampling and Analysis Plan (SAP) dated April 12, 2021, the sampling was conducted by State of Iowa licensed asbestos inspectors Mr. Alexander J. Davis (license number 20-5247) on May 14, 2021 and Mr. Steven M. Mack (license number 21-5471) on May 21, 2021. Copies Mr. Davis' and Mr. Mack's asbestos inspector licenses are included in Appendix C.

3.1 Visual Assessment

Sampling activities were initiated with visual assessments at the station to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of materials that appear similar throughout in terms of color and texture with consideration given to the date of application. Components identified as fiberglass, glass, metal, rubber, or wood are not considered suspect ACM and therefore, were not sampled.

3.2 Physical Assessment

A physical assessment of each HA of suspect ACM was conducted to assess the friability and condition of the heater components. A friable material is defined by the USEPA as a material that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect components.

3.3 Sample Collection

Based on results of the visual assessment, bulk samples of suspect ACM were collected in general accordance with USEPA sampling protocols. Samples of the suspect components were collected from the building. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in unused, dedicated and disposable sealable bags; an indelible marker was used to record the unique sample identification code on each bag. Asbestos content of suspect ACM does not diminish, degrade, or alter as a result of sample collection, holding periods, and laboratory analysis. Therefore, preservation methods and hold time limits do not apply to quality assurance/quality control (QA/QC) measures of field and laboratory activities.

To improve representativeness of samples collected to the various homogeneous areas, Terracon collected a minimum of three samples of each homogeneous area. Asbestos content in some building materials may not be constant; therefore, variation in some building materials may not indicate inaccuracy. Terracon collected 72 bulk samples from 23 homogeneous areas of ACM associated with the buildings. A summary of suspect ACM samples collected during the survey and quantity of samples collected for each homogeneous area is included as **Table 3** in **Appendix A**.

3.4 Sample Analysis

The bulk samples collected were submitted under chain of custody to EMSL Analytical, Inc. (EMSL) of Cinnaminson, New Jersey, for analysis by PLM with dispersion staining techniques per USEPA's *Method for the Determination of Asbestos in Bulk Building Materials* (600/R-93/116). The percentage of asbestos, if present, was determined by microscopic visual estimation. EMSL is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), Accreditation No. 101048-0. EMSL personnel conducted laboratory data validation for precision and accuracy in accordance with their standard laboratory analytical procedures provided with the Generic QAPP dated April 7, 2021. Based on findings via PLM analysis, supplemental analysis (point counting or other similar process to improve data precision) was not warranted or recommended by the lab to determine whether samples collected and analyzed represent asbestos containing materials in accordance with 40 CFR Part 61 subpart M.

4.0 REGULATORY OVERVIEW

In Iowa, asbestos activities are regulated by the Iowa Department of Natural Resources (IDNR) and the Division of Labor, Iowa Workforce Development (IWD). IDNR regulates asbestos fiber emissions under Iowa Administrative Code 567 Chapter 23 (IAC 567-23) and asbestos-containing waste disposal under IAC 567-109. IWD regulates occupational exposure to asbestos under IAC 875-10 and asbestos removal and encapsulation activities under IAC 875-155.

IAC 567-23.1(3) adopts USEPA's asbestos NESHAP (40 CFR Part 61, Subpart M) by reference. Subpart M regulates asbestos fiber emissions and asbestos waste disposal practices. It also requires the identification and classification of existing materials prior to demolition or renovation activity. Under NESHAP, asbestos-containing building materials are classified as friable, Category I nonfriable, or Category II nonfriable ACM. Friable materials are those that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Category I nonfriable ACM includes packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos. Category II nonfriable ACM are any materials other than Category I materials that contain more than 1% asbestos.

Regulated ACM (RACM) must be removed before renovation or demolition activities that will disturb the materials. RACM includes:

- Friable ACM;
- Category I nonfriable ACM that has become friable or will be subjected to drilling, sanding, grinding, cutting, or abrading; and
- Category II nonfriable ACM that could be crumbled, pulverized, or reduced to powder during renovation or demolition activities.

The owner or operator must provide the IDNR and IWD with written notification of planned removal activities at least 10 working days prior to the commencement of asbestos abatement activities. Removal of RACM must be conducted by an Iowa-permitted asbestos abatement contractor.

IAC 875-155 Asbestos Removal and Encapsulation require that any asbestos-related activity conducted in a public building must be conducted by personnel licensed or permitted by the IWD. Inspections for ACM must be conducted by IWD-licensed inspectors. Asbestos abatement must be conducted by IWD-permitted asbestos abatement contractors. When an abatement project design is prepared, it must be prepared by an IWD-licensed project designer.

IAC 875-10 adopts the OSHA Asbestos Standard for construction (29 CFR 1926.1101) by reference. The OSHA standard requires that employee exposure to airborne asbestos fibers be maintained below the permissible exposure limits (PELs) of 0.1 asbestos fiber per cubic centimeter of air (0.1 f/cc) as an 8-hour time-weighted average (TWA) or 1.0 f/cc as a 30-minute excursion limit. The OSHA standard classifies construction and maintenance activities that could disturb ACM and specifies work practices and precautions that employers must follow when engaging in each class of regulated work.

5.0 FINDINGS

Laboratory analysis of bulk samples confirmed the presence of asbestos in samples collected on May 14 and 24, 2021. Based on the results of the asbestos sampling, the following ACMs were confirmed:

- Roof flashing – black, gray, and white coating (3% Chrysotile) Located on building 213 roof, south end flashing
- Build-up roof – black, gray with brown fibrous insulation (8-10%Chrysotile) Located on building 213 roof
- Build-up roof – black, gray, and white tar coating (3% Chrysotile) Located on Building 211 roof
- Window glazing – white (3% Chrysotile) Located on the exterior of the building on older windows
- Window caulk – white (3% Chrysotile) Located on the exterior of the building around older window openings
- Vinyl sheet flooring – brown and tan (25% Chrysotile) Located in building 211 north end apartment kitchen
- Vinyl sheet flooring – brown square pattern (25% Chrysotile) Located in building 211 South end apartment kitchen
- Vinyl sheet flooring – off-white/gray squared pattern (20% Chrysotile) Located in 213 north end apartment bathroom
- Terrazzo flooring (3% Chrysotile) Located in building 213 1st floor path ways
- Vinyl sheet flooring – off-white/gray with streaks (20% Chrysotile) Located in 211 1st floor office on east side of building in bathroom
- Vinyl sheet flooring – yellow, pebble pattern (20% Chrysotile) Located in 211 1st floor office on west side of building in bathroom and middle room

The ACM is considered a Category I nonfriable material and must be removed by a licensed asbestos abatement contractor prior to demolition of the buildings and must be disposed of at an approved landfill.

A Less Than 1% ACM Summary is included as **Table 1**, A Confirmed ACM Summary is included as Table 2 in Appendix A, the Asbestos Survey Sample Location Summary is included as **Table 3** in **Appendix A**, and a copy of the asbestos analytical laboratory data is included as **Appendix B**. A confirmed ACM Photo Log is included as **Appendix D** and a Positive ACM Sample Location Map is included as **Appendix E**.

6.0 LIMITATIONS/GENERAL COMMENTS

The survey was conducted utilizing limited destructive sampling techniques. This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions, and recommendations expressed in this report are based on the specific conditions during our sampling. The information contained in this report is relevant to the date on which the sampling was conducted and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by ECIA for

specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories, or other third parties supplying information used in the preparation of this report. No warranty, express or implied is made.

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

Table 1. Less Than 1% ACM by Homogeneous Area (HA)

HA #	HA Material Description	HA Material Location	Percent/Type Asbestos	Friability	Condition	Estimated Quantity (LF)[1]
1	Roof flashing – black, gray, and white coating	Building 213 roof, south end flashing	<1% chrysotile	Non-friable	Significant damage	120 LF

Table 2. Confirmed Asbestos-Containing Materials by Homogeneous Area (HA)

HA #	HA Material Description	HA Material Location	Percent/Type Asbestos	Friability	Condition	Estimated Quantity (LF)
1	Roof flashing – black, gray, and white coating	Building 213 roof, south end flashing	3% chrysotile	Non-friable	Significant damage	120 LF
2	Build-up roof – black, gray with brown fibrous insulation	Building 213 roof, south end, near roof edge	8-10% chrysotile	Non-friable	Significant damage	900 SF
2	Build-up roof – black, gray, and white tar coating	Building 211 roof, south end, near roof edge	3% chrysotile	Non-friable	Significant damage	750 SF
3	Window glazing - white	Around the building	3% chrysotile	Friable	Damaged	7 Units
4	Window caulk - white	Around original window openings	3% chrysotile	Friable	Damaged	200 LF
8	Vinyl sheet flooring – brown and tan	Building 211 kitchen, north end apartment	25% chrysotile	Non-friable	Good	70 SF
9	Vinyl sheet flooring – brown square pattern	Building 211 kitchen, north end apartment	25% chrysotile	Non-friable	Good	70 SF

[1] Estimated quantities are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey. LF = linear feet

13	Vinyl sheet flooring – off-white/gray squared pattern	Bathroom of apartment 213, 2nd floor	20% chrysotile	Non-friable	Good	70 SF
15	Terrazzo flooring	Building 213, 1st floor paths	3% chrysotile	Non-friable	Good	525 SF
18	Vinyl sheet flooring – off-white/gray with streaks	Building 211, 1st floor bathroom, east side	20% chrysotile	Non-friable	Good	32 SF
21	Vinyl sheet flooring – yellow, pebble pattern	Building 211, west side, middle of 1st floor	20% chrysotile	Non-friable	Good	140 SF

Table 3. Asbestos Survey Sample Location Summary

HA #	Sample #	Material Description	Layer	Sample Locations	Lab Results
1	1-MA1-1	Red brick with gray mortar	Brick	Southwest corner of the building	ND[2]
			Mortar		ND
	1- MA1-2		Brick	South center of building in rubble	ND
			Mortar		ND
	1-MA1-3		Brick	Northeast corner of building	ND
			Mortar		ND
2	2-MA6-4	Gray stucco	Stucco	Back of building west wall	ND
	2-MA6-5		Stucco	South center of building in rubble	ND
	2-MA6-6		Stucco	Southeast corner of building	ND
3	3-SC1-7	White window glazing	Glaze	South end east wall lower window	3% chrysotile
	3-SC1-8		Glaze	Northeast 2nd floor far window	ND
	3-SC1-9		Glaze	Northwest 2nd floor far window	3% chrysotile

[2] ND = none detected

HA #	Sample #	Material Description	Layer	Sample Locations	Lab Results
4	4-CA1-10	White window caulk	Caulk	Southwest east wall 1st floor upper window	ND
	4-CA1-11		Caulk	South end 2nd floor 2nd to last window to west	ND
	4-CA1-12		Caulk	North side east end 2nd floor 3rd window to west end	3% chrysotile
5	5-CA2-13	White door caulk	Caulk	South center door	ND
	5-CA2-14		Caulk	Northwest most door	ND
	5-CA2-15		Caulk	Northeast corner of building wood to brick	ND
6	6-WB1-16	White drywall, tape, mud	Drywall	211 2nd floor north end apartment living room wall	ND
	6-WB1-17		Drywall	213 2nd floor north end apartment ceiling	ND
	6-WB1-18		Drywall	213 1st floor south wall entry room wall	ND
7	7-WB4-19	White popcorn texture ceiling	Texture	211 north end apartment bathroom	ND
	7-WB4-20		Texture	211 south apartment living room	ND
	7-WB4-21		Texture	Staircase to upstairs apartments	ND
8	8-SG1-22	Brown and tan vinyl sheet flooring	Vinyl flooring	211 north apartment kitchen northeast center	25% chrysotile
	8-SG1-23		Vinyl flooring	211 north apartment kitchen south end by wall	25% chrysotile
	8-SG1-24		Vinyl flooring	211 north apartment kitchen center of room	25% chrysotile
9	9-SG1-25	Gray square pattern vinyl sheeting 2ndy layer brown and tan vinyl sheet flooring	Vinyl flooring	211 south apartment kitchen south end	ND
			Vinyl flooring		25% chrysotile
	9-SG1-26		Vinyl flooring	211 south apartment north end by sink	ND
			Vinyl flooring		25% chrysotile
	9-SG1-27		Vinyl flooring	211 south apartment center of room	ND
			Vinyl flooring		25% chrysotile

HA #	Sample #	Material Description	Layer	Sample Locations	Lab Results
10	10-SG1-28	12” tan square pattern vinyl sheet flooring	Vinyl flooring	211 south apartment doorway to bathroom	ND
	10-SG1-29		Vinyl flooring	211 south apartment bathroom by bath tub	ND
	10-SG1-30		Vinyl flooring	211 south apartment center of bathroom	ND
11	11-MG7-31	Yellow carpet glue	Glue	North end apartment 211 living room	ND
	11-MG7-32		Glue	213 2nd floor east side apartment living room	ND
	11-MG7-33		Glue	211 1st floor east side middle room	ND
12	12-SG1-34	9” gray squares and tar paper	Flooring	Center of kitchen in building 213 2nd floor apartment	ND
			Tar paper		ND
	12-SG1-35		Flooring	Doorway into apartment 213 2nd floor	ND
			Tar paper		ND
	12-SG1-36		Flooring	Center of bedroom under carpet in building 213 apartment	ND
			Tar paper		ND
13	13-SG1-37	Off white/gray square pattern vinyl sheet flooring	Vinyl flooring	Entry to 213 bathroom 2nd floor apartment	20% chrysotile
	13-SG1-38		Vinyl flooring	North end window in 213 2nd floor apartment	20% chrysotile
	13-SG1-39		Vinyl flooring	Center of bathroom in 213 2nd floor apartment	20% chrysotile
14	14-FT2-40	12” x 12” gray square pattern floor tile and associated adhesive	Flooring	213 apartment entry way south door way	ND
	14-FT2-41		Flooring	213 apartment entry way center of area	ND
	14-FT2-42		Flooring	213 apartment entry way northeast by apartment doorway	ND
15	15-MS5-43	Gray terrazzo with speckles	Terrazzo	Center of north room building 213 1st floor	3% chrysotile
	15-MS5-44		Terrazzo	Center of middle room building 213 1st floor	3% chrysotile
	15-MS5-45		Terrazzo	West side of north room building 213 1st floor	3% chrysotile

HA #	Sample #	Material Description	Layer	Sample Locations	Lab Results
16	16-SG1-46	Gray rock pattern vinyl sheet flooring	Vinyl flooring	Building 213 1st floor entry way at doorway	ND
	16-SG1-47		Vinyl flooring	Building 213 1st floor entry way in the center	ND
	16-SG1-48		Vinyl flooring	Building 213 1st floor entry way on west side of room	ND
17	17-CT2-49	2; x 3' white ceiling tiles	Ceiling tile	Buildign213 1st floor far south end of building	ND
	17-CT2-50		Ceiling tile	Building 213 1st floor in center of room	ND
	17-CT2-51		Ceiling tile	Building 213 1st floor from fallen tile in south room	ND
18	18-SG1-52	Off white/gray with streaks vinyl sheet flooring	Vinyl flooring	Doorway to bathroom 211 east side 1st floor	20% chrysotile
	18-SG1-53		Vinyl flooring	South wall of bathroom 211 east side 1st floor	20% chrysotile
	18-SG1-54		Vinyl flooring	Center of bathroom 2111 east side 1st floor	20% chrysotile
19	19-CT1-55	2' x 4' white with small fissures and pinholes ceiling tile	Ceiling tile	Center of middle room 211 east side 1st floor	ND
	19-CT1-56		Ceiling tile	By doorway middle and north room 211 east side 1st floor	ND
	19-CT1-57		Ceiling tile	Center of north room in 211 east side 1st floor	ND
20	20-SG1-58	4" square pattern multi-color vinyl sheet flooring	Vinyl flooring	By north door to room 1st floor building 211 east side	ND
	20SG1-59		Vinyl flooring	Center of room 1st floor building 211 east side	ND
	20-SG1-60		Vinyl flooring	By door to middle room 1st floor building 211 east side	ND
21	21-SG1-61	Yellow pebble pattern vinyl sheet flooring	Vinyl flooring	Under shower 1st floor building 211 west side	20% chrysotile
	21-SG1-62		Vinyl flooring	Under carpet center of middle room building 211 west side	20% chrysotile
	21-SG1-63		Vinyl flooring	From debris pile in middle room building 211 west side	20% chrysotile
MAY 24, 2021 ROOF SAMPLING					
1	1-RF4-01	Roof flashing	Black/gray/white	Southeast corner of building on the parapet wall	<1% chrysotile
	1-RF4-02		Black	South end center of the building, near the roof edge	3% chrysotile
	1-RF4-03		Black	South end center on the brick parapet bump-out	<1% chrysotile
	1-RF4-04		Gray/white	South end center on the brick parapet bump-out	ND

HA #	Sample #	Material Description	Layer	Sample Locations	Lab Results
2	2-RF8-04	Building 213 - Build-up roof	Black/brown	Southeast corner near parapet wall	8% chrysotile
	2-RF8-05		Black/brown	South end center area, near the roof edge	10% chrysotile
	2-RF8-06		Black/brown	Southwest side near parapet wall	8% chrysotile
	2-RF8-07	Building 211 - Build-up roof	White	Southeast corner near parapet wall	ND
	2-RF8-07		Black	Southeast corner near parapet wall	3% chrysotile
	2-RF8-08		White	South end center area near bump-out	ND

APPENDIX B

ASBESTOS ANALYTICAL LABORATORY REPORT

EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	042111622
Customer ID:	TEI93
Customer PO:	07207086
Project ID:	

Attention:	Kathy Toft	**Phone:**	(563) 355-0702
	Terracon Consultants, Inc.	**Fax:**	(319) 355-4789
	870 40th Avenue	**Received Date:**	05/17/2021 8:40 AM
	Bettendorf, IA 52722	**Analysis Date:**	05/19/2021 - 05/20/2021
		Collected Date:	05/14/2021

Project: Starwood / 211 and 213 East Broadway, Stanwood, Iowa / 211 and 213 / 07207086

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1-MA1-1-Brick *042111622-0001*	Southwest Corner of Building - Red Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-MA1-1-Mortar *042111622-0001A*	Southwest Corner of Building - Gray Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-MA1-2-Brick *042111622-0002*	South Center of Building in Rubble - Red Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-MA1-2-Mortar *042111622-0002A*	South Center of Building in Rubble - Gray Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-MA1-3-Brick *042111622-0003*	Northeast Corner of Building - Red Brick	Red Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
1-MA1-3-Mortar *042111622-0003A*	Northeast Corner of Building - Gray Mortar	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2-MA6-4 *042111622-0004*	Back of Building West Wall - Gray Stucco	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2-MA6-5 *042111622-0005*	South Center of Building in Rubble - Gray Stucco	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2-MA6-6 *042111622-0006*	Southeast Corner of Building - Gray Stucco	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3-SC1-7 *042111622-0007*	South End East Wall Lower Window - White Glaze	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
3-SC1-8 *042111622-0008*	Northeast 2nd Floor Far Window - White Glaze	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3-SC1-9 *042111622-0009*	Northwest 2nd Floor Far Window - White Glaze	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
4-CA1-10 *042111622-0010*	Southwest East Wall Upper Window - White Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
4-CA1-11 *042111622-0011*	South End 2nd Floor 2nd to Last Window to West - White Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
4-CA1-12 *042111622-0012*	North Side East End 2nd Floor Window to East End - White Caulk	White Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
5-CA2-13 *042111622-0013*	South Center Door - White Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 05/21/2021 12:22:01

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EMSL Order:	042111622
Customer ID:	TEI93
Customer PO:	07207086
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
5-CA2-14 *042111622-0014*	Northwest Most Door - White Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
5-CA2-15 *042111622-0015*	Northeast Corner of Building Wood to Brick - White Caulk	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6-WB1-16 *042111622-0016*	211 North End Apartment Living Room Wall - White Drywall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6-WB1-17 *042111622-0017*	213 2nd Floor North End Apartment Ceiling - White Drywall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
6-WB1-18 *042111622-0018*	213 1st Floor South Wall Entry Room Wall - White Drywall	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7-WB4-19 *042111622-0019*	211 North End Room Bathroom - White Popcorn Texture	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7-WB4-20 *042111622-0020*	211 South End Room Living Room - White Popcorn Texture	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
7-WB4-21 *042111622-0021*	Staircase to Upstairs - White Popcorn Texture	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
8-SG1-22 *042111622-0022*	Northeast Corner - Brown and Tan Vinyl Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
8-SG1-23 *042111622-0023*	South End by Weall - Brown and Tan Vinyl Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
8-SG1-24 *042111622-0024*	Center of Floor - Brown and Tan Vinyl Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
9-SG1-25-Sheet Flooring *042111622-0025*	South End - Brown Square Pattern Vinyl Sheet Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
9-SG1-25- Sheet Flooring 2 *042111622-0025A*	South End - Gray Square Pattern Vinyl Sheet Flooring	Gray Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
9-SG1-26-Sheet Flooring *042111622-0026*	North End by Sink - Brown Square Pattern Vinyl Sheet Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile
9-SG1-26-Sheet Flooring 2 *042111622-0026A*	North End by Sink - Gray Square Pattern Vinyl Sheet Flooring	Gray Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
9-SG1-27-Sheet Flooring *042111622-0027*	Center of Kitchen - Brown Square Pattern Vinyl Sheet Flooring	Brown Non-Fibrous Homogeneous		75% Non-fibrous (Other)	25% Chrysotile

Initial report from: 05/21/2021 12:22:01

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EMSL Order:	042111622
Customer ID:	TEI93
Customer PO:	07207086
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
9-SG1-27-Sheet Flooring 2 *042111622-0027A*	Center of Kitchen - Gray Square Pattern Vinyl Sheet Flooring	Gray Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
10-SG1-28 *042111622-0028*	Doorway to Bathroom - 12" Square Tan Pattern Vinyl Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10-SG1-29 *042111622-0029*	By Bathtub - 12" Square Tan Pattern Vinyl Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10-SG1-30 *042111622-0030*	Center of Bathroom - 12" Square Tan Pattern Vinyl Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-MG7-31 *042111622-0031*	Northeast Apt 211 Living Room - Yellow Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-MG7-32 *042111622-0032*	213 2nd Floor East Side Apt Living Room - Yellow Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-MG7-33 *042111622-0033*	211 1st Floor East Side Middle Room - Yellow Carpet Mastic	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12-SG1-34-Floor Tile *042111622-0034*	Center of Kitchen in 213 Apt - Gray Squares 9" Floor Tile	Gray Non-Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
12-SG1-34-Tar Paper *042111622-0034A*	Center of Kitchen in 213 Apt - Tar Paper	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
12-SG1-35-Floor Tile *042111622-0035*	Doorway into 213 Apt - Gray Squares 9" Floor Tile	Gray Non-Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
12-SG1-35-Tar Paper *042111622-0035A*	Doorway into 213 Apt - Tar Paper	Black Non-Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
12-SG1-36-Floor Tile *042111622-0036*	Center of 213 Apt Bedroom under Carpet - Gray Squares 9" Floor Tile	Tan Non-Fibrous Homogeneous	30% Cellulose	70% Non-fibrous (Other)	None Detected
12-SG1-36-Tar Paper *042111622-0036A*	Center of 213 Apt Bedroom under Carpet - Tar Paper	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
13-SG1-37 *042111622-0037*	Entry to 213 Bathroom - Off-white/Gray Square Pattern Vinyl Sheet	White Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
13-SG1-38 *042111622-0038*	By Northend Window 213 Bathroom - Off-white/Gray Square Pattern Vinyl Sheet	White Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
13-SG1-39 *042111622-0039*	Center of 213 Bathroom - Off-white/Gray Square Pattern Vinyl Sheet	White Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile

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			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
14-FT2-40 *042111622-0040*	South Doorway - 12"x12" Gray Square Pattern Floor Tile Adhesive	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-FT2-41 *042111622-0041*	Center of Entryway - 12"x12" Gray Square Pattern Floor Tile Adhesive	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-FT2-42 *042111622-0042*	Northeast by Door to Apt - 12"x12" Gray Square Pattern Floor Tile Adhesive	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15-MS5-43 *042111622-0043*	Center of North Room Suite 213 1st Floor - Terrazo	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
15-MS5-44 *042111622-0044*	Center of Middle Room - Terrazo	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
15-MS5-45 *042111622-0045*	West Side of North Room - Terrazo	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
16-SG1-46 *042111622-0046*	At Doorway - Gray Rock Pattern Vinyl Flooring	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16-SG1-47 *042111622-0047*	In the Center - Gray Rock Pattern Vinyl Flooring	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16-SG1-48 *042111622-0048*	On West Side of Room - Gray Rock Pattern Vinyl Flooring	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17-CT2-49 *042111622-0049*	Far South End of Building - 2'x3' Ceiling Tile White	White Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
17-CT2-50 *042111622-0050*	In Center of Center Room - 2'x3' Ceiling Tile White	White Non-Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
17-CT2-51 *042111622-0051*	From Falling Tiles in South Room - 2'x3' Ceiling Tile White	White Non-Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
18-SG1-52 *042111622-0052*	Doorway to Bathroom 211 East Side 1st Floor - Off-white/Gray with Streak Vinyl Sheet Flooring	White Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
18-SG1-53 *042111622-0053*	South Wall of Bathroom 1st 211 East Side - Off-white/Gray with Streak Vinyl Sheet Flooring	White Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
18-SG1-54 *042111622-0054*	Center of Bathroom 1st 211 East Side - Off-white/Gray with Streak Vinyl Sheet Flooring	White Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile

Initial report from: 05/21/2021 12:22:01

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EMSL Order:	042111622
Customer ID:	TEI93
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Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
19-CT-55 *042111622-0055*	Center of Middle Room 1st Floor 211 East Side - 2'x4' White Small Fissures and Pinholes	White Fibrous Homogeneous	65% Cellulose 30% Min. Wool	5% Non-fibrous (Other)	None Detected
19-CT-56 *042111622-0056*	By Doorway to Middle and Noprth Room 1st 211 East Side - 2'x4' White Small Fissures and Pinholes	White Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
19-CT-57 *042111622-0057*	Center of North Room 1st 211 East Side - 2'x4' White Small Fissures and Pinholes	White Fibrous Homogeneous	98% Cellulose	2% Non-fibrous (Other)	None Detected
20-SG1-58 *042111622-0058*	By North Door to Room 1st 211 East Side - 4" Square Multi-color Vinyl Sheet Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-SG1-59 *042111622-0059*	Center of Room 1st 211 East Side - 4" Square Multi-color Vinyl Sheet Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-SG1-60 *042111622-0060*	By Door to the Middle Room 1st 211 East Side - 4" Square Multi-color Vinyl Sheet Flooring	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-SG1-61 *042111622-0061*	Under Shower 1st Floor 211 West Side - Yellow Pebble Pattern Vinyl Sheet Flooring	Yellow Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
21-SG1-62 *042111622-0062*	Under Carepet Center of Middle Room - Yellow Pebble Pattern Vinyl Sheet Flooring	Yellow Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile
21-SG1-63 *042111622-0063*	From Debris Pile in Middle Room - Yellow Pebble Pattern Vinyl Sheet Flooring	Yellow Non-Fibrous Homogeneous		80% Non-fibrous (Other)	20% Chrysotile

Analyst(s)
Stephen Severn (72)

Samantha Rundstrom, Laboratory Manager
or Other Approved Signatory

Initial report from: 05/21/2021 12:22:01

Terracon

04211622

Asbestos Bulk Sample and Chain of Custody Form

Lab Order ID:

Select a Laboratory:

Bettendorf: 870 40th Ave., Bettendorf, IA
52722 (563) 355 0702

Lab Location: HQ - Cinnaminson, NJ 101048-0

Project Name:	Stanwood	Project Number:	07207086	Project Manager:	James Baxter DNU as SM contact
Project Address:	211 & 213 East Broadway	City/State / Zip:	Stanwood, Iowa	Email Results/Invoice/Sample Confirmation To:	Alex.Davis@terracon.com James.Baxter@terracon.com
Site/Building:	211 & 213			EMSL Login: Enter Customer Contact as:	Kathy.Toft@terracon.com

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	NESHAP Classification[1]	Notes/Physical Condition[2]
1 -MA1 - 1	South west corner of building	Exterior of building	red brick gray mortar		F C1 C2	G D SD
1 -MA1- 2	south center of building in rubble					
1 -MA1 - 3	NorthEast corner of building					
2 -MA6 - 4	back of building west wall	South end of building	gray stucco		F C1 C2	G D SD
2 -MA6 - 5	South center of building in rubble					
2 -MA6 - 6	Southeast corner of building					
3 -SC1 - 7	South End East wall lower window	around building	white Glazl	7 units	F C2	G D SD
3 -SC1 - 8	Northeast 2nd floor far window					
3 -SC1 - 9	Northwest 2nd floor far window					
4 -CA1 - 10	Southwest ~~East~~ wall ~~lower~~ upper window	around windows	white caulk	11	F C1 C2	G D SD
4 -CA1 - 11	South end 2nd floor 2nd to last window to west					
4 -CA1 - 12	North side East end 2nd floor 3 window to East End					
5 -CA2 - 13	South center door	around doors & Edge of building	white caulk	80 lf	F C1 C2	G D SD
5 -CA2 - 14	Northwest most door					
5 -CA2 - 15	Northeast corner of building wood to brick					

2021 MAY 13 AM 9:02
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Page 1 Of 4

Sampling Date: 5-14-21 Collected by (print): Alex Davis Inspector's Signature:

Relinquished by: Alex Davis Date/Time: ~~12/10/2020~~ 5-14-21 Received by: Date/Time: 5-17-21 8:00

Analysis: PLM EPA 600/R-93/116 ☒ PLM 400 Point Count ☐ TEM ☐ Other

Turnaround Time: ~~Rush~~ 24 Hrs ☐ 2 Days ☐ 3 Days ☐ 5 Days ☒ Other

Instructions:

Terracon ARMS: ☒ Stop Positive: ☐ Number of samples:

OrderID 04211622

63

[1] F = Friable: C1 = Category I: packings, gaskets, asphaltic roofing products, resilient flooring; C2 = Category II Non-Friable: any materials other than Cat. I containing >1% asbestos

Terracon

042111622

Asbestos Bulk Sample and Chain of Custody Form

Lab Order ID:

Select a Laboratory:

Bettendorf: 870 40th Ave., Bettendorf, IA
52722 (563) 355 0702

Lab Location: HQ - Cinnaminson, NJ 101048-0

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	NESHAP[1] Classification	Notes/Physical Condition[2]
6 -WB1- 16	211 North end Apartment living room wall	throughout Buildings	white dry wall Tape mud		F C1 C2	G D SD
6 -WB1- 17	213 2nd floor north End Apartment ceiling					
6 -WB1- 18	213 1st floor southwall Entry room wall					
7 -WB4- 19	211 North End room bathroom	All 2nd floor ceilings	white Popcorn Texture +	925 SF	F C1 C2	G D SD
7 -WB4- 20	211 southend room living room					
7 -WB4- 21	stair cabe to upstairs					
8 -SG1- 22	Northeast corner	Kitchen in 211 North end APT	brown + tan vinyl Flooring	70 SF	F C1 C2	G D SD
8 -SG1- 23	South end by wall					
8 -SG1- 24	center of floor					
9 -SG1- 25	south end	Kitchen in 211 south end APT	gray square pattern vinyl sheet flooring	70 SF	F C1 C2 2 layer brown vinyl bottom layer	G D SD
9 -SG1- 26	North end by sink					
9 -SG1- 27	center of Kitchen					
10 -SG1- 28	Doorway to bathroom	bathroom in 211 southend APT	12" sawave tan pattern Vinyl flooring	30 SF	F C1 C2	G D SD
10 -SG1- 29	by bathtub					
10 -SG1- 30	center of bathroom					
11 -MG1- 31	North East APPt 211 living room	Throughout common area building 211	Yellow carpet mastic		F C1 C2	G D SD
11 -MG1- 32	213 2nd floor East side APt living room					
11 -MG1- 33	211 1st floor East side middle room					

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EMSL
CINNAMINSON, N.J.

OrderID: 042111622

Page 2 Of 4

Terracon

042111622 Lab Order ID:

Select a Laboratory:

Asbestos Bulk Sample and Chain of Custody Form

Bettendorf: 870 40th Ave., Bettendorf, IA
52722 (563) 355 0702

Lab Location: HQ - Cinnaminson, NJ 101048-0

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	NESHAP[1] Classification	Notes/Physical Condition[2]
12 - SG1 - 34	center of kitchen in 213 APT	Kitchen & Bedroom 213 APT 2nd Floor	gray squares 9" ~~paper~~ ~~sheet~~ floor tile, rat paper	185 sf	F C1 C2	G D SD
12 - SG1 - 35	~~door~~ doorway into 213 APT					
12 - SG1 - 36	center of 213 APT bedroom under carpet					
13 - SG1 - 37	Entry to 213 bathroom	bathroom 213 APT 2nd floor	off white/gray square pattern vinyl sheet	70 sf	F C1 C2	G D SD
13 - SG1 - 38	by Northend window 213 bathroom					
13 - SG1 - 39	center of 213 bathroom					
14 - FT2 - 40	South door way	Entry way to 213 APT 2nd Floor	12"x12" gray square patter floor tile & Adhesive	50 sf	F C1 C2	G D SD
14 - FT2 - 41	center of Entryway					
14 - FT2 - 42	Northeast by door to APT					
15 - MS5 - 43	center of north room suite 213 1st floor	~~building~~ 213 1st Floor Paths	Terrazo	325 sf	F C1 C2	G D SD
15 - MS5 - 44	center of middle room					
15 - MS5 - 45	west side of North room					
16 - SG1 - 46	at doorway	building 213 1st floor Entry	gray rock pattern vinyl flooring	120 sf	F C1 C2	G D SD
16 - SG1 - 47	in the center					
16 - SG1 - 48	on west side of room					
17 - CT2 - 49	far South End of building	Throughout 213 1st FL building	2'x3' ceiling tile white	2,600 sf	F C1 C2	G D SD
17 - CT2 - 50	in center of center room					
17 - CT2 - 51	from fallin. tiles in south room					

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Page 3 Of 4

OrderID: 042111622

042111622

Terracon

Asbestos Bulk Sample and Chain of Custody Form

Lab Order ID:

Select a Laboratory:

Bettendorf: 870 40th Ave.,
Bettendorf, IA 52722 (563) 355 0702

Lab Location: HQ - Cinnaminson, NJ 101048-0

Sample Identification IA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	NESHAP[1] Classification	Notes/Physical Condition[2]
18 - SGI - 52	door way to bathroom 211 East side 1ST FL	off white/ gray with streak vinyl sheet flooring	In bathroom to 211 East side 1st Floor	32 SF	F C1 C2	G D SD
18 - SGI - 53	South wall of bathroom 1ST 211 East sid					
18 - SGI - 54	center of bathroom 1ST 211 East side					
19 - CT - 55	center of middle room 1ST Fl 211 East side	In Entry/middle room 211 1ST Floor East side	2'x 4' white small fissures + Pinholes	200 SF	F C1 C2	G D SD
19 - CT - 56	by door way to middle & North room 1ST 211 East Side					
19 - CT - 57	Center of North room 1ST 211 east side					
20 - SGI - 58	by North door to room 1ST 211 ~~East~~ side	In Entry room 211 1st Floor East side	4" inch square multi color vinyl sheet flooring	100 SF	F C1 C2	G D SD
20 - SGI - 59	Center of room 1ST 211 East Side					
20 - SGI - 60	by door to the middle room 1ST 211 East sid					
21 - SGI - 61	under shower 1ST FL 211 west side	In middle room 211 1st Floor west side	Yellow Pebble Pattern vinyl sheet flooring	140 SF	F C1 C2	G D SD
21 - SGI - 62	under carpet center of middle room					
21 - SGI - 63	from debris pile in middle room					
– –					F C1 C2	G D SD
– –						
– –						
– –					F C1 C2	G D SD
– –						
– –						

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2021 MAY 14 PM 2:20

OrderID: 042111622

EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	042112351
Customer ID:	TEI93
Customer PO:	07207086
Project ID:	

Attention:	Kathy Toft	**Phone:**	(563) 355-0702
	Terracon Consultants, Inc.	**Fax:**	(319) 355-4789
	870 40th Avenue	**Received Date:**	05/25/2021 9:45 AM
	Bettendorf, IA 52722	**Analysis Date:**	06/01/2021
		Collected Date:	05/24/2021

Project: Stanwood Demo. Bldg. 211-213 E. Broadway / Bldg. 211 +213 / 07207086 / Stanwood, Iowa 52337

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
1-RF4-01 *042112351-0001*	Southeast Corner of Building on Parapet Wall - Black/Gray/White Coating Build-up Roofing	Gray/White/Black Fibrous Homogeneous	10% Cellulose 5% Glass	85% Non-fibrous (Other)	<1% Chrysotile
1-RF4-02 *042112351-0002*	South End Center of Building Near Roof Edge - Black/Gray/White Coating Build-up Roofing	Black Fibrous Homogeneous	15% Cellulose	82% Non-fibrous (Other)	3% Chrysotile
1-RF4-03-Built Up Roofing *042112351-0003*	South End Center on Brick Parapet Bump-out - Black/Gray/White Coating Build-up Roofing	Black Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	<1% Chrysotile
1-RF4-03-Membrane *042112351-0003A*	South End Center on Brick Parapet Bump-out - Black/Gray/White Coating Build-up Roofing	Gray/White Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
2-RF8-04 *042112351-0004*	Southeast Corner Near Parapet Wall - Black/Gray with Brown Fibrous Insulation	Brown/Black Fibrous Homogeneous	10% Cellulose	82% Non-fibrous (Other)	8% Chrysotile
2-RF8-05 *042112351-0005*	South End Center Area Near Roof Edge - Black/Gray with Brown Fibrous Insulation	Brown/Black Fibrous Homogeneous	10% Cellulose	80% Non-fibrous (Other)	10% Chrysotile
2-RF8-06 *042112351-0006*	Southwest Side Near Parapet Wall - Black/Gray with Brown Fibrous Insulation	Brown/Black Fibrous Homogeneous	20% Cellulose	72% Non-fibrous (Other)	8% Chrysotile
2-RF8-07-White Coating *042112351-0007*	Southeast Corner Near Parapet Wall - Black/Gray/White Tar and Coatings	White Fibrous Homogeneous	25% Synthetic	75% Non-fibrous (Other)	None Detected
2-RF8-07-Built Up Roofing *042112351-0007A*	Southeast Corner Near Parapet Wall - Black/Gray/White Tar and Coatings	Black Fibrous Homogeneous	10% Cellulose	87% Non-fibrous (Other)	3% Chrysotile
2-RF8-08-White Coating *042112351-0008*	South End Center Area Near Bump-out - Black/Gray/White Tar and Coatings	White Fibrous Homogeneous	10% Synthetic	90% Non-fibrous (Other)	None Detected

Initial report from: 06/01/2021 14:07:50

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	042112351
Customer ID:	TEI93
Customer PO:	07207086
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
2-RF8-08-Built Up Roofing *042112351-0008A*	South End Center Area Near Bump-out - Black/Gray/White Tar and Coatings	Gray/Black Fibrous Homogeneous	15% Cellulose	83% Non-fibrous (Other)	2% Chrysotile
2-RF8-09-White Coating *042112351-0009*	Southwest Corner Near Parapet Wall - Black/Gray/White Tar and Coatings	White Fibrous Homogeneous	15% Synthetic	85% Non-fibrous (Other)	None Detected
2-RF8-09-Built Up Roofing *042112351-0009A*	Southwest Corner Near Parapet Wall - Black/Gray/White Tar and Coatings	Black Fibrous Homogeneous	15% Cellulose	83% Non-fibrous (Other)	2% Chrysotile

Analyst(s)
Michelle Quach (5)
Mark Shuts (8)

Samantha Rundstrom, Laboratory Manager
or Other Approved Signatory

Initial report from: 06/01/2021 14:07:50

Terracon

Asbestos Bulk Sample and Chain of Custody Form

Bettendorf: 870 40th Ave., Bettendorf, IA
52722 (563) 355 0702

Lab Order ID: 042112351
Select a Laboratory:

Lab Location: HQ - Cinnaminson, NJ 101048-0

Project Name:	Stanwood Demo. Bldg.	**Project Number:**	07207086	**Project Manager:**	James Baxter DNU as SM contact
Project Address:	211-213 E. Broadway	**City/State / Zip:**	Stanwood, Iowa 52337	**Email Results/Invoice/Sample Confirmation To:**	Steve.Mack@terracon.com James.Baxter@terracon.com
Site/Building:	Bldg. 211 & 213			**EMSL Login: Enter Customer Contact as:**	Kathy.Toft@terracon.com

Sample Identification HA – BS Code – Sample #	Sample Location Description	HA General Location	Material Description (Type; Color/Texture)	Quantity (SF, LF, Cubic Ft, Units)	NESHAP Classification[1]	Notes/Physical Condition[2]
1 - RF4 - 01	Southeast Corner of building on Parpet wall	Building 213 Roof and Building 211 Roof	Black/gray/white coating Build-up Roofing	~~200~~ 120 lf	F (C1) C2	G D (SD)
1 - RF4 - 02	South end Center of building Near roof edge					
1 - RF4 - 03	South end Center on brick Parpet bump-out					
2 - RF8 - 04	South east Corner near Parpet wall	Building 213 Build-up Roof	Black/gray with Brown fibious insulation	900 sf	F (C1) C2	G D (SD)
2 - RF8 - 05	South end, center area Near the roof edge					
2 - RF8 - 06	South west side, near Parpet wall					
2 - RF8 - 07	South east Corner near Parpet wall	Building 211 Build-up Roof	Black/gray/white tar & coatings	750 sf	F (C1) C2	G (D) ~~SD~~
2 - RF8 - 08	South ~~end~~ center, center area Near Bump-out					
2 - RF8 - 09	South west Corner near Parpet wall					
- -					F C1 C2	G D SD
- -						
- -						
- -					F C1 C2	G D SD
- -						
- -						

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2021 MAY 25 AM 9:40
CINNAMINSON, N.J.

Sampling Date: [redacted] May 24, 2021 **Collected by (print):** [redacted] Steven Mack **Inspector's Signature:** Steven Mack

Relinquished by: Steven Mack **Date/Time:** [redacted] 5/24/21

Received by: [illegible] **Date/Time:** 5-25-21 945

Analysis: PLM EPA 600/R-93/116 ☒ PLM 400 Point Count ☐ TEM ☐ Other _____

Turnaround Time: 3 Hrs ☐ 24 Hrs ☐ 2 Days ☐ 3 Days ☒ 5 Days ☐ Other _____

Instructions:
Terracon ARMS: ☒ **Stop Positive:** ☐ **Number of samples:** 9 9

[1] F = Friable; C1 = Category I: packings, gaskets, asphaltic roofing products, resilient flooring; C2 = Category II Non-Friable: any materials other than Cat. I containing >1% asbestos

APPENDIX C

LICENSES

ALEXANDER DAVIS

DOB: 09-17-1990

Issued: 11-13-2020

This person is licensed to perform asbestos work in the State of Iowa. ID card is intended for official use only and must be present on jobsite.

License Type	Number	Expires
INSPECTOR	20-5247	10-15-2021
SUPERVISOR	20-5248	10-16-2021

DIVISION OF IOWA LABOR

Asbestos

Rod A. Roberts

Rod A. Roberts
Labor Commissioner

APPENDIX D

CONFRIMED ACM PHOTO LOG

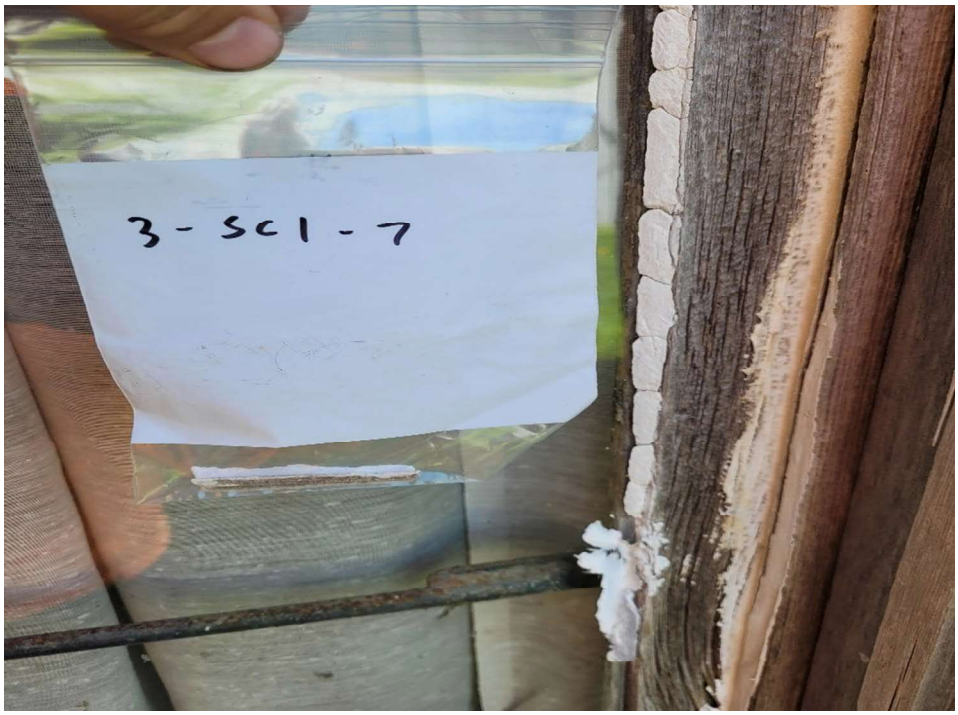


Photo 1: View of positive window glazing

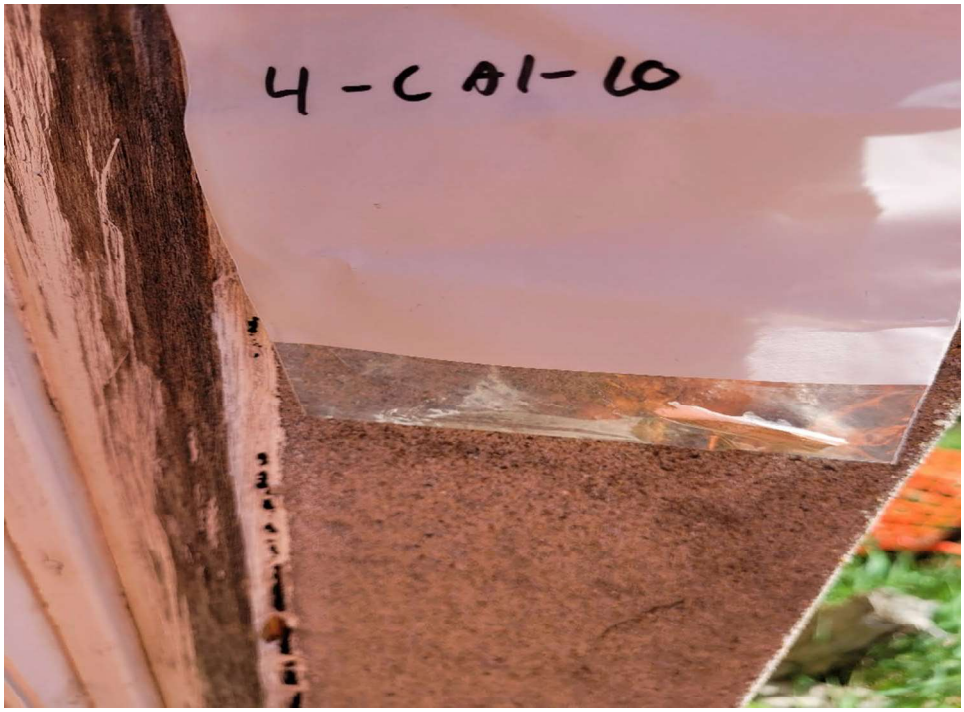


Photo 2: View of positive window caulking

Photo 3: View of positive vinyl sheet flooring in building 211 2nd floor north end apartment kitchen.

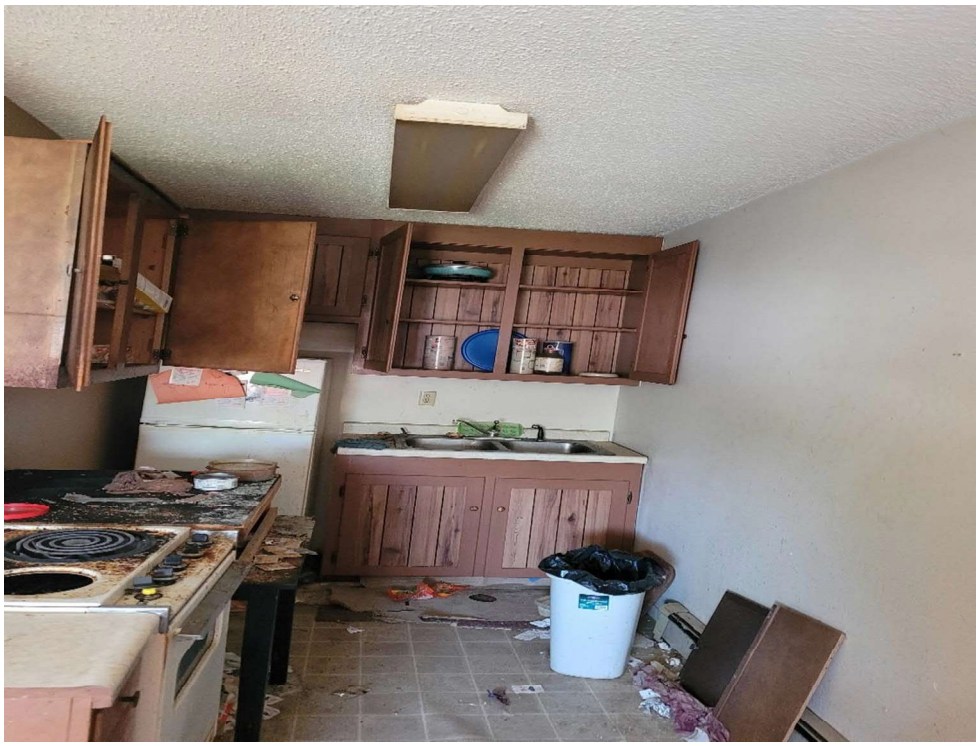


Photo 4: View of positive vinyl sheet flooring 2 layers in building 211 2nd floor south end apartment kitchen.

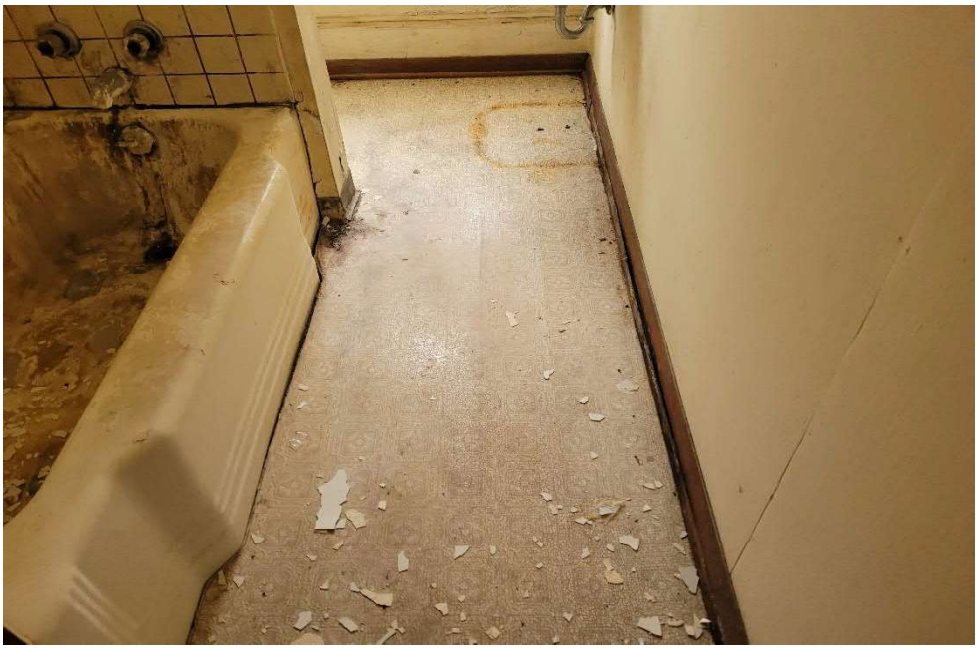


Photo 5: View of positive vinyl sheet flooring in bathroom of building 213 2nd fllor apartment.

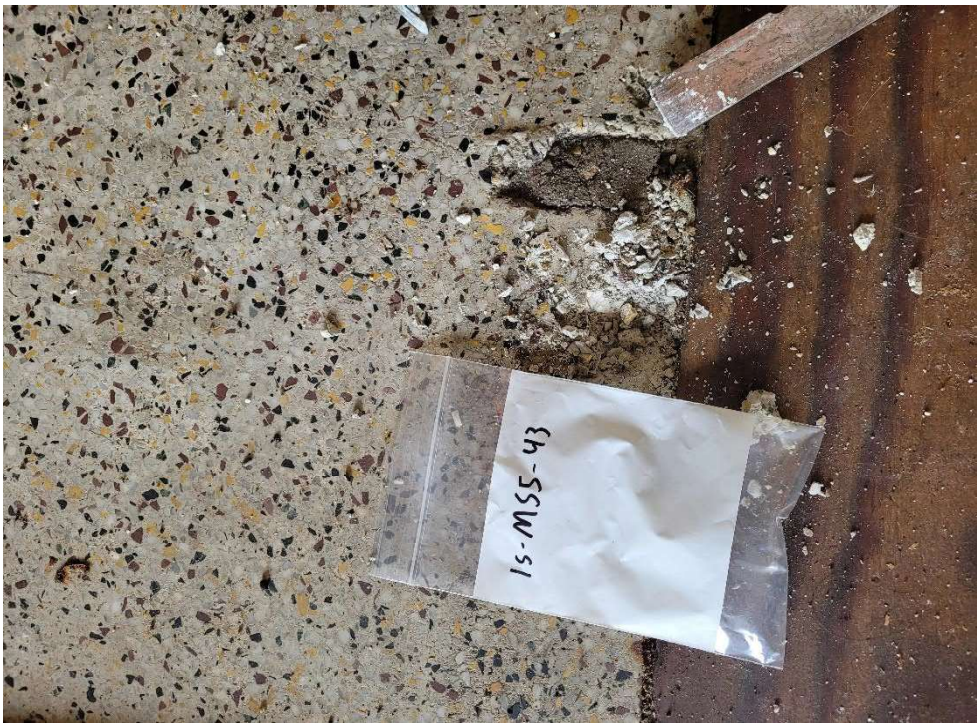


Photo 6: View of positive terrazzo flooring in building 213 1st floor office space.

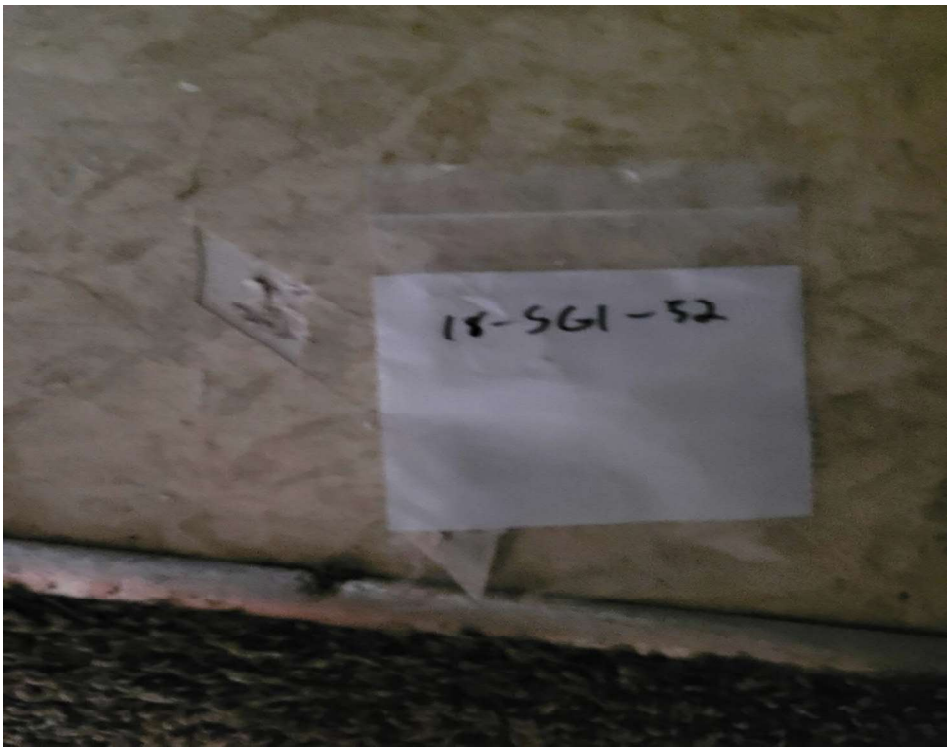


Photo 7: View of positive vinyl sheet flooring in building 211 1st floor east side office bathroom.

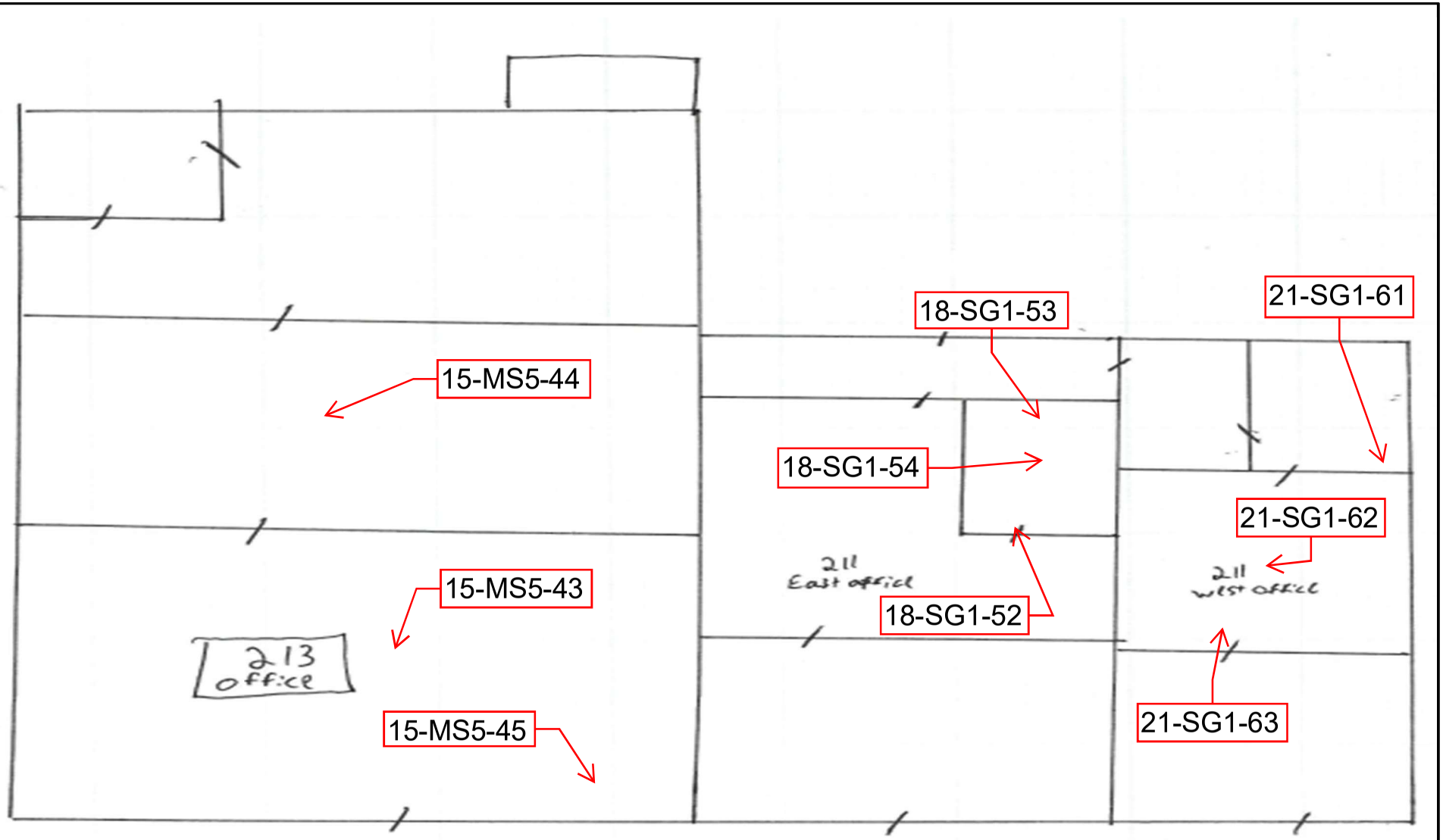
Photo 8: View of positive vinyl sheet flooring debris pile in building 211 1st floor west side office located in middle room and under carpet and shower.

Photo 9: View of positive roof decking and flashing throughtout both building roofs.

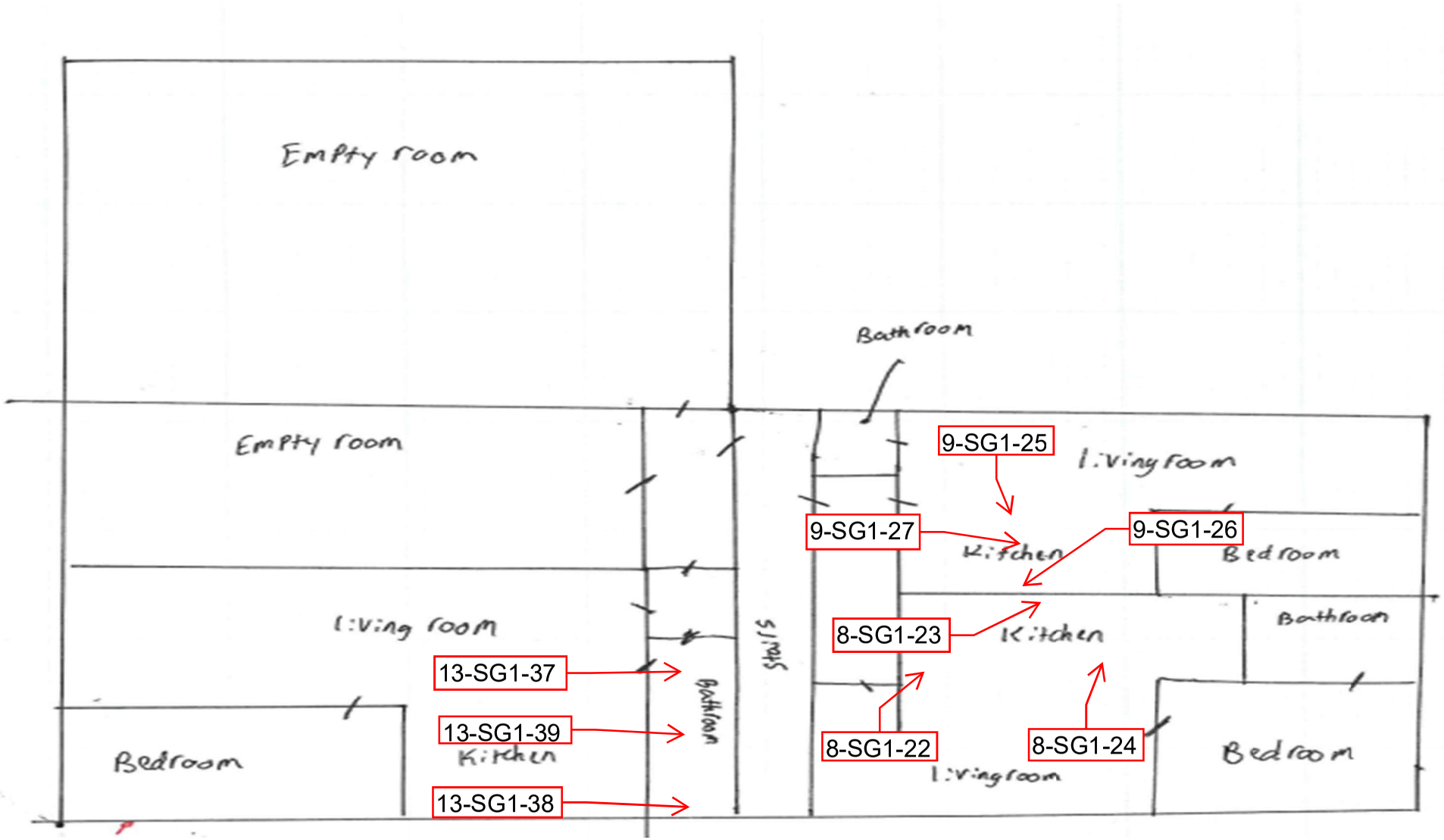
APPENDIX E

POSITIVE ACM LOCATIONS MAPS

E1 – POSTIVE SAMPLE LOCATION MAP 1F
E2 – POSITIVE SAMPLE LOCATION MAP 2F
E3 – POSITIVE SAMPLE LOCATION MAP ROOF



Project Manager: JRB	Project No. 07207086	Terracon Consulting Engineers & Scientists	POSITIVE SAMPLE LOCATION MAP 1F
Drawn by: AJD	Scale: Not To Scale	870 40th Avenue Bettendorf, Iowa 52722	211 AND 213 East Broadway Street STANWOOD, IOWA 52337
Checked by: JRB	File Name:	PH. (563) 355-0702 FAX. (563) 355-4789	Appendix E1
Approved by: JRB	Date: June 11 2021		



Project Manager: JRB	Project No. 07207086	Terracon Consulting Engineers & Scientists	POSITIVE SAMPLE LOCATION MAP 2F
Drawn by: AJD	Scale: Not To Scale	870 40th Avenue Bettendorf, Iowa 52722	211 AND 213 East Broadway Street STANWOOD, IOWA 52337
Checked by: JRB	File Name:	PH. (563) 355-0702 FAX. (563) 355-4789	Appendix E2
Approved by: JRB	Date: June 11 2021		

Project Manager: JRB	Project No. 07207086	Terracon Consulting Engineers & Scientists	POSITIVE SAMPLE LOCATION MAP ROOF
Drawn by: AJD	Scale: Not To Scale	870 40th Avenue Bettendorf, Iowa 52722	211 AND 213 East Broadway Street STANWOOD, IOWA 52337
Checked by: JRB	File Name:	PH. (563) 355-0702 FAX. (563) 355-4789	Appendix E3
Approved by: JRB	Date: June 11 2021		

APPENDIX D

PHASE II ENVIRONMENTAL SITE ASSESSMENT

Phase II Environmental Site Assessment

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

January 7, 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

January 7, 2022

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

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

Re: Phase II Environmental Site Assessment for Brownfields
ECIA Brownfields Assessment Services
211 & 213 East Broadway Street
Stanwood, Cedar County, Iowa 52337
Terracon Project No. 07207086

Dear Ms. Danielson:

Terracon Consultants, Inc. (Terracon) is pleased to submit our report for the Phase II Environmental Site Assessment completed at the site referenced above. The report presents information and data obtained during field activities which included the advancement of soil borings and the collection of soil and groundwater samples for chemical analysis. Terracon conducted this investigation in general accordance with Property Specific Sampling and Analysis Plan dated September 29, 2021.

We appreciate the opportunity to perform these services for you. If there are any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
Terracon Consultants, Inc.

Benjamin M. LaPointe, CHMM
Environmental Department Manager

Dennis R. Sensenbrenner, PG
Senior Associate

TABLE OF CONTENTS

PHASE II ENVIRONMENTAL SITE ASSESSMENT
ECIA BROWNFIELDS ASSESSMENT SERVICES
211 and 213 East Broadway Street
Stanwood, Cedar County, Iowa

Terracon Project No. 07207086
January 7, 2022

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted a Phase II Environmental Site Assessment at the site located at 211 and 213 East Broadway Street, Stanwood, Iowa, in accordance the EPA approved Property Specific Sampling and Analysis Plan (PSAP) dated September 29, 2021 and the Generic Quality Assurance Project Plan (QAPP), dated April 7, 2021.

The site is an approximate 0.12-acre lot that is improved with two (2), 2-story structures. The structure located at 211 Broadway Street is approximately 2,080-square. The structure located at 213 Broadway Street approximately 3,780-square feet. A topographic map depicting the general site location is included as **Exhibit 1** provided in **Appendix A**. The current site layout is provided as **Exhibit 2** in **Appendix A**.

The onsite structures are currently unoccupied. Terracon understands that the City of Stanwood anticipates razing the structures and redeveloping the site as green space or as an extension of adjacent city structures.

1.1 Background

A Phase I Environmental Site Assessment (ESA) was conducted at the site in March 2021 in accordance with ASTM E1527-13 to identify recognized environmental conditions associated with the property. The following recognized environmental conditions were identified during the Phase I ESA.

- A former oil and coal storage and oil containment area abutted the site to the south along the adjoining railway during the 1910s.
- The adjoining site west of the property had a former 500-gallon underground storage tank removed in 1987.

1.2 Objectives

The objective of this Phase II Environmental Site Assessment is to determine whether petroleum contaminated soil and/or groundwater are of concern for the site in regard to potential human or environment exposure and/or specific waste handling and disposal needs during redevelopment activities.

2.0 ASSESSMENT ACTIVITIES & METHODS

The Phase II field activities were conducted on December 13, 2021. Field activities included the advancement of three soil borings for the collection of soil and groundwater samples as summarized below. The approximate soil boring locations and areas of concern are shown on **Exhibit 2** provided in **Appendix A**.

The property-specific sampling design was set forth in the Property Specific Sampling and Analysis Plan (PSAP) previously approved by EPA 7. Terracon completed the following tasks as part of the Phase II ESA.

- Advancement of three borings, designated B-1 through B-3, at the locations shown on Exhibit 2 in Appendix A
- Continuous field screening of soils from the probe cores using a photo-ionization detector (PID)
- Collection of soil samples for laboratory analysis; soil samples were collected from a shallow depth and a deeper interval based on the field screening results and/or other field observations
- Collection of groundwater samples from the temporary wells using a peristaltic pump
- Submittal of soil and groundwater samples to Keystone Laboratories, Inc. for analysis

2.1 Methodology

Terracon followed Terracon Standard Operating Procedures (TSOPs) as provided with the EPA Region 7 approved Generic QAPP, dated April 7, 2021, for sampling, physical measurements, equipment cleaning, and equipment calibration. Terracon recorded discrepancies, clarifications, and corrective actions for QA/QC, if applicable, in the field logbook.

Soil Borings and Soil Sampling

Soil borings B-1 through B-3 were advanced to 20 – 24 feet below ground surface (bgs) using a truck mounted hydraulic direct push drill rig (Geoprobe®). General soil descriptions including color, relative moisture content, specific boring depths, and pertinent observations are presented on the soil boring logs provided in **Appendix B.**

Each soil core was field-screened for organic vapors continuously using closed container headspace methods and a photo-ionization detector (PID). Vapor measurements were recorded on the field soil boring logs.

Two soil samples were collected from each soil boring. One soil sample was collected from the 2-foot interval at surficial/near surface soils. The second soil sample was collected from the 2-foot interval most likely impacted based on highest PID readings and field observations. An additional third soil sample was collected from boring B-2. Soil sample depth intervals are summarized in **Table 2-1** below.

Table 2-1 Sampling Program

Boring Number	Sample Interval Depths (feet)
B-1	(0-2), (22-24)
B-2	(0-2), (8-10), (16-18)
B-3	(0-2), (18-20)

Temporary Monitoring Wells and Sampling

Based on clay soils encountered while advancing soil borings and slow recharge rates, the groundwater table was not observed in soil cores collected; however, boreholes filled with groundwater after advancing the soil borings. Static groundwater levels were measured at approximately 7 feet below ground surface in each bore hole. Soil borings were converted into temporary groundwater monitoring wells for collection of groundwater samples. The temporary monitoring wells were constructed utilizing 1-inch diameter, 0.010-inch machine slotted poly-vinyl chloride (PVC) well screen with a threaded bottom cap followed by a 1-inch diameter, threaded, flush-joint PVC riser pipe to the ground surface.

Each groundwater sample was collected using a peristaltic pump and dedicated disposable tubing. A portion of each groundwater sample collected was field filtered using dedicated, disposable 0.45-micron groundwater filters for laboratory analysis of dissolved metals. The sample for TMW-3F appeared to have failed when the sample stream became clouded mid sampling. Groundwater sample designations are summarized in **Table 2-2** below.

Table 2-2 Groundwater Samples

Boring Number	Groundwater Sample Designations	Depth to Static Groundwater Below Ground Surface (bgs)
B-1	TMW-1 TMW-1F*	7-ft
B-2	TMW-2 TMW-2F* WDUP-1 WDUP-1F*	7-ft
B-3	TMW-3 TMW-3F*	7-ft

* indicates field filtered sample

2.2 Deviations

Groundwater samples were collected using a peristaltic pump, new dedicated polyethylene and laboratory provided glassware. This approach eliminated the need for decontamination of sampling equipment.

Two soil samples were scheduled to be collected from above the saturated zone. Due to the initial slow infiltrations from groundwater, the second soil sample was collected from below the static groundwater level. Since static groundwater levels were determined to average approximately 7 feet below grade, the collection of the second soil sample from below the static groundwater table at the time of sampling did not affect project decisions.

The soil core interval intended for the field duplicate soil sampling was not duplicate sampled due to miss identification of samples collected in regard to duplicate/original in the field. Therefore, the duplicate soil sample (DUP-1) serves as an original sample from soil boring B2 at an interval between 8-10 feet in depth, which does not allow for laboratory precision analysis via field duplicate analysis. However, laboratory precision analysis is also conducted via the relative percent difference of the matrix spike and matrix spike duplicate (MS/MSD) samples. Analysis of the MS/MSD determined that the data precision is valid and usable.

There were no other deviations from the approved PSAP.

3.0 DATA FINDINGS

3.1 Physical Measurements and Field Screening

Site-specific soil lithology consisted of semi-moist silty lean clay, which extended from the near surface (immediately below surface fill material) to the termination depths of each of the soil borings advanced. Photo-ionizable vapors were not detected while screening onsite soils using a PID. PID measurements are recorded on soil borings logs provided in **Appendix B**. Observable indicators of a release (i.e. soil staining, oil sheen, free product, odors, etc.) were not observed while advancing soil borings at the site.

3.2 Laboratory Analysis

The soil and groundwater samples collected were analyzed according to the sampling program provided in the site-specific sampling and analysis plan (P07207086 T12) dated September 29, 2021. Contaminants of concern in the sampling program were based on RECs identified in Terracon's Phase I ESA for the site dated July 22, 2021. The laboratory analysis findings are discussed below and summarized in **Table 1** and **Table 2** provided in **Appendix C**. The laboratory analytical reports and executed chain-of-custody forms are provided in **Appendix D**.

Soil and groundwater samples were analyzed for concentrations of:

- Volatile organic compounds (VOCs) by EPA Method 8260,
- Total Extractable Hydrocarbons (TEH) by Iowa Method OA-2,
- RCRA Metals via EPA Method 6010, 7470, 7471

3.2.1 Soil Samples

Concentrations of detected contaminants of concern in soil samples collected is discussed below and summarized in **Table 1**, provided in **Appendix C**.

Volatile Organic Compounds

Trichloroethylene (TCE) was detected in soil sample B-3 (0-2); however, the concentration (0.002 mg/kg) did not exceed IDNR's SWS for TCE.

Other VOCs did not exceed laboratory reporting limits in soil samples collected.

Total Extractable Hydrocarbons

Total extractable hydrocarbons (TEH) classified within the waste oil range were detected in soil samples B-1 (0–2), B2 (0–2), B-3 (0–2) and B3 (18-20). However, concentrations were below their respective IDNR's SWS.

RCRA Metals

Concentrations of detected metals that exceed applicable SWSs in soil samples collected are summarized in **Table 3-1** below. The SWS for residential soil are included on **Table 1** provided **Appendix C** in for comparison.

Table 3-1 – Metals Concentrations Reported for Soil Samples (mg/kg)

Parameter	B-1 (0-2')	B-1 (22-24')	B-2 (0-2')	B-2 (16-18')	B-3 (0-2')	B-2 (18-20')	Dup-1 (B-2, 8-10)	SWS
Arsenic	**4**	**3.2**	<10.8	**3.7**	<2.0	**3.4**	**6.6**	1.9
Lead	**61.8**	**7.3**	**500**	**8**	**20.2**	**8.5**	**7.7**	400

Arsenic was detected at concentrations that exceeded IDNR's SWS for soil in soil samples B-1 through B-3. Lead was also detected at concentrations exceeding IDNR's SWS in soil sample B-2 (0-2 feet) collected from surface fill material at the site. Note: the method reporting limit was elevated in samples B-2 (0-2) and B-3 (0-2) due laboratory matrix interferences. Refer to the Laboratory Analytical Report provided in **Appendix B** to review detected concentrations that do not exceed applicable SWSs.

3.2.2 Groundwater Samples

Concentrations of detected contaminants of concern in groundwater samples collected is discussed below and summarized in **Table 2**, provided in **Appendix C**. **Table 2** includes the SWS for a protected and non-protected groundwater sources for comparison.

Volatile Organic Compounds

The petroleum compound methyl-tertiary-butyl-ether (MTBE) was detected in groundwater samples TMW-3; however, the concentration (0.0198 mg/L) does not exceed IDNR's SWS. Tetrachloroethylene was detected in the groundwater sample TMW-2, however the concentration (0.0015 mg/L) does not exceed IDNR's SWS in groundwater.

Other VOCs did not exceed laboratory reporting limits in groundwater samples collected.

Total Extractable Hydrocarbons

Total extractable hydrocarbons (TEH) classified within the diesel range and TEH classified within the waste oil range were below laboratory reporting limits.

RCRA Metals

The concentrations of arsenic, chromium, and lead in unfiltered groundwater samples TMW-1, TMW-2, and TMW-3 exceed IDNR's SWS. Barium exceeded IDNR's SWS in the groundwater sample collected from TMW-2.

The concentration of dissolved chromium was detected TMW-3. However, dissolved analysis did

not exceed an IDNR SWS for the metals analyzed. This indicates that the total metals results are likely associated with solids entrained in the sample stream that can be removed by filtration.

Other contaminants of concern did not exceed laboratory detection limits and/or Iowa SWS in the groundwater samples collected.

4.0 DATA VALIDATION & VERIFICATION (QAPP SECTION D1 & D2)

4.1 Field Methods and Measurements Review

To validate the quality and usability of data findings, a review of field activities outcomes included the following:

Table 4-1 – Field Methods and Measurements Review Summary

Review Checklist	Validated	Descriptions
Soil boring and sampling design was conducted in accordance with the approved PSAP	Yes	
Sample collection methods were conducted in accordance to Terracon Standard Operating Procedures (TSOPs) as provided in the Generic QAPP.	Yes	
Quality Assurance / Quality Control (QA/QC) Samples were collected in accordance to TSOPs.	No	The soil intended for the field duplicate sampling was not duplicate sampled due to miss identification of samples collected in regard to duplicate/original. Therefore, the duplicate soil sample (DUP-1) serves as an original sample and does not allow for laboratory precision analysis via a duplicate sample. Laboratory precision analysis is also conducted via the relative percent difference of the matrix spike and matrix spike duplicate (MS/MSD) samples. Analysis of the MS/MSD determined that the data precision is valid and usable.
Sampling is considered complete if 100% of the soil samples are obtained pursuant to the PSAP design	Yes	
Sampling is considered complete if 100% of the groundwater samples were obtained pursuant to the PSAP design	Yes	
Soil sampling is considered representative if 50% of the sample interval for soil was recovered and submitted	No	Soil sample B3(0-2) was collected from a soil core that had a 25% recovery. However, the quantity recovered was adequate for laboratory analysis; therefore, is considered representative of surface soils at the sample location. Other soil samples intervals submitted for laboratory analysis had recoveries between 75% and 100% and are representative of intervals collected.

Groundwater sampling is considered representative if 100% of the laboratory volume for groundwater samples is extracted and submitted	Yes	
Chain of custody represents samples collected and submitted and laboratory analysis requests were made pursuant to the PSAP design	Yes	
Holding and transport times were met for the sample to be considered valid	Yes	
Calibration of instruments at bench mobilization and in the field from instrument records and field logs specific to the property eligible and assessed	Yes	
Detectable concentrations of VOCs were not detected in the Trip Blank QA/QC sample, which would indicate the potential for cross-contamination between samples or other breach of sample integrity during transport.	Yes	

4.2 Laboratory Methods and Measurements Review

Laboratory Validation of Analytical Data

The laboratory is responsible for validating data in accordance with laboratory standard operating procedures. Discussions and notes regarding laboratory data validation; including but not limited to, laboratory surrogate recoveries, matrix spike / matrix spike duplicate (MS/MSD), qualifying statements, etc.; is provided in the laboratory report included as **Appendix D**.

Field Duplicate Sampling

In addition to laboratory provided validation data, Terracon assessed laboratory precision via a duplicate groundwater sample. Precision is evaluated using the relative percent difference (RPD) between concentrations reported for an actual sample and it's duplicate. A duplicate groundwater sample was collected from temporary monitor wells TMW-2 (WDUP-1). A detectable concentration of TCE (0.0015 mg/L) was encountered in groundwater sample TMW-2. However, TCE did not exceed laboratory reporting limits in the duplicate sample. The concentrations of TCE in groundwater sample TMW-2 is too small to represent other than negligible difference and is therefore considered valid. Other VOCs in groundwater sample TMW-2 and its duplicate were below the laboratory's reporting limits.

The Relative percent difference of RCRA metals are within 20% and meet the precision goals as provided in USEPA Region 7 approved Generic QAPP (QAPP Section A7.2.1) with the exception of barium (23% RPD) and dissolved arsenic (33% RPD). However, the quantity difference for barium is 1 mg/L and dissolved arsenic is 0.001 mg/L; the actual quantiles are too small to determine significant difference in precision and duplicate analysis is considered adequate for the

purpose of this assessment. As noted in Section 2.2 above, soil samples collected did not allow for laboratory precision analysis via field duplicate analysis.

Reporting Limits

To validate appropriate sensitivity of the laboratory analysis the laboratory reporting limit must not exceed Iowa SWS. The laboratory reporting limit is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The Reporting Limits used by the laboratory were generally below the primary action limits (SWS) used for this Phase II ESA. Analytes that were not measured to exceed the Reporting Limit or Method Detection Limit in soil and groundwater samples were assumed to not be present.

5.0 DATA EVALUATION (QAPP SECTION A7.3)

5.1 Decision Rule

The City intended to determine whether this property is or is not impacted relative to the IDNR statewide standards. Based on the outcome of the decision, there are two potential Project actions. They are as follows:

- If petroleum contaminants of concern in soil and/or groundwater do not exceed SWS, the site would not be considered environmentally impaired in regard to contaminants of concern assessed during this Phase II ESA. ECIA and the City can consider it feasible for redevelopment per the Iowa Land Recycling Program (LRP) (567 IAC 135) without considering remedy of soils and/or groundwater. Further assessment of contaminants of concern in soil/groundwater will not be necessary.

or,

- If contaminants of concern in soil and/or groundwater exceed SWS, then potential exposure concerns associated with the SWS exceedances would require further evaluation for potential human and/or environmental exposures.

5.2 Project Data Decisions

Data Exceeded SWS for arsenic and lead in shallow soils at the site.

5.2.1 Project Decision – Soils

Based on measured parameters in soil, levels of arsenic contamination exceed applicable SWSs in all soil samples and lead exceeded the SWS at B-2, therefore site conditions may not be suitable at this time for unrestricted land use without remedial efforts.

5.2.2 Project Decision - Groundwater

Based on measured parameters in dissolved groundwater analysis, chemicals of concern did not exceed a SWS, therefore conditions may be suitable at this time for unrestricted land use.

5.3 Exposure Risk Evaluation

The Phase II ESA soil and groundwater analytical results were evaluated for exposure risk using the IDNR LRP risk-based Statewide Standards (SWS). Maximum reported concentrations for detected analytes were entered into IDNR's cumulative risk calculator, and the results were evaluated for the following conditions.

- Impacts in soil considering site residents
- Impacts in soil considering site workers
- Impacts in groundwater considering site residents
- Impacts in groundwater considering site workers

The comparisons were made with the following considerations.

- The property is not enrolled in the LRP, and this comparison is for planning purposes only.
- The property at the time of assessment does not have restricted access to control exposures; there are no existing significant security structures, engineered barriers, or remoteness of location pursuant to the LRP rules.

5.3.1 Cumulative Risk Calculator Results[1]

Terracon entered the maximum concentrations for soil and dissolved in groundwater and ran the calculator for the above scenarios. Results were as follows:

Soil Calculator Results

	Cancer Risk	Non-Cancer Risk
Residential Use	0.28	1.8
Site Worker	0.06	0.56
Construction Worker	0.01	0.36

Dissolved Groundwater Calculator Results

	Cancer Risk	Non-Cancer Risk
Residential Use	0.5	0.68
Site Worker	0.24	0.17
Construction Worker	*Not run since most conservative pathway passes.*	

[1] Values associated with "Cumulative Cancer Risk" and non-cancer "Sum" that are less than or equal to 1.00 are within acceptable cumulative risk levels.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This Phase II ESA was conducted to assess whether petroleum and/or hazardous substance contaminants of concern associated with the identified RECs are present at the site, to identify potential human or environment exposure concerns associated with identified contaminants, and to provide information to the landowner and redevelopment contractor regarding federal, state, and local regulations associated with site redevelopment and use (i.e. handling and disposal of contaminated media).

Conclusions

Contaminants of concern in soil and groundwater samples collected that exceed IDNR's SWS for soil and groundwater include various petroleum compounds and metals. Therefore, soil and groundwater data collected represent the following exposure concerns:

1. Occupant dermal/ingestion exposure (surface contamination)
2. Contractor dermal/ingestion exposure (during excavation)
3. Groundwater ingestion exposure based on total analysis only

Potential exposure concerns associated with the SWS exceedances listed above will require additional assessment and/or mitigation before or as part of site development activities to adequately address potential exposures.

Concentrations of VOCs were not encountered in soil and groundwater samples collected at levels exceeding Iowa SWS; therefore, VOCs do not represent a vapor intrusion concern into proposed onsite structures.

Recommendations

- Engineered controls should be implemented and maintained to mitigate the potential of dermal/ingestion exposure to site occupants. Terracon recommends that impacted soils not removed from the site during redevelopment be capped with an impermeable surface (i.e. asphalt/concrete pavement, concrete foundation, and/or 3 feet of "uncontaminated" clay) to mitigate the potential for human and/or environmental exposures to impacted soils.

- To eliminate the potential for groundwater ingestion exposure concerns, groundwater resource wells should not be constructed at the site. the first saturated aquifer is likely a non-protected groundwater and would not likely be used for consumptive applications. Extraction of groundwater below the site should not be conducted for any purpose (i.e. consumption, gardening, commercial use, agriculture, etc.) except for the purpose of environmental investigation and/or remediation activities, if warranted.

- Excavation of impacted soils at the site should be done in a manner does not present a threat to human health or the environment, and which limits potential for spread of

contaminants. Excavated impacted soils should not be relocated as backfill to other areas onsite or offsite. Excavated soil waste should be disposed per local, state, and federal regulations at a municipal landfill permitted to accept the waste.

- Soil Management Plan: Terracon understands that proposed redevelopment at the site will include excavation activities and disposal of excavated media. Redevelopment contractors are potentially at risk of exposure to contaminated soil and groundwater during redevelopment activities. Disposal of impacted excavated media will also be subject to local disposal regulations. Because of these factors, Terracon recommends that a site-specific soil and groundwater management plan be prepared prior to groundbreaking activities.

  The purpose of the soil and groundwater management plan is to provide information necessary for redevelopment contractors to plan appropriate site development activities and incorporate health and safety into their bid package for the construction. The plan will discuss appropriate onsite soil profiling/screening, proper handling, best practices, backfilling, and disposal of excavated soil during site redevelopment activities.

7.0 REGULATORY SETTING

7.1 IDNR Land Recycling Program

The LRP is a voluntary, risk-based cleanup program for properties with environmental impacts. The LRP is designed to meet the dual objectives of addressing contaminated sites and promoting the redevelopment of these sites. The primary means of meeting these objectives are by encouraging voluntary participation to address contamination by establishing a set of risk-based response action standards, and by providing a measure of liability protection to participants and future property owners. Iowa has finalized a MOA with the EPA. Under the MOA, the EPA agrees not to act at sites enrolled in the LRP.

7.2 Iowa Statewide Comparison

The LRP establishes statewide standards that represent concentrations of contaminants in specific media of an affected area. These are values at which normal, unrestricted exposure through a specific exposure pathway are considered unlikely to pose a threat to human health, safety, or the environment. Risk-based contaminant concentrations for soil and groundwater are calculated using a formula that considers chemical specific properties concerning toxicity and assumptions about human exposure. The formula is used for each contaminant at a site, except for lead, which has default values specified in the regulations.

The comparison of reported chemical concentrations to the statewide standards is the primary project decision.

7.3 Statewide Soil Standards

Equation (1) is used to calculate the risk-based concentrations for compounds (other than lead).

$$C = \frac{RF \times AT \times 365\ days/year}{Abs \times \left[\left(ER_c \times EF_c \times ED_c\right) \div BW_c + \left(ER_a \times EF_a \times ED_a\right) \div BW_a\right] \times CF} \quad (1)$$

Where:

C = Risk-based concentration of contaminant
RF = Risk factor, which differs for carcinogenic and noncarcinogenic effects
AT = Averaging time (in years)
Abs = Absorption factor
ER_c = Exposure rate by a child
EF_c = Exposure frequency by a child
ED_c = Exposure duration by a child
BW_c = Body weight of exposed child
ER_a = Exposure rate by an adult
EF_a = Exposure frequency by an adult
ED_a = Exposure duration by an adult
BW_a = Body weight of exposed adult
CF = Conversion Factor

For lead, the IDNR has established a statewide standard of 400 mg/kg and a non-residential, site-specific standard of 1,100 mg/kg for soil less than two feet in depth. For non-residential site-specific standards for soil deeper than two feet and residential site-specific standards for soil deeper than ten feet, the IDNR standard is based on EPA's Exposure Model for Assessing Risk Associated with Adult Exposures to Lead in Soil.

7.4 Statewide Groundwater Standards

Statewide groundwater standards are determined as being:

- The Safe Drinking Water Act (SDWA) Maximum Contamination Limit (MCL) established by the EPA, if one exists, or
- If no enforceable MCL exists, the lifetime HAL, or
- If no MCL or HAL exists, the standard is calculated using Equation (1) with input variables specified in the rule.

The statewide groundwater standard for a non-protected groundwater source is based on a series of tests and iterations of the formula used for soil standards, with input values that are dependent on the properties of the specific compound being evaluated.

A Protected Groundwater Source is defined as "…a saturated bed, formation, or group of formations which has a hydraulic conductivity of at least 0.44 m/day and a TDS concentration of less than 2,500 mg/L." A Non-protected Groundwater Source is, by definition, a saturated bed, formation, or group of formations that has a hydraulic conductivity of less than 0.44 m/day or a TDS concentration in excess of 2,500 mg/L. The aquifer at the Site is conservatively assumed to be a Protected Groundwater Source; however, Terracon compared the Site chemistry in groundwater to statewide standards for both Protected and Non-protected Groundwater Sources.

The LRP requires multiple sampling and testing events before making the comparisons of groundwater chemistry to standards for final determination of compliance. The period of monitoring may vary dependent on IDNR approvals if enrolled in the LRP. A "favorable" comparison is not necessarily sufficient for enrollment and closure in the LRP.

7.5 Iowa Site-Specific Comparison – Cumulative Risk Calculator

The statewide standards assume that the property will be restored to unrestricted land use. They are protective of the most sensitive member of the population for the public exposures defined in the LRP rules. In general, this is sufficient for redevelopment or restoration for residential land use and residential occupancy by children.

The City may not require restoration to levels of chemical risk so that future residence by families can occur. Land use for commercial/industrial use must also be considered and is in fact often the primary consideration for reuse. The LRP rules recognize these considerations and include processes whereby site-specific standards can be determined for property-specific conditions of residential or non-residential land use. For sites in the LRP, IDNR requires parties to use its on-line cumulative risk calculator (http://programs.iowadnr.com/riskcalc/pages/calculator.aspx) to achieve compliance. The risk calculator allows for calculation of cumulative risk for residents, site workers, and site construction workers resulting from hypothetical exposure to contaminated groundwater, soil, or air. Site-specific data are entered into the calculator, and if the values of the "cumulative cancer risk" or non-carcinogenic "sum" are less than or equal to 1.00, the site is within acceptable risk levels. If the values exceed 1.00, IDNR allows parties to establish institutional and/or technological controls under sub rules 567 IAC 137.6(10) and (11) to prevent exposure to contaminants.

7.6 Application of the Standards

The user of this document must understand the limited applicability of the standards adopted under the authority of the LRP. The standards were developed within the narrow focus and constraints of the LRP. While the standards are based on a consideration of risk, they are different from other "risk-based" approaches.

The LRP does not contain standards that are established based on the migration of contaminants from one medium to another, which then becomes the basis for subsequent exposure. This does

not mean the IDNR has no concern for these cross-media transfers. IDNR chooses to address them through direct measurement of the medium in which the exposure takes place or through the calculation of such cross-media transfer standards only when it is determined that such an approach is appropriate in a site-specific context. The intent is to avoid the application of needlessly restrictive standards to situations where they are not a relevant concern. Implicit in the final application of the standards is IDNR concurrence that the standards applied in any given situation address all exposure pathways that are deemed to be of concern. This can only take place when the IDNR is adequately informed of the particulars of a situation. Without IDNR concurrence there should be no presumption that a standard is sufficiently protective or that it will meet the requirements of the LRP.

Most of the standards entail very specific exposure assumptions. Site-specific standards assume that institutional controls will be put in place in order to preserve those exposure assumptions (e.g., a prohibition of residential use or well installation). Implicit in the use of such standards is the assumption that the IDNR has evaluated the exposure assumptions, along with necessary institutional controls, and determined that they are appropriate to the situation.

As a result of the integral role of IDNR in determining and approving the appropriate use of the standards, they should not routinely be used for purposes outside of the LRP, including screening to determine whether a situation is a significant problem or whether it is reportable. Exceptions to this are the statewide standards for a Protected Groundwater Source. These standards may be used in lieu of action levels set by 567 IAC Chapter 133: *Rules for Determining Cleanup Actions and Responsible Parties*. This does not prevent IDNR from making use of the standards outside of the LRP when applicable and appropriate to projects under their supervision.

8.0 GENERAL COMMENTS

The analysis presented in this report is based upon data obtained from field activities and from other information discussed in this report. This report does not reflect any variations in subsurface stratigraphy that may occur between sampling locations or across the Site. Actual subsurface conditions may vary. The extent of such variations may not become evident without additional exploration.

This report is prepared for the exclusive use of ECIA and the City of Stanwood, Iowa for the specific application to this project and has been prepared in accordance with generally accepted environmental engineering practices. No warranties, express or implied, are intended or made. In the event any changes in nature or location of subsurface conditions as outlined in this report are observed, the conclusions contained in this report cannot be considered valid unless the changes are reviewed, and the conclusions of this report are modified or verified in writing by Terracon.

8.1 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the onsite activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable or not present during these services, and we cannot represent that the Site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this Phase II ESA. Subsurface conditions may vary from those encountered at specific borings or test pits or during other surveys, tests, assessments, investigations or exploratory services; the data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

8.2 Reliance

ECIA and the City of Stanwood, Iowa are the principal end users of this information. Although the report is available for review by the public, further reliance by others is beyond the scope of the grant and EPA funding.

ECIA and/or the City of Stanwood, Iowa will make primary use of the data to aid in decision-making relative to considering properties for redevelopment. The data will not constitute the sole or final factor in the positive or negative feasibility determination for redevelopment. It is anticipated that this Phase II ESA is for preliminary characterization and, if needed, will be used as the basis for secondary phases of remedial investigation.

The information contained in this report is for the sole benefit of the ECIA and the City of Stanwood, Iowa in determining feasibility for redevelopment and restoration of the property. The information and funding expended to produce the information does not provide windfall or extraneous benefits to property owners.
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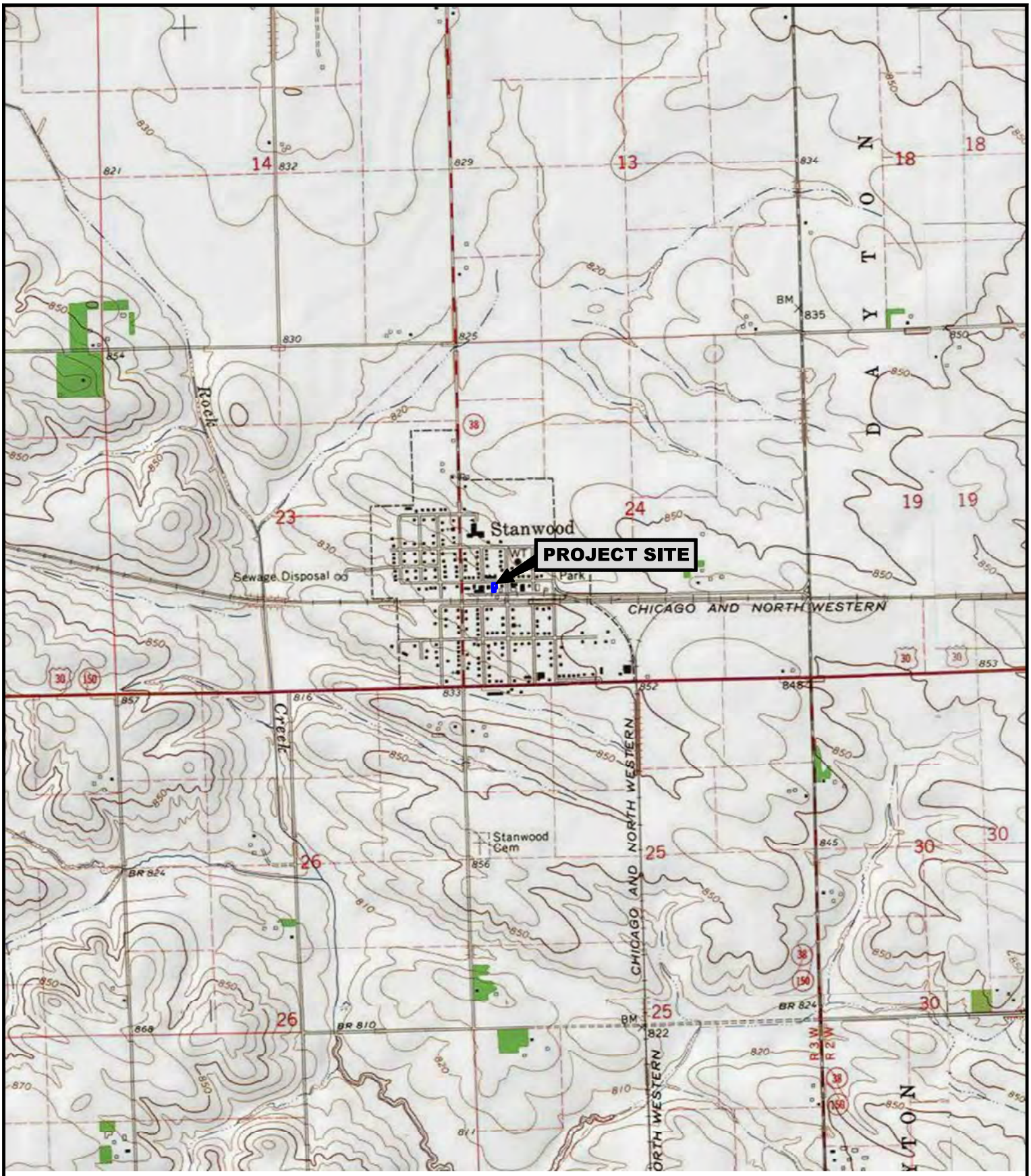
APPENDIX A

Exhibit 1– Topographic Map

Exhibit 2– Soil Boring Locations Map



TOPO IMAGE FROM ARCGIS MAP SERVER
http://services.arcgisonline.com/ArcGIS/services

LEGEND

- BOUNDARY OF ASSESSED AREA

NORTH

0 2000'

APPROXIMATE DRAWING SCALE

Project No.	07207086
Date:	3/24/2021
Project Mngr:	JFC
Drawn By:	JAL
File Name:	07207086-01.dwg
Layout Name:	E1

Terracon
Consulting Engineers and Scientists
870 40TH AVENUE BETTENDORF, IOWA 52722
PH. (563) 355-0702 FAX. (563) 355-4789

TOPOGRAPHIC SITE MAP

PHASE I ENVIRONMENTAL SITE ASSESSMENT
ECIA BROWNFIELDS
211 & 213 EAST BROADWAY STREET
STANWOOD, CEDAR COUNTY, IOWA

EXHIBIT

1

AERIAL PHOTO FROM GOOGLE EARTH

LEGEND

- BOUNDARY OF ASSESSED AREA

NORTH

0 200'

APPROXIMATE DRAWING SCALE

Project No.	07207086
Date:	3/24/2021
Project Mngr:	JFC
Drawn By:	JAL
File Name:	07207086-01.dwg
Layout Name:	E2

Terracon
Consulting Engineers and Scientists
870 40TH AVENUE BETTENDORF, IOWA 52722
PH. (563) 355-0702 FAX. (563) 355-4789

Site Boring Plan

PHASE II ENVIRONMENTAL SITE ASSESSMENT
ECIA BROWNFIELDS
211 & 213 EAST BROADWAY STREET
STANWOOD, CEDAR COUNTY, IOWA

EXHIBIT

2

APPENDIX B

Boring Logs

BORING LOG NO. B-1

PROJECT: Stanwood Iowa Brownfields

CLIENT: ECIA & City of Stanwood

SITE: 211 and 213 East Broadway Street
Stanwood, Iowa

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)	SOIL SAMPLE	PID (ppm)
0.5	**GRAVEL**, Approximately 6" of gravel							
	CL, brown, semi moist, silty, lean CLAY				75		X	0.0
	light brown with grey mottling below 6'				75			0.0
	moist below 7'	5			75			0.0
			▽		75			0.0
					75			0.0
		10						
	6" brown fine SAND seam at 11'				75			0.0
					75			0.0
		15			75			0.0
					75			0.0
	grey below 18'				75			0.0
		20			100			0.0
24.0					100		X	0.0
	Boring Terminated at 24 Feet							

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Boring backfilled with Bentonite

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽

Boring Started: 12-13-2021 | Boring Completed: 12-13-2021
Drill Rig: DR009 | Logger:
Project No.: 07207086 | Exhibit: B-1

BORING LOG NO. B-2

PROJECT: Stanwood Iowa Brownfields

CLIENT: ECIA & City of Stanwood

SITE: 211 and 213 East Broadway Street
Stanwood, Iowa

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)	SOIL SAMPLE	PID (ppm)
	FILL, Approximately 6" of gravel FILL followed by 1.5' of gravel and trace brick FILL				75		X	0.0
2.0	**CL**, brown, semi moist, silty, lean CLAY				75			0.0
	light brown below 5'	5			75			0.0
			▽		75			0.0
	6" sand seam at 9' moist below 9'				75		X	0.0
		10			75			0.0
	grey with brown mottling below 13'				75			0.0
		15			75			0.0
					75		X	0.0
20.0					75			0.0
	Boring Terminated at 20 Feet	20						

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Boring backfilled with Bentonite

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽

Boring Started: 12-13-2021 | Boring Completed: 12-13-2021
Drill Rig: DR009 | Logger:
Project No.: 07207086 | Exhibit: B-2

BORING LOG NO. B-3

PROJECT: Stanwood Iowa Brownfields

CLIENT: ECIA & City of Stanwood

SITE: 211 and 213 East Broadway Street
Stanwood, Iowa

LOCATION See Exhbit A-2

DEPTH	MATERIAL DESCRIPTION	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (%)	OVA/PID (ppm)	SOIL SAMPLE	PID (ppm)
	GRAVEL, Approximately 6" of gravel FILL followed by 1.5' of gravel and trace brick FILL				25		X	0.0
1.5	**CL**, brown, semi moist, silty, lean CLAY				25			0.0
		5			25			0.0
	grey below 7' moist below 7'		▽		25			0.0
					75			0.0
		10			75			0.0
	light brown below 12'				75			0.0
	grey below 14'	15			75			0.0
					75			0.0
20.0					75		X	0.0
	Boring Terminated at 20 Feet	20						

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Boring backfilled with Bentonite

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽

Boring Started: 12-13-2021 | Boring Completed: 12-13-2021
Drill Rig: DR009 | Logger:
Project No.: 07207086 | Exhibit: B-3

APPENDIX C

Analytical Results Summary Tables

Table 1 - Soil Analytical Results
ECIA Stanwood Iowa
211 and 213 East Broadway Street, Stanwood, Cedar County, Iowa

Analyte	Units	Iowa Statewide Standards (SWS)	B-1 0-2	B-1 22-24	B-2 0-2	B-2 16-18	B-3 0-2	B-3 18-20	DUP-1 B-2 8-10
		For Soil	12/14/2021	12/14/2021	12/14/2021	12/14/2021	12/14/2021	12/14/2021	12/14/2021
Volatile Organic Compounds									
Trichloroethylene	mg/kg	67	<0.002	<0.002	<0.002	<0.002	**0.002**	<0.002	<0.002
RCRA 8 Metals									
Arsenic	mg/kg	1.9	**4**	**3.2**	<10.8**	**3.7**	<2.0**	**3.4**	**6.6**
Barium	mg/kg	15000	**106**	**113**	**98.4**	**87.7**	**24.9**	**128**	**162**
Cadmium	mg/kg	70	BRL	BRL	BRL	BRL	BRL	BRL	0.4
Chromium (Total)	mg/kg	190	**8.9**	**12.7**	**38.6**	**15.4**	**2.2**	**15.2**	**15**
Lead	mg/kg	400	**61.8**	**7.3**	**500**	**8**	**20.2**	**8.5**	**7.7**
Mercury	mg/kg	23	**0.22**	BRL	**0.23**	BRL	**0.12**	BRL	BRL
Selenium	mg/kg	390	BRL	BRL	**7**	**16.5**	**17.6**	**17.6**	BRL
Silver	mg/kg	370	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Total Extractable Hydrocarbons (TEH)									
Gasoline	mg/kg	---	**38**	BRL	**186**	BRL	**164**	BRL	BRL
Diesel	mg/kg	28000	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Waste Oil	mg/kg	9400	**62**	**47.1**	**149**	BRL	**181**	**6**	BRL
Total Extractable Hydrocarbons	mg/kg	---	**100**	BRL	**335**	BRL	**345**	**6**	BRL

<##	= Below laboratory reporting limits and SWS
<##**	= Concentration is below laboratory reporting limits; however, the reporting limits exceeds SWS
Bold	= Exceeds laboratory reporting limits; however, concentrations are below SWS
Bold	= Exceeds SWS

Table 2 - Groundwater Analytical Results
Proposed Kinseth ECIA Stanwood Iowa
211 and 213 East Broadway Street, Stanwood, Cedar County, Iowa

Analyte	Units	Iowa Statewide Standards (SWS) Protected Groundwater Source	Iowa Statewide Standards (SWS) Non-Protected Groundwater Source	TMW-1 12/13/2021	TMW-2 12/13/2021	WDUP-1 (TMW-2) 12/13/2021	TMW-3 12/13/2021
Volatile Organic Compounds							
Methyl tert-butyl ether	mg/L	0.21	1	BRL	BRL	BRL	**0.0198**
Tetrachloroethylene	mg/L	0.005	1,700	BRL	**0.0015**	BRL	BRL
Other VOCs	mg/L	Compound Specific	Compound Specific	BRL	BRL	BRL	BRL
Total RCRA 8 Metals							
Arsenic	mg/L	0.01	0.05	**0.048**	**0.15**	**0.0912**	**0.0638**
Barium	mg/L	2	10	**0.487**	**2.04**	**1.11**	**1.19**
Cadmium	mg/L	0.005	0.025	**0.0012**	**0.0045**	**0.0033**	**0.0049**
Chromium	mg/L	0.1	0.5	**0.0588**	**0.164**	**0.116**	**0.0836**
Lead	mg/L	0.015	0.075	**0.0472**	**0.114**	**0.0765**	**0.0616**
Mercury	mg/L	0.002	0.01	BRL	BRL	BRL	BRL
Selenium	mg/L	0.05	0.25	**0.0075**	**0.0169**	**0.0135**	**0.0105**
Silver	mg/L	0.1	0.5	BRL	BRL	BRL	BRL
Dissolved RCRA 8 Metals							
Arsenic, Diss	mg/L	0.01	0.05	**0.005**	**0.0036**	**0.0046**	**0.0039**
Barium, Diss	mg/L	2	10	**0.161**	**0.17**	**0.163**	**0.314**
Cadmium, Diss	mg/L	0.005	0.025	BRL	BRL	BRL	**0.0027**
Chromium, Diss	mg/L	0.1	0.5	BRL	BRL	BRL	**0.0031**
Lead, Diss	mg/L	0.015	0.075	BRL	BRL	**0.0028**	**0.0059**
Mercury, Diss	mg/L	0.002	0.01	BRL	BRL	BRL	BRL
Selenium, Diss	mg/L	0.05	0.25	BRL	BRL	BRL	BRL
Silver, Diss	mg/L	0.1	0.5	BRL	BRL	BRL	BRL
Total Extractable Hydrocarbons (TEH)							
Gasoline	mg/L	---	---	BRL	BRL	BRL	BRL
Diesel	mg/L	2.2	44	BRL	BRL	BRL	BRL
Waste Oil	mg/L	0.73	15	BRL	BRL	BRL	BRL
Total Extractable Hydrocarbons	mg/L	---	---	BRL	N/A	N/A	BRL

BRL	= Below laboratory reporting limits and SWS
Bold	= Exceeds laboratory reporting limits; however, concentrations are below SWS
Bold	= Exceeds SWS

APPENDIX D

Laboratory Analytical Reports

January 04 2022

Joshua F. Cox
Terracon Environmental-Bettendorf
870 40th Ave
Bettendorf, IA 52722

RE: Environmental Sampling
Stanwood

Enclosed are the results of analyses for samples received by the laboratory on 12/14/21 11:25. If you have any questions concerning this report, please feel free to contact me at 1-800-858-5227.

ANALYTICAL REPORT FOR SAMPLES

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1 0-2	1EL1284-01	Soil	12/13/21 08:25	12/14/21 11:25
B-1 22-24	1EL1284-02	Soil	12/13/21 09:00	12/14/21 11:25
B-2 0-2	1EL1284-03	Soil	12/13/21 09:30	12/14/21 11:25
B-2 16-18	1EL1284-04	Soil	12/13/21 09:50	12/14/21 11:25
B-3 0-2	1EL1284-05	Soil	12/13/21 10:15	12/14/21 11:25
B-3 18-20	1EL1284-06	Soil	12/13/21 10:30	12/14/21 11:25
TMW-1	1EL1284-07	Water	12/13/21 11:10	12/14/21 11:25
TMW-2	1EL1284-08	Water	12/13/21 11:15	12/14/21 11:25
TMW-3	1EL1284-09	Water	12/13/21 11:35	12/14/21 11:25
DUP-1	1EL1284-10	Soil	12/13/21 00:00	12/14/21 11:25
WDUP-1	1EL1284-11	Water	12/13/21 00:00	12/14/21 11:25
Trip Blank	1EL1284-12	Water	12/13/21 08:00	12/14/21 11:25

Case Narrative

The client reqeusted that sample 1E1284-09, TMW-3, be analyzed for dissolved metals. However, the sample was not filtered in the field by the client before being preserved with Nitric Acid to a pH of <2. Preserving a sample with nitric acid

Phone 641-792-8451 600 East 17th Street South Newton, IA 50208 Fax 641-792-7989

Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
870 40th Ave	Project Number:	Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox	

before it is filtered can change the dissolved metals results by causing metals insoluble at the samples normal pH to become dissolved and there-by causing high bias. Similarly, adding Nitric Acid to a sample may cause some analytes that were soluble under the normal sample pH to become insoluble and there-by causing low bias.

Therefore, when sample 1E1284-09 was analyzed for dissolved metals a sub-sample from the Nitric Acid preserved container was taken by decanting the sample into an autosampler vial. The sample was not mixed. The results from the analysis of this subsample were designated as dissolved metals

James Eggers
Director of Quality Assurance

Phone 641-792-8451 600 East 17th Street South Newton, IA 50208 Fax 641-792-7989

Terracon Environmental-Bettendorf 870 40th Ave Bettendorf, IA 52722	Project: Environmental Sampling Project Number: Stanwood Project Manager: Joshua F. Cox	Reported 01/04/22 12:59

CHAIN OF CUSTODY RECORD

Keystone LABORATORIES, INC.
600 E. 17th St. S
Newton, IA. 50208
Phone:641-792-8451

PRINT OR TYPE INFO BELOW:	REPORT TO:	BILL TO:
SAMPLER: Josh F. Cox	NAME: Joshua F. Cox	NAME: Joshua F. Cox
SITE NAME: Stanwood	CO. NAME:	CO. NAME:
ADDRESS: 211-213 East Broadway	ADDRESS: 870 40th Ave.	ADDRESS: 870 40th Ave.
CITY/ST/ZIP: Stanwood, IA, 52337	CITY/ST/ZIP: Bettendrof, IA, 52722	CITY/ST/ZIP: Bettendrof, IA, 52722
PHONE: 847-714-4987	PHONE: 847-714-4987	PHONE: 847-714-4987
	Email: josh.cox@terracon.com	Email: josh.cox@terracon.com

LAB USE ONLY: Wk Order #: 1EL1284; Short Hold: ; Rush: ; Temp. oC: 0.0

CLIENT SAMPLE #	DATE	TIME		# OF CONTAINERS	MATRIX	GRAB/COMPOS	VOCs	TEH Method OA-2	RCRA 8 Metals				Sample Condition	Sample #
B-1 0-2	12/13/2021	8:25		2	S	GRAB	X	X	X					01
B-1 22-24	12/13/2021	9:00		2	S	GRAB	X	X	X					02
B-2 0-2	12/13/2021	9:30		2	S	GRAB	X	X	X					03
B-2 16-18	12/13/2021	9:50		2	S	GRAB	X	X	X					04
B-3 0-2	12/13/2021	10:15		2	S	GRAB	X	X	X					05
B-3 18-20	12/13/2021	10:30		2	S	GRAB	X	X	X					06
TMW-1	12/13/2021	11:10		6	W	GRAB	X	X	X					07
TMW-2	12/13/2021	11:15		6	W	GRAB	X	X	X					08
TMW-3	12/13/2021	11:35		6	W	GRAB	X	X	X					09
DUP-1	12/13/2021			2	S	GRAB	X	X	X					10
WDUP-1	12/13/2021			6	W	GRAB	X	X	X					11
														12

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time	Remarks
[signature]	Date: 12/13/2021 Time: 14:20		Date: Time:	Metals were field filtered Nictric bottels with F were filtered TMW-3 might need to be filtered in the lab as the filtered failed in the field half way through sampling
Relinquished by: (Signature)	Date: Time:	Received for Lab by: (Signature) [signature]	Date: 12.14.21 Time: 11:25	

The results in this report apply to the samples analyzed in accordance with the Chain-of-Custody record. This report must be reproduced in its entirety.

Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-1 0-2

1EL1284-01 (Soil)

Date Sampled:12/13/2021 8:25:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 13:10	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-1 0-2

1EL1284-01 (Soil)

Date Sampled:12/13/2021 8:25:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*97.4 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 13:10*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*99.6 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*98.0 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*91.4 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	**38**	5	mg/kg	1	1EL1309	12/27/21	12/30/21 03:37	Iowa OA-2	D-12
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	**62**	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	**100**	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*80.3 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**85.6**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.5	mg/kg dry	1	1EL1249	12/27/21	12/29/21 06:21	EPA 6010B	
Arsenic, total	**4.0**	2.6	"	"	"	"	"	"	
Barium, total	**106**	0.52	"	"	"	"	"	"	
Cadmium, total	ND	0.5	"	"	"	"	"	"	
Chromium, total	**8.9**	1.6	"	"	"	"	"	"	
Mercury, total	**0.22**	0.05	"	"	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**61.8**	2.6	"	"	1EL1249	12/27/21	12/29/21 06:21	EPA 6010B	
Selenium, total	ND	15.6	"	10	"	"	12/29/21 12:52	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-1 22-24

1EL1284-02 (Soil)

Date Sampled:12/13/2021 9:00:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 13:55	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-1 22-24

1EL1284-02 (Soil)

Date Sampled:12/13/2021 9:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton									
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*103 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 13:55*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*107 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*96.1 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	5	mg/kg	1	1EL1309	12/27/21	12/30/21 04:19	Iowa OA-2	
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	ND	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*88.3 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**80.4**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.4	mg/kg dry	1	1EL1249	12/27/21	12/29/21 07:11	EPA 6010B	
Arsenic, total	**3.2**	1.8	"	"	"	"	"	"	
Barium, total	**113**	0.36	"	"	"	"	"	"	
Cadmium, total	ND	0.4	"	"	"	"	"	"	
Chromium, total	**12.7**	1.1	"	"	"	"	"	"	
Mercury, total	ND	0.05	"	"	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**7.3**	1.8	"	"	1EL1249	12/27/21	12/29/21 07:11	EPA 6010B	
Selenium, total	ND	1.1	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-2 0-2

1EL1284-03 (Soil)

Date Sampled:12/13/2021 9:30:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 14:40	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

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1EL1284-03 (Soil)

Date Sampled:12/13/2021 9:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton									
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*107 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 14:40*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*115 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.0 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	**186**	5	mg/kg	1	1EL1309	12/27/21	12/30/21 05:02	Iowa OA-2	D-12
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	**149**	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	**335**	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*95.7 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**75.6**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	2.2	mg/kg dry	5	1EL1249	12/27/21	12/29/21 07:20	EPA 6010B	
Arsenic, total	ND	10.8	"	"	"	"	"	"	
Barium, total	**98.4**	2.16	"	"	"	"	"	"	
Cadmium, total	ND	2.2	"	"	"	"	"	"	
Chromium, total	**38.6**	6.5	"	"	"	"	"	"	
Mercury, total	**0.23**	0.05	"	1	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**500**	10.8	"	5	1EL1249	12/27/21	12/29/21 07:20	EPA 6010B	
Selenium, total	**7.0**	6.5	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-2 16-18

1EL1284-04 (Soil)

Date Sampled:12/13/2021 9:50:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 15:24	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

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1EL1284-04 (Soil)

Date Sampled:12/13/2021 9:50:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*109 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 15:24*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.2 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	5	mg/kg	1	1EL1309	12/27/21	12/30/21 05:44	Iowa OA-2	
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	ND	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*58.0 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**82.5**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.6	mg/kg dry	2	1EL1249	12/27/21	12/29/21 11:04	EPA 6010B	
Arsenic, total	**3.7**	3.1	"	"	"	"	"	"	
Barium, total	**87.7**	0.62	"	"	"	"	"	"	
Cadmium, total	ND	0.6	"	"	"	"	"	"	
Chromium, total	**15.4**	1.9	"	"	"	"	"	"	
Mercury, total	ND	0.05	"	1	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**8.0**	3.1	"	2	1EL1249	12/27/21	12/29/21 11:04	EPA 6010B	
Selenium, total	**16.5**	9.3	"	10	"	"	12/29/21 12:58	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-3 0-2

1EL1284-05 (Soil)

Date Sampled:12/13/2021 10:15:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 10:57	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	**0.002**	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-3 0-2

1EL1284-05 (Soil)

Date Sampled:12/13/2021 10:15:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*109 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 10:57*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*104 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*100 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	**164**	5	mg/kg	1	1EL1309	12/27/21	12/30/21 06:26	Iowa OA-2	D-12
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	**181**	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	**345**	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*104 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**89.3**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.4	mg/kg dry	1	1EL1249	12/27/21	12/29/21 07:36	EPA 6010B	
Arsenic, total	ND	2.0	"	"	"	"	"	"	
Barium, total	**24.9**	0.40	"	"	"	"	"	"	
Cadmium, total	ND	0.4	"	"	"	"	"	"	
Chromium, total	**2.2**	1.2	"	"	"	"	"	"	
Mercury, total	**0.12**	0.05	"	"	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**20.2**	2.0	"	"	1EL1249	12/27/21	12/29/21 07:36	EPA 6010B	
Selenium, total	**17.6**	11.9	"	10	"	"	12/29/21 13:05	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

B-3 18-20

1EL1284-06 (Soil)

Date Sampled:12/13/2021 10:30:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 16:09	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

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1EL1284-06 (Soil)

Date Sampled:12/13/2021 10:30:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton									
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*110 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 16:09*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*119 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*103 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.2 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	5	mg/kg	1	1EL1309	12/27/21	12/30/21 07:09	Iowa OA-2	
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	**6**	5	"	"	"	"	"	"	D-12
Total Extractable Hydrocarbons	**6**	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*73.7 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**80.6**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.6	mg/kg dry	2	1EL1249	12/27/21	12/29/21 11:31	EPA 6010B	
Arsenic, total	**3.4**	3.0	"	"	"	"	"	"	
Barium, total	**128**	0.60	"	"	"	"	"	"	
Cadmium, total	ND	0.6	"	"	"	"	"	"	
Chromium, total	**15.2**	1.8	"	"	"	"	"	"	
Mercury, total	ND	0.05	"	1	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**8.5**	3.0	"	2	1EL1249	12/27/21	12/29/21 11:31	EPA 6010B	
Selenium, total	**17.6**	9.0	"	10	"	"	12/29/21 13:14	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-1

1EL1284-07 (Water)

Date Sampled:12/13/2021 11:10:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	1.0	ug/L	1	1EL0786	12/15/21	12/15/21 10:30	EPA 8260B	
Vinyl Chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Acetone	ND	10.0	"	"	"	"	"	"	
Carbon Disulfide	ND	1.0	"	"	"	"	"	"	
Methylene Chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	2.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon Tetrachloride	ND	1.0	"	"	"	"	"	"	
Benzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethylene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	5.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethylene	ND	1.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes, total	ND	2.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-1

1EL1284-07 (Water)

Date Sampled:12/13/2021 11:10:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*115 %*	*79-130*		*1EL0786*	*12/15/21*	*12/15/21 10:30*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*115 %*	*68-134*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*106 %*	*87-116*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*102 %*	*84-112*		*"*	*"*	*"*	*"*	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	0.4	mg/L	1	1EL0839	"	12/22/21 07:39	Iowa OA-2	
TEH, as #2 diesel fuel	ND	0.4	"	"	"	"	"	"	
TEH, as waste oil	ND	0.4	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	0.4	"	"	"	"	"	"	
Surrogate: Pentacosane		*71.8 %*	*15-179*		*"*	*"*	*"*	*"*	
Determination of Dissolved Metals									
Silver, dissolved	ND	0.0020	mg/L	4	1EL0763	12/14/21	12/18/21 07:47	EPA 6020A	
Arsenic, dissolved	**0.0050**	0.0020	"	"	"	"	"	"	
Barium, dissolved	**0.161**	0.0020	"	"	"	"	"	"	
Cadmium, dissolved	ND	0.0008	"	"	"	"	"	"	
Chromium, dissolved	ND	0.0020	"	"	"	"	"	"	
Mercury, dissolved	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, dissolved	ND	0.0008	"	4	1EL0763	12/14/21	12/18/21 07:47	EPA 6020A	
Selenium, dissolved	ND	0.0040	"	"	"	"	"	"	
Determination of Total Metals									
Silver, total	ND	0.0040	mg/L	4	1EL0830	12/20/21	12/20/21 17:07	EPA 6020A	
Arsenic, total	**0.0480**	0.0040	"	"	"	"	"	"	
Barium, total	**0.487**	0.0040	"	"	"	"	"	"	
Cadmium, total	**0.0012**	0.0008	"	"	"	"	"	"	
Chromium, total	**0.0588**	0.0080	"	"	"	"	"	"	
Mercury, total	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, total	**0.0472**	0.0040	"	4	1EL0830	12/20/21	12/20/21 17:07	EPA 6020A	
Selenium, total	**0.0075**	0.0040	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-2

1EL1284-08 (Water)

Date Sampled:12/13/2021 11:15:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	1.0	ug/L	1	1EL0786	12/15/21	12/15/21 12:27	EPA 8260B	
Vinyl Chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Acetone	ND	10.0	"	"	"	"	"	"	
Carbon Disulfide	ND	1.0	"	"	"	"	"	"	
Methylene Chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	2.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon Tetrachloride	ND	1.0	"	"	"	"	"	"	
Benzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethylene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	5.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethylene	**1.5**	1.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes, total	ND	2.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-2

1EL1284-08 (Water)

Date Sampled:12/13/2021 11:15:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*111 %*	*79-130*		*1EL0786*	*12/15/21*	*12/15/21 12:27*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*110 %*	*68-134*		"	"	"	"	
Surrogate: Toluene-d8		*107 %*	*87-116*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*103 %*	*84-112*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	0.4	mg/L	1	1EL0839	"	12/22/21 08:22	Iowa OA-2	
TEH, as #2 diesel fuel	ND	0.4	"	"	"	"	"	"	
TEH, as waste oil	ND	0.4	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	0.4	"	"	"	"	"	"	
Surrogate: Pentacosane		*95.1 %*	*15-179*		"	"	"	"	
Determination of Dissolved Metals									
Silver, dissolved	ND	0.0020	mg/L	4	1EL0763	12/14/21	12/18/21 08:19	EPA 6020A	
Arsenic, dissolved	**0.0036**	0.0020	"	"	"	"	"	"	
Barium, dissolved	**0.170**	0.0020	"	"	"	"	"	"	
Cadmium, dissolved	ND	0.0008	"	"	"	"	"	"	
Chromium, dissolved	ND	0.0020	"	"	"	"	"	"	
Mercury, dissolved	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, dissolved	ND	0.0008	"	4	1EL0763	12/14/21	12/18/21 08:19	EPA 6020A	
Selenium, dissolved	ND	0.0040	"	"	"	"	"	"	
Determination of Total Metals									
Silver, total	ND	0.0040	mg/L	4	1EL0830	12/20/21	12/20/21 17:32	EPA 6020A	
Arsenic, total	**0.150**	0.0040	"	"	"	"	"	"	
Barium, total	**2.04**	0.0040	"	"	"	"	"	"	
Cadmium, total	**0.0045**	0.0008	"	"	"	"	"	"	
Chromium, total	**0.164**	0.0080	"	"	"	"	"	"	
Mercury, total	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, total	**0.114**	0.0040	"	4	1EL0830	12/20/21	12/20/21 17:32	EPA 6020A	
Selenium, total	**0.0169**	0.0040	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-3

1EL1284-09 (Water)

Date Sampled:12/13/2021 11:35:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	1.0	ug/L	1	1EL0786	12/15/21	12/15/21 13:05	EPA 8260B	
Vinyl Chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Acetone	ND	10.0	"	"	"	"	"	"	
Carbon Disulfide	ND	1.0	"	"	"	"	"	"	
Methylene Chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	**19.8**	2.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon Tetrachloride	ND	1.0	"	"	"	"	"	"	
Benzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethylene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	5.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethylene	ND	1.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes, total	ND	2.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

TMW-3

1EL1284-09 (Water)

Date Sampled:12/13/2021 11:35:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*110 %*	*79-130*		*1EL0786*	*12/15/21*	*12/15/21 13:05*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*111 %*	*68-134*		"	"	"	"	
Surrogate: Toluene-d8		*106 %*	*87-116*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.4 %*	*84-112*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	0.4	mg/L	1	1EL0839	"	12/22/21 09:04	Iowa OA-2	
TEH, as #2 diesel fuel	ND	0.4	"	"	"	"	"	"	
TEH, as waste oil	ND	0.4	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	0.4	"	"	"	"	"	"	
Surrogate: Pentacosane		*95.5 %*	*15-179*		"	"	"	"	
Determination of Dissolved Metals									
Silver, dissolved	ND	0.0020	mg/L	4	1EL0763	12/14/21	12/18/21 08:25	EPA 6020A	
Arsenic, dissolved	**0.0039**	0.0020	"	"	"	"	"	"	
Barium, dissolved	**0.314**	0.0020	"	"	"	"	"	"	
Cadmium, dissolved	**0.0027**	0.0008	"	"	"	"	"	"	
Chromium, dissolved	**0.0031**	0.0020	"	"	"	"	"	"	
Mercury, dissolved	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, dissolved	**0.0059**	0.0008	"	4	1EL0763	12/14/21	12/18/21 08:25	EPA 6020A	
Selenium, dissolved	ND	0.0040	"	"	"	"	"	"	
Determination of Total Metals									
Silver, total	ND	0.0040	mg/L	4	1EL0830	12/20/21	12/20/21 17:51	EPA 6020A	
Arsenic, total	**0.0638**	0.0040	"	"	"	"	"	"	
Barium, total	**1.19**	0.0040	"	"	"	"	"	"	
Cadmium, total	**0.0049**	0.0008	"	"	"	"	"	"	
Chromium, total	**0.0836**	0.0080	"	"	"	"	"	"	
Mercury, total	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, total	**0.0616**	0.0040	"	4	1EL0830	12/20/21	12/20/21 17:51	EPA 6020A	
Selenium, total	**0.0105**	0.0040	"	"	"	"	"	"	

Phone 641-792-8451 600 East 17th Street South Newton, IA 50208 Fax 641-792-7989

Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

DUP-1

1EL1284-10 (Soil)

Date Sampled:12/13/2021 12:00:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	0.002	mg/kg dry	1	1EL0835	12/15/21	12/16/21 16:54	EPA 8260B	
Vinyl Chloride	ND	0.002	"	"	"	"	"	"	
Bromomethane	ND	0.002	"	"	"	"	"	"	
Chloroethane	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Acetone	ND	0.050	"	"	"	"	"	"	
Carbon Disulfide	ND	0.005	"	"	"	"	"	"	
Methylene Chloride	ND	0.050	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	0.002	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.002	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	0.002	"	"	"	"	"	"	
2-Butanone (MEK)	ND	0.005	"	"	"	"	"	"	
Chloroform	ND	0.002	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.002	"	"	"	"	"	"	
Carbon Tetrachloride	ND	0.002	"	"	"	"	"	"	
Benzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloroethane	ND	0.002	"	"	"	"	"	"	
Trichloroethylene	ND	0.002	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.002	"	"	"	"	"	"	
Bromodichloromethane	ND	0.002	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	0.005	"	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.001	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.001	"	"	"	"	"	"	
Tetrachloroethylene	ND	0.002	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	0.005	"	"	"	"	"	"	
Dibromochloromethane	ND	0.001	"	"	"	"	"	"	
Chlorobenzene	ND	0.002	"	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	"	
Xylenes, total	ND	0.004	"	"	"	"	"	"	
Bromoform	ND	0.001	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.002	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.002	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

DUP-1

1EL1284-10 (Soil)

Date Sampled:12/13/2021 12:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton									
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*109 %*	*63-132*		*1EL0835*	*12/15/21*	*12/16/21 16:54*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*118 %*	*55-137*		"	"	"	"	
Surrogate: Toluene-d8		*102 %*	*73-130*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*100 %*	*65-127*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	5	mg/kg	1	1EL1309	12/27/21	12/30/21 07:51	Iowa OA-2	
TEH, as #2 diesel fuel	ND	5	"	"	"	"	"	"	
TEH, as waste oil	ND	5	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	5	"	"	"	"	"	"	
Surrogate: Pentacosane		*59.0 %*	*15-180*		"	"	"	"	
Determination of Conventional Chemistry Parameters									
% Solids	**82.0**	0.10	%	1	1EL0750	12/14/21	12/16/21 16:45	SM 2540 G	
Determination of Total Metals									
Silver, total	ND	0.4	mg/kg dry	1	1EL1249	12/27/21	12/29/21 07:54	EPA 6010B	
Arsenic, total	**6.6**	1.8	"	"	"	"	"	"	
Barium, total	**162**	0.36	"	"	"	"	"	"	
Cadmium, total	**0.4**	0.4	"	"	"	"	"	"	
Chromium, total	**15.0**	1.1	"	"	"	"	"	"	
Mercury, total	ND	0.05	"	"	1EL1251	12/27/21	12/28/21 08:54	EPA 7471A	
Lead, total	**7.7**	1.8	"	"	1EL1249	12/27/21	12/29/21 07:54	EPA 6010B	
Selenium, total	ND	1.1	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

WDUP-1

1EL1284-11 (Water)

Date Sampled:12/13/2021 12:00:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	1.0	ug/L	1	1EL0786	12/15/21	12/15/21 13:44	EPA 8260B	
Vinyl Chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Acetone	ND	10.0	"	"	"	"	"	"	
Carbon Disulfide	ND	1.0	"	"	"	"	"	"	
Methylene Chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	2.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon Tetrachloride	ND	1.0	"	"	"	"	"	"	
Benzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethylene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	5.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethylene	ND	1.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes, total	ND	2.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

WDUP-1

1EL1284-11 (Water)

Date Sampled:12/13/2021 12:00:00AM

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*107 %*	*79-130*		*1EL0786*	*12/15/21*	*12/15/21 13:44*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*109 %*	*68-134*		"	"	"	"	
Surrogate: Toluene-d8		*105 %*	*87-116*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.8 %*	*84-112*		"	"	"	"	
Determination of Extractable Petroleum Hydrocarbons									
TEH, as gasoline	ND	0.4	mg/L	1	1EL0839	"	12/22/21 09:47	Iowa OA-2	
TEH, as #2 diesel fuel	ND	0.4	"	"	"	"	"	"	
TEH, as waste oil	ND	0.4	"	"	"	"	"	"	
Total Extractable Hydrocarbons	ND	0.4	"	"	"	"	"	"	
Surrogate: Pentacosane		*98.4 %*	*15-179*		"	"	"	"	
Determination of Dissolved Metals									
Silver, dissolved	ND	0.0020	mg/L	4	1EL0763	12/14/21	12/18/21 08:32	EPA 6020A	
Arsenic, dissolved	**0.0046**	0.0020	"	"	"	"	"	"	
Barium, dissolved	**0.163**	0.0020	"	"	"	"	"	"	
Cadmium, dissolved	ND	0.0008	"	"	"	"	"	"	
Chromium, dissolved	ND	0.0020	"	"	"	"	"	"	
Mercury, dissolved	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, dissolved	**0.0028**	0.0008	"	4	1EL0763	12/14/21	12/18/21 08:32	EPA 6020A	
Selenium, dissolved	ND	0.0040	"	"	"	"	"	"	
Determination of Total Metals									
Silver, total	ND	0.0040	mg/L	4	1EL0830	12/20/21	12/20/21 17:58	EPA 6020A	
Arsenic, total	**0.0912**	0.0040	"	"	"	"	"	"	
Barium, total	**1.11**	0.0040	"	"	"	"	"	"	
Cadmium, total	**0.0033**	0.0008	"	"	"	"	"	"	
Chromium, total	**0.116**	0.0080	"	"	"	"	"	"	
Mercury, total	ND	0.00050	"	1	1EL0772	12/15/21	12/17/21 07:19	EPA 7470A	
Lead, total	**0.0765**	0.0040	"	4	1EL0830	12/20/21	12/20/21 17:58	EPA 6020A	
Selenium, total	**0.0135**	0.0040	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

Trip Blank

1EL1284-12 (Water)

Date Sampled:12/13/2021 8:00:00AM

Keystone Laboratories, Inc. - Newton

Determination of Volatile Organic Compounds

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chloromethane	ND	1.0	ug/L	1	1EL0786	12/15/21	12/15/21 09:51	EPA 8260B	
Vinyl Chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Acetone	ND	10.0	"	"	"	"	"	"	
Carbon Disulfide	ND	1.0	"	"	"	"	"	"	
Methylene Chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
Methyl-t-butyl Ether (MTBE)	ND	2.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethylene	ND	1.0	"	"	"	"	"	"	
2-Butanone (MEK)	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon Tetrachloride	ND	1.0	"	"	"	"	"	"	
Benzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethylene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	5.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethylene	ND	1.0	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Xylenes, total	ND	2.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
870 40th Ave	Project Number: Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager: Joshua F. Cox	

Trip Blank

1EL1284-12 (Water)

Date Sampled:12/13/2021 8:00:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Keystone Laboratories, Inc. - Newton									
Determination of Volatile Organic Compounds									
Surrogate: Dibromofluoromethane		*115 %*	*79-130*		*1EL0786*	*12/15/21*	*12/15/21 09:51*	*EPA 8260B*	
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*68-134*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*107 %*	*87-116*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*100 %*	*84-112*		*"*	*"*	*"*	*"*	

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
870 40th Ave	Project Number:	Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox	

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0786 - EPA 5030B										
Blank (1EL0786-BLK1)				Prepared & Analyzed: 12/15/21						
Chloromethane	ND	1.0	ug/L							
Vinyl Chloride	ND	1.0	"							
Bromomethane	ND	1.0	"							
Chloroethane	ND	1.0	"							
1,1-Dichloroethylene	ND	1.0	"							
Acetone	ND	10.0	"							
Carbon Disulfide	ND	1.0	"							
Methylene Chloride	ND	5.0	"							
trans-1,2-Dichloroethylene	ND	1.0	"							
Methyl-t-butyl Ether (MTBE)	ND	2.0	"							
1,1-Dichloroethane	ND	1.0	"							
cis-1,2-Dichloroethylene	ND	1.0	"							
2-Butanone (MEK)	ND	10.0	"							
Chloroform	ND	1.0	"							
1,1,1-Trichloroethane	ND	1.0	"							
Carbon Tetrachloride	ND	1.0	"							
Benzene	ND	1.0	"							
1,2-Dichloroethane	ND	1.0	"							
Trichloroethylene	ND	1.0	"							
1,2-Dichloropropane	ND	1.0	"							
Bromodichloromethane	ND	1.0	"							
cis-1,3-Dichloropropene	ND	1.0	"							
4-Methyl-2-pentanone (MIBK)	ND	5.0	"							
Toluene	ND	1.0	"							
trans-1,3-Dichloropropene	ND	1.0	"							
1,1,2-Trichloroethane	ND	1.0	"							
Tetrachloroethylene	ND	1.0	"							
2-Hexanone (MBK)	ND	5.0	"							
Dibromochloromethane	ND	1.0	"							
Chlorobenzene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	2.0	"							
Bromoform	ND	1.0	"							
1,1,2,2-Tetrachloroethane	ND	1.0	"							
1,3-Dichlorobenzene	ND	1.0	"							
1,4-Dichlorobenzene	ND	1.0	"							
1,2-Dichlorobenzene	ND	1.0	"							
Surrogate: Dibromofluoromethane	*59.1*		*"*	*50.2280*		*118*	*79-130*			
Surrogate: 1,2-Dichloroethane-d4	*59.1*		*"*	*50.3120*		*117*	*68-134*			
Surrogate: Toluene-d8	*52.9*		*"*	*50.2360*		*105*	*87-116*			
Surrogate: 4-Bromofluorobenzene	*50.7*		*"*	*50.4000*		*101*	*84-112*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
870 40th Ave	Project Number:	Stanwood	01/04/22 12:59
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox	

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0786 - EPA 5030B										
LCS (1EL0786-BS1)				Prepared & Analyzed: 12/15/21						
Chloromethane	34.24	1.0	ug/L	30.0000		114	57-130			
Vinyl Chloride	39.38	1.0	"	30.0000		131	61-134			
Bromomethane	36.00	1.0	"	30.0000		120	61-140			
Chloroethane	39.34	1.0	"	30.0000		131	68-135			
1,1-Dichloroethylene	60.40	1.0	"	50.0000		121	77-136			
Acetone	114.0	10.0	"	102.200		112	54-150			
Carbon Disulfide	120.0	1.0	"	104.400		115	73-147			
Methylene Chloride	48.69	5.0	"	50.0000		97.4	70-138			
trans-1,2-Dichloroethylene	55.26	1.0	"	50.0000		111	71-134			
Methyl-t-butyl Ether (MTBE)	123.8	2.0	"	103.000		120	72-140			
1,1-Dichloroethane	55.02	1.0	"	50.0000		110	70-131			
cis-1,2-Dichloroethylene	56.00	1.0	"	49.4750		113	76-138			
2-Butanone (MEK)	105.7	10.0	"	100.000		106	63-137			
Chloroform	54.68	1.0	"	50.0000		109	77-130			
1,1,1-Trichloroethane	51.40	1.0	"	49.9750		103	66-120			
Carbon Tetrachloride	56.96	1.0	"	50.0000		114	72-131			
Benzene	46.64	1.0	"	50.0000		93.3	77-124			
1,2-Dichloroethane	50.98	1.0	"	50.0000		102	78-122			
Trichloroethylene	50.52	1.0	"	50.0000		101	78-123			
1,2-Dichloropropane	47.47	1.0	"	50.0000		94.9	77-125			
Bromodichloromethane	47.42	1.0	"	50.0000		94.8	76-120			
cis-1,3-Dichloropropene	50.24	1.0	"	50.3250		99.8	76-119			
4-Methyl-2-pentanone (MIBK)	108.1	5.0	"	104.100		104	70-134			
Toluene	48.72	1.0	"	50.0000		97.4	75-128			
trans-1,3-Dichloropropene	50.37	1.0	"	50.4250		99.9	76-122			
1,1,2-Trichloroethane	46.47	1.0	"	50.0000		92.9	75-125			
Tetrachloroethylene	49.92	1.0	"	50.0000		99.8	76-121			
2-Hexanone (MBK)	92.09	5.0	"	111.800		82.4	64-136			
Dibromochloromethane	50.71	1.0	"	49.5000		102	78-126			
Chlorobenzene	45.01	1.0	"	50.0000		90.0	77-119			
Ethylbenzene	47.28	1.0	"	50.0000		94.6	72-119			
Xylenes, total	139.5	2.0	"	150.000		93.0	73-118			
Bromoform	49.05	1.0	"	50.0000		98.1	76-123			
1,1,2,2-Tetrachloroethane	48.94	1.0	"	49.8500		98.2	63-129			
1,3-Dichlorobenzene	50.71	1.0	"	50.0000		101	72-125			
1,4-Dichlorobenzene	52.27	1.0	"	50.0000		105	72-127			
1,2-Dichlorobenzene	49.66	1.0	"	50.0000		99.3	72-123			
Surrogate: Dibromofluoromethane	*56.4*		"	*50.2280*		*112*	*79-130*			
Surrogate: 1,2-Dichloroethane-d4	*59.0*		"	*50.3120*		*117*	*68-134*			
Surrogate: Toluene-d8	*51.5*		"	*50.2360*		*102*	*87-116*			
Surrogate: 4-Bromofluorobenzene	*51.1*		"	*50.4000*		*101*	*84-112*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

Reported
01/04/22 12:59

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0786 - EPA 5030B										
LCS Dup (1EL0786-BSD1)				Prepared & Analyzed: 12/15/21						
Chloromethane	35.43	1.0	ug/L	30.0000		118	57-130	3.42	24	
Vinyl Chloride	41.39	1.0	"	30.0000		138	61-134	4.98	25	QR-02
Bromomethane	38.48	1.0	"	30.0000		128	61-140	6.66	25	
Chloroethane	37.60	1.0	"	30.0000		125	68-135	4.52	26	
1,1-Dichloroethylene	61.46	1.0	"	50.0000		123	77-136	1.74	24	
Acetone	115.7	10.0	"	102.200		113	54-150	1.47	30	
Carbon Disulfide	126.1	1.0	"	104.400		121	73-147	4.96	24	
Methylene Chloride	51.82	5.0	"	50.0000		104	70-138	6.23	22	
trans-1,2-Dichloroethylene	57.30	1.0	"	50.0000		115	71-134	3.62	23	
Methyl-t-butyl Ether (MTBE)	126.4	2.0	"	103.000		123	72-140	2.06	23	
1,1-Dichloroethane	56.03	1.0	"	50.0000		112	70-131	1.82	25	
cis-1,2-Dichloroethylene	58.22	1.0	"	49.4750		118	76-138	3.89	23	
2-Butanone (MEK)	112.4	10.0	"	100.000		112	63-137	6.08	25	
Chloroform	56.63	1.0	"	50.0000		113	77-130	3.50	24	
1,1,1-Trichloroethane	52.37	1.0	"	49.9750		105	66-120	1.87	24	
Carbon Tetrachloride	59.96	1.0	"	50.0000		120	72-131	5.13	24	
Benzene	49.77	1.0	"	50.0000		99.5	77-124	6.49	23	
1,2-Dichloroethane	52.38	1.0	"	50.0000		105	78-122	2.71	23	
Trichloroethylene	53.46	1.0	"	50.0000		107	78-123	5.65	23	
1,2-Dichloropropane	50.10	1.0	"	50.0000		100	77-125	5.39	22	
Bromodichloromethane	49.06	1.0	"	50.0000		98.1	76-120	3.40	21	
cis-1,3-Dichloropropene	51.91	1.0	"	50.3250		103	76-119	3.27	21	
4-Methyl-2-pentanone (MIBK)	122.6	5.0	"	104.100		118	70-134	12.6	21	
Toluene	51.87	1.0	"	50.0000		104	75-128	6.26	25	
trans-1,3-Dichloropropene	52.22	1.0	"	50.4250		104	76-122	3.61	21	
1,1,2-Trichloroethane	49.05	1.0	"	50.0000		98.1	75-125	5.40	22	
Tetrachloroethylene	52.69	1.0	"	50.0000		105	76-121	5.40	25	
2-Hexanone (MBK)	118.0	5.0	"	111.800		106	64-136	24.7	25	
Dibromochloromethane	53.66	1.0	"	49.5000		108	78-126	5.65	21	
Chlorobenzene	49.26	1.0	"	50.0000		98.5	77-119	9.02	22	
Ethylbenzene	49.63	1.0	"	50.0000		99.3	72-119	4.85	25	
Xylenes, total	150.8	2.0	"	150.000		101	73-118	7.78	25	
Bromoform	52.82	1.0	"	50.0000		106	76-123	7.40	21	
1,1,2,2-Tetrachloroethane	48.67	1.0	"	49.8500		97.6	63-129	0.553	24	
1,3-Dichlorobenzene	49.60	1.0	"	50.0000		99.2	72-125	2.21	26	
1,4-Dichlorobenzene	49.61	1.0	"	50.0000		99.2	72-127	5.22	26	
1,2-Dichlorobenzene	48.08	1.0	"	50.0000		96.2	72-123	3.23	24	
Surrogate: Dibromofluoromethane	*55.4*		"	*50.2280*		*110*	*79-130*			
Surrogate: 1,2-Dichloroethane-d4	*59.2*		"	*50.3120*		*118*	*68-134*			
Surrogate: Toluene-d8	*52.1*		"	*50.2360*		*104*	*87-116*			
Surrogate: 4-Bromofluorobenzene	*50.2*		"	*50.4000*		*99.5*	*84-112*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

Reported
01/04/22 12:59

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0786 - EPA 5030B										
Matrix Spike (1EL0786-MS1)	**Source: 1EL1284-07**			Prepared & Analyzed: 12/15/21						
Chloromethane	304.5	10.0	ug/L	300.000	ND	102	51-129			
Vinyl Chloride	351.6	10.0	"	300.000	ND	117	59-132			
Bromomethane	336.0	10.0	"	300.000	ND	112	51-142			
Chloroethane	347.0	10.0	"	300.000	ND	116	70-133			
1,1-Dichloroethylene	559.4	10.0	"	500.000	ND	112	79-132			
Acetone	996.8	100	"	1022.00	ND	97.5	53-160			
Carbon Disulfide	1109	10.0	"	1044.00	ND	106	76-141			
Methylene Chloride	423.2	50.0	"	500.000	ND	84.6	71-137			
trans-1,2-Dichloroethylene	500.3	10.0	"	500.000	ND	100	75-127			
Methyl-t-butyl Ether (MTBE)	1100	20.0	"	1030.00	ND	107	66-142			
1,1-Dichloroethane	489.4	10.0	"	500.000	ND	97.9	73-125			
cis-1,2-Dichloroethylene	505.6	10.0	"	494.750	ND	102	74-136			
2-Butanone (MEK)	936.1	100	"	1000.00	ND	93.6	71-136			
Chloroform	485.7	10.0	"	500.000	ND	97.1	77-128			
1,1,1-Trichloroethane	464.1	10.0	"	499.750	ND	92.9	69-115			
Carbon Tetrachloride	511.9	10.0	"	500.000	ND	102	75-126			
Benzene	466.5	10.0	"	500.000	ND	93.3	77-121			
1,2-Dichloroethane	486.3	10.0	"	500.000	ND	97.3	79-119			
Trichloroethylene	492.6	10.0	"	500.000	ND	98.5	82-115			
1,2-Dichloropropane	459.5	10.0	"	500.000	ND	91.9	80-118			
Bromodichloromethane	431.4	10.0	"	500.000	ND	86.3	76-116			
cis-1,3-Dichloropropene	465.8	10.0	"	503.250	ND	92.6	74-113			
4-Methyl-2-pentanone (MIBK)	1030	50.0	"	1041.00	ND	99.0	69-134			
Toluene	471.8	10.0	"	500.000	ND	94.4	76-124			
trans-1,3-Dichloropropene	467.2	10.0	"	504.250	ND	92.7	76-113			
1,1,2-Trichloroethane	414.2	10.0	"	500.000	ND	82.8	77-120			
Tetrachloroethylene	485.0	10.0	"	500.000	ND	97.0	80-114			
2-Hexanone (MBK)	1016	50.0	"	1118.00	ND	90.9	66-133			
Dibromochloromethane	476.5	10.0	"	495.000	ND	96.3	80-119			
Chlorobenzene	415.5	10.0	"	500.000	ND	83.1	80-112			
Ethylbenzene	450.6	10.0	"	500.000	ND	90.1	74-113			
Xylenes, total	1332	20.0	"	1500.00	ND	88.8	76-112			
Bromoform	454.1	10.0	"	500.000	ND	90.8	76-120			
1,1,2,2-Tetrachloroethane	439.0	10.0	"	498.500	ND	88.1	61-129			
1,3-Dichlorobenzene	464.2	10.0	"	500.000	ND	92.8	71-122			
1,4-Dichlorobenzene	491.4	10.0	"	500.000	ND	98.3	71-125			
1,2-Dichlorobenzene	446.3	10.0	"	500.000	ND	89.3	70-123			
Surrogate: Dibromofluoromethane	*504*		"	*502.280*		*100*	*79-130*			
Surrogate: 1,2-Dichloroethane-d4	*552*		"	*503.120*		*110*	*68-134*			
Surrogate: Toluene-d8	*526*		"	*502.360*		*105*	*87-116*			
Surrogate: 4-Bromofluorobenzene	*498*		"	*504.000*		*98.8*	*84-112*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

Reported
01/04/22 12:59

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0786 - EPA 5030B										
Matrix Spike Dup (1EL0786-MSD1)	**Source: 1EL1284-07**			Prepared & Analyzed: 12/15/21						
Chloromethane	331.4	10.0	ug/L	300.000	ND	110	51-129	8.46	23	
Vinyl Chloride	367.5	10.0	"	300.000	ND	122	59-132	4.42	22	
Bromomethane	345.1	10.0	"	300.000	ND	115	51-142	2.67	30	
Chloroethane	369.1	10.0	"	300.000	ND	123	70-133	6.17	27	
1,1-Dichloroethylene	556.7	10.0	"	500.000	ND	111	79-132	0.484	19	
Acetone	1047	100	"	1022.00	ND	102	53-160	4.92	21	
Carbon Disulfide	1152	10.0	"	1044.00	ND	110	76-141	3.76	18	
Methylene Chloride	469.4	50.0	"	500.000	ND	93.9	71-137	10.4	16	
trans-1,2-Dichloroethylene	525.3	10.0	"	500.000	ND	105	75-127	4.88	16	
Methyl-t-butyl Ether (MTBE)	1165	20.0	"	1030.00	ND	113	66-142	5.74	15	
1,1-Dichloroethane	504.2	10.0	"	500.000	ND	101	73-125	2.98	15	
cis-1,2-Dichloroethylene	528.0	10.0	"	494.750	ND	107	74-136	4.33	16	
2-Butanone (MEK)	1121	100	"	1000.00	ND	112	71-136	18.0	12	QR-02
Chloroform	524.8	10.0	"	500.000	ND	105	77-128	7.74	13	
1,1,1-Trichloroethane	483.2	10.0	"	499.750	ND	96.7	69-115	4.03	13	
Carbon Tetrachloride	541.5	10.0	"	500.000	ND	108	75-126	5.62	13	
Benzene	502.1	10.0	"	500.000	ND	100	77-121	7.35	12	
1,2-Dichloroethane	540.3	10.0	"	500.000	ND	108	79-119	10.5	11	
Trichloroethylene	539.6	10.0	"	500.000	ND	108	82-115	9.11	12	
1,2-Dichloropropane	502.7	10.0	"	500.000	ND	101	80-118	8.98	10	
Bromodichloromethane	489.3	10.0	"	500.000	ND	97.9	76-116	12.6	11	QR-02
cis-1,3-Dichloropropene	532.6	10.0	"	503.250	ND	106	74-113	13.4	11	QR-02
4-Methyl-2-pentanone (MIBK)	1249	50.0	"	1041.00	ND	120	69-134	19.2	13	QR-02
Toluene	516.8	10.0	"	500.000	ND	103	76-124	9.10	10	
trans-1,3-Dichloropropene	512.5	10.0	"	504.250	ND	102	76-113	9.25	10	
1,1,2-Trichloroethane	478.7	10.0	"	500.000	ND	95.7	77-120	14.4	11	QR-02
Tetrachloroethylene	534.3	10.0	"	500.000	ND	107	80-114	9.67	17	
2-Hexanone (MBK)	1250	50.0	"	1118.00	ND	112	66-133	20.6	13	QR-02
Dibromochloromethane	533.7	10.0	"	495.000	ND	108	80-119	11.3	14	
Chlorobenzene	474.7	10.0	"	500.000	ND	94.9	80-112	13.3	14	
Ethylbenzene	507.8	10.0	"	500.000	ND	102	74-113	11.9	15	
Xylenes, total	1456	20.0	"	1500.00	ND	97.1	76-112	8.91	15	
Bromoform	521.6	10.0	"	500.000	ND	104	76-120	13.8	15	
1,1,2,2-Tetrachloroethane	514.5	10.0	"	498.500	ND	103	61-129	15.8	26	
1,3-Dichlorobenzene	513.6	10.0	"	500.000	ND	103	71-122	10.1	26	
1,4-Dichlorobenzene	511.4	10.0	"	500.000	ND	102	71-125	3.99	23	
1,2-Dichlorobenzene	522.6	10.0	"	500.000	ND	105	70-123	15.7	25	
Surrogate: Dibromofluoromethane	*498*		"	*502.280*		*99.1*	*79-130*			
Surrogate: 1,2-Dichloroethane-d4	*543*		"	*503.120*		*108*	*68-134*			
Surrogate: Toluene-d8	*518*		"	*502.360*		*103*	*87-116*			
Surrogate: 4-Bromofluorobenzene	*504*		"	*504.000*		*100*	*84-112*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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01/04/22 12:59

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0835 - EPA 5030 Soil GC Low										
Blank (1EL0835-BLK1)				Prepared: 12/15/21 Analyzed: 12/16/21						
Chloromethane	ND	0.002	mg/kg wet							
Vinyl Chloride	ND	0.002	"							
Bromomethane	ND	0.002	"							
Chloroethane	ND	0.002	"							
1,1-Dichloroethylene	ND	0.002	"							
Acetone	ND	0.050	"							
Carbon Disulfide	ND	0.005	"							
Methylene Chloride	ND	0.050	"							
trans-1,2-Dichloroethylene	ND	0.002	"							
Methyl-t-butyl Ether (MTBE)	ND	0.002	"							
1,1-Dichloroethane	ND	0.002	"							
cis-1,2-Dichloroethylene	ND	0.002	"							
2-Butanone (MEK)	ND	0.005	"							
Chloroform	ND	0.002	"							
1,1,1-Trichloroethane	ND	0.002	"							
Carbon Tetrachloride	ND	0.002	"							
Benzene	ND	0.002	"							
1,2-Dichloroethane	ND	0.002	"							
Trichloroethylene	ND	0.002	"							
1,2-Dichloropropane	ND	0.002	"							
Bromodichloromethane	ND	0.002	"							
cis-1,3-Dichloropropene	ND	0.001	"							
4-Methyl-2-pentanone (MIBK)	ND	0.005	"							
Toluene	ND	0.002	"							
trans-1,3-Dichloropropene	ND	0.001	"							
1,1,2-Trichloroethane	ND	0.001	"							
Tetrachloroethylene	ND	0.002	"							
2-Hexanone (MBK)	ND	0.005	"							
Dibromochloromethane	ND	0.001	"							
Chlorobenzene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.004	"							
Bromoform	ND	0.001	"							
1,1,2,2-Tetrachloroethane	ND	0.002	"							
1,3-Dichlorobenzene	ND	0.002	"							
1,4-Dichlorobenzene	ND	0.002	"							
1,2-Dichlorobenzene	ND	0.002	"							
Surrogate: Dibromofluoromethane	*0.05340*		"	*0.0502280*		*106*	*63-132*			
Surrogate: 1,2-Dichloroethane-d4	*0.05565*		"	*0.0503120*		*111*	*55-137*			
Surrogate: Toluene-d8	*0.05146*		"	*0.0502360*		*102*	*73-130*			
Surrogate: 4-Bromofluorobenzene	*0.04913*		"	*0.0504000*		*97.5*	*65-127*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0835 - EPA 5030 Soil GC Low										
LCS (1EL0835-BS1)				Prepared & Analyzed: 12/15/21						
Chloromethane	0.0270	0.002	mg/kg wet	0.0300000		89.9	47-145			
Vinyl Chloride	0.0341	0.002	"	0.0300000		114	43-160			
Bromomethane	0.0344	0.002	"	0.0300000		115	35-151			
Chloroethane	0.0259	0.002	"	0.0300000		86.3	23-155			
1,1-Dichloroethylene	0.0516	0.002	"	0.0500000		103	59-151			
Acetone	0.1131	0.050	"	0.102200		111	31-180			
Carbon Disulfide	0.1095	0.005	"	0.104400		105	54-154			
Methylene Chloride	0.0501	0.050	"	0.0500000		100	62-134			
trans-1,2-Dichloroethylene	0.0542	0.002	"	0.0500000		108	55-143			
Methyl-t-butyl Ether (MTBE)	0.1177	0.002	"	0.103000		114	62-143			
1,1-Dichloroethane	0.0532	0.002	"	0.0500000		106	52-142			
cis-1,2-Dichloroethylene	0.0574	0.002	"	0.0494750		116	65-139			
2-Butanone (MEK)	0.1108	0.005	"	0.100000		111	66-137			
Chloroform	0.0564	0.002	"	0.0500000		113	57-144			
1,1,1-Trichloroethane	0.0511	0.002	"	0.0499750		102	59-123			
Carbon Tetrachloride	0.0542	0.002	"	0.0500000		108	60-137			
Benzene	0.0531	0.002	"	0.0500000		106	73-128			
1,2-Dichloroethane	0.0553	0.002	"	0.0500000		111	68-123			
Trichloroethylene	0.0549	0.002	"	0.0500000		110	72-124			
1,2-Dichloropropane	0.0550	0.002	"	0.0500000		110	72-123			
Bromodichloromethane	0.0536	0.002	"	0.0500000		107	71-117			
cis-1,3-Dichloropropene	0.0534	0.001	"	0.0503250		106	72-118			
4-Methyl-2-pentanone (MIBK)	0.1167	0.005	"	0.104100		112	70-125			
Toluene	0.0542	0.002	"	0.0500000		108	70-132			
trans-1,3-Dichloropropene	0.0523	0.001	"	0.0504250		104	74-118			
1,1,2-Trichloroethane	0.0527	0.001	"	0.0500000		105	74-120			
Tetrachloroethylene	0.0518	0.002	"	0.0500000		104	70-129			
2-Hexanone (MBK)	0.1283	0.005	"	0.111800		115	56-142			
Dibromochloromethane	0.0545	0.001	"	0.0495000		110	70-124			
Chlorobenzene	0.0521	0.002	"	0.0500000		104	70-122			
Ethylbenzene	0.0529	0.002	"	0.0500000		106	62-129			
Xylenes, total	0.1661	0.004	"	0.150000		111	66-124			
Bromoform	0.0544	0.001	"	0.0500000		109	68-124			
1,1,2,2-Tetrachloroethane	0.0525	0.002	"	0.0498500		105	52-128			
1,3-Dichlorobenzene	0.0507	0.002	"	0.0500000		101	59-127			
1,4-Dichlorobenzene	0.0506	0.002	"	0.0500000		101	61-130			
1,2-Dichlorobenzene	0.0511	0.002	"	0.0500000		102	60-127			
Surrogate: Dibromofluoromethane	*0.04975*		"	*0.0502280*		*99.0*	*63-132*			
Surrogate: 1,2-Dichloroethane-d4	*0.05016*		"	*0.0503120*		*99.7*	*55-137*			
Surrogate: Toluene-d8	*0.05006*		"	*0.0502360*		*99.6*	*73-130*			
Surrogate: 4-Bromofluorobenzene	*0.05008*		"	*0.0504000*		*99.4*	*65-127*			

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Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0835 - EPA 5030 Soil GC Low										
LCS Dup (1EL0835-BSD1)				Prepared & Analyzed: 12/15/21						
Chloromethane	0.0315	0.002	mg/kg wet	0.0300000		105	47-145	15.5	29	
Vinyl Chloride	0.0396	0.002	"	0.0300000		132	43-160	14.8	27	
Bromomethane	0.0401	0.002	"	0.0300000		134	35-151	15.5	30	
Chloroethane	0.0335	0.002	"	0.0300000		112	23-155	25.5	30	
1,1-Dichloroethylene	0.0606	0.002	"	0.0500000		121	59-151	16.1	24	
Acetone	0.1336	0.050	"	0.102200		131	31-180	16.6	30	
Carbon Disulfide	0.1319	0.005	"	0.104400		126	54-154	18.5	23	
Methylene Chloride	0.0547	0.050	"	0.0500000		109	62-134	8.74	25	
trans-1,2-Dichloroethylene	0.0572	0.002	"	0.0500000		114	55-143	5.44	26	
Methyl-t-butyl Ether (MTBE)	0.1211	0.002	"	0.103000		118	62-143	2.86	26	
1,1-Dichloroethane	0.0554	0.002	"	0.0500000		111	52-142	3.92	26	
cis-1,2-Dichloroethylene	0.0578	0.002	"	0.0494750		117	65-139	0.521	26	
2-Butanone (MEK)	0.1102	0.005	"	0.100000		110	66-137	0.588	30	
Chloroform	0.0579	0.002	"	0.0500000		116	57-144	2.73	21	
1,1,1-Trichloroethane	0.0516	0.002	"	0.0499750		103	59-123	0.935	23	
Carbon Tetrachloride	0.0544	0.002	"	0.0500000		109	60-137	0.405	24	
Benzene	0.0550	0.002	"	0.0500000		110	73-128	3.40	19	
1,2-Dichloroethane	0.0548	0.002	"	0.0500000		110	68-123	0.781	22	
Trichloroethylene	0.0570	0.002	"	0.0500000		114	72-124	3.74	22	
1,2-Dichloropropane	0.0553	0.002	"	0.0500000		111	72-123	0.562	21	
Bromodichloromethane	0.0536	0.002	"	0.0500000		107	71-117	0.0187	21	
cis-1,3-Dichloropropene	0.0540	0.001	"	0.0503250		107	72-118	1.10	22	
4-Methyl-2-pentanone (MIBK)	0.1195	0.005	"	0.104100		115	70-125	2.37	29	
Toluene	0.0558	0.002	"	0.0500000		112	70-132	2.80	25	
trans-1,3-Dichloropropene	0.0530	0.001	"	0.0504250		105	74-118	1.50	22	
1,1,2-Trichloroethane	0.0537	0.001	"	0.0500000		107	74-120	1.94	22	
Tetrachloroethylene	0.0532	0.002	"	0.0500000		106	70-129	2.65	20	
2-Hexanone (MBK)	0.1289	0.005	"	0.111800		115	56-142	0.521	30	
Dibromochloromethane	0.0545	0.001	"	0.0495000		110	70-124	0.0917	22	
Chlorobenzene	0.0527	0.002	"	0.0500000		105	70-122	1.11	23	
Ethylbenzene	0.0539	0.002	"	0.0500000		108	62-129	1.93	24	
Xylenes, total	0.1678	0.004	"	0.150000		112	66-124	1.00	24	
Bromoform	0.0555	0.001	"	0.0500000		111	68-124	1.95	25	
1,1,2,2-Tetrachloroethane	0.0527	0.002	"	0.0498500		106	52-128	0.361	30	
1,3-Dichlorobenzene	0.0524	0.002	"	0.0500000		105	59-127	3.43	28	
1,4-Dichlorobenzene	0.0522	0.002	"	0.0500000		104	61-130	2.98	27	
1,2-Dichlorobenzene	0.0537	0.002	"	0.0500000		107	60-127	5.00	30	
Surrogate: Dibromofluoromethane	*0.04901*		"	*0.0502280*		*97.6*	*63-132*			
Surrogate: 1,2-Dichloroethane-d4	*0.04810*		"	*0.0503120*		*95.6*	*55-137*			
Surrogate: Toluene-d8	*0.05014*		"	*0.0502360*		*99.8*	*73-130*			
Surrogate: 4-Bromofluorobenzene	*0.04977*		"	*0.0504000*		*98.8*	*65-127*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

Reported
01/04/22 12:59

Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0835 - EPA 5030 Soil GC Low										
Matrix Spike (1EL0835-MS1)	**Source: 1EL1284-05**			Prepared & Analyzed: 12/15/21						
Chloromethane	0.1696	0.010	mg/kg dry	0.161585	ND	105	39-144			
Vinyl Chloride	0.2083	0.010	"	0.161585	ND	129	34-155			
Bromomethane	0.2269	0.010	"	0.161585	ND	140	21-148			
Chloroethane	0.1759	0.010	"	0.161585	ND	109	10-155			
1,1-Dichloroethylene	0.2855	0.010	"	0.269308	ND	106	46-149			
Acetone	1.450	0.240	"	0.550466	ND	263	22-193			QS-01
Carbon Disulfide	0.6032	0.024	"	0.562316	ND	107	24-162			
Methylene Chloride	0.3034	0.240	"	0.269308	ND	113	42-147			
trans-1,2-Dichloroethylene	0.2846	0.010	"	0.269308	ND	106	44-141			
Methyl-t-butyl Ether (MTBE)	0.6379	0.010	"	0.554775	ND	115	53-145			
1,1-Dichloroethane	0.2905	0.010	"	0.269308	ND	108	39-143			
cis-1,2-Dichloroethylene	0.3094	0.010	"	0.266481	ND	116	55-137			
2-Butanone (MEK)	0.5973	0.024	"	0.538617	ND	111	21-173			
Chloroform	0.3060	0.010	"	0.269308	ND	114	54-135			
1,1,1-Trichloroethane	0.2685	0.010	"	0.269174	ND	99.7	47-122			
Carbon Tetrachloride	0.2896	0.010	"	0.269308	ND	108	51-132			
Benzene	0.2868	0.010	"	0.269308	ND	106	59-127			
1,2-Dichloroethane	0.2935	0.010	"	0.269308	ND	109	59-124			
Trichloroethylene	0.2973	0.010	"	0.269308	ND	110	40-151			
1,2-Dichloropropane	0.2955	0.010	"	0.269308	ND	110	62-124			
Bromodichloromethane	0.2839	0.010	"	0.269308	ND	105	62-117			
cis-1,3-Dichloropropene	0.2822	0.005	"	0.271059	ND	104	60-118			
4-Methyl-2-pentanone (MIBK)	0.6447	0.024	"	0.560700	ND	115	66-134			
Toluene	0.2894	0.010	"	0.269308	ND	107	61-128			
trans-1,3-Dichloropropene	0.2831	0.005	"	0.271598	ND	104	61-119			
1,1,2-Trichloroethane	0.2893	0.005	"	0.269308	ND	107	66-121			
Tetrachloroethylene	0.2811	0.010	"	0.269308	ND	104	51-130			
2-Hexanone (MBK)	0.7349	0.024	"	0.602174	ND	122	37-168			
Dibromochloromethane	0.2929	0.005	"	0.266615	ND	110	67-122			
Chlorobenzene	0.2775	0.010	"	0.269308	ND	103	57-120			
Ethylbenzene	0.2829	0.010	"	0.269308	ND	105	42-137			
Xylenes, total	0.8831	0.019	"	0.807925	ND	109	53-123			
Bromoform	0.2940	0.005	"	0.269308	ND	109	57-129			
1,1,2,2-Tetrachloroethane	0.2897	0.010	"	0.268500	ND	108	33-141			
1,3-Dichlorobenzene	0.2753	0.010	"	0.269308	ND	102	49-124			
1,4-Dichlorobenzene	0.2732	0.010	"	0.269308	ND	101	50-128			
1,2-Dichlorobenzene	0.2745	0.010	"	0.269308	ND	102	44-126			
Surrogate: Dibromofluoromethane	*0.2748*		"	*0.270536*		*102*	*63-132*			
Surrogate: 1,2-Dichloroethane-d4	*0.2675*		"	*0.270989*		*98.7*	*55-137*			
Surrogate: Toluene-d8	*0.2700*		"	*0.270580*		*99.8*	*73-130*			
Surrogate: 4-Bromofluorobenzene	*0.2697*		"	*0.271463*		*99.4*	*65-127*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Volatile Organic Compounds - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0835 - EPA 5030 Soil GC Low										
Matrix Spike Dup (1EL0835-MSD1)	**Source: 1EL1284-05**			Prepared & Analyzed: 12/15/21						
Chloromethane	0.1572	0.009	mg/kg dry	0.151395	ND	104	39-144	7.56	30	
Vinyl Chloride	0.1953	0.009	"	0.151395	ND	129	34-155	6.41	30	
Bromomethane	0.2097	0.009	"	0.151395	ND	139	21-148	7.87	30	
Chloroethane	0.1617	0.009	"	0.151395	ND	107	10-155	8.43	30	
1,1-Dichloroethylene	0.2905	0.009	"	0.252325	ND	115	46-149	1.74	30	
Acetone	1.490	0.225	"	0.515752	ND	289	22-193	2.75	30	QS-01
Carbon Disulfide	0.6352	0.023	"	0.526854	ND	121	24-162	5.17	30	
Methylene Chloride	0.3098	0.225	"	0.252325	ND	123	42-147	2.07	30	
trans-1,2-Dichloroethylene	0.2754	0.009	"	0.252325	ND	109	44-141	3.25	30	
Methyl-t-butyl Ether (MTBE)	0.6138	0.009	"	0.519789	ND	118	53-145	3.86	30	
1,1-Dichloroethane	0.2709	0.009	"	0.252325	ND	107	39-143	6.98	30	
cis-1,2-Dichloroethylene	0.2877	0.009	"	0.249676	ND	115	55-137	7.28	30	
2-Butanone (MEK)	0.4841	0.023	"	0.504650	ND	95.9	21-173	20.9	30	
Chloroform	0.2840	0.009	"	0.252325	ND	113	54-135	7.45	30	
1,1,1-Trichloroethane	0.2498	0.009	"	0.252199	ND	99.0	47-122	7.24	30	
Carbon Tetrachloride	0.2643	0.009	"	0.252325	ND	105	51-132	9.13	30	
Benzene	0.2686	0.009	"	0.252325	ND	106	59-127	6.57	30	
1,2-Dichloroethane	0.2710	0.009	"	0.252325	ND	107	59-124	7.99	25	
Trichloroethylene	0.2737	0.009	"	0.252325	ND	108	40-151	8.28	30	
1,2-Dichloropropane	0.2752	0.009	"	0.252325	ND	109	62-124	7.11	29	
Bromodichloromethane	0.2679	0.009	"	0.252325	ND	106	62-117	5.79	29	
cis-1,3-Dichloropropene	0.2613	0.005	"	0.253965	ND	103	60-118	7.70	28	
4-Methyl-2-pentanone (MIBK)	0.5833	0.023	"	0.525340	ND	111	66-134	9.99	30	
Toluene	0.2702	0.009	"	0.252325	ND	107	61-128	6.87	28	
trans-1,3-Dichloropropene	0.2633	0.005	"	0.254470	ND	103	61-119	7.24	28	
1,1,2-Trichloroethane	0.2618	0.005	"	0.252325	ND	104	66-121	10.0	27	
Tetrachloroethylene	0.2548	0.009	"	0.252325	ND	101	51-130	9.82	30	
2-Hexanone (MBK)	0.6894	0.023	"	0.564198	ND	122	37-168	6.40	30	
Dibromochloromethane	0.2717	0.005	"	0.249802	ND	109	67-122	7.51	26	
Chlorobenzene	0.2547	0.009	"	0.252325	ND	101	57-120	8.57	30	
Ethylbenzene	0.2576	0.009	"	0.252325	ND	102	42-137	9.35	30	
Xylenes, total	0.8053	0.018	"	0.756975	ND	106	53-123	9.22	30	
Bromoform	0.2666	0.005	"	0.252325	ND	106	57-129	9.78	29	
1,1,2,2-Tetrachloroethane	0.2566	0.009	"	0.251568	ND	102	33-141	12.1	30	
1,3-Dichlorobenzene	0.2351	0.009	"	0.252325	ND	93.2	49-124	15.8	30	
1,4-Dichlorobenzene	0.2353	0.009	"	0.252325	ND	93.2	50-128	14.9	29	
1,2-Dichlorobenzene	0.2380	0.009	"	0.252325	ND	94.3	44-126	14.2	27	
Surrogate: Dibromofluoromethane	*0.2506*		"	*0.253476*		*98.8*	*63-132*			
Surrogate: 1,2-Dichloroethane-d4	*0.2469*		"	*0.253899*		*97.2*	*55-137*			
Surrogate: Toluene-d8	*0.2538*		"	*0.253516*		*100*	*73-130*			
Surrogate: 4-Bromofluorobenzene	*0.2541*		"	*0.254344*		*99.9*	*65-127*			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
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Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Extractable Petroleum Hydrocarbons - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0839 - 3510C OA-2 Sep Fnl										
Blank (1EL0839-BLK1)				Prepared: 12/15/21 Analyzed: 12/22/21						
TEH, as gasoline	ND	0.1	mg/L							
TEH, as #2 diesel fuel	ND	0.1	"							
TEH, as waste oil	ND	0.1	"							
Total Extractable Hydrocarbons	ND	0.1	"							
Surrogate: Pentacosane	*0.0509*		"	*0.0500000*		*102*	*15-179*			
LCS (1EL0839-BS1)				Prepared: 12/15/21 Analyzed: 12/22/21						
TEH, as #2 diesel fuel	1.43	0.1	mg/L	2.03360		70.2	33-115			
Surrogate: Pentacosane	*0.0527*		"	*0.0500000*		*105*	*15-179*			
LCS Dup (1EL0839-BSD1)				Prepared: 12/15/21 Analyzed: 12/22/21						
TEH, as #2 diesel fuel	1.46	0.1	mg/L	2.03360		71.9	33-115	2.48	30	
Surrogate: Pentacosane	*0.0521*		"	*0.0500000*		*104*	*15-179*			
Reference (1EL0839-SRM1)				Prepared: 12/15/21 Analyzed: 12/22/21						
TEH, as #2 diesel fuel	2.12	0.1	mg/L	2.03360		104	0-200			
Surrogate: Pentacosane	*0.0532*		"	*0.0500000*		*106*	*15-179*			
Batch 1EL1309 - 3550B OA-2 Sonic										
Blank (1EL1309-BLK1)				Prepared: 12/27/21 Analyzed: 12/30/21						
TEH, as gasoline	ND	5	mg/kg							
TEH, as #2 diesel fuel	ND	5	"							
TEH, as waste oil	ND	5	"							
Total Extractable Hydrocarbons	ND	5	"							
Surrogate: Pentacosane	*2.09*		"	*2.50000*		*83.6*	*15-180*			

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Determination of Extractable Petroleum Hydrocarbons - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL1309 - 3550B OA-2 Sonic										
LCS (1EL1309-BS1)				Prepared: 12/27/21 Analyzed: 12/30/21						
TEH, as #2 diesel fuel	49.2	5	mg/kg	101.680		48.3	29-114			
Surrogate: Pentacosane	*1.52*		*"*	*2.50000*		*60.7*	*15-180*			
Matrix Spike (1EL1309-MS1)	**Source: 1EL1284-10**			Prepared: 12/27/21 Analyzed: 12/30/21						
TEH, as #2 diesel fuel	62.8	5	mg/kg	101.578	ND	61.8	13-114			
Surrogate: Pentacosane	*1.91*		*"*	*2.49750*		*76.5*	*15-180*			
Matrix Spike Dup (1EL1309-MSD1)	**Source: 1EL1284-10**			Prepared: 12/27/21 Analyzed: 12/30/21						
TEH, as #2 diesel fuel	56.8	5	mg/kg	101.680	ND	55.8	13-114	10.0	30	
Surrogate: Pentacosane	*1.88*		*"*	*2.50000*		*75.2*	*15-180*			
Reference (1EL1309-SRM1)				Prepared: 12/27/21 Analyzed: 12/30/21						
TEH, as #2 diesel fuel	110.1	5	mg/kg	101.680		108	0-200			
Surrogate: Pentacosane	*2.56*		*"*	*2.50000*		*103*	*15-180*			

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Determination of Conventional Chemistry Parameters - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0750 - Wet Chem Preparation										
Duplicate (1EL0750-DUP1)		**Source: 1EL1066-01**		Prepared: 12/14/21 Analyzed: 12/16/21						
% Solids	16.6	0.10	%		16.7			0.660	11	

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Determination of Dissolved Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0763 - Dissolved Metal Prep										
Blank (1EL0763-BLK1)				Prepared: 12/14/21 Analyzed: 12/18/21						
Arsenic, dissolved	ND	0.0005	mg/L							
Barium, dissolved	ND	0.0005	"							
Cadmium, dissolved	ND	0.0002	"							
Chromium, dissolved	ND	0.0005	"							
Lead, dissolved	ND	0.0002	"							
Selenium, dissolved	ND	0.0010	"							
Silver, dissolved	ND	0.0005	"							
LCS (1EL0763-BS1)				Prepared: 12/14/21 Analyzed: 12/18/21						
Arsenic, dissolved	0.0189	0.0005	mg/L	0.0200000		94.5	80-120			
Barium, dissolved	0.0183	0.0005	"	0.0200000		91.3	80-120			
Cadmium, dissolved	0.0196	0.0002	"	0.0200000		97.9	80-120			
Chromium, dissolved	0.0187	0.0005	"	0.0200000		93.7	80-120			
Lead, dissolved	0.0197	0.0002	"	0.0200000		98.7	80-120			
Selenium, dissolved	0.0188	0.0010	"	0.0200000		93.9	80-120			
Silver, dissolved	0.0200	0.0005	"	0.0200000		100	80-120			
Matrix Spike (1EL0763-MS1)	**Source: 1EL1284-07**			Prepared: 12/14/21 Analyzed: 12/18/21						
Arsenic, dissolved	0.0837	0.0020	mg/L	0.0816326	0.0050	96.5	75-125			
Barium, dissolved	0.246	0.0020	"	0.0816326	0.161	105	75-125			
Cadmium, dissolved	0.0677	0.0008	"	0.0816326	ND	82.9	75-125			
Chromium, dissolved	0.0737	0.0020	"	0.0816326	ND	90.2	75-125			
Lead, dissolved	0.0752	0.0008	"	0.0816326	ND	92.1	75-125			
Selenium, dissolved	0.0750	0.0040	"	0.0816326	0.0017	89.8	75-125			
Silver, dissolved	0.0660	0.0020	"	0.0816326	ND	80.9	75-125			
Matrix Spike Dup (1EL0763-MSD1)	**Source: 1EL1284-07**			Prepared: 12/14/21 Analyzed: 12/18/21						
Arsenic, dissolved	0.0854	0.0020	mg/L	0.0816326	0.0050	98.6	75-125	2.06	20	
Barium, dissolved	0.248	0.0020	"	0.0816326	0.161	107	75-125	0.747	20	
Cadmium, dissolved	0.0669	0.0008	"	0.0816326	ND	82.0	75-125	1.13	20	
Chromium, dissolved	0.0722	0.0020	"	0.0816326	ND	88.5	75-125	1.97	20	
Lead, dissolved	0.0748	0.0008	"	0.0816326	ND	91.7	75-125	0.427	20	
Selenium, dissolved	0.0739	0.0040	"	0.0816326	0.0017	88.4	75-125	1.50	20	
Silver, dissolved	0.0666	0.0020	"	0.0816326	ND	81.6	75-125	0.899	10	

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Determination of Dissolved Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0772 - EPA 7470A Hg Water										
Blank (1EL0772-BLK1)				Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, dissolved	ND	0.00050	mg/L							
LCS (1EL0772-BS1)				Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, dissolved	0.00252	0.00050	mg/L	0.00250000		101	79-116			
Matrix Spike (1EL0772-MS1)		**Source: 1EL0883-01**		Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, dissolved	0.00252	0.00050	mg/L	0.00250000	ND	101	56-137			
Matrix Spike Dup (1EL0772-MSD1)		**Source: 1EL0883-01**		Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, dissolved	0.00232	0.00050	mg/L	0.00250000	ND	92.7	56-137	8.49	13	

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600 East 17th Street South
Newton, IA 50208
Fax 641-792-7989

Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

Reported
01/04/22 12:59

Determination of Total Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0772 - EPA 7470A Hg Water										
Blank (1EL0772-BLK1)				Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, total	ND	0.00050	mg/L							
LCS (1EL0772-BS1)				Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, total	0.00252	0.00050	mg/L	0.00250000		101	80-120			
Matrix Spike (1EL0772-MS1)		**Source: 1EL0883-01**		Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, total	0.00252	0.00050	mg/L	0.00250000	ND	101	75-125			
Matrix Spike Dup (1EL0772-MSD1)		**Source: 1EL0883-01**		Prepared: 12/15/21 Analyzed: 12/17/21						
Mercury, total	0.00232	0.00050	mg/L	0.00250000	ND	92.7	75-125	8.49	20	
Batch 1EL0830 - EPA 3005A Total Recoverable Metals										
Blank (1EL0830-BLK1)				Prepared: 12/15/21 Analyzed: 12/20/21						
Arsenic, total	ND	0.0040	mg/L							
Barium, total	ND	0.0040	"							
Cadmium, total	ND	0.0008	"							
Chromium, total	ND	0.0080	"							
Lead, total	ND	0.0040	"							
Selenium, total	ND	0.0040	"							
Silver, total	ND	0.0040	"							
LCS (1EL0830-BS1)				Prepared: 12/15/21 Analyzed: 12/20/21						
Arsenic, total	0.0984	0.0040	mg/L	0.100000		98.4	80-120			
Barium, total	0.104	0.0040	"	0.100000		104	80-120			
Cadmium, total	0.0954	0.0008	"	0.100000		95.4	80-120			
Chromium, total	0.101	0.0080	"	0.100000		101	80-120			
Lead, total	0.0977	0.0040	"	0.100000		97.7	80-120			
Selenium, total	0.0885	0.0040	"	0.100000		88.5	80-120			
Silver, total	0.115	0.0040	"	0.100000		115	80-120			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
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Bettendorf, IA 52722	Project Manager:	Joshua F. Cox	

Determination of Total Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL0830 - EPA 3005A Total Recoverable Metals										
Matrix Spike (1EL0830-MS1)	**Source: 1EL1284-07**			Prepared: 12/15/21 Analyzed: 12/20/21						
Arsenic, total	0.142	0.0040	mg/L	0.100000	0.0480	94.5	75-125			
Barium, total	0.612	0.0040	"	0.100000	0.487	125	75-125			
Cadmium, total	0.0790	0.0008	"	0.100000	0.0012	77.9	75-125			
Chromium, total	0.149	0.0080	"	0.100000	0.0588	89.8	75-125			
Lead, total	0.139	0.0040	"	0.100000	0.0472	91.9	75-125			
Selenium, total	0.0845	0.0040	"	0.100000	0.0075	77.0	75-125			
Silver, total	0.100	0.0040	"	0.100000	ND	100	75-125			
Matrix Spike Dup (1EL0830-MSD1)	**Source: 1EL1284-07**			Prepared: 12/15/21 Analyzed: 12/20/21						
Arsenic, total	0.139	0.0040	mg/L	0.100000	0.0480	91.4	75-125	2.15	20	
Barium, total	0.585	0.0040	"	0.100000	0.487	98.7	75-125	4.43	20	
Cadmium, total	0.0804	0.0008	"	0.100000	0.0012	79.2	75-125	1.69	20	
Chromium, total	0.146	0.0080	"	0.100000	0.0588	87.3	75-125	1.70	20	
Lead, total	0.137	0.0040	"	0.100000	0.0472	90.2	75-125	1.26	20	
Selenium, total	0.0846	0.0040	"	0.100000	0.0075	77.1	75-125	0.207	20	
Silver, total	0.103	0.0040	"	0.100000	ND	103	75-125	2.29	20	
Post Spike (1EL0830-PS1)	**Source: 1EL1284-07**			Prepared: 12/15/21 Analyzed: 12/20/21						
Arsenic, total	0.126		mg/L	0.0800000	0.0471	98.1	80-120			
Barium, total	0.596		"	0.0800000	0.477	148	80-120			PS-4X
Cadmium, total	0.0644		"	0.0800000	0.0012	79.1	80-120			PS-01
Chromium, total	0.137		"	0.0800000	0.0576	98.8	80-120			
Lead, total	0.114		"	0.0800000	0.0462	84.8	80-120			
Selenium, total	0.0705		"	0.0800000	0.0074	78.9	80-120			PS-01
Silver, total	0.0681		"	0.0800000	0.0010	83.9	80-120			
Batch 1EL1249 - EPA 3050B Digestion										
Blank (1EL1249-BLK1)				Prepared: 12/27/21 Analyzed: 12/29/21						
Arsenic, total	ND	2.5	mg/kg wet							
Barium, total	ND	0.50	"							
Cadmium, total	ND	0.5	"							
Chromium, total	ND	1.5	"							
Lead, total	ND	2.5	"							
Selenium, total	ND	1.5	"							
Silver, total	ND	0.5	"							

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
870 40th Ave	Project Number:	Stanwood
Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Total Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL1249 - EPA 3050B Digestion										
LCS (1EL1249-BS1)				Prepared: 12/27/21 Analyzed: 12/29/21						
Arsenic, total	5.5	2.5	mg/kg wet	6.00000		91.9	80-120			
Barium, total	6.25	0.50	"	6.00000		104	80-120			
Cadmium, total	5.7	0.5	"	6.00000		94.7	80-120			
Chromium, total	5.79	1.5	"	6.00000		96.4	80-120			
Lead, total	5.50	2.5	"	6.00000		91.6	80-120			
Selenium, total	6.1	1.5	"	6.00000		102	80-120			
Silver, total	5.50	0.5	"	6.00000		91.6	80-120			
Matrix Spike (1EL1249-MS1)		**Source: 1EL1284-01**		Prepared: 12/27/21 Analyzed: 12/29/21						
Arsenic, total	10.0	2.5	mg/kg dry	7.08565	4.0	83.9	75-125			
Barium, total	108	0.51	"	7.08565	106	17.0	75-125			QM-4X
Cadmium, total	6.6	0.5	"	7.08565	0.4	88.2	75-125			
Chromium, total	16.0	1.5	"	7.08565	8.90	99.6	75-125			
Lead, total	64.3	2.5	"	7.08565	61.8	36.0	75-125			QM-07
Selenium, total	25.9	15.2	"	7.08565	ND	365	75-125			QM-07
Silver, total	6.47	0.5	"	7.08565	ND	91.4	75-125			
Matrix Spike Dup (1EL1249-MSD1)		**Source: 1EL1284-01**		Prepared: 12/27/21 Analyzed: 12/29/21						
Arsenic, total	11.8	2.4	mg/kg dry	6.79371	4.0	114	75-125	16.6	20	
Barium, total	104	0.48	"	6.79371	106	NR	75-125	3.30	20	QM-4X
Cadmium, total	5.7	0.5	"	6.79371	0.4	79.0	75-125	14.2	20	
Chromium, total	17.4	1.5	"	6.79371	8.90	125	75-125	8.67	20	
Lead, total	81.2	2.4	"	6.79371	61.8	286	75-125	23.2	20	QM-07
Selenium, total	28.3	14.5	"	6.79371	ND	417	75-125	8.88	20	QM-07
Silver, total	5.41	0.5	"	6.79371	ND	79.6	75-125	17.9	20	
Post Spike (1EL1249-PS1)		**Source: 1EL1284-01**		Prepared: 12/27/21 Analyzed: 12/29/21						
Arsenic, total	4.5		mg/kg dry	4.00000	0.07	111	80-120			
Barium, total	5.82		"	4.00000	1.75	102	80-120			
Cadmium, total	4.2		"	4.00000	0.006	105	80-120			
Chromium, total	4.31		"	4.00000	0.146	104	80-120			
Lead, total	5.03		"	4.00000	1.02	100	80-120			
Selenium, total	4.6		"	4.00000	0.08	113	80-120			
Silver, total	3.93		"	4.00000	0.00159	98.3	80-120			

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling
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Bettendorf, IA 52722	Project Manager:	Joshua F. Cox

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Determination of Total Metals - Quality Control

Keystone Laboratories, Inc. - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1EL1251 - EPA 7471A Hg Solid										
Blank (1EL1251-BLK1)				Prepared: 12/27/21 Analyzed: 12/28/21						
Mercury, total	ND	0.05	mg/kg wet							
LCS (1EL1251-BS1)				Prepared: 12/27/21 Analyzed: 12/28/21						
Mercury, total	0.19	0.05	mg/kg wet	0.200000		95.2	80-120			
Matrix Spike (1EL1251-MS1)	**Source: 1EL1284-01**			Prepared: 12/27/21 Analyzed: 12/28/21						
Mercury, total	0.57	0.05	mg/kg dry	0.227671	0.22	154	80-120			QM-07
Matrix Spike Dup (1EL1251-MSD1)	**Source: 1EL1284-01**			Prepared: 12/27/21 Analyzed: 12/28/21						
Mercury, total	0.52	0.05	mg/kg dry	0.228696	0.22	131	80-120	9.28	30	QM-07

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Certified Analyses Included in This Report

Method/Matrix	Analyte	Certifications
EPA 6010B in Sludge		
	Arsenic, total	SIA1X,KS-NT
	Barium, total	SIA1X,KS-NT
	Cadmium, total	SIA1X,KS-NT
	Chromium, total	SIA1X,KS-NT
	Lead, total	SIA1X,KS-NT
	Selenium, total	SIA1X,KS-NT
	Silver, total	SIA1X,KS-NT
EPA 6020A in Water		
	Arsenic, dissolved	SIA1X,KS-NT
	Arsenic, total	SIA1X,KS-NT
	Barium, dissolved	SIA1X,KS-NT
	Barium, total	SIA1X,KS-NT
	Cadmium, dissolved	SIA1X,KS-NT
	Cadmium, total	SIA1X,KS-NT
	Chromium, dissolved	SIA1X,KS-NT
	Chromium, total	SIA1X,KS-NT
	Lead, dissolved	SIA1X,KS-NT
	Lead, total	SIA1X,KS-NT
	Selenium, dissolved	SIA1X,KS-NT
	Selenium, total	SIA1X,KS-NT
	Silver, dissolved	SIA1X,KS-NT
	Silver, total	SIA1X,KS-NT
EPA 7470A in Water		
	Mercury, dissolved	IA-NT,KS-NT
	Mercury, total	KS-NT,SIA1X
EPA 7471A in Sludge		
	Mercury, total	KS-NT,SIA1X
EPA 8260B in Soil		
	Chloromethane	KS-NT,SIA1X
	Vinyl Chloride	KS-NT,SIA1X
	Bromomethane	KS-NT,SIA1X
	Chloroethane	KS-NT,SIA1X
	1,1-Dichloroethylene	KS-NT,SIA1X
	Acetone	KS-NT,SIA1X
	Carbon Disulfide	KS-NT,SIA1X
	Methylene Chloride	KS-NT,SIA1X
	trans-1,2-Dichloroethylene	KS-NT,SIA1X
	Methyl-t-butyl Ether (MTBE)	KS-NT,SIA1X
	1,1-Dichloroethane	KS-NT,SIA1X
	cis-1,2-Dichloroethylene	KS-NT,SIA1X
	2-Butanone (MEK)	KS-NT,SIA1X
	Chloroform	KS-NT,SIA1X
	1,1,1-Trichloroethane	KS-NT,SIA1X
	Carbon Tetrachloride	KS-NT,SIA1X
	Benzene	KS-NT,SIA1X

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Terracon Environmental-Bettendorf	Project: Environmental Sampling	Reported
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	1,2-Dichloroethane	KS-NT,SIA1X
	Trichloroethylene	KS-NT,SIA1X
	1,2-Dichloropropane	KS-NT,SIA1X
	Bromodichloromethane	KS-NT,SIA1X
	cis-1,3-Dichloropropene	KS-NT,SIA1X
	4-Methyl-2-pentanone (MIBK)	KS-NT,SIA1X
	Toluene	KS-NT,SIA1X
	trans-1,3-Dichloropropene	KS-NT,SIA1X
	1,1,2-Trichloroethane	KS-NT,SIA1X
	Tetrachloroethylene	KS-NT,SIA1X
	2-Hexanone (MBK)	KS-NT,SIA1X
	Dibromochloromethane	KS-NT,SIA1X
	Chlorobenzene	KS-NT,SIA1X
	Ethylbenzene	KS-NT,SIA1X
	Xylenes, total	KS-NT,SIA1X
	Bromoform	KS-NT,SIA1X
	1,1,2,2-Tetrachloroethane	KS-NT,SIA1X
	1,3-Dichlorobenzene	KS-NT,SIA1X
	1,4-Dichlorobenzene	KS-NT,SIA1X
	1,2-Dichlorobenzene	KS-NT,SIA1X
EPA 8260B in Water		
	Chloromethane	KS-NT,SIA1X
	Vinyl Chloride	KS-NT,SIA1X
	Bromomethane	KS-NT,SIA1X
	Chloroethane	KS-NT,SIA1X
	1,1-Dichloroethylene	KS-NT,SIA1X
	Acetone	KS-NT,SIA1X
	Carbon Disulfide	KS-NT,SIA1X
	Methylene Chloride	KS-NT,SIA1X
	trans-1,2-Dichloroethylene	KS-NT,SIA1X
	Methyl-t-butyl Ether (MTBE)	KS-NT,SIA1X
	1,1-Dichloroethane	KS-NT,SIA1X
	cis-1,2-Dichloroethylene	KS-NT,SIA1X
	2-Butanone (MEK)	KS-NT,SIA1X
	Chloroform	KS-NT,SIA1X
	1,1,1-Trichloroethane	KS-NT,SIA1X
	Carbon Tetrachloride	KS-NT,SIA1X
	Benzene	KS-NT,SIA1X
	1,2-Dichloroethane	KS-NT,SIA1X
	Trichloroethylene	KS-NT,SIA1X
	1,2-Dichloropropane	KS-NT,SIA1X
	Bromodichloromethane	KS-NT,SIA1X
	cis-1,3-Dichloropropene	KS-NT,SIA1X
	4-Methyl-2-pentanone (MIBK)	KS-NT,SIA1X
	Toluene	KS-NT,SIA1X
	trans-1,3-Dichloropropene	KS-NT,SIA1X
	1,1,2-Trichloroethane	KS-NT,SIA1X
	Tetrachloroethylene	KS-NT,SIA1X
	2-Hexanone (MBK)	KS-NT,SIA1X
	Dibromochloromethane	KS-NT,SIA1X
	Chlorobenzene	KS-NT,SIA1X

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
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	Ethylbenzene	KS-NT,SIA1X
	Xylenes, total	KS-NT,SIA1X
	Bromoform	KS-NT,SIA1X
	1,1,2,2-Tetrachloroethane	KS-NT,SIA1X
	1,3-Dichlorobenzene	KS-NT,SIA1X
	1,4-Dichlorobenzene	KS-NT,SIA1X
	1,2-Dichlorobenzene	KS-NT,SIA1X
Iowa OA-2 in Soil		
	Total Extractable Hydrocarbons	SIA1X
Iowa OA-2 in Water		
	Total Extractable Hydrocarbons	SIA1X
SM 2540 G in Sludge		
	% Solids	SIA1X

Code	Certifying Authority	Certificate Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2022
KS-NT	Kansas Department of Health and Environment (NELAP	E-10287	10/31/2022
MO-KC	Missouri Department of Natural Resources	140	04/30/2022
SIA1X	Iowa Dept. of Natural Resources (updated certifica	95	02/01/2024

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Notes and Definitions

QS-01	The blank spike recovery and/or blank spike duplicate recovery were outside the established acceptance limits. Batch was accepted based on acceptable MS/MSD/RPD results.
QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration.
QM-07	The spike recovery and/or RPD was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
PS-4X	The spike recovery was outside of QC acceptance limits for the Post Spike due to analyte concentration at 4 times or greater the spike concentration.
PS-01	The post spike recovery was below acceptance limits. However, all other QC was acceptable.
D-12	Results in the Gasoline Range are primarily due to overlap from a heavier fuel hydrocarbon product.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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Terracon Environmental-Bettendorf	Project:	Environmental Sampling	Reported
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Bettendorf, IA 52722	Project Manager:	Joshua F. Cox	

Sue Thompson

Sue Thompson

Client Services Manager

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APPENDIX E

IDNR LETTER

January 27, 2022

City of Stanwood, Iowa
C/O Stephanie VonBehren (City Manager)
209 East Broadway, Stanwood, IA. 52337

RE: Environmental Assessment of Commercial Buildings at 211 and 213 East Broadway Street, Stanwood, Iowa

Dear Ms. VonBehren,

Thank you for the submittal of the Phase I and Phase II reports for the site Investigation conducted on the property referenced above. The Iowa Department of Natural Resources (DNR) has reviewed the Phase I report regarding the history of the property and the soil and groundwater data contained in the Phase II report for evidence suggesting the existence of a hazardous condition. Potential hazardous conditions are required to be reported to the Iowa DNR. The Iowa DNR evaluated the Phase II report along with other generally available information about the property. The Department's review comments for the site are summarized below.

The soil and groundwater at the site was evaluated with three soil borings and testing for metals, volatile organic and hydrocarbon compounds. Analytical results of soil samples detected arsenic above the State screening standards (SWS) and a single detection of lead (500mg/kg) which exceeds the SWS of 400 mg/kg. However, the site is located in a commercial area and the arsenic and lead levels represent a low risk. Several metals were also detected in groundwater but below the SWS when filtered.

In summary, upon review of the contamination levels reported for soil and groundwater and the low risk of potential adverse impact to the environmental or public health, it is the determination of the DNR that this site is deferred from further environmental assessment. The decision to defer does not declare the site to be without contamination, nor does it constitute an endorsement as to the appropriate use of the site. If such an endorsement is desired, you might consider enrollment of the site into the Iowa Land Recycling Program.

Please contact me if you have any questions at 1-515-725-8337

Regards,

Matt Culp Digitally signed by Matt Culp Date: 2022.01.27 08:57:22 -06'00'

Matt Culp
Iowa DNR, Contaminated Sites Section

CC:

Ms. Dawn Danielson, East Central Intergovernmental Association (ECIA), 7600 Commerce Drive Dubuque, Iowa 52002
Benjamin LaPointe, Terracon Consultants Inc., 870 40th Avenue, Bettendorf, Iowa 52722
Mike Sullivan, Supervisor, Solid Waste and Contaminated Sites Section, Iowa DNR
Iowa DNR Field Office, Washington Iowa

APPENDIX F

SELECT STRUCTURAL ENGINEERING LETTER

SELECT STRUCTURAL ENGINEERING

Friday, January 14, 2022

Lisa Burch
3500 Center Point Road Northeast, Suite 3
Cedar Rapids, Iowa 52402

RE: Deconstruction Structural Feasibility Letter
211 & 213 E Broadway
Stanwood, IA

To Whom It May Concern,
The purpose of this letter is to report the condition of the structure at the above referenced project. This is an older brick building which is deteriorating rapidly. The city of Stanwood would like to demolish it in order to make way for future development. With that, they have engaged professionals to determine the method of deconstruction and feasibility of salvaging the existing material for different projects.

This structure is an old 2 story brick building with no access to basement. It was unclear as to if there was a basement on site or if it was just on grade construction. The exterior of the building is a multi wythe façade which doubles as bearing walls to support the floor and roof systems. The floor and roof are constructed with a combination of truss framing and heavy timber framing in different parts of the facility.

The condition of the building is rapidly deteriorating and is currently uninhabitable. The roof is no longer water tight which has caused the roof trusses to rot. With that, the roof structure is not safe to walk on and it is dangerous to be under for risk of collapse.Similarly, the water infiltration into the structure causing the floor trusses to rot and the floor system to become unstable. Nobody should walk on the upstairs floor as a failure of the floor sheathing and floor framing is possible if not imminent.

There was discussion to remove and reclaim the brick walls for future construction however this would be impossible for two reasons. The first reason is that this structure was constructed with asbestos in it which is a hazardous carcinogen. Once the brick was removed it would have to go through decontamination in order to make it be reusable in the future. Furthermore, the deconstruction crew would need to have PPE including respirators during recovery in order to comply with OSHA. For these reasons it is not financially viable to reuse the brick from this structure.

The second reason the brick cannot be salvaged is due to the stability of the building. In order to salvage the brick, the roof structure would need to be removed first since the brick walls support the roof. In order to remove the roof the second story will need to be occupied by the deconstruction crew. As stated above, the floor system on the second story is compromised and is unsafe for crews to occupy and presents a real risk of partial or complete collapse of the floor system.

One solution that normally could be explored is to use shoring on the first story to help support the second story structure. In this case, this is still not possible because of the condition of the floor joists for both crushing and shear failure. If a jack post is placed on the underside of the floor truss and then a load is applied to the top of the truss (workers walking on the second story) then the truss is at risk of crushing because of how compromised it is. Furthermore, the sheathing on the second story has deteriorated enough that it is possible for a heavy individual or and individual with a lot of equipment to punch through the floor sheathing and fall.

Due to these considerations, it is not possible to deconstruct the structure with people inside without presenting safety hazards to those individuals. The deconstruction process will have to be performed from the exterior of the building and therefore the brick and other materials cannot be salvage. Please let me know if you have any questions regarding this report or its findings at jlamb@select-structural.com or (319)365-1150.

Respectfully,

Jon Lamb, PE
Structural Engineer
Select Structural Engineering

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED AND THE RELATED ENGINEERING WORK WAS PERFORMED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

11/14/2022

JON C. LAMB DATE

LICENSE NUMBER 24989
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2023
PAGES OR SHEETS COVERED BY THIS SEAL:

LETTER

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APPENDIX G

TOXFAQS FOR ASBESTOS & LEAD

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ASBESTOS
CAS # 1332-21-4

Division of Toxicology ToxFAQs™ **September 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about asbestos. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's 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, individual susceptibility and personal habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to asbestos usually occurs by breathing contaminated air in workplaces that make or use asbestos. Asbestos is also found in the air of buildings that are being torn down or renovated. Asbestos exposure can cause serious lung problems and cancer. This substance has been found at 83 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is asbestos?

Asbestos is the name given to a group of six different fibrous minerals (amosite, chrysotile, crocidolite, and the fibrous varieties of tremolite, actinolite, and anthophyllite) that occur naturally in the environment. Asbestos minerals have separable long fibers that are strong and flexible enough to be spun and woven and are heat resistant. Because of these characteristics, asbestos has been used for a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings. Some vermiculite or talc products products may contain asbestos.

What happens to asbestos when it enters the environment?

Asbestos fibers can enter the air or water from the breakdown of natural deposits and manufactured asbestos products. Asbestos fibers do not evaporate into air or dissolve in water. Small diameter fibers and particles may remain suspended in the air for a long time and be carried long distances by wind or water before settling down. Larger diameter fibers and particles tend to settle more quickly.

Asbestos fibers are not able to move through soil. Asbestos fibers are generally not broken down to other compounds and will remain virtually unchanged over long periods.

How might I be exposed to asbestos?

We are all exposed to low levels of asbestos in the air we breathe. These levels range from 0.00001 to 0.0001 fibers per milliliter of air and generally are highest in cities and industrial areas.

People working in industries that make or use asbestos products or who are involved in asbestos mining may be exposed to high levels of asbestos. People living near these industries may also be exposed to high levels of asbestos in air.

Asbestos fibers may be released into the air by the disturbance of asbestos-containing material during product use, demolition work, building or home maintenance, repair, and remodeling. In general, exposure may occur only when the asbestos-containing material is disturbed in some way to release particles and fibers into the air.

Drinking water may contain asbestos from natural sources or from asbestos-containing cement pipes.

How can asbestos affect my health?

Asbestos mainly affects the lungs and the membrane that surrounds the lungs. Breathing high levels of asbestos fibers for a long time may result in scar-like tissue in the lungs and in the pleural membrane (lining) that surrounds the lung. This disease is called asbestosis and is usually found in workers exposed to asbestos, but not in the general public. People with asbestosis have difficulty breathing, often a cough, and in severe cases heart enlargement. Asbestosis is a serious disease and can eventually lead to disability and death.

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

Breathing lower levels of asbestos may result in changes called plaques in the pleural membranes. Pleural plaques can occur in workers and sometimes in people living in areas with high environmental levels of asbestos. Effects on breathing from pleural plaques alone are not usually serious, but higher exposure can lead to a thickening of the pleural membrane that may restrict breathing.

How likely is asbestos to cause cancer?

The Department of Health and Human Services (DHHS), the World Health Organization (WHO), and the EPA have determined that asbestos is a human carcinogen.

It is known that breathing asbestos can increase the risk of cancer in people. There are two types of cancer caused by exposure to asbestos: lung cancer and mesothelioma. Mesothelioma is a cancer of the thin lining surrounding the lung (pleural membrane) or abdominal cavity (the peritoneum). Cancer from asbestos does not develop immediately, but shows up after a number of years. Studies of workers also suggest that breathing asbestos can increase chances of getting cancer in other parts of the body (stomach, intestines, esophagus, pancreas, and kidneys), but this is less certain. Early identification and treatment of any cancer can increase an individual's quality of life and survival.

Cigarette smoke and asbestos together significantly increase your chances of getting lung cancer. Therefore, if you have been exposed to asbestos you should stop smoking. This may be the most important action that you can take to improve your health and decrease your risk of cancer.

How can asbestos affect children?

We do not know if exposure to asbestos will result in birth defects or other developmental effects in people. Birth defects have not been observed in animals exposed to asbestos.

It is likely that health effects seen in children exposed to high levels of asbestos will be similar to the effects seen in adults.

How can families reduce the risk of exposure to asbestos?

Materials containing asbestos that are not disturbed or deteriorated do not, in general, pose a health risk and can be left alone. If you suspect that you may be exposed to asbestos in your home, contact your state or local health department or the regional offices of EPA to find out how to test your home and how to locate a company that is trained to remove or contain the fibers.

Is there a medical test to show whether I've been exposed to asbestos?

Low levels of asbestos fibers can be measured in urine, feces, mucus, or lung washings of the general public. Higher than average levels of asbestos fibers in tissue can confirm exposure but not determine whether you will experience any health effects.

A thorough history, physical exam, and diagnostic tests are needed to evaluate asbestos-related disease. Chest x-rays are the best screening tool to identify lung changes resulting from asbestos exposure. Lung function tests and CAT scans also assist in the diagnosis of asbestos-related disease.

Has the federal government made recommendations to protect human health?

In 1989, EPA banned all new uses of asbestos; uses established before this date are still allowed. EPA established regulations that require school systems to inspect for damaged asbestos and to eliminate or reduce the exposure by removing the asbestos or by covering it up. EPA regulates the release of asbestos from factories and during building demolition or renovation to prevent asbestos from getting into the environment.

EPA has proposed a concentration limit of 7 million fibers per liter of drinking water for long fibers (lengths greater than or equal to 5 μm). The Occupational Safety and Health Administration has set limits of 100,000 fibers with lengths greater than or equal to 5 μm per cubic meter of workplace air for 8-hour shifts and 40-hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for Asbestos. Update. Atlanta, GA: U.S. Department of 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, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address 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.

Lead - ToxFAQs™

What is lead?

Lead is a metal found naturally in the earth's crust. It can be found in all parts of our environment, including air, water, and soil. Lead can combine with other chemicals to make different compounds.

Lead is used in the production of batteries, ammunition, and metal products (solder and pipes). Because of health concerns, the use of lead in paints, ceramic products, caulking, and pipe solder has been dramatically reduced. The use of lead as an additive to automobile gasoline was banned in 1996 in the United States.

What happens to lead in the environment?

- Lead is an element, so it does not break down.
- When lead is released into the air, it may be transported long distances before it lands and stays on the ground.
- Once on the ground, lead can often stick to soil particles.
- Lead in soil can get into groundwater, but the amount of lead that moves into groundwater will depend on the lead compound and soil type.

How can I be exposed to lead?

Lead can cause health problems in almost every organ and system in your body.

- Eating food or drinking water that contains lead.
- Drinking water from pipes that were soldered with lead can cause exposure.
- Spending time or living in homes with lead-based paints can result in exposure when the paint breaks down and forms dust, which can get on your hands, or into your mouth and nose and be swallowed.
- Spending time in areas where the soil is contaminated with lead.
- Working in a job where lead is used or participating in certain hobbies where lead is used, such as making stained glass.
- Using healthcare products from other countries, alternative treatments, or folk remedies.

How can lead affect my health?

The effects of lead are the same whether it enters the body by breathing it in or eating it. Lead can affect almost every organ and system in your body. The nervous system is the main target for lead poisoning in children and adults. Long-term exposure can result in decreased learning, memory, and attention, and weakness in fingers, wrists, or ankles. Lead exposure can cause anemia (low iron in the blood) and damage to the kidneys. It can also cause increases in blood pressure, particularly in middle-aged and older individuals. Exposure to high lead levels can severely damage the brain and kidneys and can cause death. In pregnant women, exposure to high levels of lead may cause a miscarriage. In men, it can cause damage to reproductive organs.

Lead

How can lead affect children?

Children are more vulnerable to lead poisoning than adults because their nervous system is still developing. Children can be exposed to lead in their environment and before birth from lead in their mother's body. At lower levels of exposure, lead can decrease mental development, especially learning, intelligence, and behavior. Physical growth may also be decreased. A child who swallows large amounts of lead may develop anemia, severe stomachache, muscle weakness, and brain damage. Exposure to lead during pregnancy can also result in premature births. Some effects of lead poisoning in a child may continue into adulthood.

Can lead cause cancer?

Several agencies and organizations both in the United States and internationally have reviewed studies and made an assessment about whether lead can cause cancer.

- The Department of Health and Human Services (HHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens (causing cancer in people).
- The U.S. Environmental Protection Agency (EPA) has classified lead as 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.

Can I get a medical test to check for lead?

A blood test is available to measure the amount of lead in your blood. Blood tests are commonly used to screen children for lead poisoning. Your doctor can draw blood samples and send them to appropriate laboratories for analysis. If you think you or anyone in your family has been exposed to lead, contact your doctor, nurse, or poison control center.

How can I protect my family from lead exposure?

- 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 your home contains lead-based paint (built before 1978), or if 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 to remove lead dust and lead tracked in soil.
- Certain water pipes may contain lead, so if you know that pipes have lead solder, you should avoid drinking from that source.
- Check for lead in some products such as toys and jewelry and avoid such products.
- Lead is sometimes in candies imported from other countries or traditional home remedies; find out if yours has any lead and avoid using these products or giving them to children.
- You can learn more about preventing lead poisoning here: https://www.cdc.gov/nceh/lead/faqs/lead-faqs.htm

Want more information?

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at https://wwwn.cdc.gov/dcs/ContactUs/Form

Go to ATSDR's Toxicological Profile for Lead

CDC Lead Poisoning Prevention Program https://www.cdc.gov/nceh/lead/default.htm

Environmental Protection Agency https://www.epa.gov/lead/protect-your-family-exposures-lead

Go to ATSDR's Toxic Substances Portal: https://wwwn.cdc.gov/TSP/index.aspx

If you have any more questions or concerns, you can also find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html

APPENDIX H

SOIL AND GROUNDWATER MANAGEMENT PLAN

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.

---

[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.

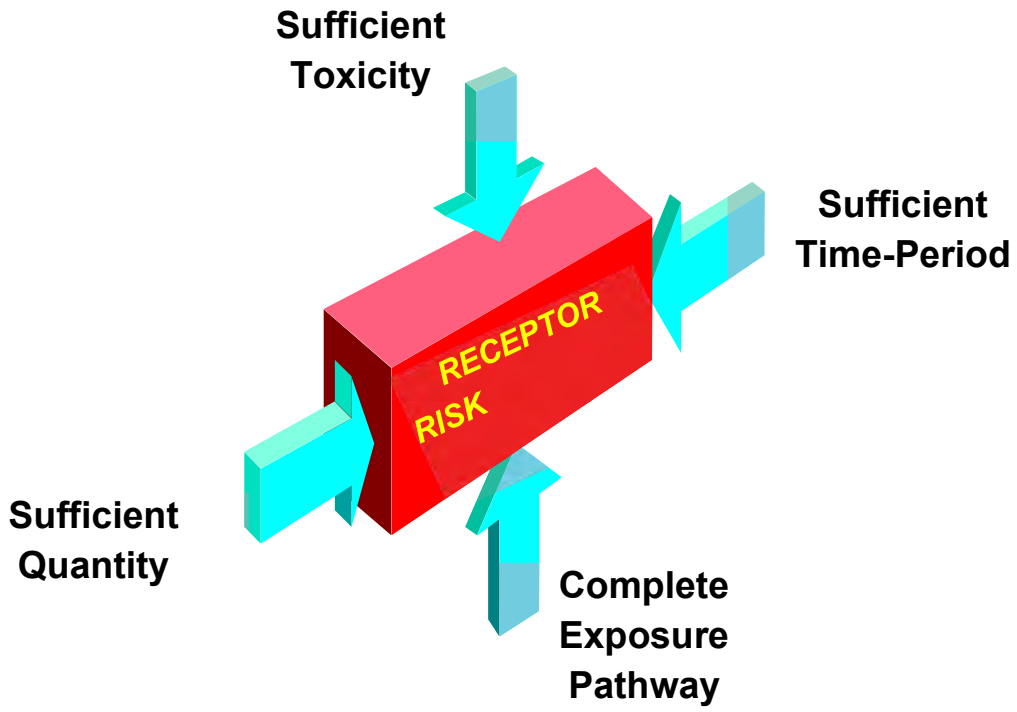


Figure 1 Concept of Risk

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:

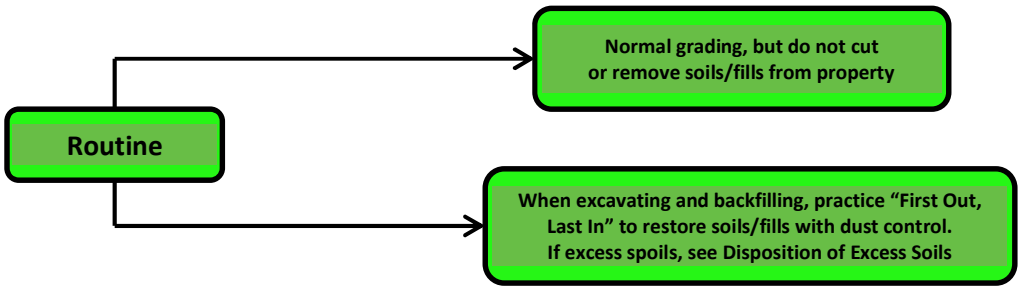
- Soils with chemical impact could be present for exposure to contractors and site workers disturbing materials, although individual exposures will likely be less than the 30 days per year, 24 hours per day assumed for the pathway;
- The analysis presented in this plan is based upon data obtained from 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.

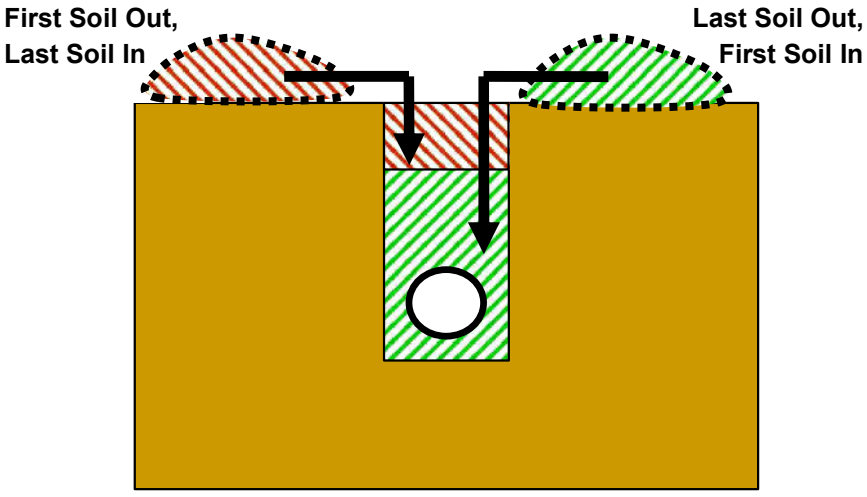
6.3 Surface Grading

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.

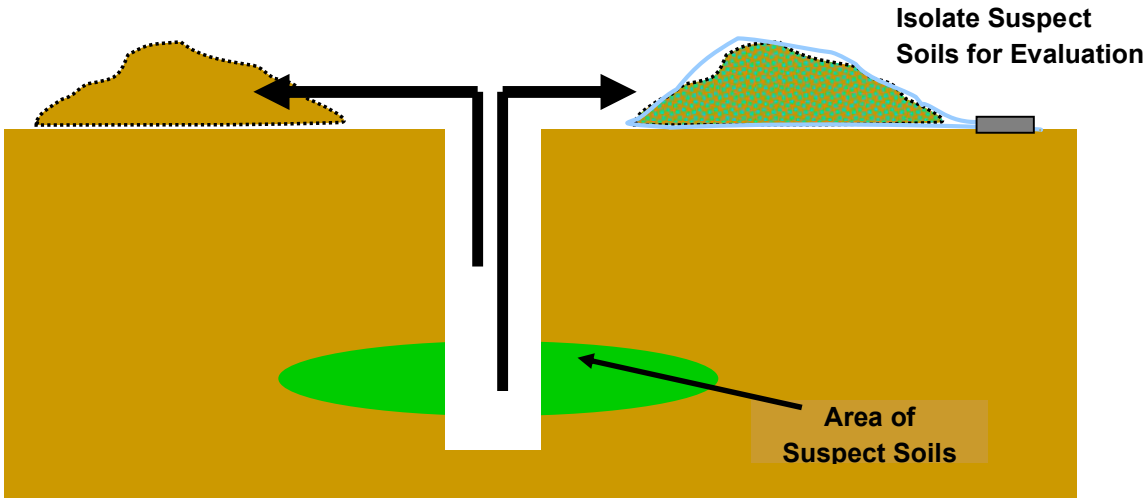


Figure 2 Isolation of Suspect Soils

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

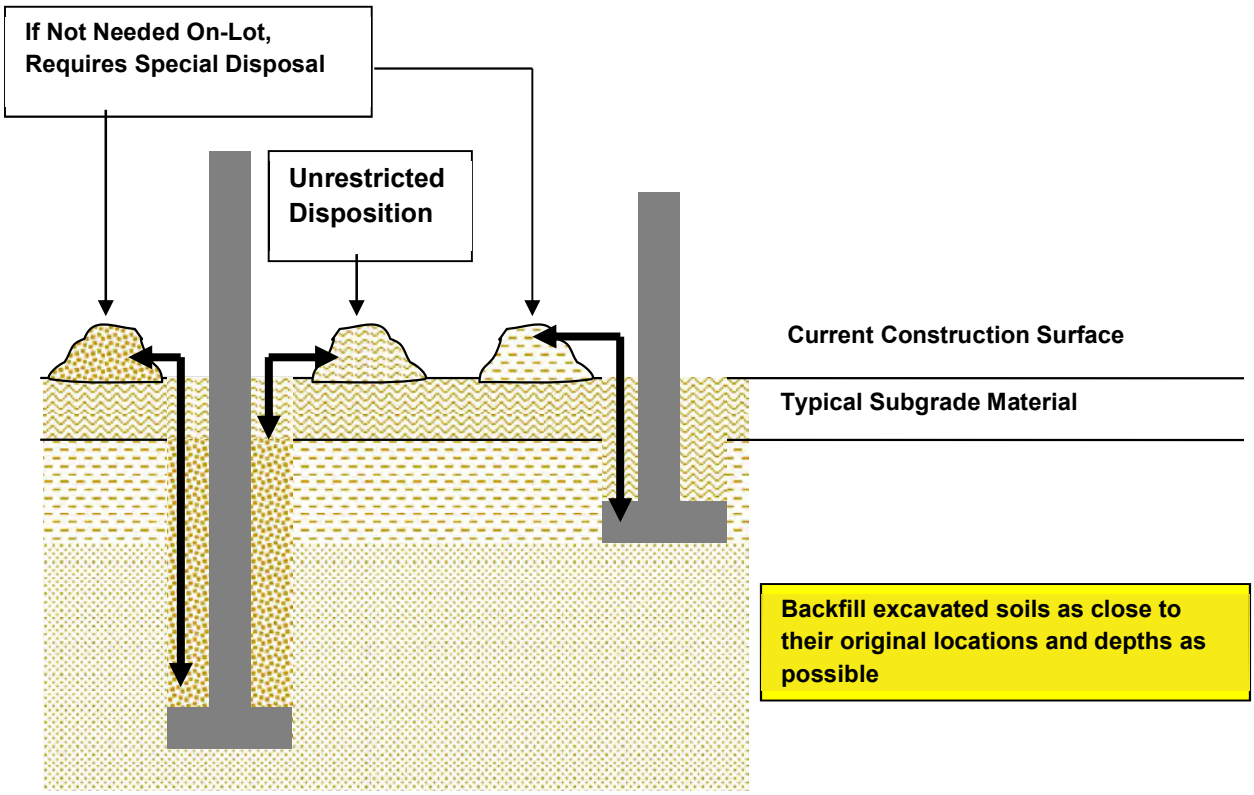
disposal options at permitted local and area landfills or water treatment facilities. Samples of excavated materials should be collected at a frequency adequate to achieve generally accepted regulatory practice.

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.

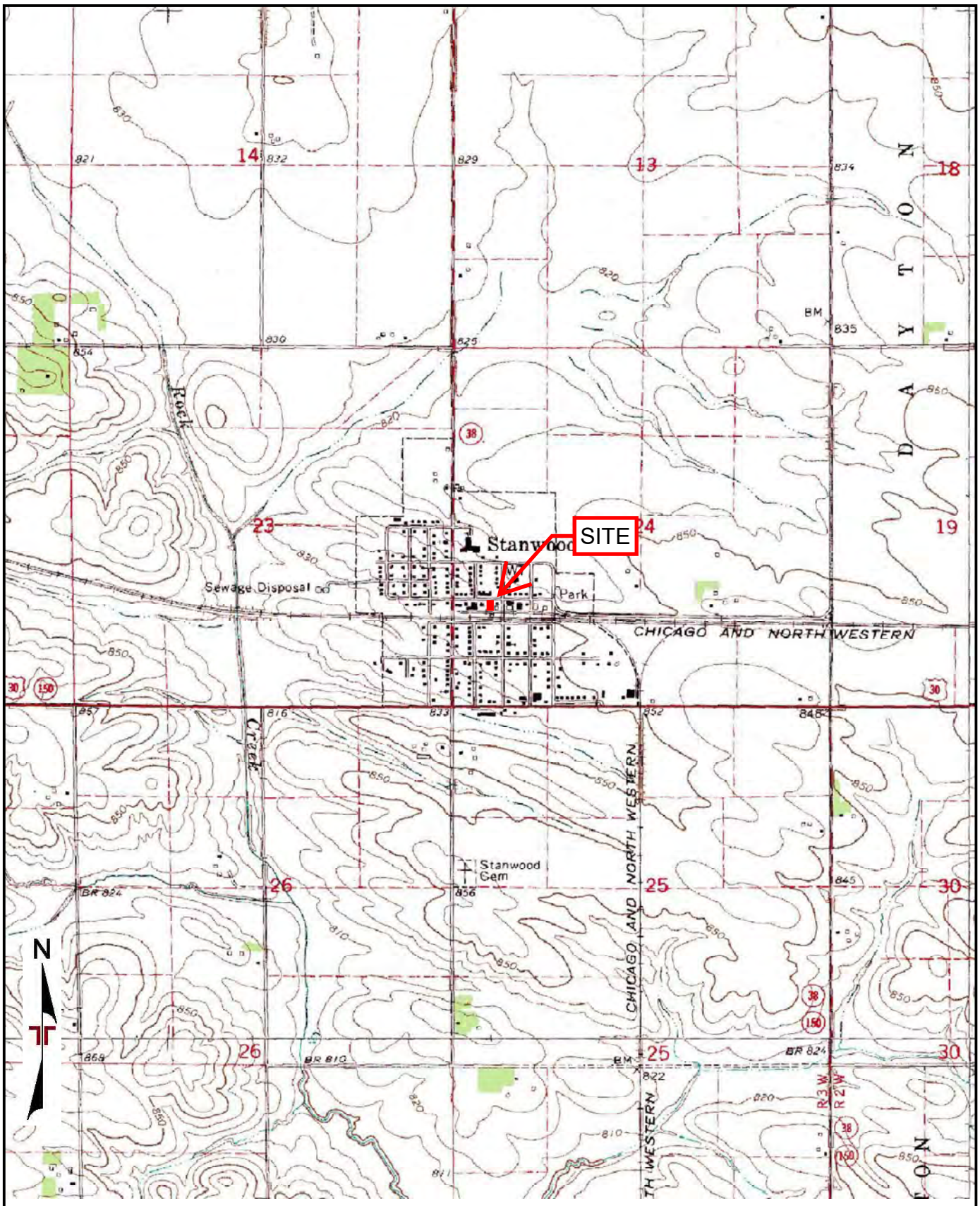
11.0 IMPORTED FILL

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
Drawn by:	BJS
Checked by:	BML
Approved by:	BML

Project No.	07207086
Scale:	1"=2,000'
Date:	2/2/2022

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

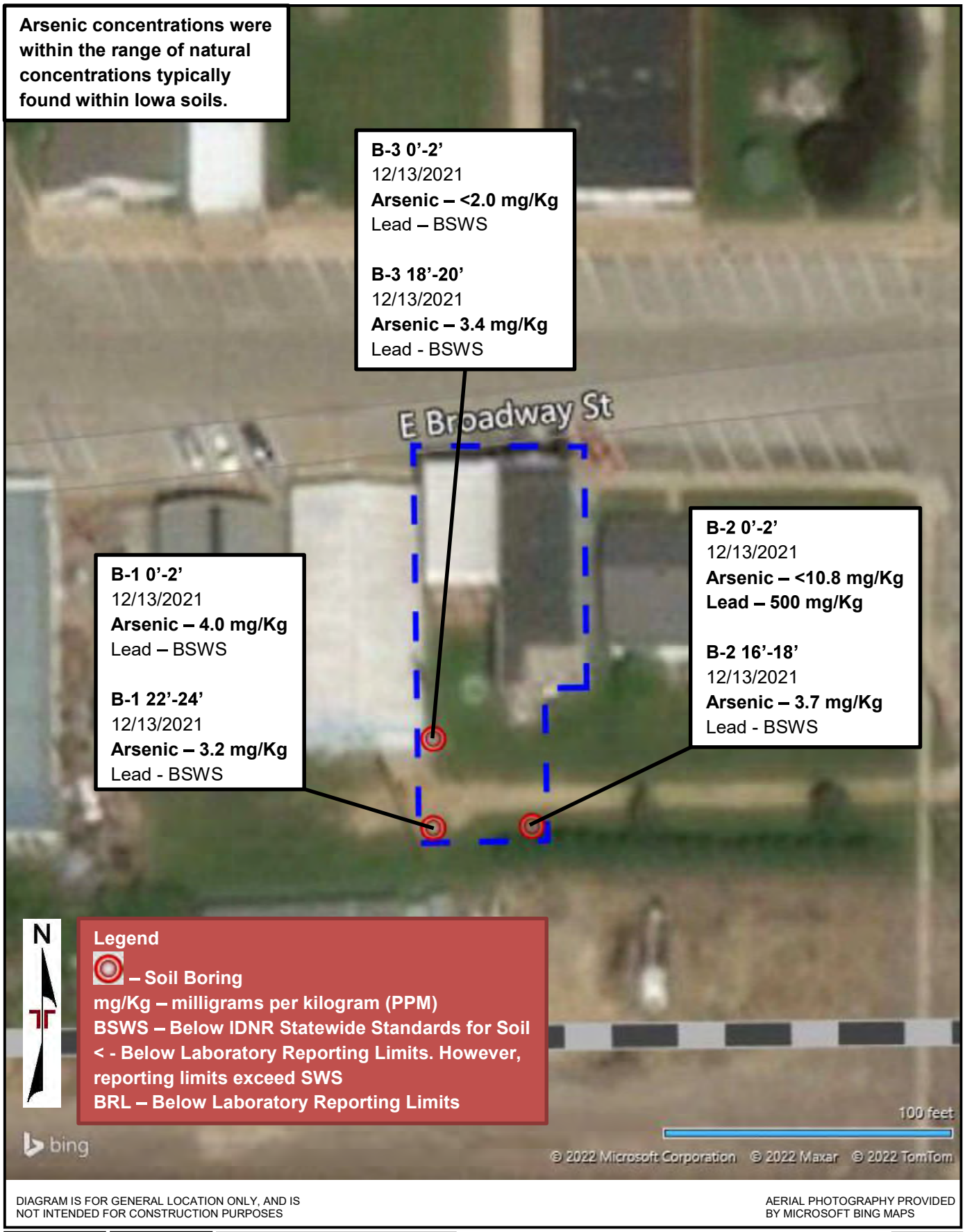


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

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.

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.