# Corrective Action Plan

**108 North Route 83**
**Lake Villa, Illinois**

**LUST Incident No. 20090562**

**LPC No. 0970845009**

*Prepared for:*

**Lake Villa School District**
**131 McKinley Avenue**
**Lake Villa, Illinois 60046**

*Prepared by:*

**A3 Environmental LLC**
**3030 Warrenville Road, Suite 418**
**Lisle, Illinois 60532**
**(630) 507-9002**

**July 2022**

## TABLE OF CONTENTS

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# Illinois Environmental Protection Agency
# Leaking Underground Storage Tank Program
# Corrective Action Plan/Corrective Action Completion Report

## A. SITE IDENTIFICATION

IEMA Incident #: 20090562 IEPA LPC #: 0970845009

Site Name: Lake Villa School District #41

Site Address (Not a P.O. Box): 108 North Route 43

City: Lake Villa County: Lake Zip Code: 60046

## B. SITE INFORMATION

1. **Will the owner/operator seek reimbursement from the Underground Storage Tank Fund?** Yes ☒ No ☐
2. **If yes, is the budget attached?** Yes ☒ No ☐
3. **Is this an amended plan?** Yes ☒ No ☐
4. **Identify the material(s) released:** Gasoline
5. **This Corrective Action Plan is being submitted pursuant to**

   a. **35 Ill. Adm. Code 731.166** ☐
      **The material released was:**
      **-petroleum** ☐
      **-hazardous substance (see Environmental Protection Act Section 3.215)** ☐
   b. **35 Ill. Adm. Code 732.404** ☐
   c. **35 Ill. Adm. Code 734.335** ☒

## C. PROPOSED METHODS OF REMEDIATION

1. **Soil;** Residual soil impact will be addressed through Tiered Approach to Corrective Action Objectives (TACO) pathway exclusion, engineered barriers, and a Highway Authority Agreement.

2. **Groundwater;** No groundwater impact has been identified.

## D. SOIL AND GROUNDWATER INVESTIGATION RESULTS (for incidents subject to 35 Ill. Adm. Code 731 only or 732 that were classified using Method One or Two, if not previously provided)

This site is subject to 35 IAC 734. Soil investigation results are provided.

**Provide the following:**

1. **Description of investigation activities performed to define the extent of soil and/or groundwater contamination.**

   The site is a former gasoline station that had three underground storage tanks removed in 2009. A release was declared during removal of the USTs because of corrosion and overfilling.

   Early Action and Stage I Investigations took place from June to September of 2009, Stage 2 Investigations took place in February of 2010 and Stage 3 Investigations took place between September and November of 2012. All Early Action and Additional Investigations and Remediation were performed by EMR.

   Soil analytical results during these investigations were compared to Tier I Soil Site Remediation Objectives for inhalation and ingestion and to site specific Tier 2 Soil Remediation Objectives (SROs) for the Soil Component of the Groundwater Ingestion Route (SCGIR) for Class I. Analytical results indicated that all the impacted soil was removed from the site except for 9 locations identified on Figure 4. A majority of these samples were taken at the property line of the site or within the IDOT right of way. Removal of soil within the IDOT right of way was not possible due to several utilities in the area that included a 10" gas main. Given that there is residual soil contamination in the IDOT right of way, EMR excavated to the property line. A total of 2,709 cubic yards of torpedo sand and CA-6 was used to backfill the excavations at the site. No residual impacts above SROs were found in the south excavation. Benzene, ethylbenzene, total xylenes and lead were found to be exceeding IEPA Inhalation, Construction Worker and Soil Component Groundwater Ingestion Route SROs. Additionally, concentrations of xylenes were observed exceeding Tier 1 soil saturation ($C_{sat}$) limits during the Stage 3 Investigation at boring location W-10 at 4 feet below ground surface (bgs).

   It should be noted that during Stage 3 Investigations, four borings (B-17 through B-20) were placed along the IDOT right of way on the eastern side of Route 83 where soils were analyzed for BTEX and MTBE at various depths down to 12 feet bgs (no groundwater was encountered). Analytical results did not show any SRO exceedances for these analytes on the eastern side of Route 83.

   A Supplemental Investigation was conducted by A3E on October 12, 2021 with the goal to ensure subsurface contaminants of concern are consistent with the last sampling event and to assess R26 modeling of contaminants of concern to determine migratory distances into the IDOT right-of-way. A total of nine soil borings were advanced during this investigation within the vicinity of the historic borings with exceedances identified during the Stage 3 Investigation. One soil sample from each boring was collected within the native soils just below the Stage 3 backfill material. An additional deeper soil sample was collected from boring CS-101221-09 in order to replicate the historical exceedances. In order to evaluate the 2012 Csat exceedance, boring CS-101221-01 was inspected for any indicators of product. No evidence of product saturation was observed. It was determined by the IEPA Project Manager, Ms. Jennifer Rossi, that because the exceedance was unable to be replicated and underground utilities make additional investigations difficult, the historical exceedance will not be investigated further and will be addressed under a proposed engineered barrier and highway authority agreement.

2. **Analytical results, chain-of custody forms, and laboratory certifications.**

   The 2021 Supplemental Investigation soil laboratory analytical reports, chain-of-custody forms, and laboratory certifications are provided in **Appendix B.**

3. **Tables comparing analytical results to applicable remediation objectives.**

   Analytical results are summarized on **Table 1**, attached.

4. **Boring logs.**

   Boring logs are provided in **Appendix C**

5. **Monitoring well logs; and**

   Monitoring wells were not installed at the site as groundwater was not found during the previous remedial activities (with concurrence from IEPA Project Manager).

6. **Site maps meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440 and showing:**

   a. **Soil sample locations.**
   b. **Monitoring well locations.**
   c. **Plumes of soil and groundwater contamination.**

   See **Figures 4 and 7**, attached.

## E. TECHNICAL INFORMATION – CORRECTIVE ACTION PLAN

Provide the following:

1. **Executive summary identifying the objectives of the corrective action plan and the technical approach to be utilized to meet such objectives.**

   The following exceedances remain at the site:

   Eight benzene, one ethyl benzene, one xylene, one methyl tertiary-butyl ether (MTBE), and one lead exceedance of the Class 1 Soil Component of Groundwater Ingestion exposure pathway were identified during the EMR investigations. During the 2021 Investigation, four benzene and one lead exceedances of the Class 1 Soil Component of Groundwater Ingestion exposure pathway were identified.

   Two xylene, one ethylbenzene, and four benzene exceedances of the Construction Worker Inhalation exposure pathway were identified during the EMR investigations, During the 2021 investigation, one benzene exceedance of the Construction Worker Inhalation exposure pathway was identified.

   One xylene and four benzene exceedances of the Residential Inhalation exposure pathway were identified during the EMR investigations. During the 2021 investigation, two benzene exceedances of the Residential Inhalation exposure pathway were identified.

One xylene exceedance of the soil saturation limit. During the 2021 investigation, no soil saturation limit exceedances were identified.

No groundwater was analyzed as no groundwater has historically been present at the site during historical remedial activities.

TACO RBCA equations R14 and R26 were used to determine the potential extent of groundwater impact from the samples exceeding the soil component of Class I groundwater ingestion benzene remediation objective. The modeled potential extent of impact includes the subject property. A groundwater use restriction is proposed.

A Construction Worker Health and Safety Plan is proposed to address the Construction Worker inhalation exposure pathway exceedances.

An engineered barrier in the form of an asphalt cap is proposed to address the Residential Inhalation exposure pathway exceedances.

**a. The major components (e.g., treatment, containment, removal) of the corrective action plan.**

The major components of this CAP are in-place management of impacted soil using pathway exclusion and the use of an engineered barrier.

**b. The scope of the problems to be addressed by the proposed corrective action; and**

Impacted soil has been identified and delineated at the subject property and will be managed in place using pathway exclusion, an engineered barrier in the form of an asphalt cap, a Highway Authority Agreement, and by a Construction Worker Health and Safety Plan.

**c. A schedule for implementation and completion of the plan;**

This CAP requests implementation of a Highway Authority Agreement for the subject property and potentially affected adjacent properties and a Construction Worker Caution. An asphalt engineered barrier will be placed following the approval of this report.

**2. Identification of the remediation objectives proposed for the site;**

The Chemicals of Concern (COCs) are benzene, ethylbenzene, xylenes, MTBE and lead. TACO Tier 1 Residential and Class I ROs are proposed.

**3. A description of the remedial technologies selected.**

**a. The feasibility of implementing the remedial technologies.**
**b. Whether the remedial technologies will perform satisfactorily and reliably until the remediation objectives are achieved.**
**c. A schedule of when the technologies are expected to achieve the applicable remediation objectives.**

An engineered barrier is defined by the IEPA as a barrier designed by using verified engineering practices that limits exposure to, or controls migration of, the contaminants of concern. A cap is a

horizontal barrier that covers the entire area of contamination to prevent vertical migration of contaminants. A cap must be constructed of compacted clay, asphalt, concrete, or other materials capable of producing similar results. The use of an engineered barrier in the form of an asphalt cap is proposed. Once given approval, the owner of the property will place an asphalt barrier over the area of concern, detailed in **Figure 8**.

4. **A confirmation sampling plan that describes how the effectiveness of the corrective action activities will be monitored during their implementation and after their completion.**

   No confirmation sampling is proposed.

5. **A description of the current and projected future uses of the site.**

   The subject property is currently a vacant, undeveloped lot. One 1,000-gallon, one 2,000-gallon, and one 3,000-gallon gasoline underground storage tank (UST) were associated with the subject property. The USTs were removed in May 2009. The projected post-remediation use of the subject site will remain as vacant, undeveloped lot.

6. **A description of engineered barriers or institutional controls that will be relied upon to achieve remediation objectives:**

   The use of engineered barriers or institutional controls is discussed in the pathway evaluation section (Section F) of this report.

   a. **An assessment of their long-term reliability.**

      See Section F.

   b. **Operating and maintenance plans.**

      See Section F.

   c. **Maps showing area covered by barriers and institutional controls.**

      See Section F.

7. **The water supply well survey:** A supplemental water well supply search has been performed to address the time lapse that has occurred since 2009 using the Illinois Source Water Assessment and Protection Program (SWAP) database. One water well (#120973358200) is located to the northwest of the site in the 1,000 foot radius, at a distance of approximately 350 feet.

   a. **Map(s) showing locations of community water supply wells and other potable wells and the setback zone for each well.**

      See **Figure 6**. The subject property is not located within any potable well setback zone. The nearest water well is located approximately 350 feet northwest of the subject property, outside of the 200-foot setback zone.

   b. **Map(s) showing the regulated recharge areas and wellhead protection areas.**

See **Figure 6**. The site is not located within any regulated recharge areas and/or wellhead protection areas.

c. **Map(s) showing the current extent of the groundwater contamination exceeding the most stringent Tier 1 remediation objectives.**

No groundwater has been investigated at the subject property.

d. **Map(s) showing the modeled extent of groundwater contamination exceeding the most stringent Tier 1 remediation objectives.**

See **Figure 7**.

e. **Tables listing the setback zone for each community water supply well and other potable water supply wells.**

The Illinois EPA Source Water Assessment Website was accessed in order to complete the water well survey. The well search information was presented in **Appendix E**. No private ISGS water wells were listed in the database located within 200 feet from the subject property. The subject property is not located within a CWS Phase I Wellhead Protection Area, a CWS Phase II Wellhead Protection Area, or a CWS Minimum Setback Zone.

The water source for the adjoining properties is obtained from the Lake Villa Water Department. There is no water source for the subject property, as it is an undeveloped lot. The Lake Villa Water Department obtains its water from Lake Michigan. The water is subjected to conventional treatment processes prior to being released for public consumption.

f. **A narrative identifying each entity contacted to identify potable water supply wells, the name and title of each person contacted, and any field observations associated with any wells identified.**

The IEPA SWAP database was utilized.

g. **A certification from a licensed Professional Engineer or Licensed Professional Geologist that the survey was conducted in accordance with the requirements and that documentation submitted includes information obtained as a result of the survey (certification of this plan satisfies this requirement).**

Please refer to **Appendix F** for the Professional Geologist Certification.

8. **Appendices.**

a. **References and data sources report that are organized.**

Please refer to **Appendix A** through F.

b. **Field logs, well logs, and reports of laboratory analysis.**

Field logs, well logs, and reports of soil laboratory analysis are included in **Appendix B and C.** Analytical results are summarized on **Table 1.**

9. **Site map(s) meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440.**

   See **Figure 2.**

10. **Engineering design specifications, diagrams, schematics, calculations, manufacturer's specifications, etc.**

    Engineered barrier design and specifications dependent upon IEPA approval.

11. **A description of bench/pilot studies.**

    Not applicable.

12. **Cost comparison between proposed method of remediation and other methods of remediation.**

    Not applicable.

13. **For the proposed Tier 2 or Tier 3 remediation objectives, provide the following:**

    a. **The equation used.**

       Tier 2 or Tier 3 remediation objectives are not proposed.

    b. **A discussion of how input variables were determined.**

       Not applicable.

    c. **Map(s) depicting distances used in the equations.**

       Not applicable.

    d. **Calculations.**

       Not applicable.

14. **Provide documentation to demonstrate the following for alternative technologies:**

    a. **The proposed alternative technology has a substantial likelihood of successfully achieving compliance with all applicable regulations and remediation objectives.**
    b. **The proposed alternative technology will not adversely affect human health and safety or the environment.**
    c. **The owner or operator will obtain all Illinois EPA permits necessary to legally authorize use of alternative technology.**
    d. **The owner or operator will implement a program to monitor whether the requirements of subsection 14(a) have been met.**
    e. **Within one year from the date of Illinois EPA approval, the owner or operator will provide to the Illinois EPA monitoring program results establishing whether the**

**proposed alternative technology will successfully achieve compliance with the requirements of subsection 14(a).**

**f. Demonstration that the cost of alternative technology will not exceed the cost of conventional technology as is not substantially higher than at least two other alternative technologies, if available and technically feasible.**

Alternative technologies are not proposed.

## F. EXPOSURE PATHWAY EVALUATION & EXCLUSIONS

**Provide the following:**

1. **A description of the tests to be performed in determining whether the following requirements will be met:**

   **a. Attenuation capacity of the soil will not be exceeded for any of the organic contaminants.**

   A default value of 6,000 mg/kg for soils within the top meter and 2,000 mg/kg for soils below one meter of the surface were used. The sum total of organics detected in all soil samples collected during site investigation did not exceed the soil attenuation capacity.

   **b. Soil saturation limit will not be exceeded for any of the organic contaminants.**

   One soil sample collected from boring W-10 (at 4 feet bgs) during the Stage 3 Investigation was observed with a Tier 1 soil saturation ($C_{sat}$) limits exceedance. It was determined by the IEPA Project Manager, Ms. Jennifer Rossi, that because the exceedance was unable to be replicated and underground utilities make additional investigations difficult, the historical exceedance will be addressed by the proposed engineered barrier and Highway Authority Agreement.

   **c. Contaminated soils do not exhibit any of the reactivity characteristics of hazardous wastes per 35 Ill. Adm. Code 721.123.**

   The contaminants of concern (COCs) for this site do not exhibit any reactivity characteristics of hazardous waste based on a review of 35 IAC 721.123 subsection a) 1 through 8, and subsection b).

   **d. Contaminated soils do not exhibit a pH $\leq$ 2.0 or $\geq$ 12.5.**

   Based on the soils encountered during site investigation activities and since no problems with laboratory analytical methods were encountered, it can be reasonably assumed that soils outside the pH range listed above are not present at the site, therefore, no impact is likely to have occurred which exhibit corrosive or caustic characteristics.

   **e. Contaminated soils which contain arsenic, barium, cadmium, chromium, lead, mercury, or selenium (or their associated salts) do not exhibit any of the toxicity characteristics of hazardous waste per 35 Ill. Adm. Code 721.124.**

   Soil samples exhibiting exceedances of lead did not exhibit any of the toxicity characteristics of hazardous waste per 35 Ill. Adm. Code 721.124.

**2. A discussion of how any exposure pathways are to be excluded.**

**Soil Ingestion Exposure Route**

Tier 1 Evaluation

The soil sample analytical results were compared to the IEPA Tier 1 soil remediation objectives for the soil ingestion pathway. None of the detected COC concentrations exceed any Tier 1 soil residential, industrial/commercial, or construction worker ingestion remediation objectives.

No further evaluation of the soil ingestion exposure route is needed.

**Soil Inhalation Exposure Route**

Tier 1 Evaluation

The soil sample analytical results were compared to the IEPA Tier 1 soil remediation objectives for the soil inhalation pathway. COC concentrations exceed the Tier 1 inhalation soil remediation objectives in the following samples:

***Benzene:***

- W-1 at 6' bgs (residential, industrial/commercial, construction worker)
- B-1 at 12' bgs (residential, industrial/commercial, construction worker)
- W-10 at 4' bgs (residential, industrial/commercial, construction worker)
- B-7 at 12' bgs (residential, industrial/commercial, construction worker)
- CS-101221-05 at 5' (construction worker)

***Ethylbenzene:***

- W-10 at 4' bgs (construction worker)

***Xylenes:***

- W-10 at 4' bgs (residential, industrial/commercial, construction worker)
- W-4 at 4' bgs (construction worker)

No other detected COC concentrations exceed any Tier 1 soil residential, commercial, or construction worker inhalation remediation objectives.

A proposed engineered barrier, in the form of asphalt, in accordance with 35 IAC 742.1105(c)(2)(C), that shall be maintained to prevent exposure to the soils exceeding the Tier I inhalation exposure pathways. Additionally, a Construction Worker health and safety plan in the areas of concern will be implemented.

No buildings are currently developed at the site, and the property owner has indicated that there are no plans to develop the property. Any future building to be constructed over the VOC impacted area or if the current building is expanded will need to be either slab-on-grade or have a BCT to prevent vapor intrusion.

**Soil Component of Groundwater Ingestion Exposure Route**

Tier 1 Evaluation

The soil sample analytical results were compared to the IEPA Tier 1 soil remediation objectives for the soil component to groundwater ingestion pathway for Class I groundwater. COC concentrations exceeded the Tier 1 soil component of Class I groundwater remediation objectives in the following samples:

***Benzene***

- B-4 at 8.5' bgs (Class I)
- W-2 at 5' bgs (Class I)
- B-2 at 10.5' bgs (Class I)
- W-1 at 6' bgs (Class I)
- W-10 at 4' bgs (Class I)
- B-7 at 12' and 14' bgs (Class I)

***Ethylbenzene:***

- W-10 at 4' bgs (Class I)

***Xylenes:***

- W-10 at 4' bgs (Class I)

***Lead:***

- CS-101221-08 at 3' (Class I)

No other detected COC concentrations exceed any Tier 1 soil component of groundwater ingestion remediation objectives.

Modeling was performed using TACO equations R14 and R26 to predict potential future groundwater impacts from soil leaching to groundwater. The modeling uses site-specific values that were previously utilized and approved in the 2013 CACR to determine potential future impact from locations with current impact. The equations were used to determine the distance from the source point at which the groundwater RO will not be exceeded. Please note that MTBE did not have a degradation constant to use during modeling. A3E contacted the IEPA Toxicology department and spoke to Carrol Hallbecker. Carrol recommended that A3E use a calculated retardation factor on the United States Environmental Protection Agency's website. A screenshot of the retardation factor calculation and the site specific values are provided in **Appendix A.**

*Benzene*

The highest concentration of benzene (14 milligrams per kilogram {mg/kg}) in soil sample W-10 (4') was used to determine maximum potential future extent of impacted groundwater from the

source area. RBCA equation R14 was used to determine a leaching factor. The W-10 (4') benzene concentration was then multiplied by the leaching factor to obtain a predicted leached groundwater concentration. The leached groundwater concentration was used as a source groundwater concentration in RBCA equation R26 to determine the distance at which benzene would meet the Class I Groundwater RO of 0.005 milligrams per liter (mg/L). The calculation indicates that the benzene concentration would meet the Class I Groundwater RO at a distance of six inches from the edge of the source.

*Ethylbenzene*

The highest concentration of ethylbenzene (93 milligrams per kilogram {mg/kg}) in soil sample W-10 (4') was used to determine maximum potential future extent of impacted groundwater from the source area. RBCA equation R14 was used to determine a leaching factor. The W-10 (4') benzene concentration was then multiplied by the leaching factor to obtain a predicted leached groundwater concentration. The leached groundwater concentration was used as a source groundwater concentration in RBCA equation R26 to determine the distance at which benzene would meet the Class I Groundwater RO of 0.7 milligrams per liter (mg/L). The calculation indicates that the ethylbenzene concentration would meet the Class I Groundwater RO at a distance of less than three inches from the edge of the source.

*Xylenes*

The highest concentration of total xylenes (380 milligrams per kilogram {mg/kg}) in soil sample W-10 (4') was used to determine maximum potential future extent of impacted groundwater from the source area. RBCA equation R14 was used to determine a leaching factor. The W-10 (4') benzene concentration was then multiplied by the leaching factor to obtain a predicted leached groundwater concentration. The leached groundwater concentration was used as a source groundwater concentration in RBCA equation R26 to determine the distance at which benzene would meet the Class I Groundwater RO of 10 milligrams per liter (mg/L). The calculation indicates that the xylenes concentration would meet the Class I Groundwater RO at a distance of six inches from the edge of the source.

*MTBE*

The highest concentration of MTBE (0.851 milligrams per kilogram {mg/kg}) in soil sample EA-10 (7') was used to determine maximum potential future extent of impacted groundwater from the source area. RBCA equation R14 was used to determine a leaching factor. The EA-10 (7') benzene concentration was then multiplied by the leaching factor to obtain a predicted leached groundwater concentration. The leached groundwater concentration was used as a source groundwater concentration in RBCA equation R26 to determine the distance at which benzene would meet the Class I Groundwater RO of 0.07 milligrams per liter (mg/L). The calculation indicates that the MTBE concentration would meet the Class I Groundwater RO at a distance of six inches from the edge of the source.

*Lead*

A3E collected a new sample from the approximate location of the historic lead exceedance, which was later analyzed for Synthetic Precipitation Leaching Procedure (SPLP) lead. A concentration of SPLP lead (0.013 milligrams per liter {mg/L}) in soil sample CS-101221-08 was used to determine maximum potential future extent of impacted groundwater from the source

area. RBCA equation R14 was used to determine a leaching factor. The EA-10 (7') benzene concentration was then multiplied by the leaching factor to obtain a predicted leached groundwater concentration. The leached groundwater concentration was used as a source groundwater concentration in RBCA equation R26 to determine the distance at which benzene would meet the Class I Groundwater RO of 0.07 milligrams per liter (mg/L). The calculation indicates that the lead concentration would meet the Class I Groundwater RO at a distance of approximately 35 feet from the edge of the source.

Equation R26 modeling indicates that the predicted maximum extent of impacted groundwater from potential soil leachates for these contaminants of concern remain at the subject property. Please refer to **Figure 7** for the predicted extent of groundwater impact. The modeling calculation spreadsheet, including input variables, is attached in **Appendix A.**

The proposed pathway exclusion for the soil component of groundwater ingestion is use of a groundwater use restriction at the subject property.

**Groundwater Component of Groundwater Ingestion and Inhalation Exposure Routes**

Groundwater was not encountered or collected during the EMR and A3E investigations.

**Groundwater Indoor Inhalation Exposure Route**

Groundwater was not encountered or collected during the EMR and A3E investigations.

A Property Owner Summary Form is attached as **Appendix D.**

## G. SIGNATURES

**All plans, budgets, and reports must be signed by the owner or operator and list the owner's or operator's full name, address, and telephone number.**

| **UST Owner or Operator** | | **Consultant** | |
|---|---|---|---|
| Name: | Lake Villa Community Consolidated School District 41 | Company: | A3 Environmental |
| Contact: | Anna Kasprzyk | Contact | Patrick Hook |
| Address: | 131 McKinley Avenue | Address | 3030 Warrenville Road |
| City: | Lake Villa | City: | Lisle |
| State: | Illinois | State: | Illinois |
| ZIP Code: | 60046 | Zip Code: | 60532 |
| Phone: | | Phone: | 888-405-1742 |
| Signature: | Anna Kasprzyk | Signature: | Patrick Hook |
| Date: | 7/1/2022 | Date: | 07/01/2022 |

I certify under penalty of law that all activities that are the subject of this plan were conducted under my supervision or were conducted under the supervision of another Licensed Professional Engineer and reviewed my me; that this plan and all attachments were prepared under my supervision; that, to the best of my knowledge and belief, the work described in this plan has been completed in accordance to the Environmental Protection Act [415 ILCS 5], 35 Ill Adm. Code 731, 732, or 734, and generally accepted standards and practices of my profession; and that the information presented is accurate and complete. I am aware there are significant penalties for submitting false statements or representations to the Illinois EPA, including but not limited to fines imprisonment, or both as provided in Section 44 and 57.17 of the Environmental Protection Act [415 ILCS 5/44 and 57.17].

**Licensed Professional Engineer**

| | |
|---|---|
| Name: | Steven Gobelman, PE, LPG |
| Company: | Andrews Engineering |
| Address: | 3300 Ginger Creek Drive |
| City: | Springfield |
| State: | Illinois |
| ZIP Code: | 62711 |
| Phone: | 217-787-2334 |
| Ill. Registration No.: | 062-046852 |
| License Expiration Date: | 11/30/2023 |
| Signature: | |
| Date: | 6/17/22 |

**L.P.E. Seal**

# TABLES

# FIGURES

Lake Villa School District
108 North Route 83
Lake Villa, Illinois

Soil Analytical Results 2021

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Client Sample ID : | CS-101221-01 | CS-101221-02 | CS-101221-03 | CS-101221-04 | CS-101221-05 |
| | | | | | | | | Laboratory ID : | 40234981001 | 40234981002 | 40234981003 | 40234981004 | 40234981005 |
| | | | | | | | | Date Collected : | 10/12/2021 | 10/12/2021 | 10/12/2021 | 10/12/2021 | 10/12/2021 |
| | | | Route Specific Values for Soil | | Construction Worker Route Specific Values for Soil | | Soil Component of Groundwater Ingestion Exposure Route Values | | | | | |
| | Analyte | Units | Ingestion | Inhalation | Ingestion | Inhalation | Class I | Class II | | | | |
| VOC | Benzene | mg/kg | 12 | 0.8 / 2.2* | 2,300 | 2.2 | 0.03 | 0.17 | <0.00061 | **0.91** | <0.00055 | **0.081** | **2.5** |
| | Ethylbenzene | mg/kg | 7,800 | 400 / 58* | 20,000 | 58 | 13 | 19 | <0.00077 | 1.3 | <0.00069 | 0.004 | 7.3 |
| | Methyl-tert-butyl ether | mg/kg | 780 | 8,800 / 140* | 2,000 | 140 | 0.32 | 0.32 | 0.0028 | <0.020 | <0.0016 | <0.0019 | <0.020 |
| | Toluene | mg/kg | 16,000 | 650 / 42* | 410,000 | 42 | 12 | 29 | <0.00076 | 0.032 | <0.00068 | 0.0028 | 0.25 |
| | Xylene (Total) | mg/kg | 16,000 | 320 / 5.6* | 41,000 | 5.6 | 150 | 150 | <0.0030 | 1.2 | <0.0026 | 0.0055 | 4.6 |
| METALS | Lead | mg/kg | 400 | NC | 700 | NC | NC | NC | NA | NA | NA | NA | NA |
| | SPLP Lead | mg/L | NC | NC | NC | NC | **0.0075** | 0.1 | NA | NA | NA | NA | NA |

Notes:

Shaded/Bolded values = CoNAentration exceeds IEPA SRO

SROs = Soil Remediation Objectives

NA = No toxicity criteria for this exposure route.

NA = Not analyzed for this constituent.

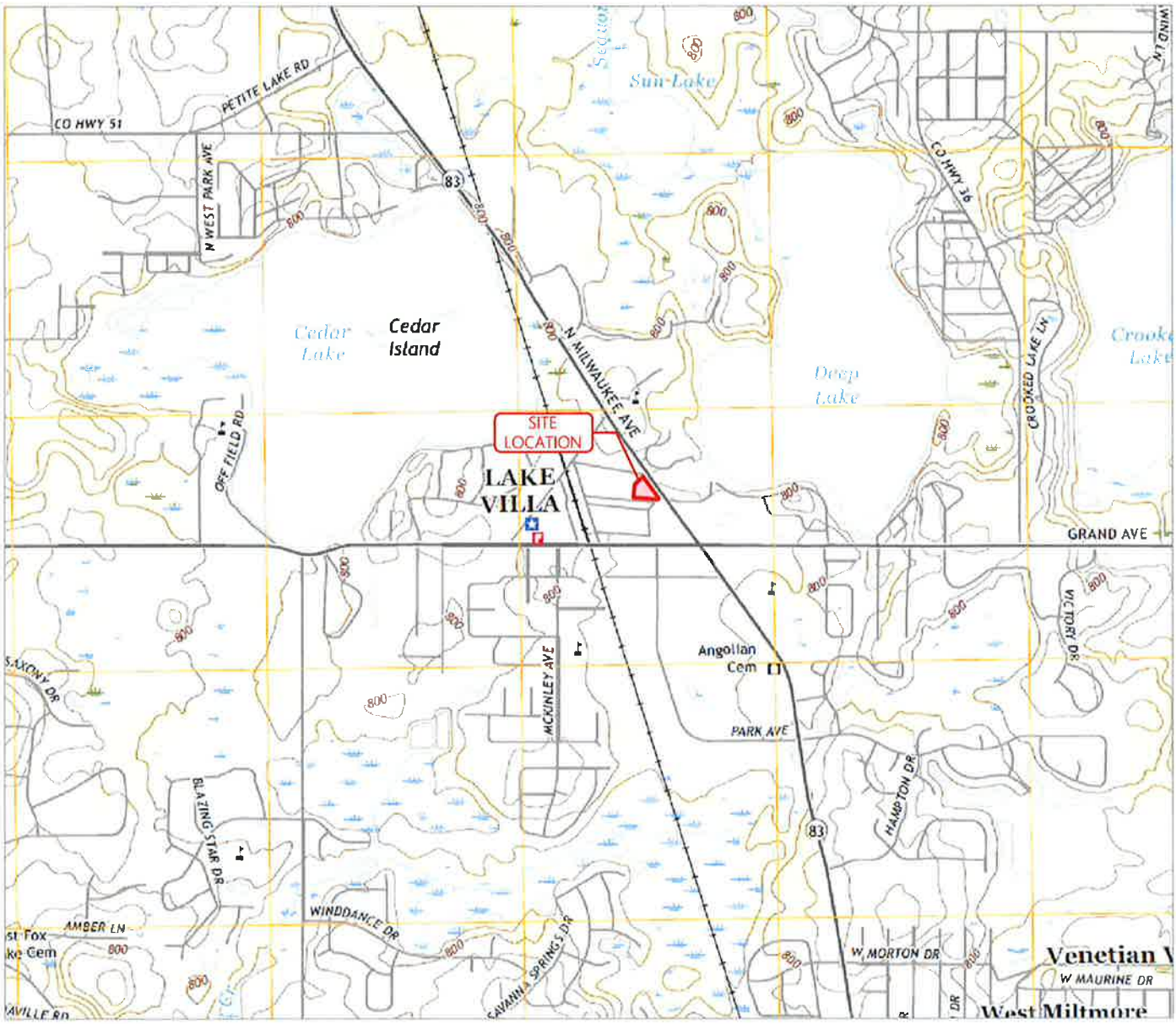
Lake Villa School District
108 North Route 83
Lake Villa, Illinois

Soil Analytical Results 2021

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Client Sample ID : | CS-101221-06 | CS-101221-07 | CS-101221-08 | CS-101221-09A | CS-101221-09B |
| | | | | | | | | Laboratory ID : | 40234981006 | 40234981007 | 40234981008 | 40234981009 | 40234981010 |
| | | | | | | | | Date Collected : | 10/12/2021 | 10/12/2021 | 10/12/2021 | 10/12/2021 | 10/12/2021 |
| | | | Route Specific Values for Soil | | Construction Worker Route Specific Values for Soil | | Soil Component of Groundwater Ingestion Exposure Route Values | | | | | | |
| | Analyte | Units | Ingestion | Inhalation | Ingestion | Inhalation | Class I | Class II | | | | | |
| VOC | Benzene | mg/kg | 12 | 0.8 / 2.2* | 2,300 | 2.2 | 0.03 | 0.17 | <0.00042 | <0.00043 | <0.00043 | **0.68** | 0.0054 |
| | Ethylbenzene | mg/kg | 7,800 | 400 / 58* | 20,000 | 58 | 13 | 19 | <0.00054 | <0.00054 | <0.00054 | 4.8 | <0.00054 |
| | Methyl-tert-butyl ether | mg/kg | 780 | 8,800 / 140* | 2,000 | 140 | 0.32 | 0.32 | <0.0012 | <0.0012 | <0.0012 | <0.039 | <0.0012 |
| | Toluene | mg/kg | 16,000 | 650 / 42* | 410,000 | 42 | 12 | 29 | <0.00053 | <0.00054 | <0.00053 | 0.29 | <0.00053 |
| | Xylene (Total) | mg/kg | 16,000 | 320 / 5.6* | 41,000 | 5.6 | 150 | 150 | <0.0020 | <0.0021 | <0.0021 | 3.6 | <0.0021 |
| METALS | Lead | mg/kg | 400 | NC | 700 | NC | NC | NC | NA | NA | 13.1 | NA | NA |
| | SPLP Lead | mg/L | NC | NC | NC | NC | **0.0075** | 0.1 | NA | NA | **0.013** | NA | NA |

Notes:
Shaded/Bolded values = CoNAentration exceeds IEPA SRO
SROs = Soil Remediation Objectives
NA = No toxicity criteria for this exposure route.
NA = Not analyzed for this constituent.

**FIGURES**




*Contour Interval 10 Feet*
*North American Vertical Datum of 1988*
*Topographical Map adopted by USGS*
*Antioch, IL, WI 2018*

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

1 0.5 0 1
MILES

1 0.5 0 1 2
1000 500 0 1000 2000
KILOMETERS
METERS

# FIGURE 1

## Site Topographic Map

Scale 1:24000

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

A3 Environmental Consultants
3030 Warrenville Road, Suite 418, Lisle, IL 60532
Phone: 888-405-1742

| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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Scale 1" = 300'

150' 0 300'

# FIGURE 2
## Site Base Map

Legend

Remediation Boundary

LAND USE INFORMATION

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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| | | | |
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| Date | 2.28.2022 | Revision | |

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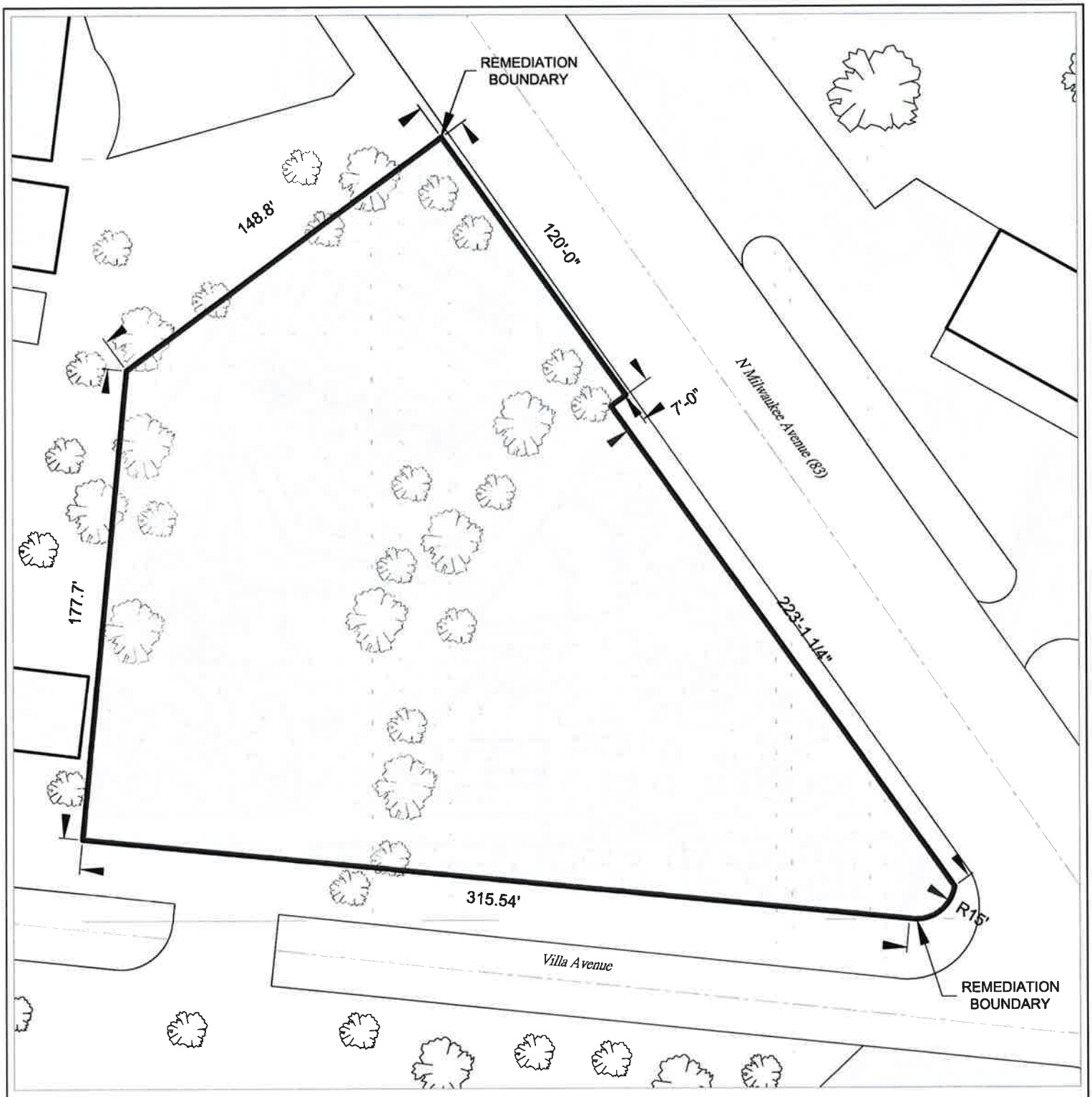


Scale 1" = 50'

25' 0 50'

# FIGURE 3
## Site Remediation and Boundary Detail

Legend

Remediation Boundary

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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Phone: 888-405-1742

| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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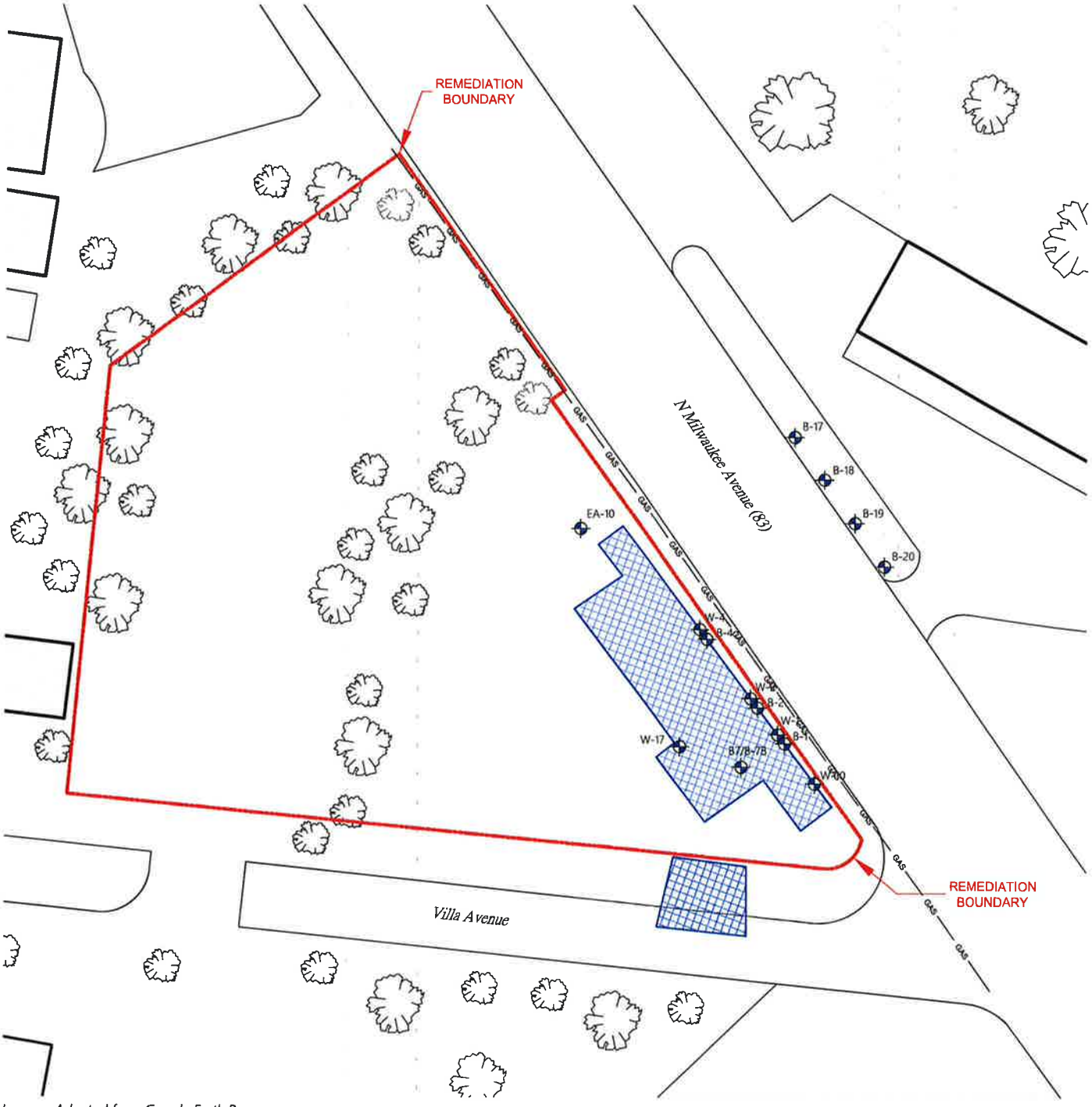


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

Scale 1" = 60'

30' 0 60'

# FIGURE 4a

## Historical Soil Boring Location Map

**Legend**

- Remediation Boundary
- Historical Soil Sample
  - W-# Wall Sample
  - B-# Bottom/Floor Sample
- GAS Apx Location of Gas Line
- Excavation Limits *(Backfilled with Sand)*

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

A3 Environmental Consultants
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| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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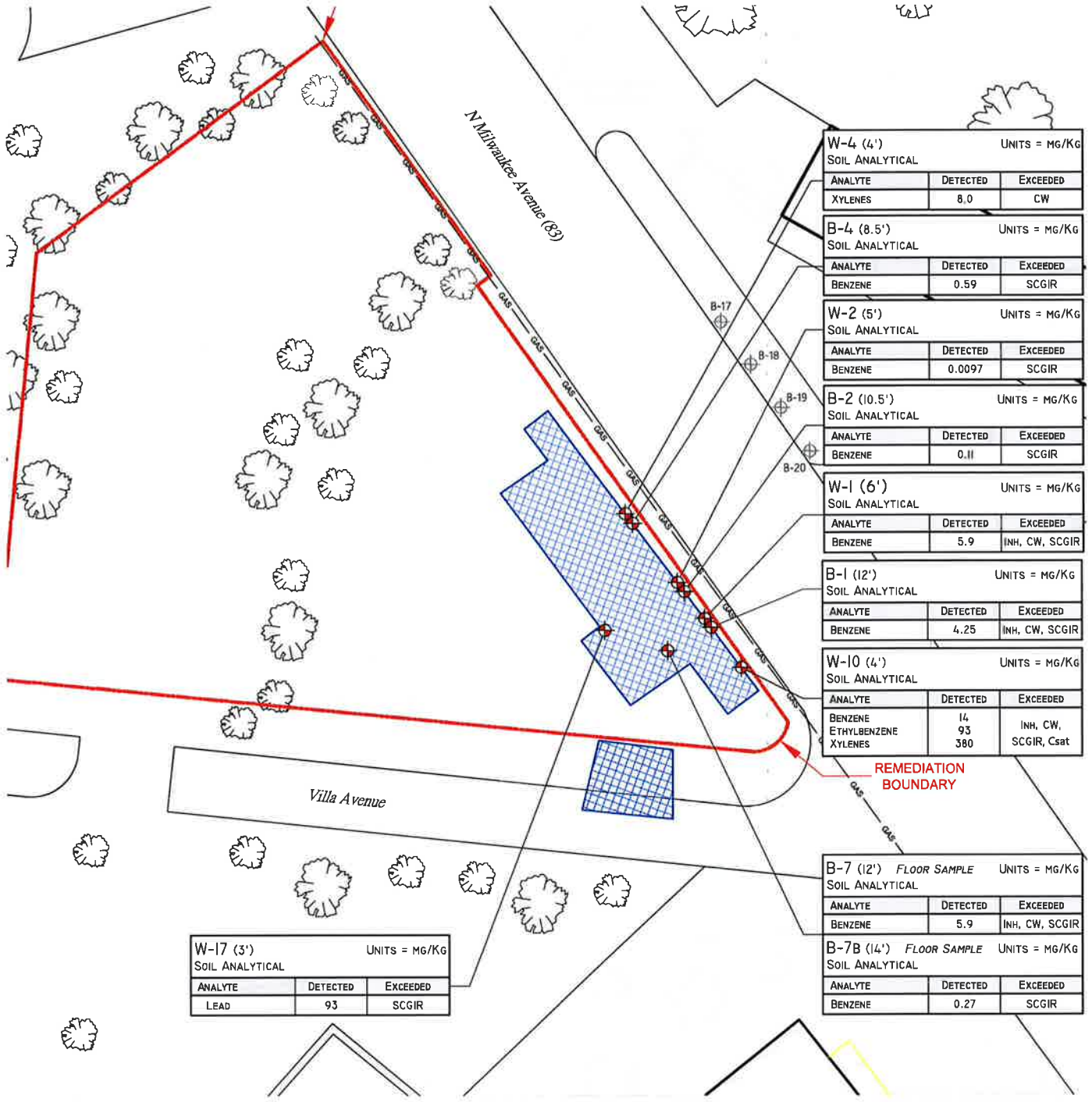


**W-4 (4')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Xylenes | 8.0 | CW |

**B-4 (8.5')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 0.59 | SCGIR |

**W-2 (5')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 0.0097 | SCGIR |

**B-2 (10.5')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 0.11 | SCGIR |

**W-1 (6')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 5.9 | INH, CW, SCGIR |

**B-1 (12')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 4.25 | INH, CW, SCGIR |

**W-10 (4')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 14 | INH, CW, SCGIR, Csat |
| Ethylbenzene | 93 | |
| Xylenes | 380 | |

**B-7 (12')** *Floor Sample* — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 5.9 | INH, CW, SCGIR |

**B-7B (14')** *Floor Sample* — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Benzene | 0.27 | SCGIR |

**W-17 (3')** — Units = mg/Kg
Soil Analytical

| Analyte | Detected | Exceeded |
|---|---|---|
| Lead | 93 | SCGIR |

*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

Scale 1" = 60'

30' 0 60'

**Boring Markers shown in red exceed Tier I Soil Remediation Objective C riteria - See Callout for Details*

# FIGURE 4b
## Historical - Soil Impacts Above Tier 1 SROs

**Legend**

- Remediation Boundary
- Historical Soil Sample*
  - W-# Wall Sample
  - B-# Bottom/Floor Sample
- GAS Apx Location of Gas Line
- Excavation Limits *(Backfilled with Sand)*

**SRO Exceedance Legend**

- INH Inhalation
- CW Construction Worker
- SCGIR Soil Component Groundwater Ingestion Route
- Csat Soil Saturation Limit

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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|---|---|---|---|
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| Date | 2.28.2022 | Revision | |

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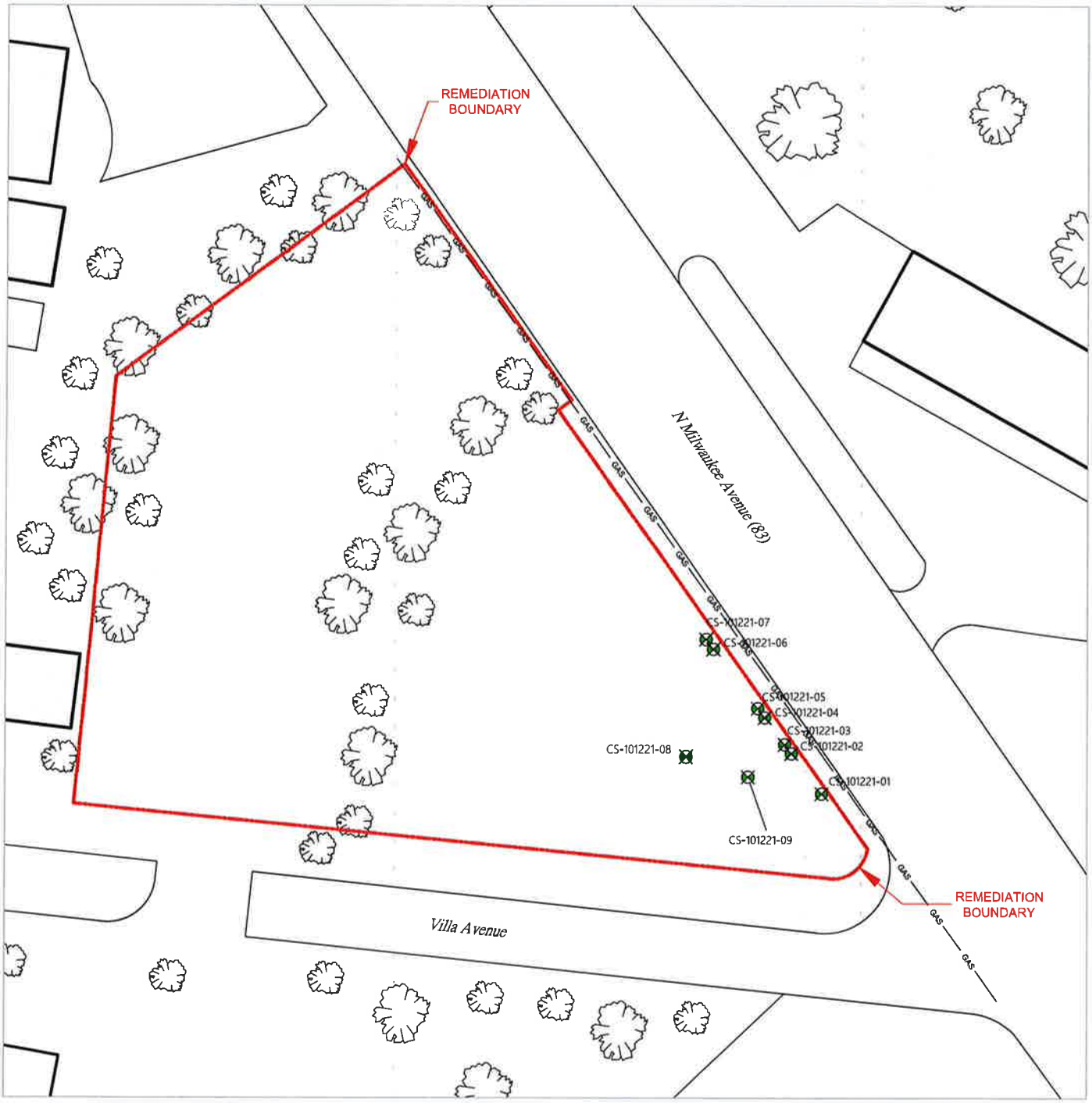


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

Scale 1" = 60'

30' 0 60'

# FIGURE 5a

## October 2021
## Soil Boring Location Map

Legend

- Remediation Boundary
- October 2021 Soil Sample
- GAS Apx Location of Gas Line

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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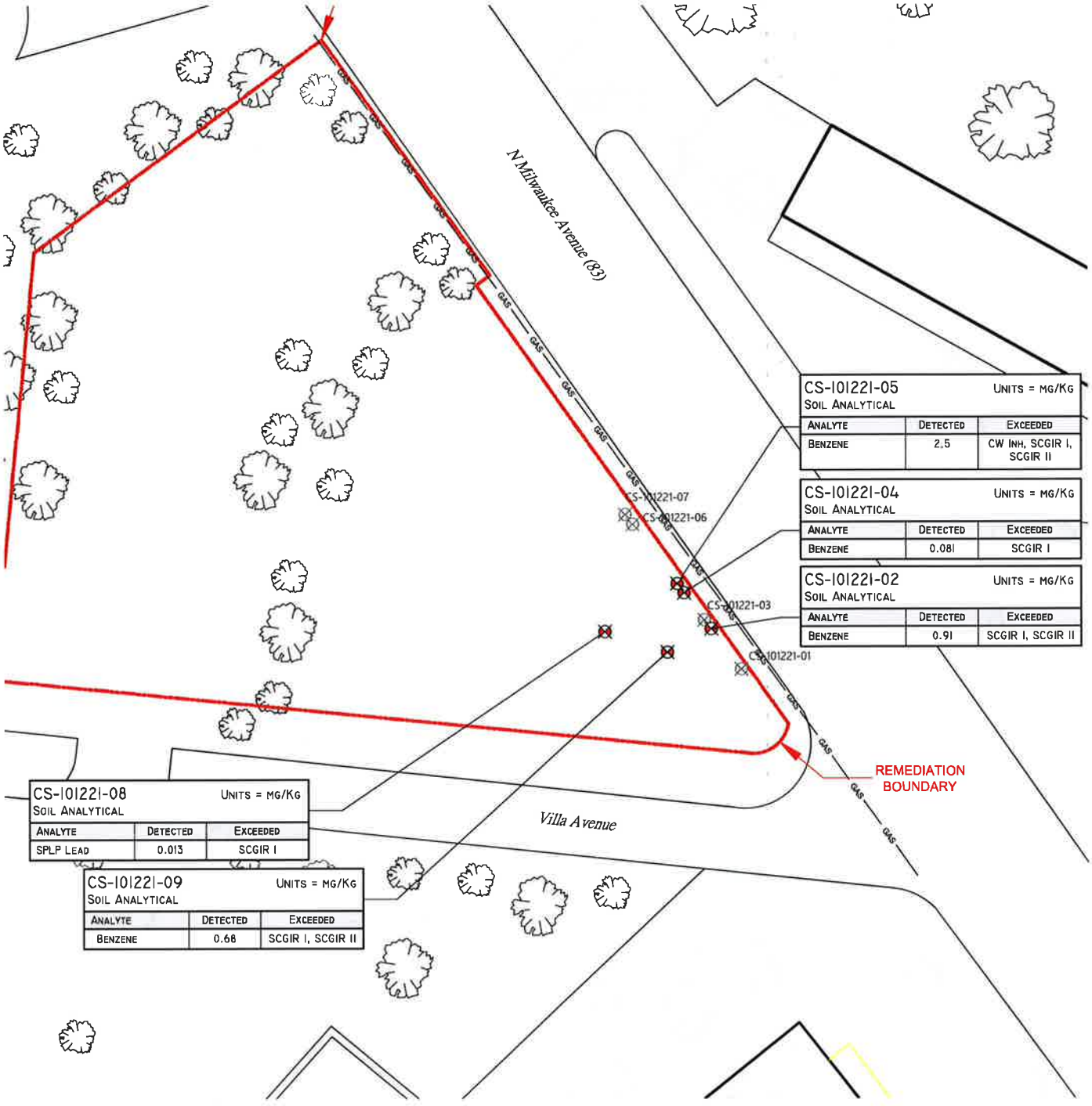


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

Scale 1" = 60'

30' 0 60'

# FIGURE 5b

## October 2021 - Soil Impacts Above Tier 1 SROs

**Boring Markers shown in red exceed Tier I Soil Remediation Objective Criteria - See Callout for Details*

**Legend**

- Remediation Boundary
- October 2021 Soil Sample*
- GAS — Apx Location of Gas Line

**SRO Exceedance Legend**

- CW Inh — Construction Worker - Inhalation
- SCGIR I — Soil Component Groundwater Ingestion Route - Class I
- SCGIR II — Soil Component Groundwater Ingestion Route - Class II

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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Phone: 888-405-1742

| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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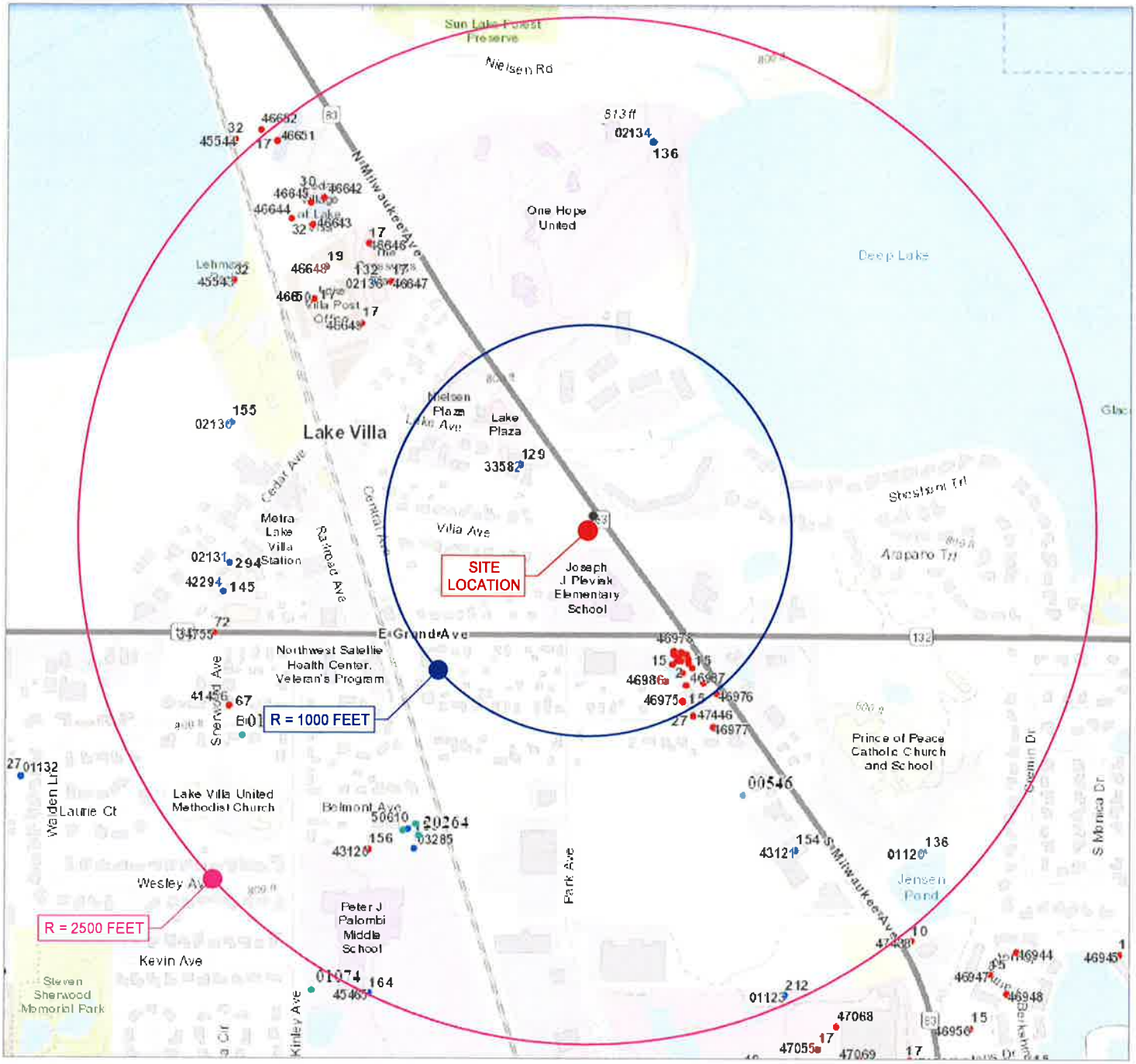


*Illinois State Geological Survey | not to be used for commercial profit | County of Lake, IL, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA*

Scale 1" = 700'

350' 0 700'

# FIGURE 6

## Source Water Assessment Protection (SWAP) Map

**Legend**

- CW Wells with Well ID Labels
- ISGS Water and Related Wells
- Labels - Total Depth
- Water and Related Wells
- Hazardous Waster or Leaking Tank
- Water
- Dry
- Engineering
- Stratigraphic
- Observation
- Mineral Test
- Outcrop
- Mine-related

| | |
|---|---|
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|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
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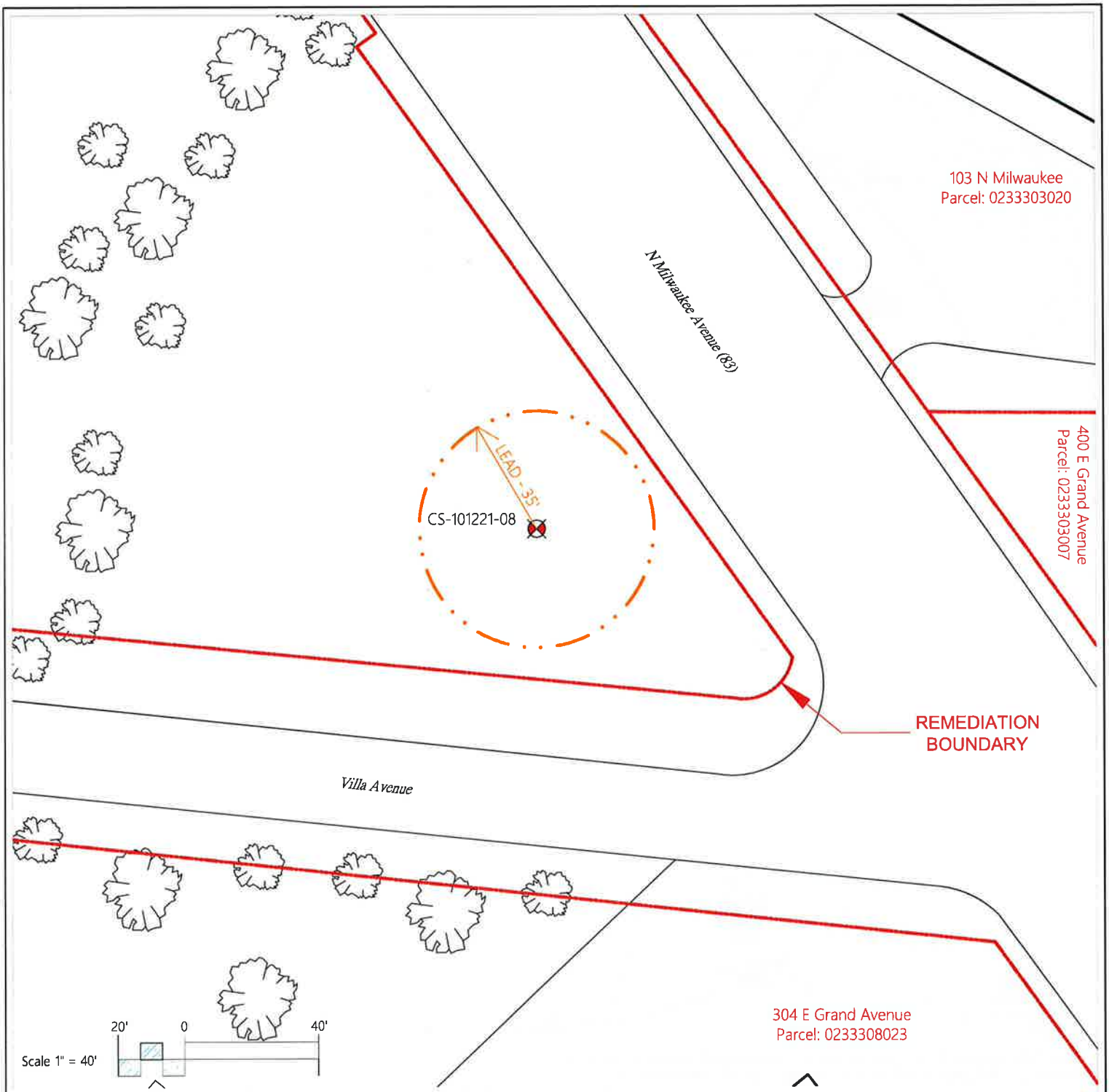


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

# FIGURE 7a

## Predicted Extent of Impact Map

Legend

- Remediation Boundary
- October 2021 Soil Sample
- Lead (Distance Modeled Radially in US Feet)

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

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| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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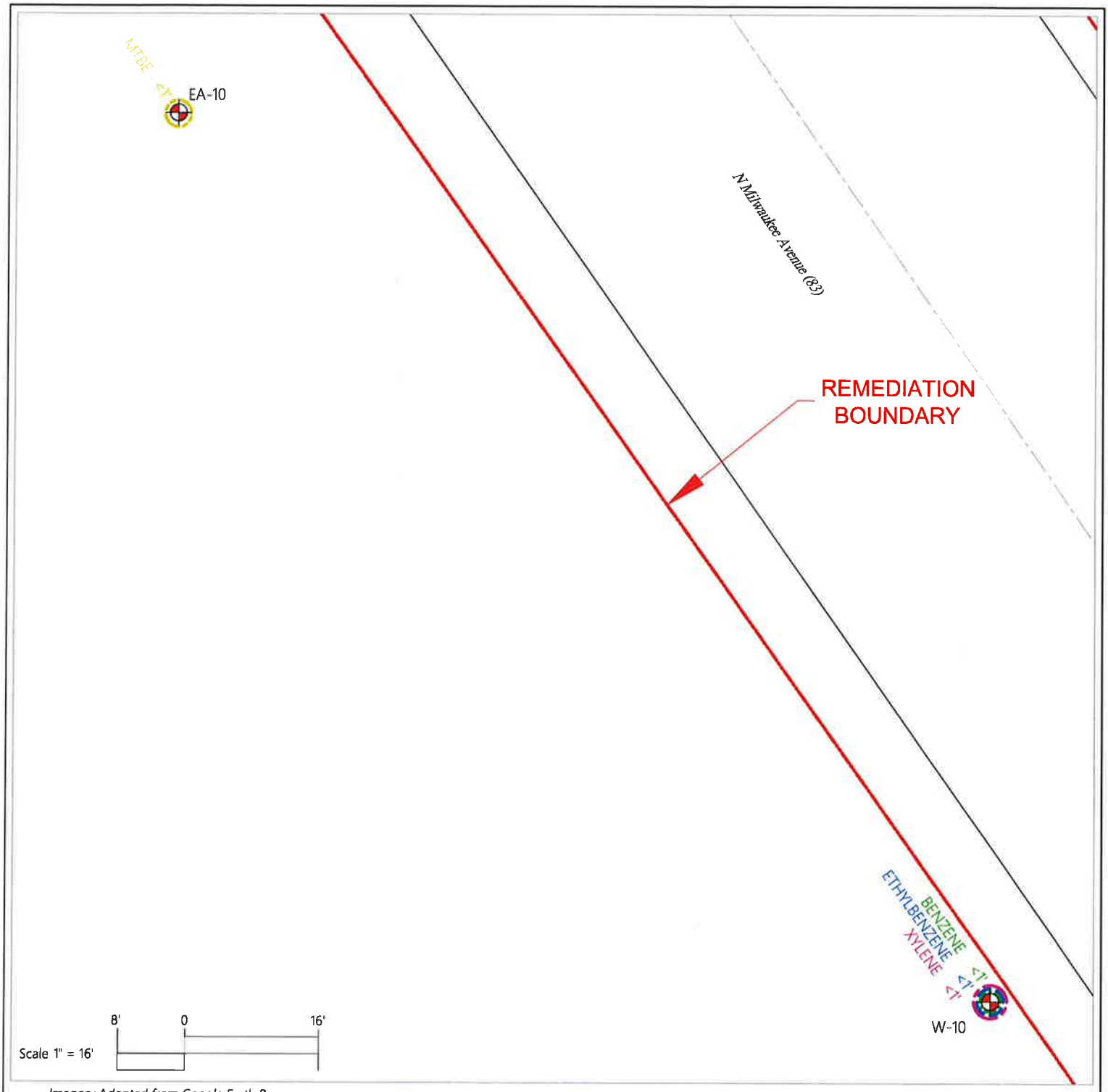


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

# FIGURE 7b

## Predicted Extent of Impact Map

Legend

- Remediation Boundary
- Historical Soil Sample
- Benzene (Distance Modeled Radially in US Feet)
- Ethylbenzene (Distance Modeled Radially in US Feet)
- Xylenes (Distance Modeled Radially in US Feet)
- MTBE (Distance Modeled Radially in US Feet)

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

A3 Environmental Consultants
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Phone: 888-405-1742

| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

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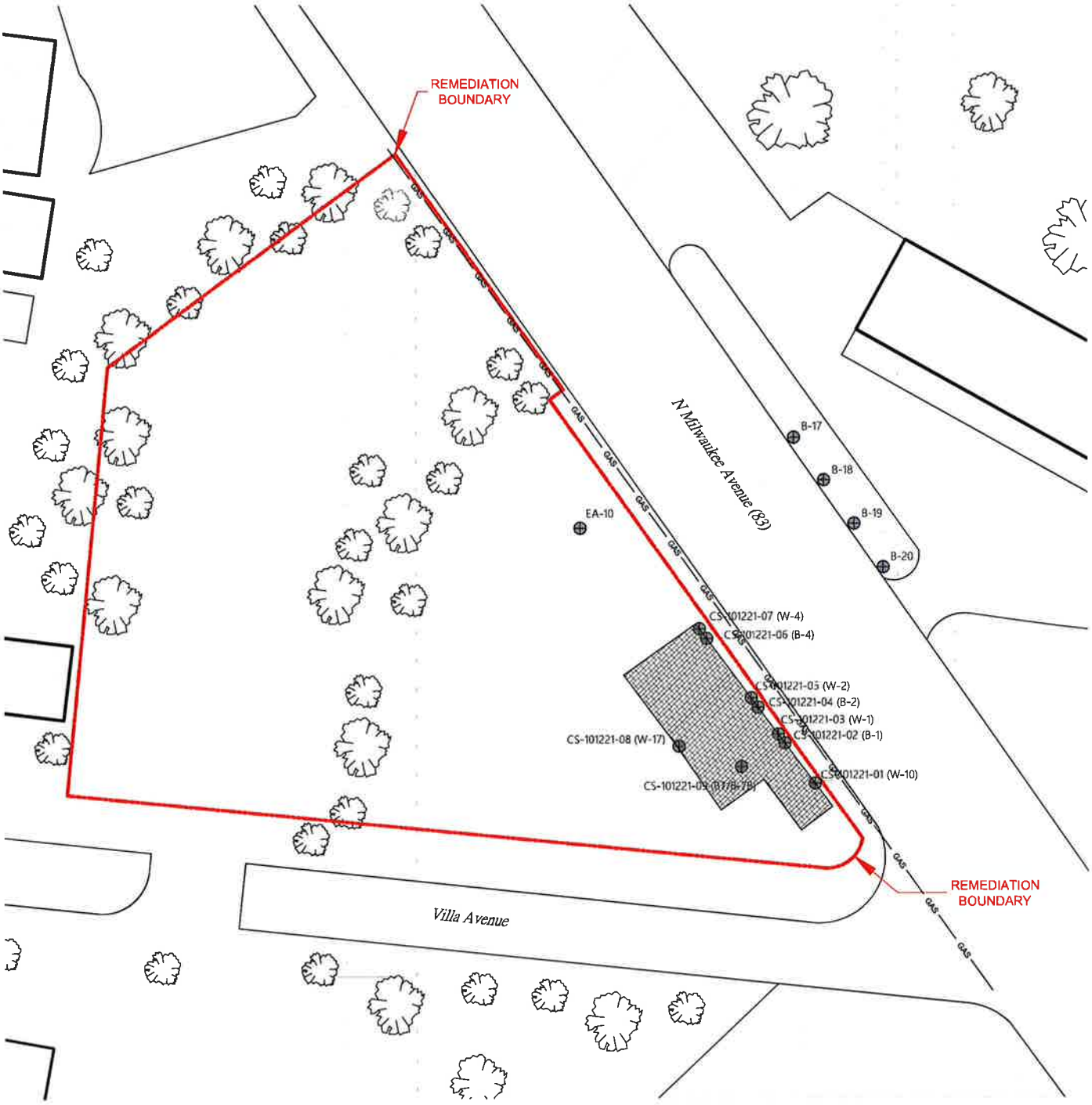


*Imagery Adopted from Google Earth Pro*
*Parcel Data from Report All*

Scale 1" = 60'

30' 0 60'

# FIGURE 8
## Proposed Corrective Action Map

**Legend**

- Remediation Boundary
- Soil Sample
- W-# Historical Wall Sample
- B-# Historical Bottom/Floor Sample
- CS-# October 2021 Sample
- GAS Apx Location of Gas Line
- Asphalt Barrier

| | |
|---|---|
| Site Location | Pleviak School<br>108 N Milwaukee Avenue, Lake Villa, IL 60046 |
| Client | Lake Villa School District 41<br>131 McKinley Avenue, Lake Villa, IL 60046 |

A3 Environmental Consultants
3030 Warrenville Road, Suite 418, Lisle, IL 60532
Phone: 888-405-1742

| | | | |
|---|---|---|---|
| Project No. | 2021.0520 | Drawn By | S. Clark |
| Date | 2.28.2022 | Revision | |

A3E ENVIRONMENTAL CONSULTANTS

# APPENDIX A: Modeling Calculation Spreadsheets

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Lead **Location:** NW

*Leaching Factor Calculation*

| | | | |
|---|---|---|---|
| Maximum soil concentration | $Soil_{source}$: | 93 | mg/kg |
| Leaching factor | $LF_{SW}$: | 0.001407872 | $(mg/l_{water})/(mg/kg_{soil})$ |
| Soil bulk density | $\rho_s$: | 1.5 | $g/cm^3$ |
| Volumetric water content in vadose zone soils | $\theta_{WS}$: | 0.30 | $cm^3_{water}/cm^3_{soil}$ |
| Soil water sorption coefficient (based on pH of soil, from 35 IAC 742, Appendix C, Table J) | $k_s$: | 710 | $cm^3_{water}/g_{soil}$ |
| pH of soil | pH: | 8.4 | |
| Henry's Law Constant | H': | 0 | $cm^3_{water}/cm^3_{air}$ |
| Volumetric air content in vadose zone soils | $\theta_{as}$: | 0.13 | $cm^3_{air}/cm^3_{soil}$ |
| Groundwater Darcy velocity | $U_{gw}$: | 0.094608 | cm/yr |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = 0.01296 cm/d = 4.7304 cm/yr |
| Groundwater mixing zone thickness | $\delta_{gw}$: | 200 | cm |
| Infiltration rate | I: | 30 | cm/yr |
| Width of source parallel to direction of groundwater movement | W: | 160 | ft = 4876.8 cm |

| $\theta_{WS}$ |
|---|
| surface soil=0.15 |
| subsurface soil=0.30 |
| gravel=0.20 |
| sand=0.18 |
| silt=0.16 |
| clay=0.17 |
| or site specific |

| $\rho_b$ |
|---|
| 1.5 or |
| gravel=2.0 |
| sand=1.8 |
| silt=1.6 |
| clay=1.7 |
| or site specific |

| $f_{oc}$ |
|---|
| surface soil = 0.006 |
| subsurface soil = 0.002 |
| or site specific |

| $\theta_{as}$ |
|---|
| surface soil=0.28 |
| subsurface soil=0.13 |
| gravel=0.05 |
| sand=0.14 |
| silt=0.16 |
| clay=0.17 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Leaching factor | $LF_{sw}$: | 0.001407872 | mg/kg |
| Maximum soil concentration | $Soil_{source}$: | 93 | mg/kg |
| with | $GW_{source} = Soil_{source} * LF_{sw}$ | | |
| Predicted groundwater concentration at the source | $GW_{source}$: | 0.13 | mg/l |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Lead **Location:** NW

*Downgradient Groundwater Calculation*

| | | | | |
|---|---|---|---|---|
| Greatest potential concentration of COC at the source | $C_{source}$: | 0.13 mg/l | | |
| Distance along centerline of groundwater plume emanating from a source | X: | 105 ft = | 3200.4 cm | |
| Longitudinal dispersivity | $\alpha_X$: | 320.04 cm | | |
| First order degradation constant | $\lambda$: | 0 $d^{-1}$ | | |
| Specific discharge | U: | 0.000602791 cm/d | | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 cm/s = | 0.01296 cm/d | |
| Hydraulic gradient | i: | 0.02 cm/cm (unitless) | | |
| Total soil porosity | $\theta_T$: | 0.43 $cm^3/cm^3_{soil}$ | | |
| Source width perpendicular to groundwater flow direction (horiz.) | $S_W$: | 14 ft = | 426.72 cm | |
| Transverse dispersivity | $\alpha_y$: | 106.68 cm | | |
| Source width perpendicular to groundwater flow direction (vert.) | $S_d$: | 6.56 ft = | 199.9488 cm | |
| Vertical dispersivity | $\alpha_z$: | 16.002 cm | | |

| $\theta_T$ |
|---|
| 0.43 or |
| gravel=0.25 |
| sand=0.32 |
| silt=0.40 |
| clay=0.36 |
| or site specific |

**SOLUTION**

| | | |
|---|---|---|
| Dissolved concentration along centerline | $C_{(X)}$: | 0.012481424 mg/l |

Intermediate Solutions

| | | |
|---|---|---|
| R16 | $\alpha_X$: | 320.04 cm |
| R17 | $\alpha_y$: | 106.68 cm |
| R18 | $\alpha_z$: | 16.002 cm |
| R19 | U: | 0.000602791 cm/d |
| R20 | $k_s$: | 710 $cm^3_{water}/g_{soil}$ |
| R24 | $U_{gw}$: | 0.094608 cm/yr |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Benzene **Location:**

*Leaching Factor Calculation*

| | | | | |
|---|---|---|---|---|
| Maximum soil concentration | $Soil_{source}$: | 14 | mg/kg | |
| Leaching factor | $LF_{SW}$: | 3.125246987 | $(mg/l_{water})/(mg/kg_{soil})$ | |
| Soil bulk density | $\rho_s$: | 1.5 | $g/cm^3$ | |
| Volumetric water content in vadose zone soils | $\theta_{WS}$: | 0.30 | $cm^3_{water}/cm^3_{soil}$ | |
| Soil water sorption coefficient | $k_s$: | 0.1 | $cm^3_{water}/g_{oil}$ | |
| Organic carbon partition coefficient | $K_{oc}$: | 50 | $cm^3/kg$ or l/kg | |
| Organic carbon content of soil | $f_{oc}$: | 0.002 | g/g | |
| Henry's Law Constant | H': | 0.23 | $cm^3_{water}/cm^3_{air}$ | |
| Volumetric air content in vadose zone soils | $\theta_{as}$: | 0.13 | $cm^3_{air}/cm^3_{soil}$ | |
| Groundwater Darcy velocity | $U_{gw}$: | 0.094608 | cm/yr | |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = 0.01296 cm/d = 4.7304 cm/yr | |
| Groundwater mixing zone thickness | $\delta_{gw}$: | 200 | cm | |
| Infiltration rate | I: | 30 | cm/yr | |
| Width of source parallel to direction of groundwater movement | W: | 160 | ft = 4876.8 cm | |

**$\rho_b$**
1.5 or
gravel=2.0
sand=1.8
silt=1.6
clay=1.7
or site specific

**$\theta_{WS}$**
surface soil=0.15
subsurface soil=0.30
gravel=0.20
sand=0.18
silt=0.16
clay=0.17
or site specific

**$f_{oc}$**
surface soil = 0.006
subsurface soil = 0.002
or site specific

**$\theta_{as}$**
surface soil=0.28
subsurface soil=0.13
gravel=0.05
sand=0.14
silt=0.16
clay=0.17
or site specific

**SOLUTION**

| | | | |
|---|---|---|---|
| Leaching factor | $LF_{sw}$: | 3.125246987 | mg/kg |
| Maximum soil concentration | $Soil_{source}$: | 14 | mg/kg |
| with | $GW_{source} = Soil_{source} * LF_{sw}$ | | |
| Predicted groundwater concentration at the source | $GW_{source}$: | 43.75 | mg/l |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Benzene **Location:**

*Downgradient Groundwater Calculation*

| | | | | |
|---|---|---|---|---|
| Greatest potential concentration of COC at the source | $C_{source}$: | 43.75 | mg/l | |
| Distance along centerline of groundwater plume emanating from a source | X: | 1 | ft = | 30.48 cm |
| Longitudinal dispersivity | $\alpha_X$: | 3.048 | cm | |
| First order degradation constant | $\lambda$: | 0.0009 | $d^{-1}$ | |
| Specific discharge | U: | 0.000602791 | cm/d | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = | 0.01296 cm/d |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Total soil porosity | $\theta_T$: | 0.43 | $cm^3/cm^3_{soil}$ | |
| Source width perpendicular to groundwater flow direction (horiz.) | $S_W$: | 49 | ft = | 1493.52 cm |
| Transverse dispersivity | $\alpha_y$: | 1.016 | cm | |
| Source width perpendicular to groundwater flow direction (vert.) | $S_d$: | 6.56 | ft = | 199.949 cm |
| Vertical dispersivity | $\alpha_z$: | 0.1524 | cm | |

| $\theta_T$ |
|---|
| 0.43 or |
| gravel=0.25 |
| sand=0.32 |
| silt=0.40 |
| clay=0.36 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Dissolved hydrocarbon concentration along centerline | $C_{(X)}$: | 1.98036E-06 | mg/l |

Intermediate Solutions

| | | | |
|---|---|---|---|
| R16 | $\alpha_X$: | 3.048 | cm |
| R17 | $\alpha_y$: | 1.016 | cm |
| R18 | $\alpha_z$: | 0.1524 | cm |
| R19 | U: | 0.000602791 | cm/d |
| R20 | $k_s$: | 0.1 | $cm^3_{water}/g_{soil}$ |
| R24 | $U_{gw}$: | 0.094608 | cm/yr |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Ethylbenzene **Location:** NW

*Leaching Factor Calculation*

| | | | | |
|---|---|---|---|---|
| Maximum soil concentration | $Soil_{source}$: | 93 | mg/kg | |
| Leaching factor | $LF_{SW}$: | 1.328498468 | $(mg/l_{water})/(mg/kg_{soil})$ | |
| Soil bulk density | $\rho_s$: | 2.667 | $g/cm^3$ | |
| Volumetric water content in vadose zone soils | $\theta_{WS}$: | 0.30 | $cm^3_{water}/cm^3_{soil}$ | |
| Soil water sorption coefficient | $k_s$: | 0.64 | $cm^3_{water}/g_{oil}$ | |
| Organic carbon partition coefficient | $K_{oc}$: | 320 | $cm^3/kg$ or l/kg | |
| Organic carbon content of soil | $f_{oc}$: | 0.002 | g/g | |
| Henry's Law Constant | H': | 0.003 | $cm^3_{water}/cm^3_{air}$ | |
| Volumetric air content in vadose zone soils | $\theta_{as}$: | 0.13 | $cm^3_{air}/cm^3_{soil}$ | |
| Groundwater Darcy velocity | $U_{gw}$: | 0.094608 | cm/yr | |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = 0.01296 cm/d = 4.7304 cm/yr | |
| Groundwater mixing zone thickness | $\delta_{gw}$: | 200 | cm | |
| Infiltration rate | I: | 30 | cm/yr | |
| Width of source parallel to direction of groundwater movement | W: | 160 | ft = 4876.8 cm | |

| $\rho_s$ |
|---|
| 1.5 or |
| gravel=2.0 |
| sand=1.8 |
| silt=1.6 |
| clay=1.7 |
| or site specific |

| $\theta_{WS}$ |
|---|
| surface soil=0.15 |
| subsurface soil=0.30 |
| gravel=0.20 |
| sand=0.18 |
| silt=0.16 |
| clay=0.17 |
| or site specific |

| $f_{oc}$ |
|---|
| surface soil = 0.006 |
| subsurface soil = 0.002 |
| or site specific |

| $\theta_{as}$ |
|---|
| surface soil=0.28 |
| subsurface soil=0.13 |
| gravel=0.05 |
| sand=0.14 |
| silt=0.16 |
| clay=0.17 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Leaching factor | $LF_{sw}$: | 1.328498468 | mg/kg |
| Maximum soil concentration | $Soil_{source}$: | 93 | mg/kg |
| with | $GW_{source} = Soil_{source} * LF_{sw}$ | | |
| Predicted groundwater concentration at the source | $GW_{source}$: | 123.55 | mg/l |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Ethylbenzene **Location:** NW

*Downgradient Groundwater Calculation*

| | | | | | |
|---|---|---|---|---|---|
| Greatest potential concentration of COC at the source | $C_{source}$: | 123.55 | mg/l | | |
| Distance along centerline of groundwater plume emanating from a source | X: | 1 | ft = | 30.48 | cm |
| Longitudinal dispersivity | $\alpha_x$: | 3.048 | cm | | |
| First order degradation constant | $\lambda$: | 0.324 | $d^{-1}$ | | |
| Specific discharge | U: | 0.000602791 | cm/d | | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = | 0.01296 | cm/d |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | | |
| Total soil porosity | $\theta_T$: | 0.43 | $cm^3/cm^3_{soil}$ | | |
| Source width perpendicular to groundwater flow direction (horiz.) | $S_w$: | 49 | ft = | 1493.52 | cm |
| Transverse dispersivity | $\alpha_y$: | 1.016 | cm | | |
| Source width perpendicular to groundwater flow direction (vert.) | $S_d$: | 6.56 | ft = | 199.949 | cm |
| Vertical dispersivity | $\alpha_z$: | 0.1524 | cm | | |

| $\theta_T$ |
|---|
| 0.43 or |
| gravel=0.25 |
| sand=0.32 |
| silt=0.40 |
| clay=0.36 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Dissolved hydrocarbon concentration along centerline | $C_{(X)}$: | 2.9189E-172 | mg/l |

Intermediate Solutions

| | | | |
|---|---|---|---|
| R16 | $\alpha_X$: | 3.048 | cm |
| R17 | $\alpha_y$: | 1.016 | cm |
| R18 | $\alpha_z$: | 0.1524 | cm |
| R19 | U: | 0.000602791 | cm/d |
| R20 | $k_s$: | 0.64 | $cm^3_{water}/g_{soil}$ |
| R24 | $U_{gw}$: | 0.094608 | cm/yr |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Xylene **Location:** NW

*Leaching Factor Calculation*

| | | | | |
|---|---|---|---|---|
| Maximum soil concentration | $Soil_{source}$: | 380 | mg/kg | |
| Leaching factor | $LF_{SW}$: | 3.125246987 | $(mg/l_{water})/(mg/kg_{soil})$ | |
| Soil bulk density | $\rho_s$: | 1.5 | $g/cm^3$ | |
| Volumetric water content in vadose zone soils | $\theta_{WS}$: | 0.30 | $cm^3_{water}/cm^3_{soil}$ | |
| Soil water sorption coefficient | $k_s$: | 0.1 | $cm^3_{water}/g_{soil}$ | |
| Organic carbon partition coefficient | $K_{oc}$: | 50 | $cm^3/kg$ or l/kg | |
| Organic carbon content of soil | $f_{oc}$: | 0.002 | g/g | |
| Henry's Law Constant | H': | 0.23 | $cm^3_{water}/cm^3_{air}$ | |
| Volumetric air content in vadose zone soils | $\theta_{as}$: | 0.13 | $cm^3_{air}/cm^3_{soil}$ | |
| Groundwater Darcy velocity | $U_{gw}$: | 0.094608 | cm/yr | |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = 0.01296 cm/d = 4.7304 cm/yr | |
| Groundwater mixing zone thickness | $\delta_{gw}$: | 200 | cm | |
| Infiltration rate | I: | 30 | cm/yr | |
| Width of source parallel to direction of groundwater movement | W: | 160 | ft = 4876.8 cm | |

$\rho_s$
1.5 or
gravel=2.0
sand=1.8
silt=1.6
clay=1.7
or site specific

$\theta_{WS}$
surface soil=0.15
subsurface soil=0.30
gravel=0.20
sand=0.18
silt=0.16
clay=0.17
or site specific

$f_{oc}$
surface soil = 0.006
subsurface soil = 0.002
or site specific

$\theta_{as}$
surface soil=0.28
subsurface soil=0.13
gravel=0.05
sand=0.14
silt=0.16
clay=0.17
or site specific

**SOLUTION**

| | | | |
|---|---|---|---|
| Leaching factor | $LF_{sw}$: | 3.125246987 | mg/kg |
| Maximum soil concentration | $Soil_{source}$: | 380 | mg/kg |
| with | $GW_{source}$ = | $Soil_{source}$ * $LF_{sw}$ | |
| Predicted groundwater concentration at the source | $GW_{source}$: | 1187.59 | mg/l |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** Xylene **Location:** NW

*Downgradient Groundwater Calculation*

| | | | | |
|---|---|---|---|---|
| Greatest potential concentration of COC at the source | $C_{source}$: | 1187.59 | mg/l | |
| Distance along centerline of groundwater plume emanating from a source | X: | 1 | ft = | 30.48 cm |
| Longitudinal dispersivity | $\alpha_X$: | 3.048 | cm | |
| First order degradation constant | $\lambda$: | 0.00051 | $d^{-1}$ | |
| Specific discharge | U: | 0.000602791 | cm/d | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = | 0.01296 cm/d |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Total soil porosity | $\theta_T$: | 0.43 | $cm^3/cm^3_{soil}$ | |
| Source width perpendicular to groundwater flow direction (horiz.) | $S_W$: | 49 | ft = | 1493.52 cm |
| Transverse dispersivity | $\alpha_y$: | 1.016 | cm | |
| Source width perpendicular to groundwater flow direction (vert.) | $S_d$: | 6.56 | ft = | 199.949 cm |
| Vertical dispersivity | $\alpha_z$: | 0.1524 | cm | |

| $\theta_T$ |
|---|
| 0.43 or |
| gravel=0.25 |
| sand=0.32 |
| silt=0.40 |
| clay=0.36 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Dissolved hydrocarbon concentration along centerline | $C_{(X)}$: | 0.008744164 | mg/l |

Intermediate Solutions

| | | | |
|---|---|---|---|
| R16 | $\alpha_X$: | 3.048 | cm |
| R17 | $\alpha_y$: | 1.016 | cm |
| R18 | $\alpha_z$: | 0.1524 | cm |
| R19 | U: | 0.000602791 | cm/d |
| R20 | $k_s$: | 0.1 | $cm^3_{water}/g_{soil}$ |
| R24 | $U_{gw}$: | 0.094608 | cm/yr |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** MTBE **Location:** NW

*Leaching Factor Calculation*

| | | | |
|---|---|---|---|
| Maximum soil concentration | $Soil_{source}$: | 0.851 | mg/kg |
| Leaching factor | $LF_{SW}$: | 4.501948182 | $(mg/l_{water})/(mg/kg_{soil})$ |
| Soil bulk density | $\rho_s$: | 1.5 | $g/cm^3$ |
| Volumetric water content in vadose zone soils | $\theta_{WS}$: | 0.30 | $cm^3_{water}/cm^3_{soil}$ |
| Soil water sorption coefficient | $k_s$: | 0.02 | $cm^3_{water}/g_{oil}$ |
| Organic carbon partition coefficient | $K_{oc}$: | 10 | $cm^3/kg$ or l/kg |
| Organic carbon content of soil | $f_{oc}$: | 0.002 | g/g |
| Henry's Law Constant | H': | 0.0242 | $cm^3_{water}/cm^3_{air}$ |
| Volumetric air content in vadose zone soils | $\theta_{as}$: | 0.13 | $cm^3_{air}/cm^3_{soil}$ |
| Groundwater Darcy velocity | $U_{gw}$: | 0.094608 | cm/yr |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = 0.01296 cm/d = 4.7304 cm/yr |
| Groundwater mixing zone thickness | $\delta_{gw}$: | 200 | cm |
| Infiltration rate | I: | 30 | cm/yr |
| Width of source parallel to direction of groundwater movement | W: | 160 | ft = 4876.8 cm |

**$\rho_b$**
1.5 or
gravel=2.0
sand=1.8
silt=1.6
clay=1.7
or site specific

**$\theta_{WS}$**
surface soil=0.15
subsurface soil=0.30
gravel=0.20
sand=0.18
silt=0.16
clay=0.17
or site specific

**$f_{oc}$**
surface soil = 0.006
subsurface soil = 0.002
or site specific

**$\theta_{as}$**
surface soil=0.28
subsurface soil=0.13
gravel=0.05
sand=0.14
silt=0.16
clay=0.17
or site specific

**SOLUTION**

| | | | |
|---|---|---|---|
| Leaching factor | $LF_{sw}$: | 4.501948182 | mg/kg |
| Maximum soil concentration | $Soil_{source}$: | 0.851 | mg/kg |
| with | $GW_{source} = Soil_{source} * LF_{sw}$ | | |
| Predicted groundwater concentration at the source | $GW_{source}$: | 3.83 | mg/l |

# RBCA Equations R14/R26

**Site:** Lake Villa LUST
**Address:** 108 North Milwaukee Avenue
**Exposure Route:** predicted downgradient groundwater concentration of COC leached from soil
**Analyte:** MTBE **Location:** NW

*Downgradient Groundwater Calculation*

| | | | | |
|---|---|---|---|---|
| Greatest potential concentration of COC at the source | $C_{source}$: | 3.83 | mg/l | |
| Distance along centerline of groundwater plume emanating from a source | X: | 0.25 | ft = | 7.62 cm |
| Longitudinal dispersivity | $\alpha_x$: | 0.762 | cm | |
| First order degradation constant | $\lambda$: | 1.1 | $d^{-1}$ | |
| Specific discharge | U: | 0.000602791 | cm/d | |
| Aquifer hydraulic conductivity | K: | 1.50E-07 | cm/s = | 0.01296 cm/d |
| Hydraulic gradient | i: | 0.02 | cm/cm (unitless) | |
| Total soil porosity | $\theta_T$: | 0.43 | $cm^3/cm^3_{soil}$ | |
| Source width perpendicular to groundwater flow direction (horiz.) | $S_w$: | 49 | ft = | 1493.52 cm |
| Transverse dispersivity | $\alpha_y$: | 0.254 | cm | |
| Source width perpendicular to groundwater flow direction (vert.) | $S_d$: | 14 | ft = | 426.72 cm |
| Vertical dispersivity | $\alpha_z$: | 0.0381 | cm | |

| $\theta_T$ |
|---|
| 0.43 or |
| gravel=0.25 |
| sand=0.32 |
| silt=0.40 |
| clay=0.36 |
| or site specific |

**SOLUTION**

| | | | |
|---|---|---|---|
| Dissolved hydrocarbon concentration along centerline | $C_{(X)}$: | 6.2017E-160 | mg/l |

Intermediate Solutions

| | | | |
|---|---|---|---|
| R16 | $\alpha_x$: | 0.762 | cm |
| R17 | $\alpha_y$: | 0.254 | cm |
| R18 | $\alpha_z$: | 0.0381 | cm |
| R19 | U: | 0.000602791 | cm/d |
| R20 | $k_s$: | 0.02 | $cm^3_{water}/g_{soil}$ |
| R24 | $U_{gw}$: | 0.094608 | cm/yr |

# EPA On-line Tools for Site Assessment Calculation

Module Home Objectives Table of Contents Previous < Next >

**Retardation Factor Calculator**

**Retardation Factor** $R = 1 + r_b k_d / q$

R = retardation factor

$r_b$ = bulk density = $r_s(1-q)$

$r_s$ = solids density

q = porosity

$k_d$ = (soil) distribution coefficient = $f_{oc} K_{oc}$

$f_{oc}$ = fraction organic carbon

$K_{oc}$ = organic carbon/water partition coefficient

Example Data | Calculate | Clear

Save Data | Recall Data | Go Back

**Input Parameters**

Site Name: Example

Date: 11/8/2021 Current Date

Porosity (q): 0.43 (Try 0.25)

Fraction Organic Carbon ($f_{oc}$): 0.002 (Try 0.0001)

Chemical Data Source: Illinois Environmental Protection Agency

Note: Title 25: Environmental Protection, Subtitle G Land Pollution, Chapter I: Pollution Control Board, Subchapter f: Risk Based Cleanup Objectives, Part 742 Tiered Approach to

Data revision date: April 2002

Chemical: (MTBE) methyl tert-butyl ether

**Default Parameters**

| | | |
|---|---|---|
| Solids Density ($r_s$) | 2.65 | Default |
| $K_{oc}$ value | 11.5 | L/kg |

**Results**

| | | |
|---|---|---|
| Bulk Density ($r_b$) | 1.51 | $g/cm^3$ |
| $k_d$ | 0.02300 | L/kg |
| Retardation Factor (R) | 1.1 | |

Previous Top ^ Next

Home | Glossary | Notation | Links | References | Calculators

Table 6

**Equation S17 Site Remediation Objectives -**
**Lake Villa School District #41 Site**
**EMR Project No. 8878-000**

**Equation S-17**

$$Cw * \left(K_d + \frac{(\theta_w + \theta_a * H')}{\rho_b}\right)$$

For Benzene

| | | | | |
|---|---|---|---|---|
| $C_w$ = | 0.1 | mg/kg | From Eq. S17 |
| Kd = | 0.389 | cm3/g | From Eq. S18 |
| $\theta_w$ = | 0.17 | $cm^3_{water}/cm^3_{soil}$ | App. C Table D p.137 |
| $\theta_a$ = | 0.19 | $cm^3_{air}/cm^3_{soil}$ | App. C Table D p.137 |
| H' = | 0.228 | $cm^3_{water}/cm^3_{air}$ | App. C Table E p.139 |
| $\rho_b$ = | 1.951 | g/cm | Site-specific value |
| RO = | 0.049 | mg/kg | For Soil component to Groundwater Ingestion Pathway |

| COC | $C_w$ (mg/L) | $K_d$ (cm3/g) | $\theta_w$ ($cm^3_{water}/cm^3_{soil}$) | $\theta_a$ ($cm^3_{air}/cm^3_{soil}$) | H' ($cm^3_{water}/cm^3_{air}$) | $\rho_b$ (g/cm) | Tier 2 RO (mg/kg) |
|---|---|---|---|---|---|---|---|
| Benzene | 0.1 | 0.38874 | 0.17 | 0.19 | 0.228 | 1.951 | 0.04980788 |
| Ethylbenzene | 14 | 2.3958 | 0.17 | 0.19 | 0.323 | 1.951 | 35.20146653 |
| Toluene | 20 | 1.2012 | 0.17 | 0.19 | 0.272 | 1.951 | 26.29647565 |
| Total Xylenes | 200 | 1.716 | 0.17 | 0.19 | 0.25 | 1.951 | 365.4962583 |
| MTBE | 1.4 | 0.0759 | 0.17 | 0.19 | 0.0241 | 1.951 | 0.231534526 |
| Total Lead | 0.15 | 0 | 0.17 | 0.19 | | 1.951 | 0.01307022 |

**Table 7**
**Equation R26 - Groundwater Impact**
**Based on Source Soil Concentrations**
**Lake Villa School District #41 Site**
**EMR Project No. 8878-000**

## Equation R26 (source: IAC 742, Appendix C, Table C)

$$C_x = C_{source} * \exp\left[\left(\frac{X}{2\alpha_x}\right) * \left(1 - \sqrt{1 + \frac{4\lambda * \alpha_x}{U}}\right)\right] * erf\left[\frac{S_w}{4 * \sqrt{\alpha_y * X}}\right] * erf\left[\frac{S_d}{2 * \sqrt{\alpha_z * X}}\right]$$

$$A = \exp[(\frac{X}{2a_x}) \times (1 - \sqrt{1 + \frac{4\lambda \times \alpha_x}{U}})]$$

$$B = erf\,[\frac{S_w}{4 \times \sqrt{\alpha_y \times X}}]$$

$$C = erf\,[\frac{S_d}{2 \times \sqrt{\alpha_z \times X}}]$$

Where:

$C_{source} = LF * C_{source\ soil}$

| | | |
|---|---|---|
| X | = | distance along centerline of impacted groundwater emanating from B-2, B-5, etc. (source), 49 feet, or 1,493 cm (Figure 8) |
| $\alpha_x$ | = | longitudinal dispersivity (from Eq. R16), 0.10 × X, 149.3 cm |
| $\lambda$ | = | first order degradation constant for COCs, (0.0009/d for benzene; 0.003/d for ethylbenzene; 0.011/d for toluene, etc.) |
| U | = | specific discharge (from Eq. R19), K x i/ $_T$, 7.62 x $10^{-4}$ cm/d |
| K | = | hydraulic conductivity, 1.50 x $10^{-7}$ cm/s (field measurement); 0.013 cm/d |
| $S_w$ | = | source width perpendicular to groundwater flow direction in horizontal plane, 49 feet, 1493 cm (Figure 8) |
| $\alpha_y$ | = | transverse dispersivity (from Eq. R17), $\alpha_x$/3, 497.7 cm |
| $\alpha_z$ | = | vertical dispersivity (from Eq. R18), $\alpha_x$/20, 74.65 cm |
| $S_d$ | = | source width perpendicular to groundwater flow in vertical plane, 12 feet, or 365.7 cm |

## Equation R19 (source: IAC 742, Appendix C, Table C)

**U Specific discharge = K x i/ $\theta_T$ (cm/d) (from Equation R19)**

**K hydraulic conductivity = 1.5 x $10^{-7}$ cm/s (field measurement)**

**i hydraulic gradient = 0.02 cm/cm (default value when groundwater not encountered)**

**$\theta_T$ total soil porosity = 0.34 (cm3/cm3) (value for sand and clay)**

| K (cm/s) | K (cm/d) | i (cm/cm) | $\theta_T$ ($cm^3/cm^3$) | U (cm/d) |
|---|---|---|---|---|
| 1.50E-07 | 1.30E-02 | 0.02 | 0.34 | 7.62E-04 |

| COC | $c_{source}$ (mg/L) | LF (mg/L / mg/kg) | A | B | C | erf(B) | erf(C) | c(x) (mg/L) |
|---|---|---|---|---|---|---|---|---|
| Benzene | 174.70 | 2.1409798 | 2.97085E-56 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 4.84578E-54 |
| Ethylbenzene | 96.35 | 0.4031522 | 7.6028E-104 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 6.8394E-102 |
| Toluene | 495.93 | 0.7797597 | 3.861E-200 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 1.7877E-197 |
| Total Xylenes | 679.32 | 0.5568205 | 2.33677E-82 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 1.48208E-79 |
| MTBE | 17.99 | 7.0823261 | 1 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 16.79534799 |
| Total Lead | 414.12 | 15.686198 | 1 | 1.3693064 | 1.732009 | 0.9471925 | 0.98569177 | 386.6348509 |

| COC | X (cm) | αx(cm) | αy(cm) | αz(cm) | λ (1/d) | U (cm/d) | Sw (cm) | Sd (cm) |
|---|---|---|---|---|---|---|---|---|
| Benzene | 1493 | 149.3 | 49.76666667 | 7.465 | 0.0009 | 7.62E-04 | 1493 | 365.7 |
| Ethylbenzene | 1493 | 149.3 | 49.76666667 | 7.465 | 0.003 | 7.62E-04 | 1493 | 365.7 |
| Toluene | 1493 | 149.3 | 49.76666667 | 7.465 | 0.011 | 7.62E-04 | 1493 | 365.7 |
| Total Xylenes | 1493 | 149.3 | 49.76666667 | 7.465 | 0.0019 | 7.62E-04 | 1493 | 365.7 |
| MTBE | 1493 | 149.3 | 49.76666667 | 7.465 | 0 | 7.62E-04 | 1493 | 365.7 |
| Total Lead | 1493 | 149.3 | 49.76666667 | 7.465 | 0 | 7.62E-04 | 1493 | 365.7 |

Table 8

## Equation R14 Leaching Factor for Soils - Lake Villa School District #41 Site

**Equation R-14**

$$\frac{(\rho_s)}{[\ )\theta_{ws}+(k_s*\rho_s)+(H'*\theta_{as})(\ ]*\left[1+(U_{gw}*\delta_{gw}\right)/(I*W(\ ]}$$

| | | | | |
|---|---|---|---|---|
| For Benzene | $\rho_s$ = | 2.667 | g/cm3 | Site-specific value (App. C, Table F) |
| | $k_s$ = | 0.389 | cm3/g | Eq. R20, App. C Table E |
| | $\theta_{as}$ = | 0.17 | $cm^3_{water}/cm^3_{soil}$ | App. C Table D p.137 |
| | $\theta_{ws}$ = | 0.19 | $cm^3_{air}/cm^3_{soil}$ | App. C Table D p.137 |
| | H' = | 0.228 | $cm^3_{water}/cm^3_{air}$ | App. C Table E p.139 |
| | $U_{gw}$ = | | cm/yr | Eq. R24, App. C Table E (U = K*i) |
| | $\delta_{gw}$ = | 200 | cm | App. C Table D p.139 |
| | I = | 30 | cm/yr | App. C Table D p.139 |
| | W = | 4877 | cm | Site-specific value (App. C, Table D) |
| | LF = | 2.141 | (mg/L) / (mg/kg) | Leaching Factor |

**Equation R-24** U = K * i

| | | |
|---|---|---|
| K = | 1.50E-07 | cm/sec |
| i = | 0.02 | cm (Default value) |
| $U_{gw}$ = | 0.095 | cm/yr |

| COC | $\rho_s$ (g/cm$^3$) | $k_s$ (cm3 water/g soil) | $\theta_{ws}$ ($cm^3_{water}/cm^3_{soil}$) | $\theta_{as}$ ($cm^3_{air}/cm^3_{soil}$) | H' ($cm^3_{water}/cm^3_{air}$) | $U_{gw}$ (cm/yr) | $\delta_{gw}$ (cm) | I (cm/yr) | W (cm) | LF (mg/L)/(mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 2.667 | 0.38874 | 0.17 | 0.17 | 0.228 | 0.095 | 200 | 30 | 4877 | 2.140979827 |
| Ethylbenzene | 2.667 | 2.3958 | 0.17 | 0.17 | 0.323 | 0.095 | 200 | 30 | 4877 | 0.403152202 |
| Toluene | 2.667 | 1.2012 | 0.17 | 0.17 | 0.272 | 0.095 | 200 | 30 | 4877 | 0.779759694 |
| Total Xylenes | 2.667 | 1.716 | 0.17 | 0.17 | 0.25 | 0.095 | 200 | 30 | 4877 | 0.55682055 |
| MTBE | 2.667 | 0.0759 | 0.17 | 0.17 | 0.0241 | 0.095 | 200 | 30 | 4877 | 7.08232608 |
| Total Lead | 2.667 | 0 | 0.17 | 0.17 | | 0.095 | 200 | 30 | 4877 | 15.68619826 |

# APPENDIX B: Laboratory Report, Chain of Custody, and Lab Accreditations

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

October 19, 2021

Alisa Allen
A3 Environmental, LLC
3030 Warrenville Road, Ste 418
Lisle, IL 60532

RE: Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

Dear Alisa Allen:

Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

Pace Analytical®
www.pacelabs.com

**Pace Analytical Services, LLC**
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

## CERTIFICATIONS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Pace Analytical Services Green Bay**
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| 40234981001 | CS-101221-01 | Solid | 10/12/21 08:50 | 10/13/21 07:35 |
| 40234981002 | CS-101221-02 | Solid | 10/12/21 09:10 | 10/13/21 07:35 |
| 40234981003 | CS-101221-03 | Solid | 10/12/21 09:20 | 10/13/21 07:35 |
| 40234981004 | CS-101221-04 | Solid | 10/12/21 09:30 | 10/13/21 07:35 |
| 40234981005 | CS-101221-05 | Solid | 10/12/21 09:40 | 10/13/21 07:35 |
| 40234981006 | CS-101221-06 | Solid | 10/12/21 09:50 | 10/13/21 07:35 |
| 40234981007 | CS-101221-07 | Solid | 10/12/21 10:00 | 10/13/21 07:35 |
| 40234981008 | CS-101221-08 | Solid | 10/12/21 10:10 | 10/13/21 07:35 |
| 40234981009 | CS-101221-09A | Solid | 10/12/21 10:20 | 10/13/21 07:35 |
| 40234981010 | CS-101221-09B | Solid | 10/12/21 10:25 | 10/13/21 07:35 |



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## SAMPLE ANALYTE COUNT

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

| Lab ID | Sample ID | Method | Analysts | Analytes Reported |
|---|---|---|---|---|
| 40234981001 | CS-101221-01 | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981002 | CS-101221-02 | EPA 8260 | ALD | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981003 | CS-101221-03 | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981004 | CS-101221-04 | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981005 | CS-101221-05 | EPA 8260 | ALD | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981006 | CS-101221-06 | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981007 | CS-101221-07 | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981008 | CS-101221-08 | EPA 6010D | TXW | 1 |
| | | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981009 | CS-101221-09A | EPA 8260 | ALD | 8 |
| | | ASTM D2974-87 | K1S | 1 |
| 40234981010 | CS-101221-09B | EPA 8260 | SMT | 8 |
| | | ASTM D2974-87 | K1S | 1 |

PASI-G = Pace Analytical Services - Green Bay

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(920)469-2436

## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-01** **Lab ID: 40234981001** Collected: 10/12/21 08:50 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **<0.00061** | mg/kg | 0.0043 | 0.00061 | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 71-43-2 | |
| Ethylbenzene | **<0.00077** | mg/kg | 0.0043 | 0.00077 | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 100-41-4 | |
| Methyl-tert-butyl ether | **0.0028J** | mg/kg | 0.0043 | 0.0018 | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 1634-04-4 | |
| Toluene | **<0.00076** | mg/kg | 0.0043 | 0.00076 | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 108-88-3 | |
| Xylene (Total) | **<0.0030** | mg/kg | 0.0086 | 0.0030 | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 109 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 162 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 460-00-4 | 1q |
| 1,2-Dichlorobenzene-d4 (S) | 111 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/15/21 09:33 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.7** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-02** **Lab ID: 40234981002** Collected: 10/12/21 09:10 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV Med Level Short List** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **0.91** | mg/kg | 0.027 | 0.016 | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 71-43-2 | |
| Ethylbenzene | **1.3** | mg/kg | 0.069 | 0.016 | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.020** | mg/kg | 0.069 | 0.020 | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 1634-04-4 | |
| Toluene | **0.032J** | mg/kg | 0.069 | 0.017 | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 108-88-3 | |
| Xylene (Total) | **1.2** | mg/kg | 0.21 | 0.050 | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 94 | % | 66-153 | | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 460-00-4 | |
| Toluene-d8 (S) | 127 | % | 67-159 | | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 2037-26-5 | |
| 1,2-Dichlorobenzene-d4 (S) | 90 | % | 82-158 | | 1 | 10/14/21 14:00 | 10/15/21 05:55 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.8** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-03** **Lab ID: 40234981003** Collected: 10/12/21 09:20 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **<0.00055** | mg/kg | 0.0038 | 0.00055 | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 71-43-2 | |
| Ethylbenzene | **<0.00069** | mg/kg | 0.0038 | 0.00069 | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0016** | mg/kg | 0.0038 | 0.0016 | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 1634-04-4 | |
| Toluene | **<0.00068** | mg/kg | 0.0038 | 0.00068 | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 108-88-3 | |
| Xylene (Total) | **<0.0026** | mg/kg | 0.0077 | 0.0026 | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 120 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 167 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 460-00-4 | 1q |
| 1,2-Dichlorobenzene-d4 (S) | 119 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/15/21 10:21 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.3** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-04** **Lab ID: 40234981004** Collected: 10/12/21 09:30 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **0.081** | mg/kg | 0.0047 | 0.00067 | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 71-43-2 | |
| Ethylbenzene | **0.0040J** | mg/kg | 0.0047 | 0.00084 | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0019** | mg/kg | 0.0047 | 0.0019 | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 1634-04-4 | |
| Toluene | **0.0028J** | mg/kg | 0.0047 | 0.00083 | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 108-88-3 | |
| Xylene (Total) | **0.0055J** | mg/kg | 0.0094 | 0.0032 | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 108 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 173 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 99 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/15/21 11:33 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.6** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-05** **Lab ID: 40234981005** Collected: 10/12/21 09:40 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV Med Level Short List** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **2.5** | mg/kg | 0.027 | 0.016 | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 71-43-2 | |
| Ethylbenzene | **7.3** | mg/kg | 0.066 | 0.016 | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.020** | mg/kg | 0.066 | 0.020 | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 1634-04-4 | |
| Toluene | **0.25** | mg/kg | 0.066 | 0.017 | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 108-88-3 | |
| Xylene (Total) | **4.6** | mg/kg | 0.20 | 0.048 | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 107 | % | 66-153 | | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 460-00-4 | |
| Toluene-d8 (S) | 142 | % | 67-159 | | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 2037-26-5 | |
| 1,2-Dichlorobenzene-d4 (S) | 98 | % | 82-158 | | 1 | 10/14/21 14:00 | 10/15/21 06:15 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **14.1** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-06** **Lab ID: 40234981006** Collected: 10/12/21 09:50 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **<0.00042** | mg/kg | 0.0030 | 0.00042 | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 71-43-2 | |
| Ethylbenzene | **<0.00054** | mg/kg | 0.0030 | 0.00054 | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0012** | mg/kg | 0.0030 | 0.0012 | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 1634-04-4 | |
| Toluene | **<0.00053** | mg/kg | 0.0030 | 0.00053 | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 108-88-3 | |
| Xylene (Total) | **<0.0020** | mg/kg | 0.0060 | 0.0020 | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 109 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 176 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 105 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/14/21 18:28 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.2** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-07** **Lab ID: 40234981007** Collected: 10/12/21 10:00 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **<0.00043** | mg/kg | 0.0030 | 0.00043 | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 71-43-2 | |
| Ethylbenzene | **<0.00054** | mg/kg | 0.0030 | 0.00054 | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0012** | mg/kg | 0.0030 | 0.0012 | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 1634-04-4 | |
| Toluene | **<0.00054** | mg/kg | 0.0030 | 0.00054 | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 108-88-3 | |
| Xylene (Total) | **<0.0021** | mg/kg | 0.0061 | 0.0021 | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 103 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 167 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 107 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/14/21 18:52 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.5** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-08** **Lab ID: 40234981008** Collected: 10/12/21 10:10 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **6010D MET ICP** | Analytical Method: EPA 6010D Preparation Method: EPA 3050B<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Lead | **13.1** | mg/kg | 2.2 | 0.65 | 1 | 10/14/21 06:24 | 10/15/21 06:43 | 7439-92-1 | |
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **<0.00043** | mg/kg | 0.0030 | 0.00043 | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 71-43-2 | |
| Ethylbenzene | **<0.00054** | mg/kg | 0.0030 | 0.00054 | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0012** | mg/kg | 0.0030 | 0.0012 | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 1634-04-4 | |
| Toluene | **<0.00053** | mg/kg | 0.0030 | 0.00053 | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 108-88-3 | |
| Xylene (Total) | **<0.0021** | mg/kg | 0.0060 | 0.0021 | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 102 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 172 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 103 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/14/21 19:16 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **14.3** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-09A** **Lab ID: 40234981009** Collected: 10/12/21 10:20 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV Med Level Short List** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030B<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **0.68** | mg/kg | 0.053 | 0.032 | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 71-43-2 | |
| Ethylbenzene | **4.8** | mg/kg | 0.13 | 0.032 | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.039** | mg/kg | 0.13 | 0.039 | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 1634-04-4 | |
| Toluene | **0.29** | mg/kg | 0.13 | 0.034 | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 108-88-3 | |
| Xylene (Total) | **3.6** | mg/kg | 0.40 | 0.096 | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| 4-Bromofluorobenzene (S) | 121 | % | 66-153 | | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 460-00-4 | |
| Toluene-d8 (S) | 156 | % | 67-159 | | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 2037-26-5 | |
| 1,2-Dichlorobenzene-d4 (S) | 104 | % | 82-158 | | 2 | 10/14/21 14:00 | 10/15/21 06:35 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87<br>Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **14.3** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## ANALYTICAL RESULTS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

**Sample: CS-101221-09B** **Lab ID: 40234981010** Collected: 10/12/21 10:25 Received: 10/13/21 07:35 Matrix: Solid

***Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.***

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **8260 MSV 5030/5035 Low Level** | Analytical Method: EPA 8260 Preparation Method: EPA 5035/5030 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Benzene | **0.0054** | mg/kg | 0.0030 | 0.00043 | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 71-43-2 | |
| Ethylbenzene | **<0.00054** | mg/kg | 0.0030 | 0.00054 | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 100-41-4 | |
| Methyl-tert-butyl ether | **<0.0012** | mg/kg | 0.0030 | 0.0012 | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 1634-04-4 | |
| Toluene | **<0.00053** | mg/kg | 0.0030 | 0.00053 | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 108-88-3 | |
| Xylene (Total) | **<0.0021** | mg/kg | 0.0060 | 0.0021 | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 1330-20-7 | |
| ***Surrogates*** | | | | | | | | | |
| Toluene-d8 (S) | 90 | % | 70-130 | | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 2037-26-5 | |
| 4-Bromofluorobenzene (S) | 134 | % | 33-176 | | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 460-00-4 | |
| 1,2-Dichlorobenzene-d4 (S) | 104 | % | 79-143 | | 1 | 10/14/21 07:00 | 10/15/21 09:09 | 2199-69-1 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | | |
| | Pace Analytical Services - Green Bay | | | | | | | | |
| Percent Moisture | **15.5** | % | 0.10 | 0.10 | 1 | | 10/14/21 11:40 | | |

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## QUALITY CONTROL DATA

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

QC Batch: 398450
QC Batch Method: EPA 3050B
Analysis Method: EPA 6010D
Analysis Description: 6010D MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234981008

METHOD BLANK: 2300159 Matrix: Solid
Associated Lab Samples: 40234981008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Lead | mg/kg | <0.60 | 2.0 | 0.60 | 10/15/21 05:30 | |

LABORATORY CONTROL SAMPLE: 2300160

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Lead | mg/kg | 25 | 26.4 | 106 | 80-120 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2300161 2300162

| Parameter | Units | 40234891001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | mg/kg | 30.0 | 29.9 | 29.9 | 59.2 | 52.9 | 98 | 76 | 75-125 | 11 | 20 | |

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## QUALITY CONTROL DATA

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

QC Batch: 398689 — Analysis Method: EPA 8260
QC Batch Method: EPA 5035/5030 — Analysis Description: 8260 MSV Low
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234981001, 40234981003, 40234981004, 40234981006, 40234981007, 40234981008, 40234981010

METHOD BLANK: 2301777 — Matrix: Solid
Associated Lab Samples: 40234981001, 40234981003, 40234981004, 40234981006, 40234981007, 40234981008, 40234981010

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | mg/kg | <0.00071 | 0.0050 | 0.00071 | 10/14/21 09:41 | |
| Ethylbenzene | mg/kg | <0.00089 | 0.0050 | 0.00089 | 10/14/21 09:41 | |
| Methyl-tert-butyl ether | mg/kg | <0.0020 | 0.0050 | 0.0020 | 10/14/21 09:41 | |
| Toluene | mg/kg | <0.00088 | 0.0050 | 0.00088 | 10/14/21 09:41 | |
| Xylene (Total) | mg/kg | <0.0034 | 0.010 | 0.0034 | 10/14/21 09:41 | |
| 1,2-Dichlorobenzene-d4 (S) | % | 96 | 79-143 | | 10/14/21 09:41 | |
| 4-Bromofluorobenzene (S) | % | 132 | 33-176 | | 10/14/21 09:41 | |
| Toluene-d8 (S) | % | 90 | 70-130 | | 10/14/21 09:41 | |

LABORATORY CONTROL SAMPLE & LCSD: 2301778 2301779

| Parameter | Units | Spike Conc. | LCS Result | LCSD Result | LCS % Rec | LCSD % Rec | % Rec Limits | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | mg/kg | 0.05 | 0.042 | 0.048 | 85 | 96 | 61-134 | 12 | 20 | |
| Ethylbenzene | mg/kg | 0.05 | 0.040 | 0.047 | 81 | 94 | 68-124 | 15 | 20 | |
| Methyl-tert-butyl ether | mg/kg | 0.05 | 0.038 | 0.044 | 76 | 88 | 61-124 | 14 | 20 | |
| Toluene | mg/kg | 0.05 | 0.042 | 0.049 | 84 | 98 | 68-119 | 15 | 20 | |
| Xylene (Total) | mg/kg | 0.15 | 0.12 | 0.13 | 80 | 90 | 63-130 | 12 | 20 | |
| 1,2-Dichlorobenzene-d4 (S) | % | | | | 102 | 100 | 79-143 | | | |
| 4-Bromofluorobenzene (S) | % | | | | 128 | 139 | 33-176 | | | |
| Toluene-d8 (S) | % | | | | 96 | 93 | 70-130 | | | |

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## QUALITY CONTROL DATA

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

QC Batch: 398566
QC Batch Method: EPA 5035/5030B
Analysis Method: EPA 8260
Analysis Description: 8260 MSV Med Level Short List
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234981002, 40234981005, 40234981009

METHOD BLANK: 2300779 Matrix: Solid
Associated Lab Samples: 40234981002, 40234981005, 40234981009

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | mg/kg | <0.012 | 0.020 | 0.012 | 10/14/21 19:49 | |
| Ethylbenzene | mg/kg | <0.012 | 0.050 | 0.012 | 10/14/21 19:49 | |
| Methyl-tert-butyl ether | mg/kg | <0.015 | 0.050 | 0.015 | 10/14/21 19:49 | |
| Toluene | mg/kg | <0.013 | 0.050 | 0.013 | 10/14/21 19:49 | |
| Xylene (Total) | mg/kg | <0.036 | 0.15 | 0.036 | 10/14/21 19:49 | |
| 1,2-Dichlorobenzene-d4 (S) | % | 85 | 82-158 | | 10/14/21 19:49 | |
| 4-Bromofluorobenzene (S) | % | 85 | 66-153 | | 10/14/21 19:49 | |
| Toluene-d8 (S) | % | 101 | 67-159 | | 10/14/21 19:49 | |

LABORATORY CONTROL SAMPLE: 2300780

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Benzene | mg/kg | 2.5 | 2.7 | 107 | 70-130 | |
| Ethylbenzene | mg/kg | 2.5 | 2.8 | 112 | 78-120 | |
| Methyl-tert-butyl ether | mg/kg | 2.5 | 2.1 | 86 | 65-130 | |
| Toluene | mg/kg | 2.5 | 2.7 | 108 | 76-120 | |
| Xylene (Total) | mg/kg | 7.5 | 8.0 | 106 | 70-130 | |
| 1,2-Dichlorobenzene-d4 (S) | % | | | 92 | 82-158 | |
| 4-Bromofluorobenzene (S) | % | | | 93 | 66-153 | |
| Toluene-d8 (S) | % | | | 118 | 67-159 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2300781 2300782

| Parameter | Units | 40234828018 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | mg/kg | <16.8 ug/kg | 1.4 | 1.4 | 1.4 | 1.4 | 100 | 98 | 70-130 | 2 | 20 | |
| Ethylbenzene | mg/kg | <16.8 ug/kg | 1.4 | 1.4 | 1.5 | 1.4 | 106 | 99 | 78-120 | 7 | 20 | |
| Methyl-tert-butyl ether | mg/kg | <20.8 ug/kg | 1.4 | 1.4 | 1.2 | 1.2 | 84 | 84 | 65-130 | 0 | 20 | |
| Toluene | mg/kg | <17.8 ug/kg | 1.4 | 1.4 | 1.5 | 1.4 | 104 | 98 | 76-120 | 6 | 20 | |
| Xylene (Total) | mg/kg | <51.0 ug/kg | 4.2 | 4.2 | 4.4 | 4.1 | 104 | 97 | 70-130 | 7 | 20 | |
| 1,2-Dichlorobenzene-d4 (S) | % | | | | | | 102 | 101 | 82-158 | | | |
| 4-Bromofluorobenzene (S) | % | | | | | | 105 | 102 | 66-153 | | | |
| Toluene-d8 (S) | % | | | | | | 127 | 126 | 67-159 | | | |

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## QUALITY CONTROL DATA

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

QC Batch: 398510
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40234981001, 40234981002, 40234981003, 40234981004, 40234981005, 40234981006, 40234981007, 40234981008, 40234981009, 40234981010

SAMPLE DUPLICATE: 2300470

| Parameter | Units | 40234888001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Percent Moisture | % | 3.8 | 3.9 | 2 | 10 | |

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# QUALIFIERS

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

## DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## BATCH QUALIFIERS

Batch: 398699

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

## ANALYTE QUALIFIERS

1q The internal standard response was below the laboratory acceptance criteria limits confirmed by re-analysis. The results reported are from the most QC compliant analysis. Results may be biased high.



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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 2021-520 LAKE VILLA
Pace Project No.: 40234981

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| 40234981008 | CS-101221-08 | EPA 3050B | 398450 | EPA 6010D | 398549 |
| 40234981001 | CS-101221-01 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981003 | CS-101221-03 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981004 | CS-101221-04 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981006 | CS-101221-06 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981007 | CS-101221-07 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981008 | CS-101221-08 | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981010 | CS-101221-09B | EPA 5035/5030 | 398689 | EPA 8260 | 398699 |
| 40234981002 | CS-101221-02 | EPA 5035/5030B | 398566 | EPA 8260 | 398569 |
| 40234981005 | CS-101221-05 | EPA 5035/5030B | 398566 | EPA 8260 | 398569 |
| 40234981009 | CS-101221-09A | EPA 5035/5030B | 398566 | EPA 8260 | 398569 |
| 40234981001 | CS-101221-01 | ASTM D2974-87 | 398510 | | |
| 40234981002 | CS-101221-02 | ASTM D2974-87 | 398510 | | |
| 40234981003 | CS-101221-03 | ASTM D2974-87 | 398510 | | |
| 40234981004 | CS-101221-04 | ASTM D2974-87 | 398510 | | |
| 40234981005 | CS-101221-05 | ASTM D2974-87 | 398510 | | |
| 40234981006 | CS-101221-06 | ASTM D2974-87 | 398510 | | |
| 40234981007 | CS-101221-07 | ASTM D2974-87 | 398510 | | |
| 40234981008 | CS-101221-08 | ASTM D2974-87 | 398510 | | |
| 40234981009 | CS-101221-09A | ASTM D2974-87 | 398510 | | |
| 40234981010 | CS-101221-09B | ASTM D2974-87 | 398510 | | |



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UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

40234981

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# CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

| (Please Print Clearly) | |
|---|---|
| Company Name: | ABE |
| Branch/Location: | Lisle, IL |
| Project Contact: | Colleen Stull |
| Phone: | 224-567-1226 |
| Project Number: | 2021-520 |
| Project Name: | Lake Villa |
| Project State: | IL |
| Sampled By (Print): | Colleen Stull |
| Sampled By (Sign): | Colleen Stull |
| PO #: | Regulatory Program: |

| | |
|---|---|
| Quote #: | |
| Mail To Contact: | Colleen Stull |
| Mail To Company: | ABE |
| Mail To Address: | 3030 Warrenville Rd |
| Invoice To Contact: | Colleen Stull |
| Invoice To Company: | ABE |
| Invoice To Address: | 3030 Warrenville Rd Lisle, IL 60532 |
| Invoice To Phone: | 224-567-1221 |

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, W = Water, B = Biota, DW = Drinking Water, C = Charcoal, GW = Ground Water, O = Oil, SW = Surface Water, S = Soil, WW = Waste Water, SI = Sludge, WP = Wipe

| PACE LAB # | CLIENT FIELD ID | COLLECTION DATE | COLLECTION TIME | MATRIX | FILTERED? (YES/NO) Y/N | PRESERVATION (CODE)* Pick Letter | Analyses Requested: BTEX/MTBE | Analyses Requested: Lead | CLIENT COMMENTS | LAB COMMENTS (Lab Use Only) | Profile # |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | CS-101221-01 | 10/12/21 | 0850 | S | | N | X | | Hold all lead except -08 | ~~hold all lead~~ except (CS) | |
| 002 | CS-101221-02 | | 0910 | | | A | X | | | | |
| 003 | CS-101221-03 | | 0920 | | | | X | | | | |
| 004 | CS-101221-04 | | 0930 | | | | X | | | | |
| 005 | CS-101221-05 | | 0940 | | | | X | | | | |
| 006 | CS-101221-06 | | 0950 | | | | X | | | | |
| 007 | CS-101221-07 | | 1000 | | | | X | | | | |
| 008 | CS-101221-08 | | 1010 | | | | X | X | | | |
| 009 | CS-101221-09A | | 1020 | | | | X | | | | |
| 010 | CS-101221-09B | ↓ | 1025 | ↓ | | | X | | | | |

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

| Relinquished By: | Date/Time: | Received By: | Date/Time: |
|---|---|---|---|
| Colleen Stull | 10/12/21 1200 | | |
| CS Logistics | 10/13/21 0735 | Susan Kilkpatrick | 10/13/21 0735 |
| | | | |
| | | | |
| | | | |

PACE Project No.: 40234981
Receipt Temp = 3.5 °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / ~~Not Present~~
Intact / Not Intact

Version 6.0 06/14/06



C019a(27Jun2006)

ORIGINAL

Client Name: A3E

# Sample Preservation Receipt Form

Project # 4023498

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☐N/A

Lab Lot# of pH paper: /

Lab Std #ID of preservation (if pH adjusted):

Initial when completed:

Date/ Time:

| Pace Lab # | Glass | | | | | | | | Plastic | | | | | Vials | | | | | | Jars | | | | General | | | VOA Vials (>6mm) * | H2SO4 pH ≤2 | NaOH+Zn Act pH ≥9 | NaOH pH ≥12 | HNO3 pH ≤2 | pH after adjusted | Volume (mL) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AG1U | BG1U | AG1H | AG4S | AG4U | AG5U | AG2S | BG3U | BP1U | BP3U | BP3B | BP3N | BP3S | VG9A | DG9T | VG9U | VG9H | VG9M | VG9D | JGFU | JG9U | WGFU | WPFU | SP5T | ZPLC | GN | | | | | | | |
| 001 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 002 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 003 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 004 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 005 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 006 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 007 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 008 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 009 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 010 | | | | | | | | | | | | | | | | | | — | 2 | | | | — | | | | | | | | | | 2.5 / 5 / 10 |
| 011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 014 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 016 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 017 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 018 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2.5 / 5 / 10 |
| 020 | | | | | | | | | | | | | | | | | | | | | | | | | | 10/13/21 | | | | | | | 2.5 / 5 / 10 |

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other:_____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☐N/A *If yes look in headspace column

| | |
|---|---|
| AG1U | 1 liter amber glass |
| BG1U | 1 liter clear glass |
| AG1H | 1 liter amber glass HCL |
| AG4S | 125 mL amber glass H2SO4 |
| AG4U | 120 mL amber glass unpres |
| AG5U | 100 mL amber glass unpres |
| AG2S | 500 mL amber glass H2SO4 |
| BG3U | 250 mL clear glass unpres |

| | |
|---|---|
| BP1U | 1 liter plastic unpres |
| BP3U | 250 mL plastic unpres |
| BP3B | 250 mL plastic NaOH |
| BP3N | 250 mL plastic HNO3 |
| BP3S | 250 mL plastic H2SO4 |

| | |
|---|---|
| VG9A | 40 mL clear ascorbic |
| DG9T | 40 mL amber Na Thio |
| VG9U | 40 mL clear vial unpres |
| VG9H | 40 mL clear vial HCL |
| VG9M | 40 mL clear vial MeOH |
| VG9D | 40 mL clear vial DI |

| | |
|---|---|
| JGFU | 4 oz amber jar unpres |
| JG9U | 9 oz amber jar unpres |
| WGFU | 4 oz clear jar unpres |
| WPFU | 4 oz plastic jar unpres |
| SP5T | 120 mL plastic Na Thiosulfate |
| ZPLC | ziploc bag |
| GN | |

| Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302 | Document Name: Sample Condition Upon Receipt (SCUR) | Document Revised: 26Mar2020 |
|---|---|---|
| | Document No.: ENV-FRM-GBAY-0014-Rev.00 | Author: Pace Green Bay Quality Office |

# Sample Condition Upon Receipt Form (SCUR)

**Client Name:** A3E

Project #:

WO# : 40234981

40234981

**Courier:** ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other: _____

**Tracking #:** _____

**Custody Seal on Cooler/Box Present:** ☐ yes ☒ no Seals intact: ☐ yes ☐ no

**Custody Seal on Samples Present:** ☐ yes ☒ no Seals intact: ☐ yes ☐ no

**Packing Material:** ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

**Thermometer Used** SR - 105 **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

**Cooler Temperature** Uncorr: 4 /Corr: 3.5

**Person examining contents:** Date: 10/13/21 /Initials: SCV

**Temp Blank Present:** ☒ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

**Labeled By Initials:** NB

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

| | | |
|---|---|---|
| Chain of Custody Present: | ☑Yes ☐No ☐N/A | 1. |
| Chain of Custody Filled Out: | ☑Yes ☐No ☐N/A | 2. |
| Chain of Custody Relinquished: | ☑Yes ☐No ☐N/A | 3. |
| Sampler Name & Signature on COC: | ☑Yes ☐No ☐N/A | 4. |
| Samples Arrived within Hold Time: | ☑Yes ☐No | 5. |
| - VOA Samples frozen upon receipt | ☐Yes ☑No | Date/Time: |
| **Short Hold Time Analysis (<72hr):** | ☑Yes ☐No | 6. |
| **Rush Turn Around Time Requested:** | ☐Yes ☑No | 7. |
| Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A | | 8. |
| Correct Containers Used: | ☑Yes ☐No | 9. |
| -Pace Containers Used: | ☑Yes ☐No ☐N/A | |
| -Pace IR Containers Used: | ☐Yes ☐No ☑N/A | |
| Containers Intact: | ☑Yes ☐No | 10. |
| Filtered volume received for Dissolved tests | ☐Yes ☐No ☑N/A | 11. |
| Sample Labels match COC: | ☑Yes ☐No ☐N/A | 12. |
| -Includes date/time/ID/Analysis Matrix: S | | |
| Trip Blank Present: | ☐Yes ☑No ☐N/A | 13. |
| Trip Blank Custody Seals Present | ☐Yes ☐No ☑N/A | |
| Pace Trip Blank Lot # (if purchased): _____ | | |

**Client Notification/ Resolution:** If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

**PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi**

Page 2 of 2

# STATE OF ILLINOIS

## ENVIRONMENTAL PROTECTION AGENCY
## NELAP - RECOGNIZED
## ENVIRONMENTAL LABORATORY ACCREDITATION

is hereby granted to

Eurofins TestAmerica Chicago
2417 Bond Street
University Park, IL 60484

**NELAP ACCREDITED**

Accreditation Number #100201

According to the Illinois Administrative Code, Title 35, Subtitle A, Chapter II, Part 186, ACCREDITATION OF LABORATORIES FOR DRINKING WATER, WASTEWATER AND HAZARDOUS WASTES ANALYSIS, the State of Illinois formally recognizes that this laboratory is technically competent to perform the environmental analyses listed on the scope of accreditation detailed below.

The laboratory agrees to perform all analyses listed on this scope of accreditation according to the Part 186 requirements and acknowledges that continued accreditation is dependent on successful ongoing compliance with the applicable requirements of Part 186. Please contact the Illinois EPA Environmental Laboratory Accreditation Program (IL ELAP) to verify the laboratory's scope of accreditation and accreditation status. Accreditation by the State of Illinois is not an endorsement or a guarantee of validity of the data generated by the laboratory.

Primary Accrediting Authority:Illinois

Millie Rose

Millie Rose
Supervisor
Environmental Laboratory Accreditation Program

Certificate No: 1002012021-9
Expiration Date: 4/29/2022
Issued On: 6/30/2021

# *State of Illinois*
# *Environmental Protection Agency*
**Awards the Certificate of Approval to:**

Eurofins TestAmerica Chicago
2417 Bond Street
University Park, IL 60484

The Illinois Environmental Laboratory Accreditation Program encourages all clients and data users to verify the most current scope of accreditation for Eurofins TestAmerica Chicago.

Certificate No.: 1002012021-9

| | Primary AB |
|---|---|
| **Field of Testing /Matrix:** ***CWA (Non Potable Water)*** | |
| **Method EPA 1664A Rev: 1** | |
| Oil & Grease | IL |
| **Method EPA 1664A (SGT-HEM)** | |
| Oil & Grease | IL |
| **Method EPA 1664B** | |
| Oil & Grease | IL |
| **Method EPA 1664B (SGT-HEM)** | |
| Oil & Grease | IL |
| **Method EPA 180.1 Rev: 2** | |
| Turbidity | IL |
| **Method EPA 200.7 Rev: 4.4** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| **Method EPA 200.8 Rev: 5.4** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| **Method EPA 218.6 Rev: 3.3** | |
| Chromium VI | IL |
| **Method EPA 245.1 Rev: 3** | |
| Mercury | IL |
| **Method EPA 300.0 Rev: 2.1** | |
| Bromide | IL |
| Chloride | IL |
| Fluoride | IL |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |
| Nitrite | IL |
| Orthophosphate as P | IL |
| Sulfate | IL |
| **Method EPA 335.4 Rev: 1** | |
| Cyanide | IL |
| **Method EPA 350.1 Rev: 2** | |
| Ammonia | IL |
| **Method EPA 351.1** | |
| Total Kjeldahl Nitrogen (TKN) | IL |
| **Method EPA 353.2 Rev: 2** | |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |
| **Method EPA 420.1** | |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| Total phenolics | IL |
| **Method EPA 420.4 Rev: 1** | |
| Total phenolics | IL |
| **Method EPA 608** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| Aroclor-1016 (PCB-1016) | IL |
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |
| Endosulfan II | IL |
| Endosulfan sulfate | IL |
| Endrin | IL |
| Endrin aldehyde | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Methoxychlor | IL |
| Toxaphene (Chlorinated camphene) | IL |
| **Method EPA 608.3 GC-ECD** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| Aroclor-1016 (PCB-1016) | IL |
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |
| Endosulfan II | IL |
| Endosulfan sulfate | IL |
| Endrin | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| Endrin aldehyde | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Methoxychlor | IL |
| Toxaphene (Chlorinated camphene) | IL |

**Method EPA 624**

| | |
|---|---|
| 1,1,1-Trichloroethane | IL |
| 1,1,2,2-Tetrachloroethane | IL |
| 1,1,2-Trichloroethane | IL |
| 1,1-Dichloroethane | IL |
| 1,1-Dichloroethylene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Dichloroethane (Ethylene dichloride) | IL |
| 1,2-Dichloropropane | IL |
| 1,3-Dichlorobenzene | IL |
| 1,4-Dichlorobenzene | IL |
| 2-Chloroethyl vinyl ether | IL |
| Acrolein (Propenal) | IL |
| Acrylonitrile | IL |
| Benzene | IL |
| Bromodichloromethane | IL |
| Bromoform | IL |
| Carbon tetrachloride | IL |
| Chlorobenzene | IL |
| Chlorodibromomethane | IL |
| Chloroethane (Ethyl chloride) | IL |
| Chloroform | IL |
| cis-1,3-Dichloropropene | IL |
| Ethylbenzene | IL |
| Methyl bromide (Bromomethane) | IL |
| Methyl chloride (Chloromethane) | IL |
| Methyl tert-butyl ether (MTBE) | IL |
| Methylene chloride (Dichloromethane) | IL |
| Tetrachloroethylene (Perchloroethylene) | IL |
| Toluene | IL |
| trans-1,2-Dichloroethylene | IL |
| trans-1,3-Dichloropropylene | IL |
| Trichloroethene (Trichloroethylene) | IL |
| Trichlorofluoromethane (Fluorotrichloromethane, Freon 11) | IL |
| Vinyl chloride | IL |
| Xylene (total) | IL |

**Method EPA 624.1**

| | |
|---|---|
| 1,1,1-Trichloroethane | IL |
| 1,1,2,2-Tetrachloroethane | IL |
| 1,1,2-Trichloroethane | IL |
| 1,1-Dichloroethane | IL |
| 1,1-Dichloroethylene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Dichloroethane (Ethylene dichloride) | IL |
| 1,2-Dichloropropane | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| 1,3-Dichlorobenzene | IL |
| 1,4-Dichlorobenzene | IL |
| 2-Chloroethyl vinyl ether | IL |
| Acrolein (Propenal) | IL |
| Acrylonitrile | IL |
| Benzene | IL |
| Bromodichloromethane | IL |
| Bromoform | IL |
| Carbon tetrachloride | IL |
| Chlorobenzene | IL |
| Chlorodibromomethane | IL |
| Chloroethane (Ethyl chloride) | IL |
| Chloroform | IL |
| cis-1,3-Dichloropropene | IL |
| Ethylbenzene | IL |
| Methyl bromide (Bromomethane) | IL |
| Methyl chloride (Chloromethane) | IL |
| Methyl tert-butyl ether (MTBE) | IL |
| Methylene chloride (Dichloromethane) | IL |
| Tetrachloroethylene (Perchloroethylene) | IL |
| Toluene | IL |
| trans-1,2-Dichloroethylene | IL |
| trans-1,3-Dichloropropylene | IL |
| Trichloroethene (Trichloroethylene) | IL |
| Trichlorofluoromethane (Fluorotrichloromethane, Freon 11) | IL |
| Vinyl chloride | IL |
| Xylene (total) | IL |

**Method EPA 625**

| | |
|---|---|
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,4-Dichlorobenzene | IL |
| 2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Nitrophenol | IL |
| 3,3'-Dichlorobenzidine | IL |
| 4-Bromophenyl phenyl ether | IL |
| 4-Chloro-3-methylphenol | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Nitrophenol | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Anthracene | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Chrysene | IL |
| Dibenz(a,h) anthracene | IL |
| Diethyl phthalate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Fluoranthene | IL |
| Fluorene | IL |
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isophorone | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| Pentachlorophenol | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Pyrene | IL |
| **Method EPA 625.1** | |
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,4-Dichlorobenzene | IL |
| 2,2'-Oxybis(1-chloropropane), bis(2-Chloro-1-methylethyl)ether | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Nitrophenol | IL |
| 3,3'-Dichlorobenzidine | IL |
| 4-Bromophenyl phenyl ether | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| 4-Chloro-3-methylphenol | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Nitrophenol | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Anthracene | IL |
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Chrysene | IL |
| Dibenz(a,h) anthracene | IL |
| Diethyl phthalate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Fluoranthene | IL |
| Fluorene | IL |
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isophorone | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| Pentachlorophenol | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Pyrene | IL |
| **Method NECi N07-0003** | |
| Nitrate-nitrite | IL |
| **Method SM 2320 B-1997** | |
| Alkalinity as CaCO3 | IL |
| **Method SM 2320 B-2011** | |
| Alkalinity as CaCO3 | IL |
| **Method SM 2340 B-1997** | |
| Hardness | IL |
| **Method SM 2340 B-2011** | |
| Hardness | IL |
| **Method SM 2510 B-1997** | |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

Conductivity IL

**Method SM 2510 B-2011**
Conductivity IL

**Method SM 2540 B-1997**
Residue-total IL

**Method SM 2540 B-2011**
Residue-total IL

**Method SM 2540 C-1997**
Residue-filterable (TDS) IL

**Method SM 2540 C-2011**
Residue-filterable (TDS) IL

**Method SM 2540 D-1997**
Residue-nonfilterable (TSS) IL

**Method SM 2540 D-2011**
Residue-nonfilterable (TSS) IL

**Method SM 2540 E-1997**
Residue-volatile IL

**Method SM 2540 E-2011**
Residue-volatile IL

**Method SM 2540 F-1997**
Residue-settleable IL

**Method SM 2540 F-2011**
Residue-settleable IL

**Method SM 3500-Cr B-2009**
Chromium VI IL

**Method SM 3500-Cr B-2011**
Chromium VI IL

**Method SM 4500-Cl F-2000**
Total residual chlorine IL

**Method SM 4500-Cl F-2011**
Total residual chlorine IL

**Method SM 4500-Cl G-2000**
Total residual chlorine IL

**Method SM 4500-Cl G-2011**
Total residual chlorine IL

**Method SM 4500-$Cl^-$ E-1997 Rev: 21st ED**
Chloride IL

**Method SM 4500-$CN^-$ E-1999**
Cyanide IL

**Method SM 4500-$CN^-$ E-2011**
Cyanide IL

**Method SM 4500-$CN^-$ G-1999**
Amenable cyanide IL

**Method SM 4500-$CN^-$ G-2011**
Amenable cyanide IL

**Method SM 4500-$F^-$ C-1997 Rev: 21st ED**

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| Fluoride | IL |
| **Method SM 4500-F⁻ C-2011 Rev: 22nd ED** | |
| Fluoride | IL |
| **Method SM 4500-H+ B-2000** | |
| pH | IL |
| **Method SM 4500-H+ B-2011** | |
| pH | IL |
| **Method SM 4500-NH3 G Rev: 21st ED** | |
| Ammonia | IL |
| Total Kjeldahl Nitrogen (TKN) | IL |
| **Method SM 4500-NH3 G-2011** | |
| Ammonia | IL |
| **Method SM 4500-NO2⁻ B-2000** | |
| Nitrite | IL |
| **Method SM 4500-NO2⁻ B-2011** | |
| Nitrite | IL |
| **Method SM 4500-NO3⁻ F-2000** | |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |
| **Method SM 4500-NO3⁻ F-2011** | |
| Nitrate plus Nitrite as N | IL |
| **Method SM 4500-O G-2001** | |
| Oxygen, dissolved | IL |
| **Method SM 4500-O G-2011** | |
| Oxygen, dissolved | IL |
| **Method SM 4500-P E-1999** | |
| Orthophosphate as P | IL |
| Phosphorus | IL |
| **Method SM 4500-P E-2011** | |
| Orthophosphate as P | IL |
| Phosphorus | IL |
| **Method SM 4500-S2⁻ F-2000** | |
| Sulfide | IL |
| **Method SM 4500-S2⁻ F-2011** | |
| Sulfide | IL |
| **Method SM 4500-SO4⁻ E-1997** | |
| Sulfate | IL |
| **Method SM 4500-SO4⁻ E-2011** | |
| Sulfate | IL |
| **Method SM 5210 B-2001** | |
| Biochemical oxygen demand | IL |
| Carbonaceous BOD, CBOD | IL |
| **Method SM 5210 B-2011** | |
| Biochemical oxygen demand | IL |
| Carbonaceous BOD, CBOD | IL |
| **Method SM 5220 C-1997 Rev: 21st ED** | |
| Chemical oxygen demand | IL |

**Field of Testing /Matrix:** ***CWA (Non Potable Water)***

| | |
|---|---|
| **Method SM 5310 C-2000** | |
| Total organic carbon | IL |
| **Method SM 5310 C-2011** | |
| Total organic carbon | IL |

**Field of Testing /Matrix:** ***CWA (Solid & Hazardous Material)***

| | |
|---|---|
| **Method EPA 120.1** | |
| Conductivity | IL |
| **Method EPA 160.4** | |
| Residue-volatile | IL |
| **Method EPA 1664A Rev: 1** | |
| Oil & Grease | IL |
| **Method EPA 1664A (SGT-HEM)** | |
| Oil & Grease | IL |
| **Method EPA 1664B** | |
| Oil & Grease | IL |
| **Method EPA 1664B (SGT-HEM)** | |
| Oil & Grease | IL |
| **Method EPA 200.7 Rev: 4.4** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| **Method EPA 350.1 Rev: 2** | |
| Ammonia | IL |
| **Method EPA 353.2 Rev: 2** | |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |
| **Method EPA 420.1** | |
| Total phenolics | IL |
| **Method EPA 420.4 Rev: 1** | |
| Total phenolics | IL |

**Field of Testing /Matrix:** ***CWA (Solid & Hazardous Material)***

| | |
|---|---|
| **Method SM 2320 B-1997** | |
| Alkalinity as CaCO3 | IL |
| **Method SM 2510 B-1997** | |
| Conductivity | IL |
| **Method SM 4500-$Cl^-$ E-1997 Rev: 21st ED** | |
| Chloride | IL |
| **Method SM 4500-$CN^-$ E-1999** | |
| Cyanide | IL |
| **Method SM 4500-$F^-$ C-1997 Rev: 21st ED** | |
| Fluoride | IL |
| **Method SM 4500-NH3 G Rev: 21st ED** | |
| Ammonia | IL |
| Total Kjeldahl Nitrogen (TKN) | IL |
| **Method SM 4500-$NO2^-$ B-2000** | |
| Nitrite | IL |
| **Method SM 4500-$NO2^-$ B-2011** | |
| Nitrite | IL |
| **Method SM 4500-$NO3^-$ F-2000** | |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |
| **Method SM 4500-P E-1999** | |
| Orthophosphate as P | IL |
| Phosphorus | IL |
| **Method SM 4500-$S2^-$ F-2000** | |
| Sulfide | IL |
| **Method SM 5210 B-2001** | |
| Biochemical oxygen demand | IL |
| Carbonaceous BOD, CBOD | IL |
| **Method SM 5220 C-1997 Rev: 21st ED** | |
| Chemical oxygen demand | IL |
| **Method SM 5310 C-2000** | |
| Total organic carbon | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| **Method EPA 1010A** | |
| Ignitability | IL |
| **Method EPA 1311 Rev: 0** | |
| Toxicity Characteristic Leaching Procedure (TCLP) | IL |
| **Method EPA 1312 Rev: 0** | |
| Synthetic Precipitation Leaching Procedure (SPLP) | IL |
| **Method EPA 6010B Rev: 2** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| **Method EPA 6010C** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |

**Method EPA 6010D**

| | |
|---|---|
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| Zirconium | IL |

**Method EPA 6020 Rev: 0**

| | |
|---|---|
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Vanadium | IL |
| Zinc | IL |

**Method EPA 6020A Rev: 1**

| | |
|---|---|
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Vanadium | IL |
| Zinc | IL |

**Method EPA 6020B**

| | |
|---|---|
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silver | IL |
| Sodium | IL |
| Thallium | IL |
| Tin | IL |
| Vanadium | IL |
| Zinc | IL |
| **Method EPA 7196A Rev: 1** | |
| Chromium VI | IL |
| **Method EPA 7199 Rev: 0** | |
| Chromium VI | IL |
| **Method EPA 7470A Rev: 1** | |
| Mercury | IL |
| **Method EPA 8015B Rev: 2** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8015C** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8015D** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8081A Rev: 1** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Alachlor | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| alpha-Chlordane, cis-Chlordane | IL |
| Atrazine | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |
| Endosulfan II | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Endosulfan sulfate | IL |
| Endrin | IL |
| Endrin aldehyde | IL |
| Endrin ketone | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| gamma-Chlordane | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Isodrin | IL |
| Kepone | IL |
| Methoxychlor | IL |
| Simazine | IL |
| Toxaphene (Chlorinated camphene) | IL |
| **Method EPA 8081B** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Alachlor | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| alpha-Chlordane, cis-Chlordane | IL |
| Atrazine | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |
| Endosulfan II | IL |
| Endosulfan sulfate | IL |
| Endrin | IL |
| Endrin aldehyde | IL |
| Endrin ketone | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| gamma-Chlordane | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Isodrin | IL |
| Kepone | IL |
| Methoxychlor | IL |
| Simazine | IL |
| Toxaphene (Chlorinated camphene) | IL |
| **Method EPA 8082 Rev: 0** | |
| Aroclor-1016 (PCB-1016) | IL |
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |
| **Method EPA 8082A** | |
| Aroclor-1016 (PCB-1016) | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |
| **Method EPA 8151A** | |
| 2,4,5-T | IL |
| 2,4-D | IL |
| 2,4-DB | IL |
| Dalapon | IL |
| Dicamba | IL |
| Dichloroprop (Dichlorprop) | IL |
| Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP) | IL |
| Pentachlorophenol | IL |
| Picloram | IL |
| Silvex (2,4,5-TP) | IL |
| **Method EPA 8260B** | |
| 1,1,1,2-Tetrachloroethane | IL |
| 1,1,1-Trichloroethane | IL |
| 1,1,2,2-Tetrachloroethane | IL |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | IL |
| 1,1,2-Trichloroethane | IL |
| 1,1-Dichloroethane | IL |
| 1,1-Dichloroethylene | IL |
| 1,1-Dichloropropene | IL |
| 1,2,3-Trichlorobenzene | IL |
| 1,2,3-Trichloropropane | IL |
| 1,2,4-Trichlorobenzene | IL |
| 1,2,4-Trimethylbenzene | IL |
| 1,2-Dibromo-3-chloropropane (DBCP) | IL |
| 1,2-Dibromoethane (EDB, Ethylene dibromide) | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Dichloroethane (Ethylene dichloride) | IL |
| 1,2-Dichloropropane | IL |
| 1,3,5-Trichlorobenzene | IL |
| 1,3,5-Trimethylbenzene | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dichloropropane | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |
| 1-Chlorohexane | IL |
| 2,2-Dichloropropane | IL |
| 2-Butanone (Methyl ethyl ketone, MEK) | IL |
| 2-Chloroethyl vinyl ether | IL |
| 2-Chlorotoluene | IL |
| 2-Hexanone | IL |
| 2-Methylnaphthalene | IL |
| 2-Nitropropane | IL |
| 4-Chlorotoluene | IL |
| 4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene) | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| 4-Methyl-2-pentanone (MIBK) | IL |
| Acetone | IL |
| Acetonitrile | IL |
| Acrolein (Propenal) | IL |
| Acrylonitrile | IL |
| Allyl chloride (3-Chloropropene) | IL |
| Benzene | IL |
| Benzyl chloride | IL |
| Bromobenzene | IL |
| Bromochloromethane | IL |
| Bromodichloromethane | IL |
| Bromoform | IL |
| Carbon disulfide | IL |
| Carbon tetrachloride | IL |
| Chlorobenzene | IL |
| Chlorodibromomethane | IL |
| Chloroethane (Ethyl chloride) | IL |
| Chloroform | IL |
| Chloroprene (2-Chloro-1,3-butadiene) | IL |
| cis-1,2-Dichloroethylene | IL |
| cis-1,3-Dichloropropene | IL |
| Dibromomethane (Methylene bromide) | IL |
| Dichlorodifluoromethane (Freon-12) | IL |
| Diethyl ether | IL |
| Di-isopropylether (DIPE) (Isopropyl Ether) | IL |
| Ethanol | IL |
| Ethyl acetate | IL |
| Ethyl methacrylate | IL |
| Ethylbenzene | IL |
| Hexachlorobutadiene | IL |
| Iodomethane (Methyl iodide) | IL |
| Isobutyl alcohol (2-Methyl-1-propanol) | IL |
| Isopropyl alcohol (2-Propanol, Isopropanol) | IL |
| Isopropylbenzene | IL |
| m+p-xylene | IL |
| Methacrylonitrile | IL |
| Methyl bromide (Bromomethane) | IL |
| Methyl chloride (Chloromethane) | IL |
| Methyl methacrylate | IL |
| Methyl tert-butyl ether (MTBE) | IL |
| Methylene chloride (Dichloromethane) | IL |
| m-Xylene | IL |
| Naphthalene | IL |
| n-Butyl alcohol (1-Butanol, n-Butanol) | IL |
| n-Butylbenzene | IL |
| n-Propylbenzene | IL |
| o-Xylene | IL |
| Pentachloroethane | IL |
| Propionitrile (Ethyl cyanide) | IL |
| p-Xylene | IL |
| sec-Butylbenzene | IL |
| Styrene | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| tert-Butyl alcohol | IL |
| tert-Butylbenzene | IL |
| Tetrachloroethylene (Perchloroethylene) | IL |
| Tetrahydrofuran (THF) | IL |
| Toluene | IL |
| trans-1,2-Dichloroethylene | IL |
| trans-1,3-Dichloropropylene | IL |
| trans-1,4-Dichloro-2-butene | IL |
| Trichloroethene (Trichloroethylene) | IL |
| Trichlorofluoromethane (Fluorotrichloromethane, Freon 11) | IL |
| Vinyl acetate | IL |
| Vinyl chloride | IL |
| Xylene (total) | IL |

**Method EPA 8270C Rev: 3**

| | |
|---|---|
| 1,2,4,5-Tetrachlorobenzene | IL |
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Diphenylhydrazine | IL |
| 1,3,5-Trinitrobenzene (1,3,5-TNB) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dinitrobenzene (1,3-DNB) | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dinitrobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |
| 1,4-Naphthoquinone | IL |
| 1,4-Phenylenediamine | IL |
| 1-Chloronaphthalene | IL |
| 1-Methylnaphthalene | IL |
| 1-Naphthylamine | IL |
| 2,3,4,6-Tetrachlorophenol | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dichlorophenol | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Acetylaminofluorene | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Methylaniline (o-Toluidine) | IL |
| 2-Methylnaphthalene | IL |
| 2-Methylphenol (o-Cresol) | IL |
| 2-Naphthylamine | IL |
| 2-Nitroaniline | IL |
| 2-Nitrophenol | IL |
| 2-Picoline (2-Methylpyridine) | IL |
| 3,3'-Dichlorobenzidine | IL |
| 3,3'-Dimethylbenzidine | IL |
| 3-Methylcholanthrene | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| 3-Methylphenol (m-Cresol) | IL |
| 3-Nitroaniline | IL |
| 4-Aminobiphenyl | IL |
| 4-Bromophenyl phenyl ether | IL |
| 4-Chloro-3-methylphenol | IL |
| 4-Chloroaniline | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Dimethyl aminoazobenzene | IL |
| 4-Methylphenol (p-Cresol) | IL |
| 4-Nitroaniline | IL |
| 4-Nitrophenol | IL |
| 4-Nitroquinoline 1-oxide | IL |
| 5-Nitro-o-toluidine | IL |
| 7,12-Dimethylbenz(a) anthracene | IL |
| a-a-Dimethylphenethylamine | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Acetophenone | IL |
| Aniline | IL |
| Anthracene | IL |
| Aramite | IL |
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| Benzoic acid | IL |
| Benzyl alcohol | IL |
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Chloroisopropyl) ether, bis(2-Chloro-1-methylethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Carbazole | IL |
| Carbofuran (Furaden) | IL |
| Chlorobenzilate | IL |
| Chrysene | IL |
| Diallate | IL |
| Dibenz(a,h) anthracene | IL |
| Dibenz(a,j) acridine | IL |
| Dibenzofuran | IL |
| Diethyl phthalate | IL |
| Dimethoate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP) | IL |
| Diphenylamine | IL |
| Ethyl methanesulfonate | IL |
| Famphur | IL |
| Fluoranthene | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Fluorene | IL |
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Hexachlorophene | IL |
| Hexachloropropene | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isodrin | IL |
| Isophorone | IL |
| Isosafrole | IL |
| Kepone | IL |
| Methapyrilene | IL |
| Methyl methanesulfonate | IL |
| Methyl parathion (Parathion, methyl) | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodiethylamine | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitroso-di-n-butylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| n-Nitrosomethylethylamine | IL |
| n-Nitrosomorpholine | IL |
| n-Nitrosopiperidine | IL |
| n-Nitrosopyrrolidine | IL |
| o,o,o-Triethyl phosphorothioate | IL |
| Parathion | IL |
| Pentachlorobenzene | IL |
| Pentachloronitrobenzene | IL |
| Pentachlorophenol | IL |
| Phenacetin | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Phorate | IL |
| p-Phenylenediamine | IL |
| Pronamide (Kerb) | IL |
| Pyrene | IL |
| Pyridine | IL |
| Safrole | IL |
| Thionazin (Zinophos) | IL |

**Method EPA 8270D**

| | |
|---|---|
| 1,2,4,5-Tetrachlorobenzene | IL |
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Diphenylhydrazine | IL |
| 1,3,5-Trinitrobenzene (1,3,5-TNB) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dinitrobenzene (1,3-DNB) | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dinitrobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| 1,4-Naphthoquinone | IL |
| 1,4-Phenylenediamine | IL |
| 1-Chloronaphthalene | IL |
| 1-Methylnaphthalene | IL |
| 1-Naphthylamine | IL |
| 2,3,4,6-Tetrachlorophenol | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dichlorophenol | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Acetylaminofluorene | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Methylaniline (o-Toluidine) | IL |
| 2-Methylnaphthalene | IL |
| 2-Methylphenol (o-Cresol) | IL |
| 2-Naphthylamine | IL |
| 2-Nitroaniline | IL |
| 2-Nitrophenol | IL |
| 2-Picoline (2-Methylpyridine) | IL |
| 3,3'-Dichlorobenzidine | IL |
| 3,3'-Dimethylbenzidine | IL |
| 3-Methylcholanthrene | IL |
| 3-Methylphenol (m-Cresol) | IL |
| 3-Nitroaniline | IL |
| 4-Aminobiphenyl | IL |
| 4-Bromophenyl phenyl ether | IL |
| 4-Chloro-3-methylphenol | IL |
| 4-Chloroaniline | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Dimethyl aminoazobenzene | IL |
| 4-Methylphenol (p-Cresol) | IL |
| 4-Nitroaniline | IL |
| 4-Nitrophenol | IL |
| 4-Nitroquinoline 1-oxide | IL |
| 5-Nitro-o-toluidine | IL |
| 7,12-Dimethylbenz(a) anthracene | IL |
| a-a-Dimethylphenethylamine | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Acetophenone | IL |
| Aniline | IL |
| Anthracene | IL |
| Aramite | IL |
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| Benzoic acid | IL |
| Benzyl alcohol | IL |
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Chloroisopropyl) ether, bis(2-Chloro-1-methylethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Carbazole | IL |
| Carbofuran (Furaden) | IL |
| Chlorobenzilate | IL |
| Chrysene | IL |
| Diallate | IL |
| Dibenz(a,h) anthracene | IL |
| Dibenz(a,j) acridine | IL |
| Dibenzofuran | IL |
| Diethyl phthalate | IL |
| Dimethoate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP) | IL |
| Diphenylamine | IL |
| Ethyl methanesulfonate | IL |
| Famphur | IL |
| Fluoranthene | IL |
| Fluorene | IL |
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Hexachlorophene | IL |
| Hexachloropropene | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isodrin | IL |
| Isophorone | IL |
| Isosafrole | IL |
| Kepone | IL |
| Methapyrilene | IL |
| Methyl methanesulfonate | IL |
| Methyl parathion (Parathion, methyl) | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodiethylamine | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitroso-di-n-butylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| n-Nitrosomethylethylamine | IL |
| n-Nitrosomorpholine | IL |

**Field of Testing /Matrix:** ***RCRA (Non Potable Water)***

| | |
|---|---|
| n-Nitrosopiperidine | IL |
| n-Nitrosopyrrolidine | IL |
| o,o,o-Triethyl phosphorothioate | IL |
| Parathion | IL |
| Pentachlorobenzene | IL |
| Pentachloronitrobenzene | IL |
| Pentachlorophenol | IL |
| Phenacetin | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Phorate | IL |
| p-Phenylenediamine | IL |
| Pronamide (Kerb) | IL |
| Pyrene | IL |
| Pyridine | IL |
| Safrole | IL |
| Thionazin (Zinophos) | IL |
| **Method EPA 9012B** | |
| Cyanide | IL |
| **Method EPA 9034 Rev: 0** | |
| Sulfide | IL |
| **Method EPA 9038 Rev: 0** | |
| Sulfate | IL |
| **Method EPA 9040B Rev: 2** | |
| pH | IL |
| **Method EPA 9040C** | |
| pH | IL |
| **Method EPA 9050A Rev: 1** | |
| Conductivity | IL |
| **Method EPA 9056A** | |
| Bromide | IL |
| Chloride | IL |
| Fluoride | IL |
| Nitrate | IL |
| Nitrite | IL |
| Orthophosphate as P | IL |
| Sulfate | IL |
| **Method EPA 9060A** | |
| Total organic carbon | IL |
| **Method EPA 9066 Rev: 0** | |
| Total phenolics | IL |
| **Method EPA 9071B** | |
| non-Polar Extractable Material (TPH) | IL |
| **Method EPA 9095A** | |
| Paint Filter Test | IL |
| **Method EPA 9095B** | |
| Paint Filter Test | IL |
| **Method EPA 9251 Rev: 0** | |
| Chloride | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| **Method EPA 1311 Rev: 0** | |
| Toxicity Characteristic Leaching Procedure (TCLP) | IL |
| **Method EPA 1312 Rev: 0** | |
| Synthetic Precipitation Leaching Procedure (SPLP) | IL |
| **Method EPA 6010B Rev: 2** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| **Method EPA 6010C** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |
| Magnesium | IL |
| Manganese | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |

**Method EPA 6010D**

| | |
|---|---|
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Boron | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Cobalt | IL |
| Copper | IL |
| Iron | IL |
| Lead | IL |
| Lithium | IL |
| Magnesium | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Potassium | IL |
| Selenium | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Strontium | IL |
| Thallium | IL |
| Tin | IL |
| Titanium | IL |
| Vanadium | IL |
| Zinc | IL |
| Zirconium | IL |

**Method EPA 6020B**

| | |
|---|---|
| Strontium | IL |
| Titanium | IL |

**Method EPA 7196A Rev: 1**

| | |
|---|---|
| Chromium VI | IL |

**Method EPA 7471B**

| | |
|---|---|
| Mercury | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| **Method EPA 8015B Rev: 2** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8015C** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8015D** | |
| Diesel range organics (DRO) | IL |
| Gasoline range organics (GRO) | IL |
| **Method EPA 8081A Rev: 1** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Alachlor | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| alpha-Chlordane, cis-Chlordane | IL |
| Atrazine | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |
| Endosulfan II | IL |
| Endosulfan sulfate | IL |
| Endrin | IL |
| Endrin aldehyde | IL |
| Endrin ketone | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| gamma-Chlordane | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Isodrin | IL |
| Kepone | IL |
| Methoxychlor | IL |
| Simazine | IL |
| Toxaphene (Chlorinated camphene) | IL |
| **Method EPA 8081B** | |
| 4,4'-DDD | IL |
| 4,4'-DDE | IL |
| 4,4'-DDT | IL |
| Alachlor | IL |
| Aldrin | IL |
| alpha-BHC (alpha-Hexachlorocyclohexane) | IL |
| alpha-Chlordane, cis-Chlordane | IL |
| Atrazine | IL |
| beta-BHC (beta-Hexachlorocyclohexane) | IL |
| Chlordane (tech.)(N.O.S.) | IL |
| delta-BHC | IL |
| Dieldrin | IL |
| Endosulfan I | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| Endosulfan II | IL |
| Endosulfan sulfate | IL |
| Endrin | IL |
| Endrin aldehyde | IL |
| Endrin ketone | IL |
| gamma-BHC (Lindane, gamma-Hexachlorocyclohexane) | IL |
| gamma-Chlordane | IL |
| Heptachlor | IL |
| Heptachlor epoxide | IL |
| Isodrin | IL |
| Kepone | IL |
| Methoxychlor | IL |
| Simazine | IL |
| Toxaphene (Chlorinated camphene) | IL |

**Method EPA 8082 Rev: 0**

| | |
|---|---|
| Aroclor-1016 (PCB-1016) | IL |
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |

**Method EPA 8082A**

| | |
|---|---|
| Aroclor-1016 (PCB-1016) | IL |
| Aroclor-1221 (PCB-1221) | IL |
| Aroclor-1232 (PCB-1232) | IL |
| Aroclor-1242 (PCB-1242) | IL |
| Aroclor-1248 (PCB-1248) | IL |
| Aroclor-1254 (PCB-1254) | IL |
| Aroclor-1260 (PCB-1260) | IL |

**Method EPA 8151A**

| | |
|---|---|
| 2,4,5-T | IL |
| 2,4-D | IL |
| 2,4-DB | IL |
| Dalapon | IL |
| Dicamba | IL |
| Dichloroprop (Dichlorprop) | IL |
| Pentachlorophenol | IL |
| Picloram | IL |
| Silvex (2,4,5-TP) | IL |

**Method EPA 8260B**

| | |
|---|---|
| 1,1,1,2-Tetrachloroethane | IL |
| 1,1,1-Trichloroethane | IL |
| 1,1,2,2-Tetrachloroethane | IL |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | IL |
| 1,1,2-Trichloroethane | IL |
| 1,1-Dichloroethane | IL |
| 1,1-Dichloroethylene | IL |
| 1,1-Dichloropropene | IL |
| 1,2,3-Trichlorobenzene | IL |
| 1,2,3-Trichloropropane | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| 1,2,4-Trichlorobenzene | IL |
| 1,2,4-Trimethylbenzene | IL |
| 1,2-Dibromo-3-chloropropane (DBCP) | IL |
| 1,2-Dibromoethane (EDB, Ethylene dibromide) | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Dichloroethane (Ethylene dichloride) | IL |
| 1,2-Dichloropropane | IL |
| 1,3,5-Trichlorobenzene | IL |
| 1,3,5-Trimethylbenzene | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dichloropropane | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |
| 1-Chlorohexane | IL |
| 2,2-Dichloropropane | IL |
| 2-Butanone (Methyl ethyl ketone, MEK) | IL |
| 2-Chloroethyl vinyl ether | IL |
| 2-Chlorotoluene | IL |
| 2-Hexanone | IL |
| 2-Methylnaphthalene | IL |
| 2-Nitropropane | IL |
| 4-Chlorotoluene | IL |
| 4-Isopropyltoluene (p-Cymene,p-Isopropyltoluene) | IL |
| 4-Methyl-2-pentanone (MIBK) | IL |
| Acetone | IL |
| Acetonitrile | IL |
| Acrolein (Propenal) | IL |
| Acrylonitrile | IL |
| Allyl chloride (3-Chloropropene) | IL |
| Benzene | IL |
| Benzyl chloride | IL |
| Bromobenzene | IL |
| Bromochloromethane | IL |
| Bromodichloromethane | IL |
| Bromoform | IL |
| Carbon disulfide | IL |
| Carbon tetrachloride | IL |
| Chlorobenzene | IL |
| Chlorodibromomethane | IL |
| Chloroethane (Ethyl chloride) | IL |
| Chloroform | IL |
| Chloroprene (2-Chloro-1,3-butadiene) | IL |
| cis-1,2-Dichloroethylene | IL |
| cis-1,3-Dichloropropene | IL |
| Dibromomethane (Methylene bromide) | IL |
| Dichlorodifluoromethane (Freon-12) | IL |
| Diethyl ether | IL |
| Di-isopropylether (DIPE) (Isopropyl Ether) | IL |
| Ethanol | IL |
| Ethyl acetate | IL |
| Ethyl methacrylate | IL |
| Ethylbenzene | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| Hexachlorobutadiene | IL |
| Iodomethane (Methyl iodide) | IL |
| Isobutyl alcohol (2-Methyl-1-propanol) | IL |
| Isopropyl alcohol (2-Propanol, Isopropanol) | IL |
| Isopropylbenzene | IL |
| m+p-xylene | IL |
| Methacrylonitrile | IL |
| Methyl bromide (Bromomethane) | IL |
| Methyl chloride (Chloromethane) | IL |
| Methyl methacrylate | IL |
| Methyl tert-butyl ether (MTBE) | IL |
| Methylene chloride (Dichloromethane) | IL |
| m-Xylene | IL |
| Naphthalene | IL |
| n-Butyl alcohol (1-Butanol, n-Butanol) | IL |
| n-Butylbenzene | IL |
| n-Propylbenzene | IL |
| o-Xylene | IL |
| Pentachloroethane | IL |
| Propionitrile (Ethyl cyanide) | IL |
| p-Xylene | IL |
| sec-Butylbenzene | IL |
| Styrene | IL |
| tert-Butyl alcohol | IL |
| tert-Butylbenzene | IL |
| Tetrachloroethylene (Perchloroethylene) | IL |
| Tetrahydrofuran (THF) | IL |
| Toluene | IL |
| trans-1,2-Dichloroethylene | IL |
| trans-1,3-Dichloropropylene | IL |
| trans-1,4-Dichloro-2-butene | IL |
| Trichloroethene (Trichloroethylene) | IL |
| Trichlorofluoromethane (Fluorotrichloromethane, Freon 11) | IL |
| Vinyl acetate | IL |
| Vinyl chloride | IL |
| Xylene (total) | IL |

**Method EPA 8270C Rev: 3**

| | |
|---|---|
| 1,2,4,5-Tetrachlorobenzene | IL |
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Diphenylhydrazine | IL |
| 1,3,5-Trinitrobenzene (1,3,5-TNB) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dinitrobenzene (1,3-DNB) | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dinitrobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |
| 1,4-Naphthoquinone | IL |
| 1,4-Phenylenediamine | IL |
| 1-Chloronaphthalene | IL |
| 1-Methylnaphthalene | IL |
| 1-Naphthylamine | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| 2,3,4,6-Tetrachlorophenol | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dichlorophenol | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Acetylaminofluorene | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Methylaniline (o-Toluidine) | IL |
| 2-Methylnaphthalene | IL |
| 2-Methylphenol (o-Cresol) | IL |
| 2-Naphthylamine | IL |
| 2-Nitroaniline | IL |
| 2-Nitrophenol | IL |
| 2-Picoline (2-Methylpyridine) | IL |
| 3,3'-Dichlorobenzidine | IL |
| 3,3'-Dimethylbenzidine | IL |
| 3-Methylcholanthrene | IL |
| 3-Methylphenol (m-Cresol) | IL |
| 3-Nitroaniline | IL |
| 4-Aminobiphenyl | IL |
| 4-Bromophenyl phenyl ether | IL |
| 4-Chloro-3-methylphenol | IL |
| 4-Chloroaniline | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Dimethyl aminoazobenzene | IL |
| 4-Methylphenol (p-Cresol) | IL |
| 4-Nitroaniline | IL |
| 4-Nitrophenol | IL |
| 4-Nitroquinoline 1-oxide | IL |
| 5-Nitro-o-toluidine | IL |
| 7,12-Dimethylbenz(a) anthracene | IL |
| a-a-Dimethylphenethylamine | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Acetophenone | IL |
| Aniline | IL |
| Anthracene | IL |
| Aramite | IL |
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| Benzoic acid | IL |
| Benzyl alcohol | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Chloroisopropyl) ether, bis(2-Chloro-1-methylethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Carbazole | IL |
| Carbofuran (Furaden) | IL |
| Chlorobenzilate | IL |
| Chrysene | IL |
| Diallate | IL |
| Dibenz(a,h) anthracene | IL |
| Dibenz(a,j) acridine | IL |
| Dibenzofuran | IL |
| Diethyl phthalate | IL |
| Dimethoate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP) | IL |
| Diphenylamine | IL |
| Ethyl methanesulfonate | IL |
| Famphur | IL |
| Fluoranthene | IL |
| Fluorene | IL |
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Hexachlorophene | IL |
| Hexachloropropene | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isodrin | IL |
| Isophorone | IL |
| Isosafrole | IL |
| Kepone | IL |
| Methapyrilene | IL |
| Methyl methanesulfonate | IL |
| Methyl parathion (Parathion, methyl) | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodiethylamine | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitroso-di-n-butylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| n-Nitrosomethylethylamine | IL |
| n-Nitrosomorpholine | IL |
| n-Nitrosopiperidine | IL |
| n-Nitrosopyrrolidine | IL |
| o,o,o-Triethyl phosphorothioate | IL |
| Parathion | IL |
| Pentachlorobenzene | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| Pentachloronitrobenzene | IL |
| Pentachlorophenol | IL |
| Phenacetin | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Phorate | IL |
| p-Phenylenediamine | IL |
| Pronamide (Kerb) | IL |
| Pyrene | IL |
| Pyridine | IL |
| Safrole | IL |
| Thionazin (Zinophos) | IL |

**Method EPA 8270D**

| | |
|---|---|
| 1,2,4,5-Tetrachlorobenzene | IL |
| 1,2,4-Trichlorobenzene | IL |
| 1,2-Dichlorobenzene (o-Dichlorobenzene) | IL |
| 1,2-Diphenylhydrazine | IL |
| 1,3,5-Trinitrobenzene (1,3,5-TNB) | IL |
| 1,3-Dichlorobenzene | IL |
| 1,3-Dinitrobenzene (1,3-DNB) | IL |
| 1,4-Dichlorobenzene | IL |
| 1,4-Dinitrobenzene | IL |
| 1,4-Dioxane (1,4- Diethyleneoxide) | IL |
| 1,4-Naphthoquinone | IL |
| 1,4-Phenylenediamine | IL |
| 1-Chloronaphthalene | IL |
| 1-Methylnaphthalene | IL |
| 1-Naphthylamine | IL |
| 2,3,4,6-Tetrachlorophenol | IL |
| 2,4,5-Trichlorophenol | IL |
| 2,4,6-Trichlorophenol | IL |
| 2,4-Dichlorophenol | IL |
| 2,4-Dimethylphenol | IL |
| 2,4-Dinitrophenol | IL |
| 2,4-Dinitrotoluene (2,4-DNT) | IL |
| 2,6-Dichlorophenol | IL |
| 2,6-Dinitrotoluene (2,6-DNT) | IL |
| 2-Acetylaminofluorene | IL |
| 2-Chloronaphthalene | IL |
| 2-Chlorophenol | IL |
| 2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol) | IL |
| 2-Methylaniline (o-Toluidine) | IL |
| 2-Methylnaphthalene | IL |
| 2-Methylphenol (o-Cresol) | IL |
| 2-Naphthylamine | IL |
| 2-Nitroaniline | IL |
| 2-Nitrophenol | IL |
| 2-Picoline (2-Methylpyridine) | IL |
| 3,3'-Dichlorobenzidine | IL |
| 3,3'-Dimethylbenzidine | IL |
| 3-Methylcholanthrene | IL |
| 3-Methylphenol (m-Cresol) | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| 3-Nitroaniline | IL |
| 4-Aminobiphenyl | IL |
| 4-Bromophenyl phenyl ether | IL |
| 4-Chloro-3-methylphenol | IL |
| 4-Chloroaniline | IL |
| 4-Chlorophenyl phenylether | IL |
| 4-Dimethyl aminoazobenzene | IL |
| 4-Methylphenol (p-Cresol) | IL |
| 4-Nitroaniline | IL |
| 4-Nitrophenol | IL |
| 4-Nitroquinoline 1-oxide | IL |
| 5-Nitro-o-toluidine | IL |
| 7,12-Dimethylbenz(a) anthracene | IL |
| a-a-Dimethylphenethylamine | IL |
| Acenaphthene | IL |
| Acenaphthylene | IL |
| Acetophenone | IL |
| Aniline | IL |
| Anthracene | IL |
| Aramite | IL |
| Benzidine | IL |
| Benzo(a)anthracene | IL |
| Benzo(a)pyrene | IL |
| Benzo(b)fluoranthene | IL |
| Benzo(g,h,i)perylene | IL |
| Benzo(k)fluoranthene | IL |
| Benzoic acid | IL |
| Benzyl alcohol | IL |
| bis(2-Chloroethoxy)methane | IL |
| bis(2-Chloroethyl) ether | IL |
| bis(2-Chloroisopropyl) ether, bis(2-Chloro-1-methylethyl) ether | IL |
| bis(2-Ethylhexyl) phthalate (DEHP) | IL |
| Butyl benzyl phthalate | IL |
| Carbazole | IL |
| Carbofuran (Furaden) | IL |
| Chlorobenzilate | IL |
| Chrysene | IL |
| Diallate | IL |
| Dibenz(a,h) anthracene | IL |
| Dibenz(a,j) acridine | IL |
| Dibenzofuran | IL |
| Diethyl phthalate | IL |
| Dimethoate | IL |
| Dimethyl phthalate | IL |
| Di-n-butyl phthalate | IL |
| Di-n-octyl phthalate | IL |
| Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP) | IL |
| Diphenylamine | IL |
| Ethyl methanesulfonate | IL |
| Famphur | IL |
| Fluoranthene | IL |
| Fluorene | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| Hexachlorobenzene | IL |
| Hexachlorobutadiene | IL |
| Hexachlorocyclopentadiene | IL |
| Hexachloroethane | IL |
| Hexachlorophene | IL |
| Hexachloropropene | IL |
| Indeno(1,2,3-cd) pyrene | IL |
| Isodrin | IL |
| Isophorone | IL |
| Isosafrole | IL |
| Kepone | IL |
| Methapyrilene | IL |
| Methyl methanesulfonate | IL |
| Methyl parathion (Parathion, methyl) | IL |
| Naphthalene | IL |
| Nitrobenzene | IL |
| n-Nitrosodiethylamine | IL |
| n-Nitrosodimethylamine | IL |
| n-Nitroso-di-n-butylamine | IL |
| n-Nitrosodi-n-propylamine | IL |
| n-Nitrosodiphenylamine | IL |
| n-Nitrosomethylethylamine | IL |
| n-Nitrosomorpholine | IL |
| n-Nitrosopiperidine | IL |
| n-Nitrosopyrrolidine | IL |
| o,o,o-Triethyl phosphorothioate | IL |
| Parathion | IL |
| Pentachlorobenzene | IL |
| Pentachloronitrobenzene | IL |
| Pentachlorophenol | IL |
| Phenacetin | IL |
| Phenanthrene | IL |
| Phenol | IL |
| Phorate | IL |
| p-Phenylenediamine | IL |
| Pronamide (Kerb) | IL |
| Pyrene | IL |
| Pyridine | IL |
| Safrole | IL |
| Thionazin (Zinophos) | IL |
| **Method EPA 9012B** | |
| Cyanide | IL |
| **Method EPA 9034 Rev: 0** | |
| Sulfide | IL |
| **Method EPA 9045C Rev: 3** | |
| pH | IL |
| **Method EPA 9045D** | |
| pH | IL |
| **Method EPA 9050A Rev: 1** | |
| Conductivity | IL |

**Field of Testing /Matrix:** ***RCRA (Solid & Hazardous Material)***

| | |
|---|---|
| **Method EPA 9056A** | |
| Bromide | IL |
| Chloride | IL |
| Fluoride | IL |
| Nitrate | IL |
| Nitrite | IL |
| Orthophosphate as P | IL |
| Sulfate | IL |
| **Method EPA 9060A** | |
| Total organic carbon | IL |
| **Method EPA 9066 Rev: 0** | |
| Total phenolics | IL |
| **Method EPA 9071B** | |
| non-Polar Extractable Material (TPH) | IL |
| **Method EPA 9095A** | |
| Paint Filter Test | IL |
| **Method EPA 9095B** | |
| Paint Filter Test | IL |
| **Method EPA 9251 Rev: 0** | |
| Chloride | IL |

**Field of Testing /Matrix:** ***SDWA (Potable Water)***

| | |
|---|---|
| **Method EPA 180.1** | |
| Turbidity | IL |
| **Method EPA 200.7 Rev: 4.4** | |
| Aluminum | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Cadmium | IL |
| Calcium | IL |
| Chromium | IL |
| Copper | IL |
| Iron | IL |
| Magnesium | IL |
| Manganese | IL |
| Nickel | IL |
| Silica as SiO2 | IL |
| Silver | IL |
| Sodium | IL |
| Zinc | IL |
| **Method EPA 200.8 Rev: 5.4** | |
| Aluminum | IL |
| Antimony | IL |
| Arsenic | IL |
| Barium | IL |
| Beryllium | IL |
| Cadmium | IL |
| Chromium | IL |
| Copper | IL |
| Lead | IL |
| Manganese | IL |
| Molybdenum | IL |
| Nickel | IL |
| Selenium | IL |
| Silver | IL |
| Thallium | IL |
| Zinc | IL |
| **Method EPA 245.1 Rev: 3** | |
| Mercury | IL |
| **Method EPA 300.0 Rev: 2.1** | |
| Chloride | IL |
| Fluoride | IL |
| Nitrate | IL |
| Nitrite | IL |
| Orthophosphate as P | IL |
| Sulfate | IL |
| **Method EPA 335.4 Rev: 1** | |
| Cyanide | IL |
| **Method EPA 353.2 Rev: 2** | |
| Nitrate | IL |
| Nitrate plus Nitrite as N | IL |

**Field of Testing /Matrix:** ***SDWA (Potable Water)***

| | |
|---|---|
| **Method SM 2320 B-1997 Rev: 20th ED** | |
| Alkalinity as CaCO3 | IL |
| **Method SM 2340 B-1997 Rev: 20th ED** | |
| Hardness | IL |
| **Method SM 2510 B-1997 Rev: 20th ED** | |
| Conductivity | IL |
| **Method SM 2540 C-1997 Rev: 20th ED** | |
| Total dissolved solids | IL |
| **Method SM 4500-Cl F-1993 Rev: 20th ED** | |
| Chlorine | IL |
| **Method SM 4500-$CN^-$ E-1997 Rev: 20th ED** | |
| Cyanide | IL |
| **Method SM 4500-$F^-$ C-1997 Rev: 21st ED** | |
| Fluoride | IL |
| **Method SM 4500-H+ B-1996 Rev: 20th ED** | |
| pH | IL |
| **Method SM 4500-$NO2^-$ B-1993 Rev: 20th ED** | |
| Nitrite | IL |
| **Method SM 4500-$NO3^-$ F-1997 Rev: 20th ED** | |
| Nitrate | IL |
| **Method SM 4500-P E-1997 Rev: 20th ED** | |
| Orthophosphate as P | IL |
| **Method SM 4500-$SO4^-$ E-1997 Rev: 20th ED** | |
| Sulfate | IL |
| **Method SM 5310 C Rev: 20th ED** | |
| Dissolved organic carbon (DOC) | IL |
| Total organic carbon | IL |

**End of Scope of Accreditation**

# APPENDIX C: Boring Logs

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| **PROJECT NAME:** | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | **BORING I.D.:** | CS-101221-01 |
| **PROJECT LOCATION:** | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | **DATE(S) DRILLED:** | October 12th, 2021 |
| | | **DRILLING COMPANY:** | ESP Drilling |
| **PROJECT NUMBER:** | 2021_0520 | **DRILL METHOD:** | 6620 DT/GP |
| | | **BORING DIAMETER:** | Two (2) Inches |
| **SAMPLES COLLECTED FROM BORING:** | Soil: CS-101221-01 for BTEX / MTBE | **SAMPLING METHOD/INTERVAL:** | MC/Five (5) foot |
| | | **WELL DIAMETER/MATERIAL:** | N/A |
| **FIELD LOGGED BY:** | Colleen Stull | **TOTAL DEPTH:** | Ten (10) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 5/5 | 0.0 | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sond backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 3/5 | | 6.0 | | CLAY - Light brown clay, moist, dense |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |
| | | | 11.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-02 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Fifteen (15) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 4/5 | | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sand, poorly graded backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 4/5 | | 6.0 | | |
| | | | 7.0 | | FILL - Sand, poorly graded backfill |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |
| 10-15 | 3/5 | 3.9 | 11.0 | | |
| | | | 12.0 | | |
| | | | 13.0 | | CLAY - Light brown to gray clay, moist, dense |
| | | | 14.0 | | |
| | | | 15.0 | | |

**Petroleum odors were noted**

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-03 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Ten (10) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 5/5 | 0.0 | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 3/5 | | 6.0 | | |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-04 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Ten (10) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 3/5 | | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 2/5 | 0.0 | 6.0 | | |
| | | | 7.0 | | |
| | | | 8.0 | | FILL - Sand backfill / CLAY - Medium brown clay, dry, dense |
| | | | 9.0 | | |
| | | | 10.0 | | |

# SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-05 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Ten (10) Foot |

A3E ENVIRONMENTAL

## DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 4/5 | 25.6 | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 3/5 | | 6.0 | | |
| | | | 7.0 | | |
| | | | 8.0 | | CLAY - Medium brown clay, dry, dense |
| | | | 9.0 | | |
| | | | 10.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| **PROJECT NAME:** | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | **BORING I.D.:** | CS-101221-06 |
| **PROJECT LOCATION:** | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | **DATE(S) DRILLED:** | October 12th, 2021 |
| | | **DRILLING COMPANY:** | ESP Drilling |
| **PROJECT NUMBER:** | 2021_0520 | **DRILL METHOD:** | 6620 DT/GP |
| | | **BORING DIAMETER:** | Two (2) Inches |
| **SAMPLES COLLECTED FROM BORING:** | Soil: CS-101221-01 for BTEX / MTBE | **SAMPLING METHOD/INTERVAL:** | MC/Five (5) foot |
| | | **WELL DIAMETER/MATERIAL:** | N/A |
| **FIELD LOGGED BY:** | Colleen Stull | **TOTAL DEPTH:** | Fifteen (15) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| | | | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| 0-5 | 2/5 | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 2/5 | 0.0 | 6.0 | | FILL - Sand backfill / CLAY - Medium brown clay, dry, dense |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-07 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Ten (10) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| 0-5 | 3/5 | 0.0 | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| | | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 2/5 | | 6.0 | | CLAY - Medium brown clay, wet, dense |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-08 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Ten (10) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| | | | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| 0-5 | 5/5 | 0.0 | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 3/5 | | 6.0 | | CLAY - Light brown clay, dry, dense |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | |

## SUBSURFACE SOIL BORING LOG

| | | | |
|---|---|---|---|
| PROJECT NAME: | 2021_0520 LUST_PleviakSchool_LakeVilla, IL | BORING I.D.: | CS-101221-09 |
| PROJECT LOCATION: | 108 North Milwaukee AVE, Lake Villa, IL, 60046 | DATE(S) DRILLED: | October 12th, 2021 |
| | | DRILLING COMPANY: | ESP Drilling |
| PROJECT NUMBER: | 2021_0520 | DRILL METHOD: | 6620 DT/GP |
| | | BORING DIAMETER: | Two (2) Inches |
| SAMPLES COLLECTED FROM BORING: | Soil: CS-101221-01 for BTEX / MTBE | SAMPLING METHOD/INTERVAL: | MC/Five (5) foot |
| | | WELL DIAMETER/MATERIAL: | N/A |
| FIELD LOGGED BY: | Colleen Stull | TOTAL DEPTH: | Fifteen (15) Foot |

A3E ENVIRONMENTAL

### DESCRIPTIVE LOG

| SAMPLE INTERVAL (FT BGS) | RECOVERY FT/FT | PID/FID (ppm) | DEPTH (FT) | Graphic Log | DESCRIPTION OF MATERIAL |
|---|---|---|---|---|---|
| | | | 0.0 | | TOPSOIL - 6 inches thich, moist loose and dark brown. |
| 0-5 | 3/5 | | 1.0 | | FILL - Sand backfill |
| | | | 2.0 | | |
| | | | 3.0 | | |
| | | | 4.0 | | |
| | | | 5.0 | | |
| 5-10 | 3/5 | 0.0 | 6.0 | | |
| | | | 7.0 | | |
| | | | 8.0 | | |
| | | | 9.0 | | |
| | | | 10.0 | | CLAY - Medium brown clay, moist, dense |
| 10-15 | 3/5 | 0.0 | 11.0 | | |
| | | | 12.0 | | |
| | | | 13.0 | | |
| | | | 14.0 | | |
| | | | 15.0 | | |

**DRILLING METHODS**

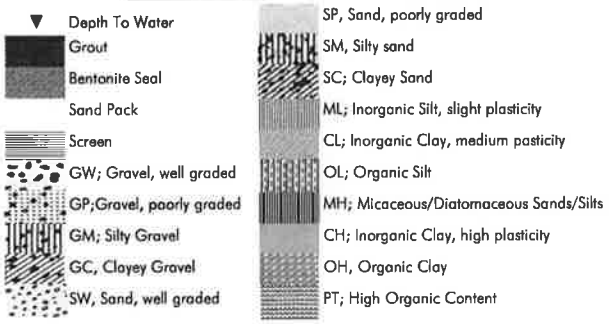
AIR - Air Rotary
CFA - Continuous Flight Auger
DC - Driven Casing
HA - Hand Auger
HSA - Hollow Stem Auger
MD - Mud Drilling
RC - Rock Coring
WR - Water Rotary
DP - Direct Push

**SAMPLING METHODS**

GP-Geoprobe
SS - Split Spoon
DT - Dual Tube
MC - Macro Core

NA = Not Applicable
EOB = End of Boring

**GRAPHIC COLUMN**



# APPENDIX D: Property Owner Summary Form

# Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 - 57.19). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false, fictitious, or fraudulent material statement or representation, orally or in writing, to the Agency, or to a unit of local government to which the Agency has delegated authority under subsection (r) of Section 4 of this Act, related to or required by this Act, a regulation adopted under this Act, any federal law or regulation for which the Agency has responsibility, or any permit, term, or condition thereof, commits a Class 4 felony, and each such statement or writing shall be considered a separate Class 4 felony. A person who, after being convicted under paragraph 415 ILCS 5/44 (h)(8), violates paragraph 415 ILCS 5/44 (h)(8) a second or subsequent time, commits a Class 3 felony. (415 ILCS 5/44). This form has been approved by the Forms Management Center.

## Leaking Underground Storage Tank Program
## Property Owner Summary

### A. Site Identification

IEMA Incident # (6- or 8-digit): 20090562 IEPA LPC# (10-digit): 0970845009

Site Name: Lake Villa School District #41

Site Address (not a P.O. Box): 108 North Route 43

City: Lake Villa County: Lake Zip Code: 60046

Leaking UST Technical File

Engineered barriers, institutional controls, and other use restrictions, if any, proposed for this site may not be implemented without approval by the title holder(s) of record for the above-named property or the agent(s) of such person(s). These controls and restrictions will be identified in the No Further Remediation (NFR) Letter, which must be recorded in the chain of title for the property. Failure to maintain these controls is grounds for voidance of the NFR Letter.

### B. Preventive, Engineering, and Institutional Controls and Land Use Limitations

The following controls and restrictions are proposed for the above-named site:

- ☐ Industrial/commercial land use limitation;
- ☑ On-site groundwater restriction prohibiting the use of groundwater beneath the site as a potable water supply;
- ☑ An engineered barrier: ☐ Building, ☑ asphalt/concrete, or ☐ Other:
  (*description*) _____
- ☐ Concrete Base with no Sumps;
- ☑ Building Control Technology: ☐ Existing ☑ Future
- ☐ Groundwater ordinance: ☐ With a MOU; ☐ Without a MOU;
- ☐ Construction worker caution notification;
- ☐ Maintain a clean soil barrier (indoor inhalation):
- ☑ Other: Highway Authority Agreement
- ☐ None (There are no proposed institutional controls other than the NFR Letter.).

## C. Property Ownership Declaration

Report Title: Corrective Action Plan - 108 North Route 83, Lake Villa, Illinois

Report Date: July 01 2022

I hereby affirm that I have reviewed the attached report entitled *Corrective Action Plan - 108 North Route 83, Lake Villa, Illinois* and dated June 30, 2022, and that I accept the terms and conditions set forth therein, including any land use limitations, that apply to property I own. I further affirm that I have no objection to the recording of a No Further Remediation Letter containing the terms and conditions identified in the report upon the property I own.

Name of Property Owner: Lake Villa School District #41

Name of Officer or Agent: Anna Kasprzyk

Mailing Address: 131 MicKinley Avenue

City: Lake Villa

State: Illinois

Zip Code: 60046

E-mail:

Signature: Anna Kasprzyk

Date: 7/1/2022

## D. Site Description

Real Estate Tax/Parcel Index Number:

0233306035

**Legal Description of Site** (must be provided on a separate sheet):

# APPENDIX E: SWAP Search Documentation

# ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well | Top | Bottom |
|---|---|---|
| yellow clay | 0 | 21 |
| b clay & gravel | 21 | 81 |
| b clay | 81 | 119 |
| sand | 119 | 129 |
| **Total Depth** | | 129 |

Casing: 4" GALV 11#/FT from 0' to 124'

Screen: 6' of 3" diameter .009999999776482582 slot

Grout: B CLAY from 0 to 16.

Size hole below casing: 3"

Water from sand at 124' to 129'.
Static level 99' below casing top which is 1' above GL
Pumping level 107' when pumping at 10 gpm for 3 hours

Permanent pump installed at 110'
on September 26, 1981, with a capacity of 10 gpm

Owner Address: 38925 N. Park Ave. Lake Villa, IL
Add'l loc. info: Lot: 2 Subdivision: Fowler's

Location source: Tax record verified

**Permit Date:** September 9, 1981 **Permit #:** 101263

**COMPANY** Madsen, Charles E.
**FARM** Muller, Franz
**DATE DRILLED** September 25, 1981 **NO.**
**ELEVATION** 786 **COUNTY NO.** 33582
**LOCATION** 100'S line, 1200'W line of NW SW
**LATITUDE** 42.417651 **LONGITUDE** -88.075994
**COUNTY** Lake **API** 120973358200 **33 - 46N - 10E**